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HOW TO BUILD SMALL MODEL RAILROADS

WINTER 2014

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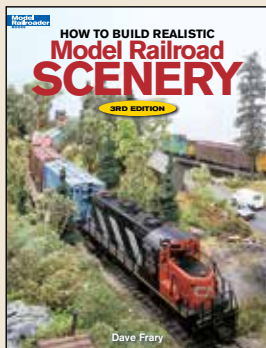
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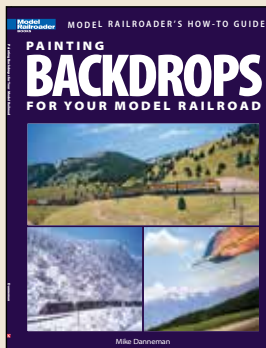


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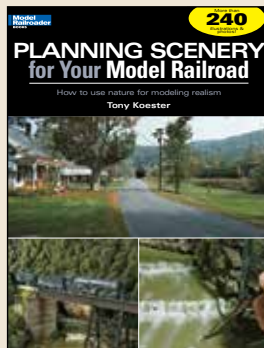
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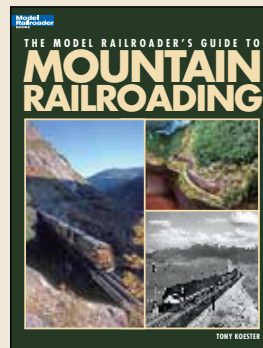
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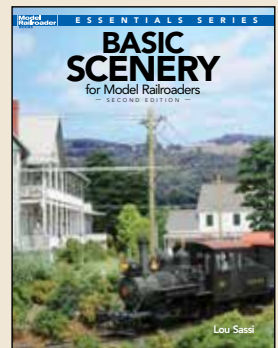
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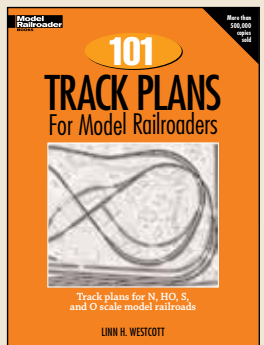
TRACK PLANNING



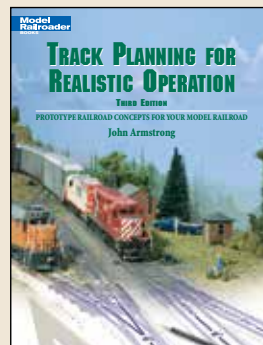
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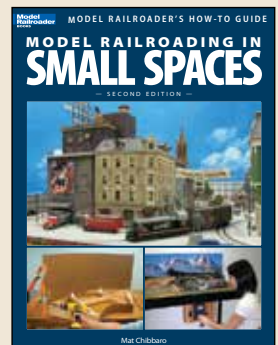
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ON THE COVER: Going small sometimes means constructing only part of a layout. This photo was taken on a module. See page 53. Photo by Peter Nesbitt



PLAN BIG BUILD SMALL



THE FAMOUS ARCHITECT and urban planner Daniel Burnham once said, "Make no little plans; they have no magic to stir men's blood and probably will themselves not be realized." Taking at face value the advice of the man who was influential in U.S. city planning and architecture, model railroaders should design nothing but massive layouts.

Indeed, some have. We've all seen the larger, iconic layouts of the hobby. These beautiful, well-crafted projects have taken years to complete, and are monuments to both enjoyment and perseverance. But let's face it, most of us will never build layouts that big, if we build a "big" layout at all.

The truth of the matter is, the vast majority of layouts built by model railroaders fall into the "small" category. Another fact is many of the folks who built those large layouts have downsized into something more manageable.

The great thing about model railroad layouts is, smaller doesn't equal less fun. In fact, the challenges one faces in making a compact layout seem bigger than it actually is are enjoyable in their own right. In addition, depending on how it's planned and built, a smaller railroad can be a building block for a larger railroad.

This special issue is designed to spark your imagination to make those big plans for your small railroad. The ideas

here are useful if you're in the planning stages of building a model railroad, or if you already have one and you're looking to give it a little more character.

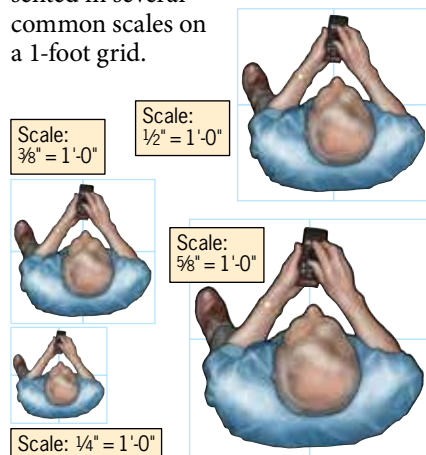
Burnham's original quote frequently is used without his follow-up thought: "Make big plans; aim high in hope and work, remembering that a noble, logical diagram once recorded will not die."

To that end, read this publication, put together a grand plan, and get busy building your small model railroad, or making the one you have better.

Daniel Burnham

KNOW PLAN SIZES AT A GLANCE

WHEREVER POSSIBLE in this book, we've included two key features to give an at-a-glance idea of just how big a track plan is. First, each plan is set on a grid, so regardless of the scale of the drawing, you get an idea of proportion. Second, the people we've placed around the plans are in scale with them, giving a fast way to identify the size of a layout. Below is an example, with the same person represented in several common scales on a 1-foot grid.

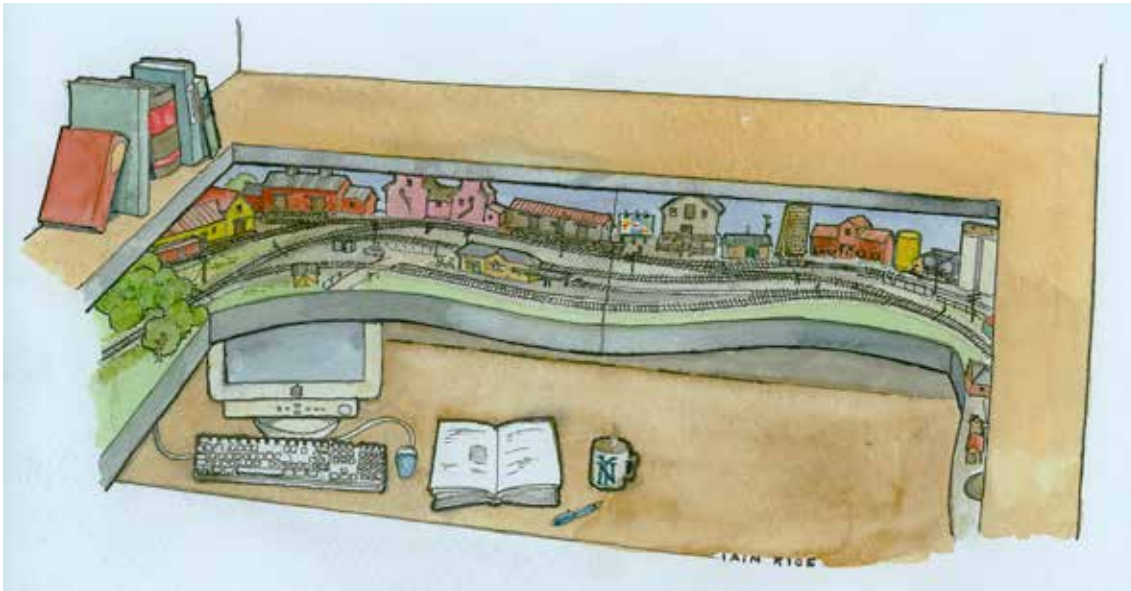


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SMALL LAYOUT PLANNING IDEAS



Iain Rice offers tips on designing a shelf layout (above) starting on page 26. He also shares design tips. John Allen's Gorre & Daphetid is mined for ideas, and two other authors build layouts in phases.

A layout doesn't need the wide-open spaces of a giant basement

BY ERIC WHITE

SO, YOU WANT TO BUILD a model railroad. Well, you're going to need a plan.

What will you model, what scale, what era, how big will it be, and where are you going to put it?

These are all things to consider when you decide you want a layout, and the following articles will help you come up with some of the answers. All of them extol the virtues of a small layout, either out of necessity or just for their own sakes.

Iain Rice offers eight tips for planning a small layout in the first story, then comes back on page 26 with more information about designing and building a layout on a shelf, whether that shelf is on just one wall of a room, or all the way around.

On page 18, "Learning from John Allen's original Gorre & Daphetid" looks at the ideas of one of model railroading's founding fathers. Although John's final layout eventually grew to fill his basement, it started

with a model railroad that didn't even take up a full 4 x 8 sheet of plywood. Even after the Gorre & Daphetid had grown, John was still sketching plans for compact layouts with a focus on operation.

Also in this section are two stories about building a layout in phases, but they each take their own direction. The first, on page 14, looks at building a 4 x 8 layout and expanding it to eventually fill the basement. Later, on page 22, another builder describes how he planned his layout using David Barrow's domino concept. He started with six dominoes arranged in an oval that could eventually be rearranged and spread out to fill the author's basement, or another space if he moves before completing the whole concept.

Finally, on pages 31 and 32, there are some ideas for leaving room for things in addition to track.

So, whatever your situation, there's probably a solution that will allow you to get some trains running. **SMR**



Author Iain Rice knows all about planning and building a layouts in a tight spaces. His Proto:87 HO scale 2 x 8-foot Roque Bluffs was one of the smaller *Model Railroader* project layouts.

8 DESIGN TIPS FOR SMALL LAYOUTS

Planning an effective model railroad in a small space

BY IAIN RICE • PHOTOS AND ILLUSTRATIONS BY THE AUTHOR

DESIGNING A MODEL RAILROAD

is a balance between what you want to model and what you have space to model. The smaller the railroad, the more apparent this balancing act becomes. I've designed many small lay-

outs, and in this article I'll outline some of the space-saving strategies that I've learned. As with any layout design project, careful planning is crucial, especially when you need to maximize every square inch of space.

MORE PLANS FROM IAIN RICE

Iain's Roque Bluffs series is available online for download. Click the "Shop" link at www.ModelRailroader.com.

1 CHOOSE A PROTOTYPE THAT FITS

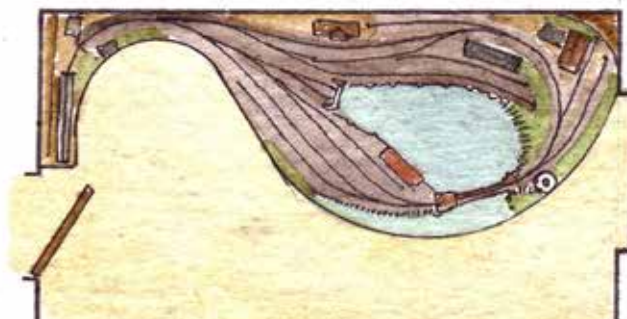
THE FIRST TWO QUESTIONS you have to ask yourself when designing a model railroad are: "What scale am I going to use?" and "What am I going to model?" It's worth thinking about which combinations of scale and subject will fit best with the space you have available. The same space might suit modern-era mainline railroading in N, a transition-era secondary line in HO, or a backwoods branch line in On2½, also called On30.

On a small layout, shorter locomotives and rolling stock both look and operate better. For example, 40-foot boxcars and first-generation four-axle diesels look and run better on the tight curves and sharp turnouts of a small layout than multi-unit intermodal cars and six-axle

SD70s. I took this approach with my Roque Bluffs HO scale Proto:87 layout shown in the photo on the facing page and also on page 12. [See the October through December 2003 and January through May 2004 issues of *Model Railroader*. – Ed.] Industrial, mining, and logging lines feature short equipment and are good layout themes when space is limited.

If you're downsizing from a larger layout and don't want to part with your six-axle diesels or articulated steamers, you could model part of an engine terminal. However, you may find it more liberating to retire your big locomotives to the showcase or swap meet table and make a fresh start with a new smaller layout.

2 THINK OUTSIDE THE BOX



Don't limit yourself to around-the-walls or tabletop layout footprints. Other layout footprints, such as those on the right, will fit in the same size room and allow more space for track and scenery.

THE LAYOUT'S FOOTPRINT or physical area is another consideration, but don't limit yourself to obvious choices. A narrow around-the-walls shelf layout or a centrally located tabletop layout would both fit in the same size rectangular room. However, other configurations can give you more space for track and scenery. Two of my favorite alternatives are shown in the drawings above, on the top and bottom right.

A full-size mock-up is a useful tool when determining the best footprint for a layout. You can draw a chalk outline of the proposed layout edge or set up temporary benchwork. A scale drawing is a useful tool, but it's all too easy to nudge a line on a track plan; it's a lot harder to nudge the actual wall of a house.

I used a full-size mock-up to test the track arrangements and placement of structures on my layout.



Using a door on sawhorses, Iain mocked up his HO Dutch-prototype layout. The door is covered in paper so he can trace the final track and structure arrangement.

3 DESIGN TIGHT



John Wright's Proto:87 Federal Street layout is a great example of a "tight" layout design. John carefully planned and built his layout to exacting standards.

DESIGNING "TIGHT" is about optimizing the fit of your track plan with the shape and size of the site you have available. First, you must avoid the temptation to compromise your layout design to fit large locomotives you'll never run, or a modeling subject that won't fit into your space.

Next you must determine your layout's critical dimensions, including minimum curve radii, limiting grades, vertical and horizontal clearances, turnout lengths, track centers, and equipment lengths. To design a successful model railroad you must know and maintain these values.

You can get some of these values from published sources like National Model Railroad Association standards and recommended practices, or a model manufacturer's specifications. I prefer to arrive at my own values by practical experiment.

For example, minimum curves are normally determined by what your largest locomotive will negotiate.

Using compact track arrangements, such as the lap turnout above, also helped him fit a lot of operation into his narrow 2'-0" x 11'-6" layout.

But locomotives don't usually run alone, so what I'm really interested in is what curves my trains can run around reliably. Equally importantly, I determine the minimum radius on which a train looks realistic, which is usually a much wider curve.

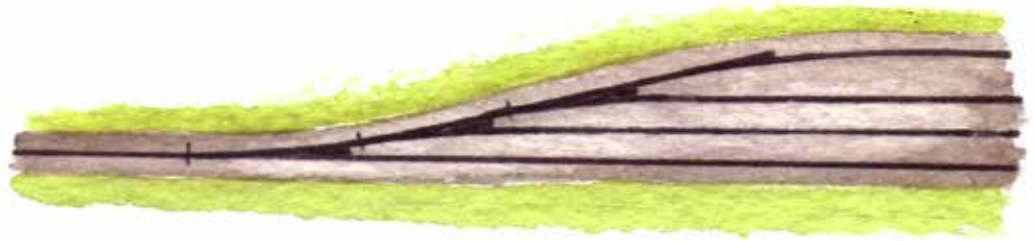
For this step I also use a layout mock-up. I temporarily lay flextrack to test different curve radii chalked on the temporary benchwork or the floor. I set these curves using a piece of string as a compass, or with curved track templates like the Tracksetta products made in the United Kingdom by Rails of Sheffield (railsofsheffield.com). [Ribbonrail makes radius gauges in the United States. You can order them through Walthers (www.walthers.com). – Ed.]

John Wright's Federal Street layout in the photo above is a great example of designing tight. [See the May 2003 issue of *Model Railroader*. – Ed.] John built the 2'-0" x 11'-6" layout to Proto:87 standards. The layout's theme is a transition-era industrial branch line.

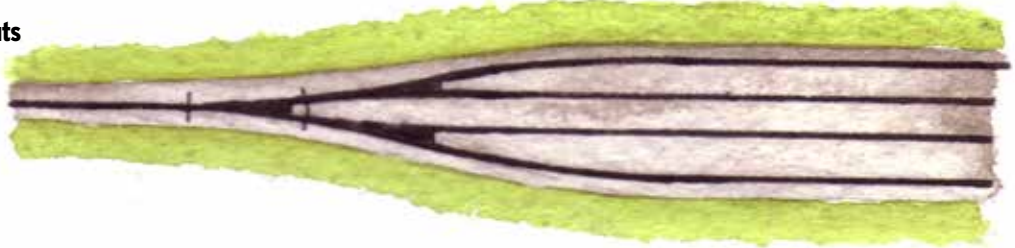
4 USE TURNOUTS WISELY

EXAMPLE A

Three straight turnouts

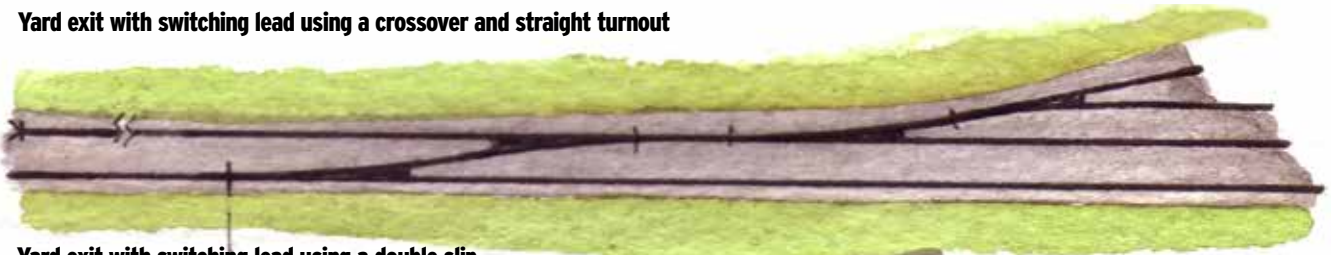


Wye with two straight turnouts

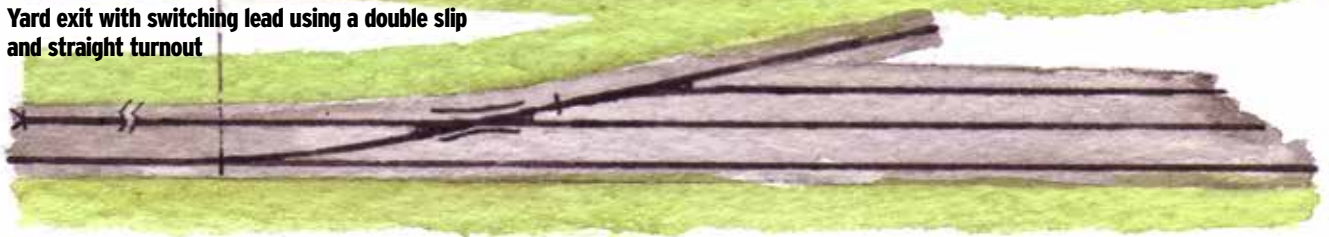


EXAMPLE B

Yard exit with switching lead using a crossover and straight turnout



Yard exit with switching lead using a double slip and straight turnout



In example A, you can see how using a wye and two turnouts makes each yard track longer than the yard ladder laid with three straight turnouts. Example B shows how a double slip switch at a yard exit lengthens the yard tracks.

WHEN WE TALK ABOUT compact space for a model railroad, we're usually referring to its lack of length. Narrow width will affect curve radii and space for scenery, but a short length pares down mainline runs and limits siding capacity. You can save length – and width – using curved, wye, and three-way turnouts and slip switches. These types of turnouts are especially useful when designing yard ladders, as shown in the examples above.

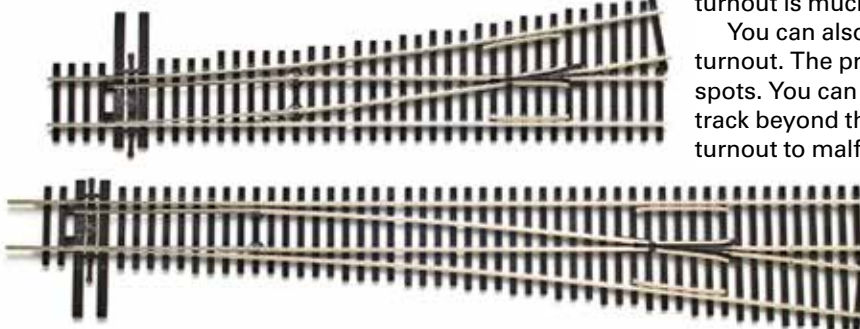
Small-numbered turnouts, such as no. 4, are short but have sharp divergence angles and tight curve radii. Large

locomotives and rolling stock have difficulty negotiating them. Aside from an industrial or backwoods setting, no. 4 turnouts don't look realistic.

Using a shallower-angle no. 6 turnout looks better and isn't as long as a no. 8 turnout but adds about an extra 1½" per turnout in HO. Not all no. 6 turnouts are the same length, since different makers use different geometries, so look for the shortest option.

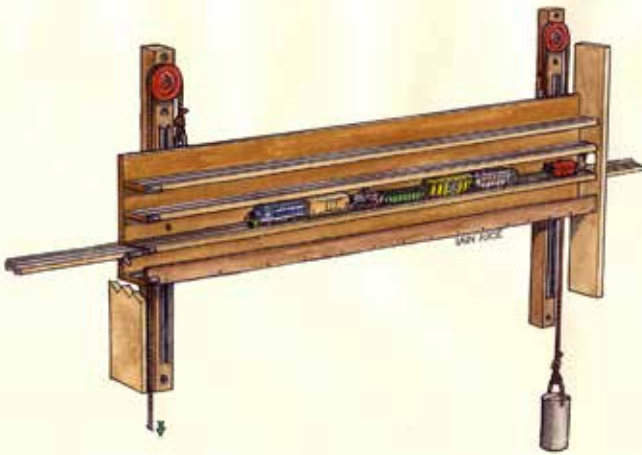
You could use no. 5 turnouts, which provide a compromise between no. 4 and no. 6 turnouts. The no. 5 turnout is much shorter than the no. 8.

You can also gain track length by shortening a turnout. The prototype railroads often do this in tight spots. You can trim one or two tie lengths off the straight track beyond the points and the frog without causing the turnout to malfunction.

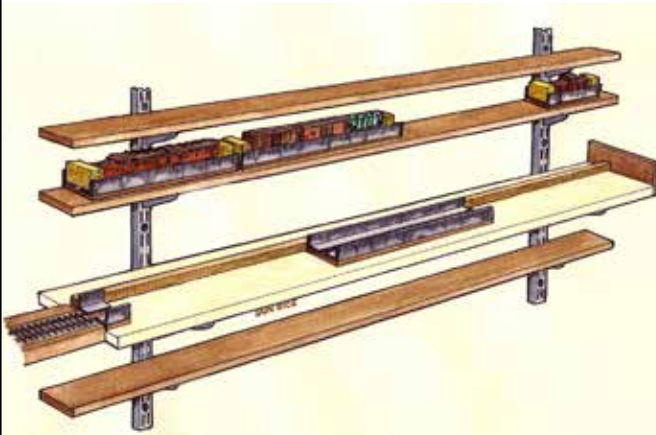


A Peco no. 8 turnout (bottom) looks great on mainline sidings and yards, but takes up a lot of track length. The no. 5 turnout (top) is a better choice for a compact layout. Jim Forbes photo

5 USE MINIMAL STAGING



Since it stages trains vertically, the train stacker (also called a train elevator) saves a lot of floor space. The train stacker has multiple tracks and slides up and down like a sash window.



Cassettes make it easier to lift locomotives and multiple cars from storage shelves to staging in a fiddle yard. This speeds up the process of putting together a train.

A SMALL LAYOUT with a short mainline run might model only one or two destinations, such as a depot or industry. Adding hidden staging to represent the rest of the railroad gives the trains somewhere to go. A well-designed staging or fiddle yard system can greatly increase the operating potential of a small layout, although it's important to get a good balance between the seen and unseen track. There's no point in having a staging yard capable of handling 10-car trains if the runaround on the layout can only take eight cars.

When space is tight, you don't want to devote any more of it than necessary to staging. But our trains don't get any smaller when they leave a modeled scene and enter hidden track. You may be able to use tighter curves or sharper turnouts behind the scenes than your visibly acceptable minimum, but the track and turnouts in a staging yard can often take up nearly as much space as the scenicked layout.

In Britain, where I live and where small layouts are common, there are many well-proven staging systems that occupy a small footprint. These systems stack trains vertically rather than side-by-side in a yard.

The multi-shelf train stacker (also called a train elevator) slides up and down like a window sash. The train stacker is best suited to holding complete trains ready to appear unaltered when next required by the layout's operating sequence.

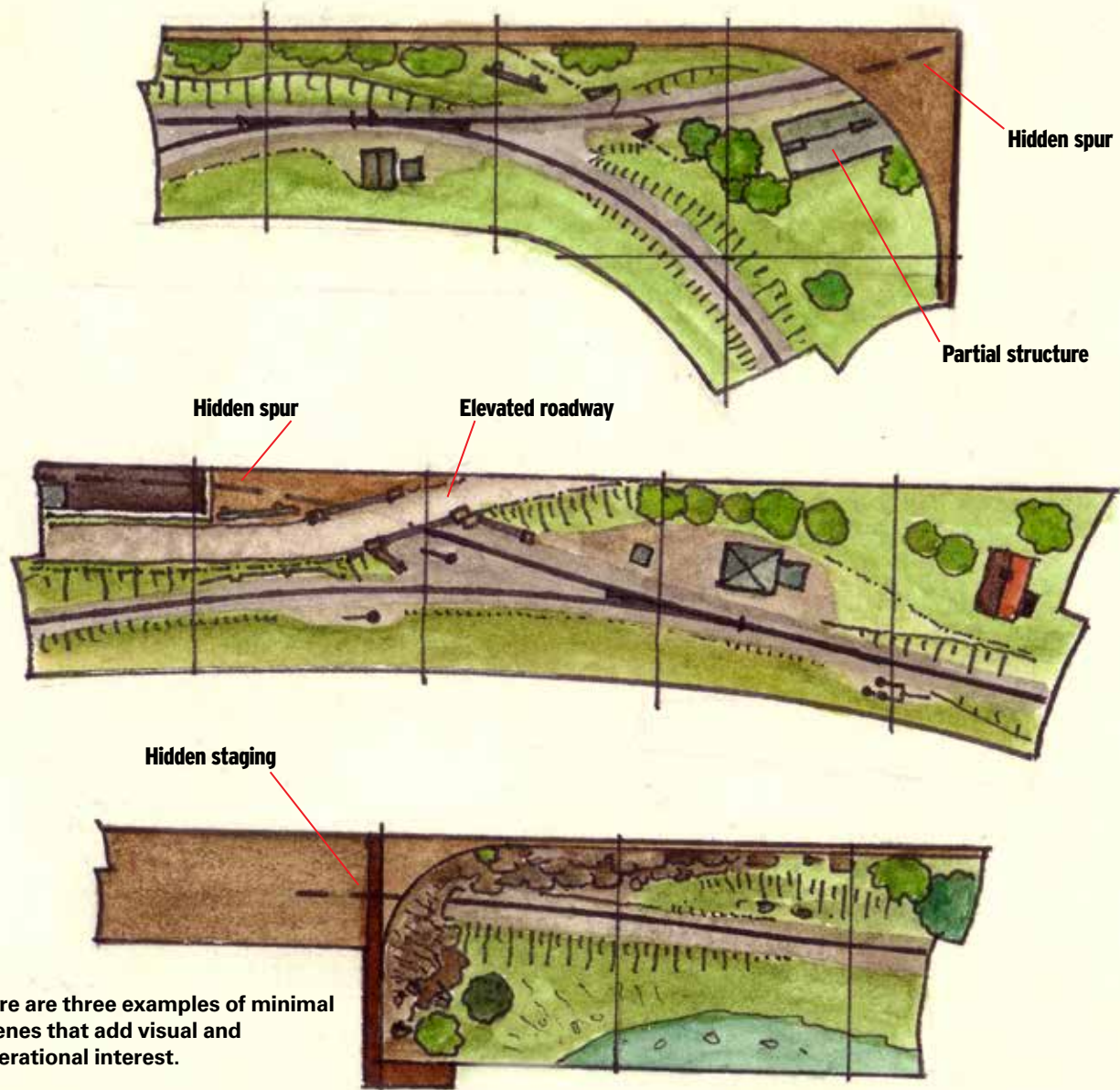
Cassettes are removable trays for holding locomotives and rolling stock. They can be easily lifted onto shelves, such as in a vertical fiddle yard. Cassette systems work especially well for fiddle yards, where trains are broken down and assembled.

The aluminium-angle-framed cassette was invented by British modeler Chris Pendleton and has become widely used. Rolling stock wheels fit in the space between the angles, which is the same width as the track gauge. This makes re-railing a train from the staging shelf onto the track quick and easy.



The Pendleton cassette, developed by British modeler Chris Pendleton, is made from aluminum angle stock screwed to a wood base. The spacing between the two pieces of angle matches the track width.

6 MODEL MINIMAL SCENES



Here are three examples of minimal scenes that add visual and operational interest.

LOW-RELIEF STRUCTURES represent a whole building with just a facade and part of one or two side walls against a layout backdrop. Such structures can suggest large industries in very little space, as in the photo on the right. I apply this idea more broadly with what I call “bitsa” modeling. I model bits of scenes (bitsa), just enough to represent a larger location and make it a place of operating interest.

A track running off layout to a short concealed spur could be combined with a gateway, signs, and an appropriate backdrop to represent a large industry like a quarry, coal mine, or manufacturing plant. The spur is another spot where cars can be picked up and set out.

Such principles can be applied to a variety of subjects. A branch line can be represented by a turnout, a tower, and just enough hidden track to hold a short train. An interchange can be represented by a dummy crossing (diamond), an interlocking tower, and a hidden spur.



Low-relief structures, which have more depth than a building flat, are useful for suggesting much larger structures on a small layout. On his Dutch-themed layout, Iain modeled only the end of an industrial shed.

7 MOVE IT TO THE BACKDROP



Iain modeled the Rotterdam intermodal yard on this shelf layout with only a few spurs and 3-D models. The photo backdrop of the Dutch harbor adds depth and visually expands the scene.

A PAINTED OR PHOTO BACKDROP can add the illusion of many square miles of depth with the thickness of a sheet of paper, as you can see in this scene on my Dutch layout. Moving layout design elements like an industry or town from the 3-D modeled scene to a 2-D image on a backdrop can save a lot of space without compromising the layout's operational potential. Especially for a layout in a narrow space, it's important to ask yourself, "Do I have to actually model this feature, or can I represent it some other way?"

You could even design your compact model railroad to fit with a commercially available backdrop or combine images from different backdrops. Given the wide choice of photo-based backdrop scenes available, it should be possible to find a suitable starting point for almost any layout theme.

The photo backdrops that I used above are Dutch. Manufacturers of U.S.-themed backdrops include Backdrop Warehouse (backdropwarehouse.com) and SceniKing (www.sceniking.com).

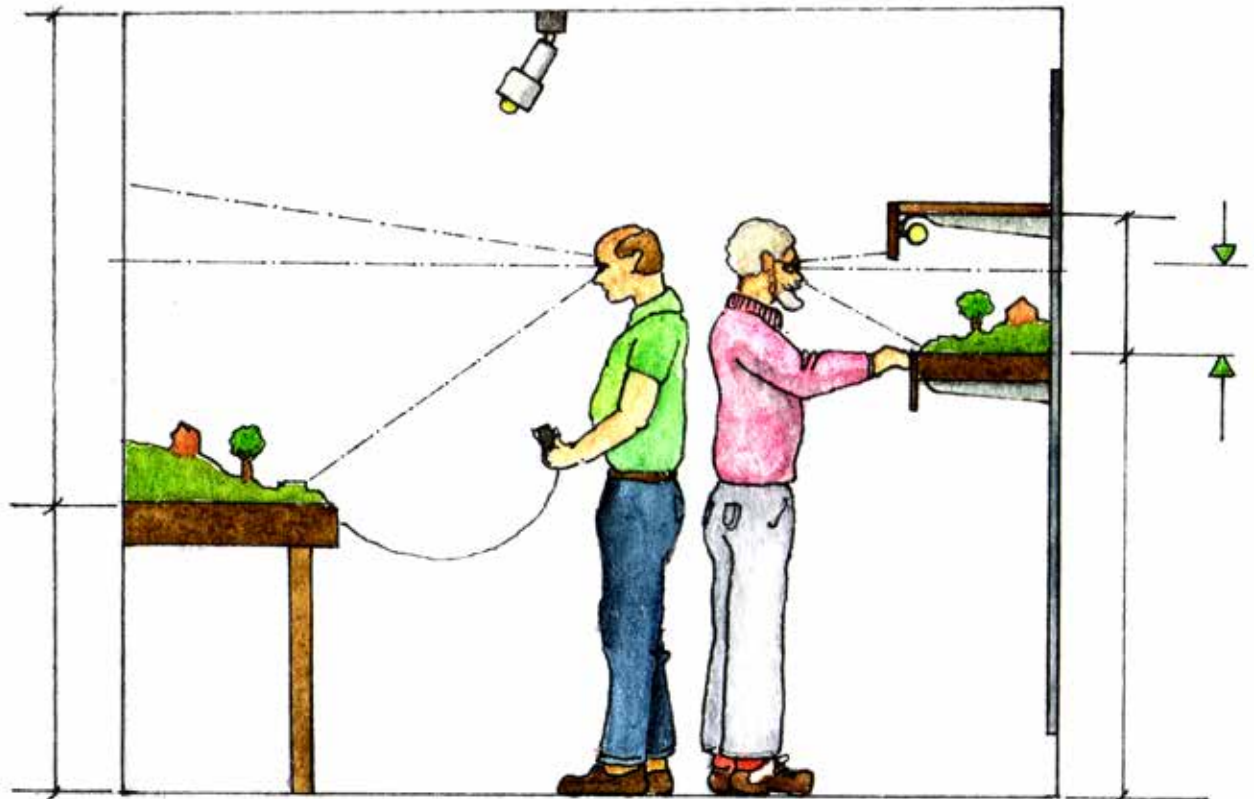
KEYS TO SUCCESS



When designing his HO scale Proto:87 Roque Bluffs layout, Iain Rice followed many of the tips outlined in this article. Short trains and equipment let him use shorter spurs, tighter curves, and sharper turnouts.

- Don't constrain your layout footprint to obvious choices; experiment with different layout footprint shapes.
- Mock up your layout and determine and follow a set of standards for your railroad.
- Take advantage of the space-saving qualities of curved and wye turnouts and slip-switches where you can.
- Use train-stacker or cassette and fiddle yard staging to save floor space.
- Use low-relief structures and backdrop images to model large industries.
- Design your layout so that the viewing angle is as close to eye level as possible.

8 MAXIMIZE THE VIEW



Looking down on a layout, as on the left, reduces the effectiveness of a photo backdrop. Looking in at a layout at eye level preserves the perspective of a photo backdrop and makes low-relief structures more effective.

A LAYOUT SCENE is far more realistic when viewed at eye level. That way, the viewer looks across the model from close range rather than looking down on it as from a great height and distance. This difference is shown in the illustration above. When you view the layout up close, you're much less aware of its boundaries and less conscious of its small size.

If you operate the layout standing, I've found 54" above the floor is an optimum track height. If you prefer to operate sitting down, then a level around 45" works well. Of course if you're especially tall or short you'll need to use trial and error to find a height that works for you.

Eye-level viewing makes low-relief structures and building flats more visually effective. When looking at these models from a high viewing angle, you'll notice their unprototypical narrow depth.

It's easier to conceal hidden tracks when a scene is viewed at eye level than if you were looking down on the layout. Another advantage of looking across, rather than down on, the layout is that tight-radius curves and sharp turnouts are less apparent.

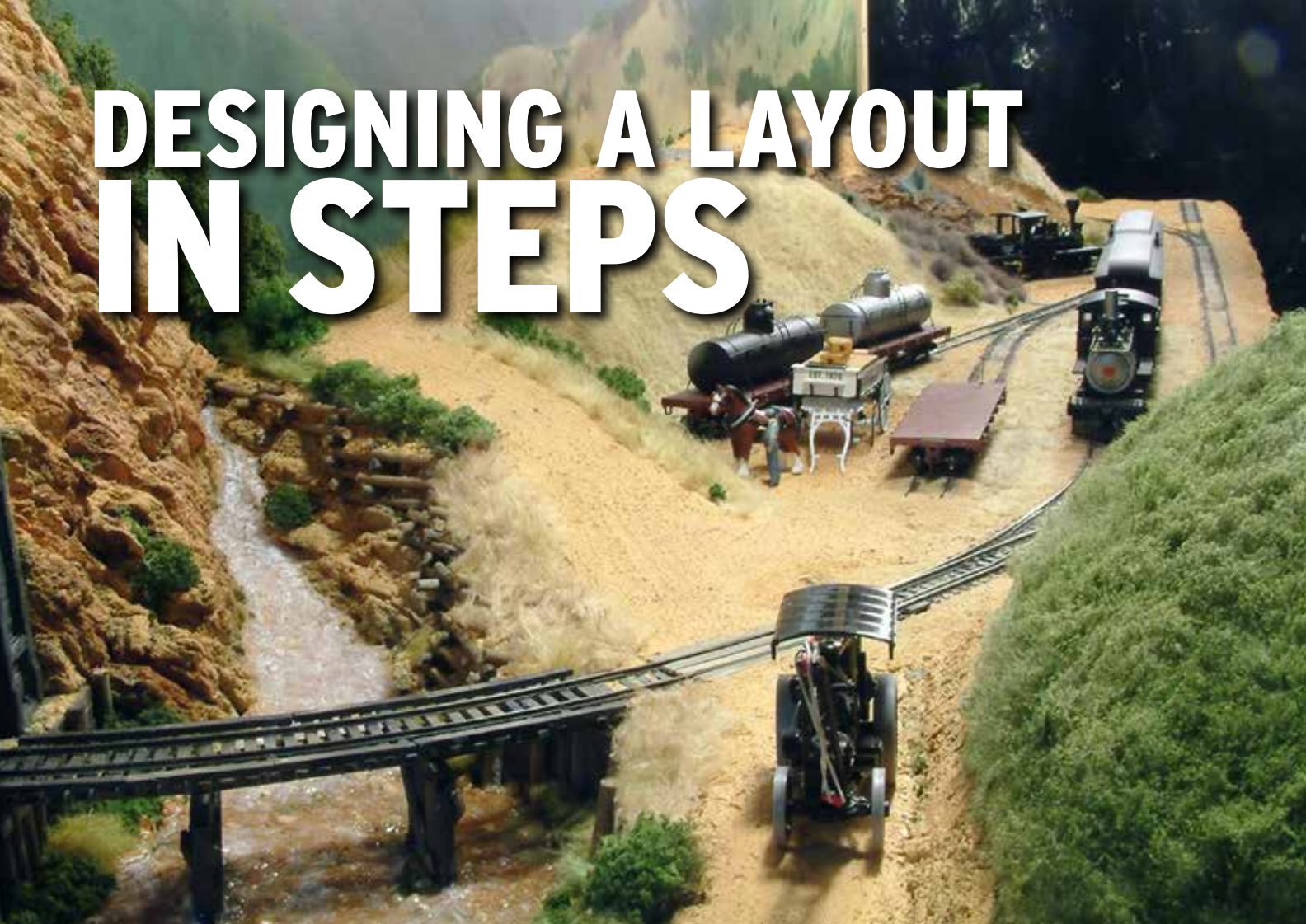
Using high levels of detail on every aspect of the foreground scene is another way of maximizing the view and use of space for a model railroad. Scenes at eye level invite close examination. If there's limited space for modeling on your layout, you can put more time and effort into every aspect of a scene. For example, you could add an interior and lighting to a structure.

The final reason to maximize the view is that you'll enjoy a finished railroad relatively quickly compared to building a larger layout. You may need to compromise between your dreams and your available space, but if you've taken the time to plan it well, a small layout can be just as much fun as a basement-size empire. **SMR**



Eye-level viewing doesn't mean you have to stand up to operate. This compact shelf layout is mounted at eye level for a seated viewer and is operated from a rolling desk chair. The height of the chair is also adjustable.

DESIGNING A LAYOUT IN STEPS



To get trains running quickly and keep his interest high, Harold Minkwitz built his On30 layout in stages. Shown is Harold's 4 x 8-foot first phase, with tank cars at the future oil transfer facility at center and, just beyond, the spur into the quarry.

A 4 x 8-foot On30 layout that's destined to grow

BY HAROLD MINKWITZ • PHOTOS BY THE AUTHOR

I'VE BEEN ENAMORED WITH early 20th century railroading since the 1960s, inspired by examples I saw in *Model Railroader* magazine. My interest was rekindled by Bachmann's release of vintage narrow gauge rolling stock in On30 (also known as On2½). These are 1:48 proportion (O scale) narrow gauge models that ride on HO scale track.

I've built car kits in HO_{N3}, Sn3, and On3, which ride on scale 3-foot gauge track, and the thought of building up a large roster for a future basement-size layout was mind-numbing. I'm sure that other modelers share similar concerns.

A key virtue of the Bachmann models is that, unlike most O scale narrow gauge models, they're both ready-to-run and fairly inexpensive. With these prod-

ucts, Bachmann has ushered in an exciting new era for modelers interested in O scale narrow gauge.

The average modeler can now build a narrow gauge empire with ready-to-use equipment. Indeed, these products may expand interest in slim-gauge modeling.

CALIFORNIA NARROW GAUGE

To keep the project manageable, and enjoy it in the short term, I decided to build my layout in phases. I'll start a new phase when the previous phase is about 90 percent complete.

With that decision made, I began looking for a narrow gauge railroad to model that wasn't in Colorado, something a little off the beaten path. The prototype had to have been successful enough to

support a lot of traffic, and it had to have scenic points of interest. When I saw a copy of Kenneth E. Westcott and Curtiss H. Johnson's book, *The Pacific Coast Railway* (1998 Benchmark Publications Ltd.), I knew I'd found a great prototype for my freelanced railroad.

The PCR's rolling stock was much like the models made by Bachmann, mainly flatcars and low-side gondolas. The railroad had a scenic gem in the Harford Pier at Port San Luis, Calif. The terrain, though less than spectacular, was modelgenic. And, back in 1905, the Pacific Coast Ry. had enough traffic to make modeling its operations interesting.

I'm not the only modeler to discover the virtues of the Pacific Coast Ry., of course. Tom Knapp described how he



A Broadway Limited Imports class C-16 2-8-0 pauses at Wagon Road Creek. The author trims and dyes various types of faux fur to model Golden State grasses. Ready-to-run rolling stock from Bachmann makes narrow gauge more attractive.

modeled PCR's San Luis Obispo facilities as an Nn3 Layout Design Element in *Model Railroad Planning 2003*. A system map appeared on page 21 of that issue.

NARROW GAUGE HEYDAY

My interest in 19th century railroad- ing stems from the classy lines of the equipment, something like the automobiles of the 1930s. Narrow gauge was very popular during the boom years of railroad construction (the 1870s through the '90s), and there were many thriving railroads that had yet to be standard- gauged or abandoned.

The discovery of oil deposits in California toward the end of the 19th century provided a great deal of traffic for some of these narrow gauge railroads. There were other sources of traffic as well. Construction projects required shipments of sand and gravel, and farmers needed a reliable way to get sugar beets and other farm products to market.

Access to the California coast made narrow gauge railroads a viable way to

ship local products and to bring in goods from elsewhere. The slim-gauge railroads also offered a way to bypass the price- gouging monopolies of the major standard gauge carriers.

The PCR brought prosperity to the communities it served, but it was sowing the seeds of its own demise. As it carried construction materials into rural areas, it enabled contractors to build highways that offered shippers more alternatives and passengers a more personal means of transportation. Oil pipelines similarly ended the petroleum traffic.

By the 1920s, the good times were in the past for the Pacific Coast Ry., but my On30 Pacific Coast Air Line Ry., replicates the PCR of 1905, back when prosperity was in the air.

BUILDING IN PHASES

I based the first phase of my layout on Chris Webster's 4 x 8-foot On30 track plan that appeared in MRP 2002. I liked his use of the loads-in/empties-out operating scheme, which involves connecting

related industries with hidden track, in my case, a rock quarry and a rock crusher on opposite sides of the backdrop. My local picks up loaded rock cars from the quarry, then shoves empty cars through a hole in the backdrop, where they appear under the crusher, ready to be switched from the other side of the layout.

I modified the plan so I could use Atlas code 100 sectional track, and I was able to lengthen the sidings to hold four freight cars or three passenger cars. I use HO track for my layout, rather than special On30 track. That means the ties are too short and are spaced too closely, but I'm happy with the result.

I built the rural half of my layout in the first phase, with an urban setting on the other side of the central sky backdrop to be developed as the second phase. The third phase will be the terminal yard at San Luis Obispo, Calif. I have a 24 x 53-foot basement, so the railroad will gradually grow, as shown on the larger track plan. The 4 x 8 will be a featured part of the expanded railroad,

THE LAYOUT AT A GLANCE

Name: Pacific Coast Air Line Ry.

Scale: On30 (1:48 proportion)

Size: 4 x 8 feet

Prototype: Pacific Coast Ry.

Locale: California

Era: 1905

Style: island

Mainline run: 17 feet

Minimum radius: 18"

Minimum turnout: no. 4

Maximum grade: none

Benchwork: 7/16" oriented-strand board (OSB) on 1 x 4 frame

Height: 50"

Roadbed: cork

Track: Atlas HO gauge code 100 sectional

Scenery: plaster-soaked paper towels over cardboard lattice

Backdrop: painted hardboard

Control: Digitrax Digital Command Control (DCC)

much as John Allen kept his original 3'-7" x 6'-8" Gorre & Daphetid layout as the GD Line expanded to basement size.

PHASE 1 AS A TEST BED

I used the front half of the 4 x 8 plan to test my scenery and lighting techniques. I described how I make grass from faux fur purchased at Jo-Ann Fabrics in the March 2005 *Railroad Model Craftsman*. I colored the material with Dye-Na-Flow liquid fabric dyes, which are available at craft stores, including Dharma Trading Co. (www.dharmatrading.com) and Dick Blick Art Materials (www.dickblick.com).

I've been experimenting with lighting techniques that can be applied to the larger layout. I wanted directional lighting that approximates sunlight's strong shadows. I rigged serrated light modulators to eliminate realism-killing multiple shadows. This has been a worthwhile process because I've learned what my lighting requirements will be for the large layout, and I'll be able to add 120-volt circuits accordingly.

My 4 x 8-foot test bed has been a lot of fun to build. It represents my first attempt at scenery, as my primary interest has been in operating trains in a prototypical fashion. So far, the techniques I've tried have worked out well.

You can see more photos on my website, www.pacificcoastairlinerr.com, which I created to promote On30 as well as to cover all aspects of the PCAL's construction and equipment. Please drop by for a virtual visit. **SMR**



Gons loaded with gravel are ready to be picked up at the quarry. These loads had been shoved into the rock crusher (a "paired industry") on the other side of the backdrop to replace empties that had been shoved into the quarry.



Twisted fluorescent bulbs and serrated light baffles help to create a sunny California look without realism-killing multiple shadows.

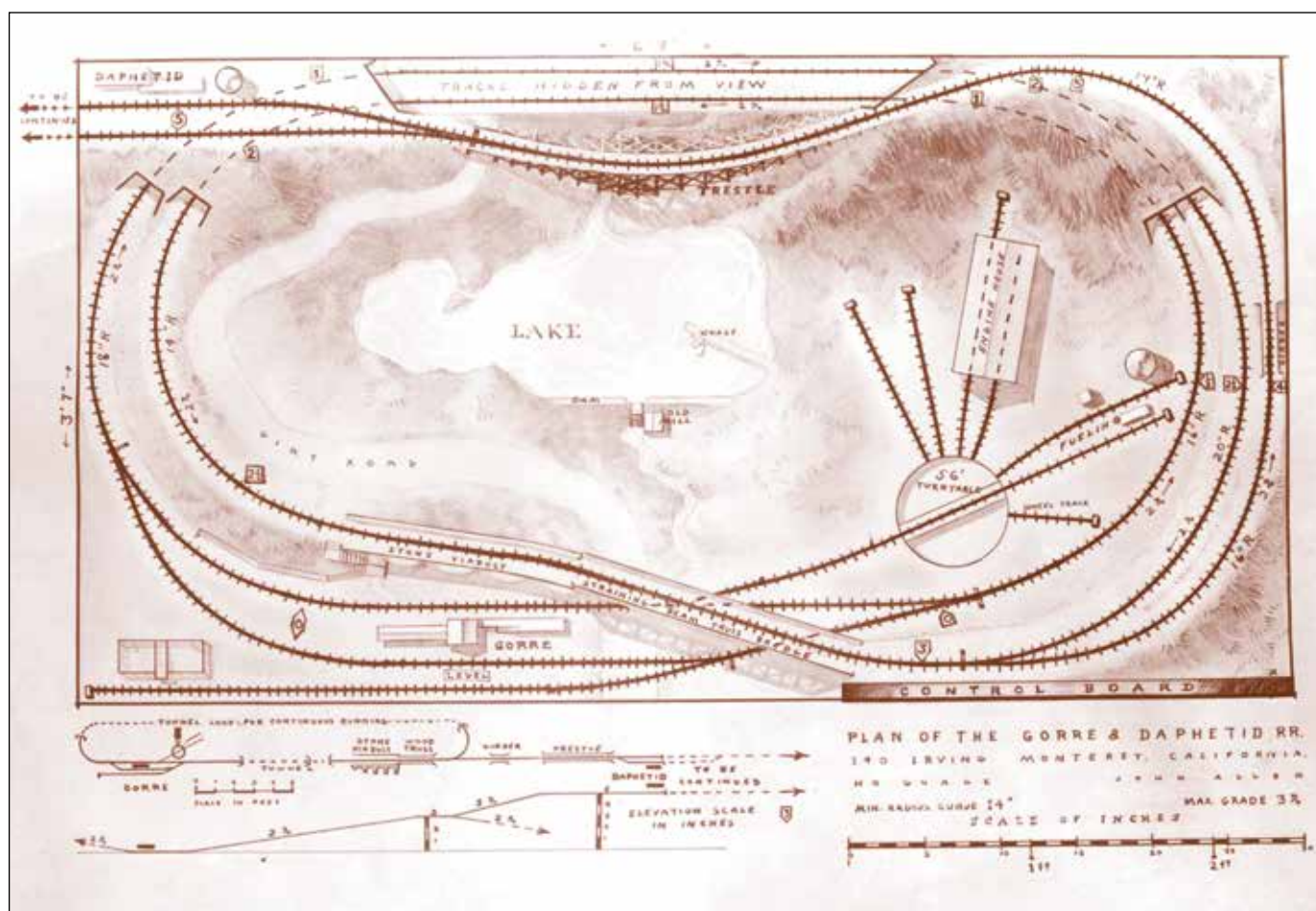


A separate staging area provides a handy place for trains to be stored and turned.

LEARNING FROM JOHN ALLEN'S ORIGINAL GORRE & DAPHETID

How to get the most out of a small layout

BY DON MITCHELL



This track plan of the original Gorre & Daphetid reveals many of the features John Allen considered essential for a small model railroad. Don Mitchell describes the lessons that modelers can learn from this 3'-7" x 6'-8" layout. John Allen illustration

JOHN ALLEN APPEARED on the model railroading scene in 1946. His original layout, the 3'-7" x 6'-8" Gorre & Daphetid, appeared shortly thereafter and forever changed the way people approach the hobby. In a masterful fashion that captured the attention of model railroaders everywhere, his first layout combined careful planning with precise modeling, weathering,

careful attention to detail, and realistic operations.

Through the years, John's modeling techniques and ground-breaking layouts were described in a multitude of articles, photo spreads, color transparencies, a book, and a video. Yet it's important to remember he started model railroading with a rather small layout, even smaller than the

4 x 8-foot sheet-of-plywood size that's the usual starter layout for many modelers.

ADVANTAGES OF A SMALL LAYOUT

John originally built railroad models as props for realistic photography. By studying the resulting photos and applying his training in art, John rapidly improved his model building

to the point where his models looked more realistic than most of those seen in contemporary hobby publications. Having only a small layout allowed him to focus on details as well as to weave together the overall theme of the Gorre & Daphetid.

By 1948, John's prize-winning enginehouse model, with such innovative features as weathering, a broken window pane, and birds on the roof peak, literally changed the hobby from building pristine models to depicting the world as it really existed. Yet even as late as 1950, John considered himself a newcomer to model railroading.

John wrote "Some Advantages of a Small Layout" in the August 1950 issue of *The HO Monthly*. "The builder with a limited amount of time to spend on the hobby can put far more time per square foot on the small layout than he could hope to achieve on a large one."

He further opined that "... one of the principal advantages of the small layout ... (is) placing it at a high elevation, even eye level." Less depth is needed in scenes, and the sky can come down to the horizon level. This makes the backdrop easier to paint, since many problems of perspective are avoided.

One of John's notebooks reflects his continued interest in small layouts. The notebook contains sketches of several small- and medium-size track plans, each reflecting some ideas on how to incorporate operation into a small area. A page from that notebook is shown on page 21.

THE PLAN EVOLVES

The original track plan, as shown at left, had the engine terminal inside the loop. John didn't build the enginehouse and turntable in that location; instead, he changed the design, moving the engine terminal outside the twice-around loop and placed industries where the turntable had been planned.

At about the same time, John also changed the branch line, which originally cut diagonally across one side of the layout and continued into a reverse loop, passing through a city. He moved the branch line so that it crossed a trestle over a lake in the center of the layout, curving back to Daphetid.

John always planned the Daphetid line as one that would continue to a larger layout and, in fact, it served that purpose on the second Gorre & Daphetid. The track plan most often



In 1947 John permanently installed the layout in his home on Cannery Row. In this photo he's painting the recently installed linoleum backdrop. John Allen photo



This scale model of one version of the original Gorre & Daphetid survived the fire that consumed John's third layout in 1973. Don Mitchell photo



John Allen incorporated his original layout, visible in the background, into the second Gorre & Daphetid begun in 1948. He altered the original track plan by moving the engine terminal outside the loop. John Allen photo



You can still see the first Gorre & Daphetid in this photo of John's third, and final, layout. John Allen photo

published for the first G-D Line reflects these changes – the engine terminal outside the loops and the curved trestle up to Daphetid. These changes were in good part motivated by John's shifting interest from building models and photography to realistic operation.

The layout's 14" radius curves and 3 percent grades didn't hamper operations. Such small radii and steep grades were unusual at the time (and still are!), but John carefully chose the equipment for the G-D Line. He used small four- and six-driven engines, ran no cars more than 50 scale feet long, and kept his train lengths short, too.

DESIGN TIPS FOR A SMALL LAYOUT

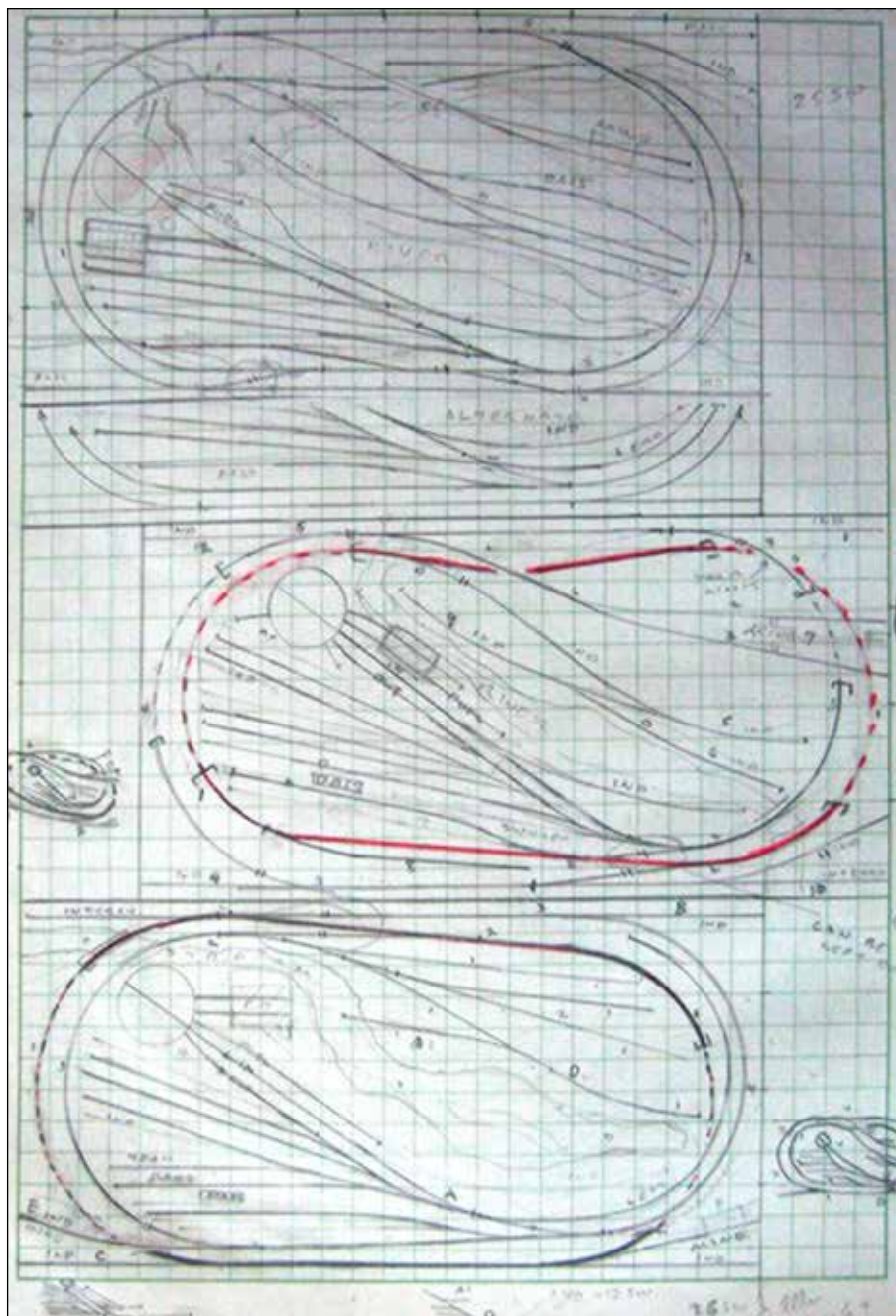
The original G-D Line incorporates the operational features John considered essential for a small layout:

- Detailed planning, with leeway for changes and provisions for expansion.
- A continuous run of some length, achieved by using grades so that one loop could pass over the other.
- Sections of hidden track that could be used to hide trains from view and hold them for a length of time (now regarded as a form of staging).
- A passing siding that could be used as a runaround to get a locomotive on the correct end of cars for switching.
- An engine terminal, including a turntable and enginehouse.
- At least one track leading to the edge of the layout for future connection to a larger layout.
- Sharp curves and relatively steep grades used as necessary.
- Locomotives and rolling stock capable of negotiating sharp curves and steep grades.

These features allowed the original, compact Gorre & Daphetid to be incorporated in John's two successive, larger layouts. Some additional modifications were required to fit the original G-D Line into these later layouts.

For the third and last layout, which is the best known, the original continuous run was chopped off by boarding up a tunnel entrance as part of an abandoned right-of-way. The remaining stub was used as a switchback to reach Daphetid, which now had a couple of industries located on dead-end spurs.

Another big advantage of a carefully planned small layout is achieving the greatest possible operation while spending the least amount of time on routine maintenance requirements. During



A page from one of John Allen's notebooks shows more small layouts planned for operation, much like the Gorre & Daphetid. Don Mitchell photo

my association with John over the last decade of his larger layout's existence, he remarked about the increasing amount of time he had to spend just keeping the layout running.

REDISCOVERING THE MESSAGE

In a model railroading world that seems to feature one gigantic layout after another, maybe that world is rediscovering John Allen's early message: Start small and build well. In his own words, "... plan your small railroad for operation rather than as a race track, and build it with care. You will be amazed at how much fun a small pike can be." **SMR**

MORE GORRE & DAPHETID INFO

This download focusing on John Allen's Gorre & Daphetid gives a great overview of the layout. You'll learn how John planned for realistic operations; see track plans as well as an operating schematic; plus many black-and-white and color photos of the Gorre & Daphetid. Click the "Shop" link at www.ModelRailroader.com.



A PHASED APPROACH TO LAYOUT CONSTRUCTION



An N scale railroad
that will grow to fit the
available space

BY PETER SIERSON

FOR NEARLY 50 YEARS, I've been drawing track plans. A few have progressed to benchwork and even tracklaying, but only one has made it to the nearly compete stage, and I sold it soon after. So why such a decades-long struggle with design?

I can think of several reasons. First, what appears on paper and what those lines actually become are two very different things. It's amazing what you think you can achieve on paper versus what is actually possible. A software design



Peter Sierson's N scale layout is based on the New York Central Adirondack Division. In the Philip R. Hastings photo above, we see an oil-burning New York Central class K-11 Pacific arriving at Lake Placid, N.Y. The Adirondack Scenic RR's Saranac Lake, N.Y., depot on the old NYC line is shown below. Jim Shaughnessy photo

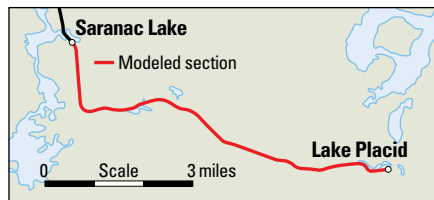
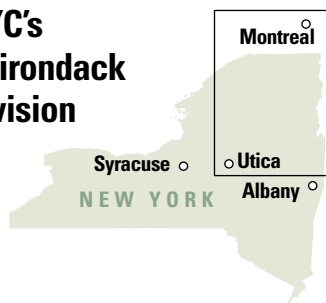
program can minimize this, but until it's in 1:1 scale, I find it hard to visualize a layout's curves and slopes.

Second, my interests have changed over the years. I no longer want a layout with as much track as possible. Instead, I now prefer a simple, linear, single-track main line.

However, the biggest factor has been that my designs have aimed toward the ultimate dream layout, which has never materialized because of time, space, and money.

Today, thanks to input from friends and articles in magazines such as *Model Railroad Planning*, I've been able to shift

NYC's Adirondack Division



my thinking from freelance to prototype, from continuous-loop to point-to-point, and from anything-goes to creating a design based on realistic operation. I had to learn that sometimes flipping a plan section or creating a mirror image works much better.

But even with all these changes in my thinking, the greatest dawning was realizing that my dream model railroad can begin simply 4 feet at a time. Moreover, by drawing on the thoughts of well-known layout designers and operators such as Bruce Metcalf, David Barrow, and Tony Koester, I've at long last been able to design a layout that meets my current and future needs.

SELECTING A REGION TO MODEL

Most of us select an area to model that has some personal significance. I grew up on the outskirts of Utica, N.Y., and was drawn to the New York Central. The NYC is best known for its four-track



The former New York Central's Adirondack Division – part tourist line today – sliced through the heavily eroded mountains and numerous lakes that typify the region between Saranac Lake and Lake Placid. Jim Shaughnessy photo

main line filled with long freights and sleek passenger trains flowing between major cities. But the railroad also had single-track lines through some scenic areas. I'm modeling one of these, a portion of the New York Central's Adirondack Division between Saranac Lake and Lake Placid, N.Y.

Although the distance between these two towns is less than 10 miles, the branch served as a primary way of getting both natural resources out and people and supplies in. Saranac Lake became an oasis for people with tuberculosis, as it was thought that the fresh mountain air would help their lungs restore themselves. There is a nearby cemetery where the Swedish flag still flies over graves of Swedish sailors who died from TB.

East of Saranac Lake is Lake Placid, a town well known for hosting two winter Olympics. Both cities have thousands of vacationers every year. During the 1930s, train after train rolled into those towns carrying passengers and supplies. This stretch of track is still used by the Adirondack Scenic RR, and there are plans to upgrade the line all the way south to Utica.

CHOOSING A PROTOTYPE

It never occurred to me in my formative years in the hobby, but there are tremendous benefits in modeling an actual section of a railroad in a real place during a specific period. To my surprise, doing so has proven quite liberating. But how can something as limiting as modeling a specific prototype create so much freedom?

Let's start with the basics. First, it helps to find a track diagram for a specific location, especially if your goal is designing a layout with operations in mind. The full-size railroads typically don't waste space or money in building and maintaining track they don't need.

Since they've done the track planning for you, chances of creating an unworkable plan are greatly reduced. This is the thinking behind the Layout Design Element (LDE) approach – you scale down a bit of an actual railroad into a visually and operationally recognizable plan for your available space, knowing in advance that what worked for them should work for you.

Another benefit of modeling a prototypical locale and a specific era is that it narrows your shopping choices. No longer do I buy what catches my eye, but only what fits my locale and period. That has simplified the hobby for me and given me a great deal of freedom.

There is also a lot of fun to be had finding sources of information about the railroads and the towns they rolled through. Taking time to do the research adds depth and gives meaning to the miniature worlds we create.

INTERCHANGE TRAFFIC

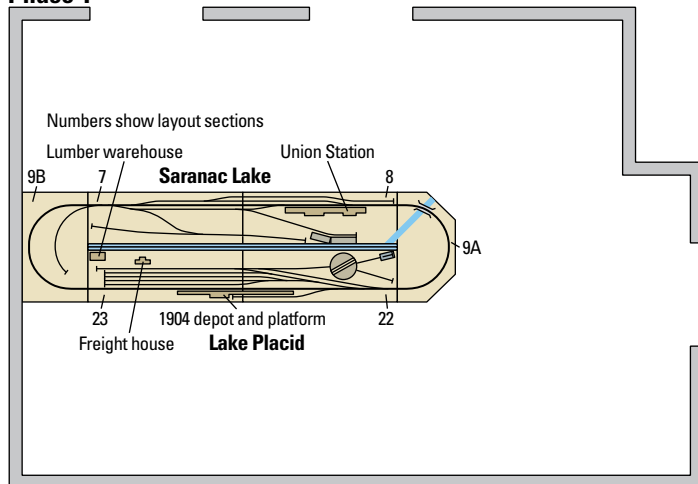
Another important aspect of railroading that makes this area ideal to model is the interchange between the NYC and the Delaware & Hudson. Even though the D&H ended this connection in 1947, I plan to generate a greater volume of traffic and destinations by keeping it active a decade longer for my period. There can be some leeway, I think, in what you choose to define as prototype modeling.

Suggesting an interchange doesn't require much extra space, and I can expand this feature in future layout sections or create a lower level to accommodate more traffic.

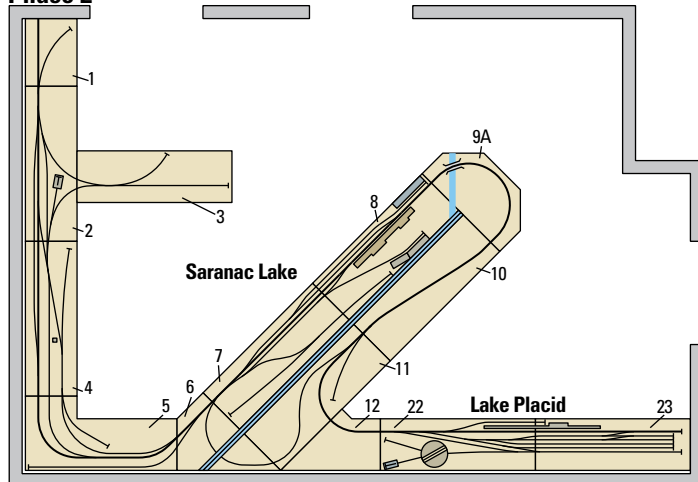
SELECTIVE COMPRESSION

It's true that N scale accommodates a lot of modeling in a limited space, but even with slightly more than 10 scale miles of main line (about 330

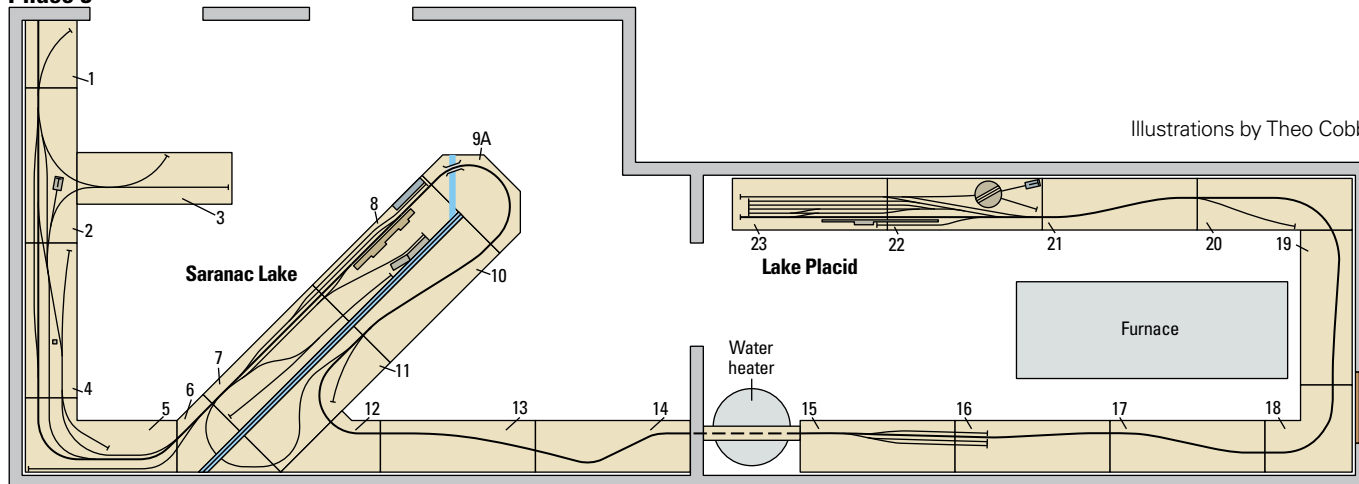
Phase 1



Phase 2



Phase 3



THE LAYOUT AT A GLANCE

Name: Adirondack Division of the New York Central

Scale: N (1:160)

Size: phase 1: 2'-10" x 11'-3"

phase 2: 11'-9" x 17'-3"

phase 3: 11'-9" x 34'-5"

Prototype: NYC RR

Locale: central New York State

Era: 1957

Style: linear walkaround

Mainline run: phase 1: 25 feet

phase 2: 44 feet, phase 3: 90 feet

Minimum radius: 12"

Minimum turnout: no. 6

Maximum grade: less than

1 percent on main

Train length: 12 cars

Benchwork: sectional grid

Height: 50"

Roadbed: cork glued on foam

Track: code 80

Scenery: extruded-foam insulation board

Backdrop: lauan painted with acrylics

Control: Digitrax Digital Command Control

Illustrations by Theo Cobb

actual feet), it would still be difficult to model every inch of the NYC Adirondack line. The difficulty therefore becomes how to compress the prototype into a layout I can actually fit in my basement.

Selective compression is a bit too subjective for me. How do I know what to choose or what to ignore? How short can I make a siding and still make it long enough for operational needs? Can

I eliminate some turnouts to cut down cost and still have a layout that operates properly?

I'm therefore grateful for the collective wisdom of fellow modelers. No one wants to spend all that time and money building a layout, only to find out it doesn't operate well. I'm amazed by the insights you can gain by sharing a layout design with other people, such as the members of the National Model Railroad

Association's Layout Design Special Interest Group (www.ldsigs.net).

Since Lake Placid is the end of the line and has a yard perfect for staging, it became a vital element to include. But how far to the west and south should I go? Part of me wanted to run all the way to Utica with all the stops in between, but it soon became clear that there was a better option: Model less so you can model it well.

PHASED DOMINO SECTIONS

The use of David Barrow's domino approach was the ideal solution to some of my layout dilemmas. [Dominoes are 4-foot-long sections that can vary in width from 12" to 30"; for more information, see *Model Railroad Planning 2004 – Ed.*] Moving to a new location is always a possibility and can be fatal for a layout built without relocation in mind. Another benefit of dominoes is the ability to change your mind or modify elements without losing the entire layout. Even a dream layout will need updating, and the domino concept more easily accommodates changes. But the biggest benefit of dominoes is the flexibility to expand or reconfigure a layout.

I designed my layout in three phases, shown on page 24. Each is designed to fit the space I currently have. Allocating more space from the "real-estate department" or future moves may allow new dominoes to be added. But moves don't always yield more space, and by using this method, at least a portion of my dream layout will always find a home.

Each domino is 16" wide by 48" long, a size determined by seeing how far I could compress the track arrangements and still have an operational layout. The 16" width ensures easy reach, portability, and wide aisles. I wrestled with how long to build each domino, but 48" creates an easy size to handle and still provides a lot of action per section, especially in N scale.

I designed each domino section or pair of sections as an LDE. Dominoes and LDEs go together well and convinced me I could capture part of the layout now and add to it later.

I didn't come to this way of thinking on my own. Bruce Metcalf challenged me to view layouts in a totally differently way by guiding me through many difficult questions about what I wanted and why. He also encouraged me to start building the future layout today with LDEs rather than building just another layout.

This became a vital key for me, and I began to study the history of the region with the intention of designing LDEs to fit domino layout sections.

PHASE 1

Phase 1 uses six dominoes. Saranac Lake will comprise dominoes 1 through 10, though I'll start with sections 7 and 8. Domino 8 contains the Union Station LDE, and domino 7 is the continuation of that same scene, but to the west. Domino 9 is the continuation of the



The two photos here provide a visual progress report on Peter's layout. Four of the dominoes are already well under way. Peter Sierson photos

scene to the east of domino 8, but 9 provides a 180-degree turn. (Section 9 is labeled 9A, since the opposite end has a similar section labeled 9B. But 9B is a temporary section for phase 1 and will not be completed beyond the tracklaying stage.)

The last two dominoes in this phase are sections 22 and 23, which make up the complete LDE for Lake Placid. By selecting these six dominoes, I'll have both key towns in my layout, even though initially they are placed back-to-back with only a backdrop between them.

PHASE 2

With phase 1 complete, I can build dominoes to either add to or accumulate until all of phase 2 is ready. Either way, I can keep trains running, and there will be no rush to get to the next phase. I'll have time to carefully build and create while still enjoying the layout in action.

Phase 2 incorporates dominoes 1 through 12 and still employs sections 22 and 23. The only domino not used is the temporary section 9B, which is no longer needed and can be rebuilt. The continuous-loop feature is still found on this point-to-point design, as dominoes 6 and 12 pair up using two sidings to create this feature. It will be nice to be able to break in a new locomotive or entertain friends who just want to see a train run.

PHASE 3

Phase 3 takes advantage of an adjoining room that houses our water heater and furnace. By using this space, I can have more distance between Saranac Lake and Lake Placid. Even though this extends the main line another 50 feet, selective compression still has to rule on my layout.

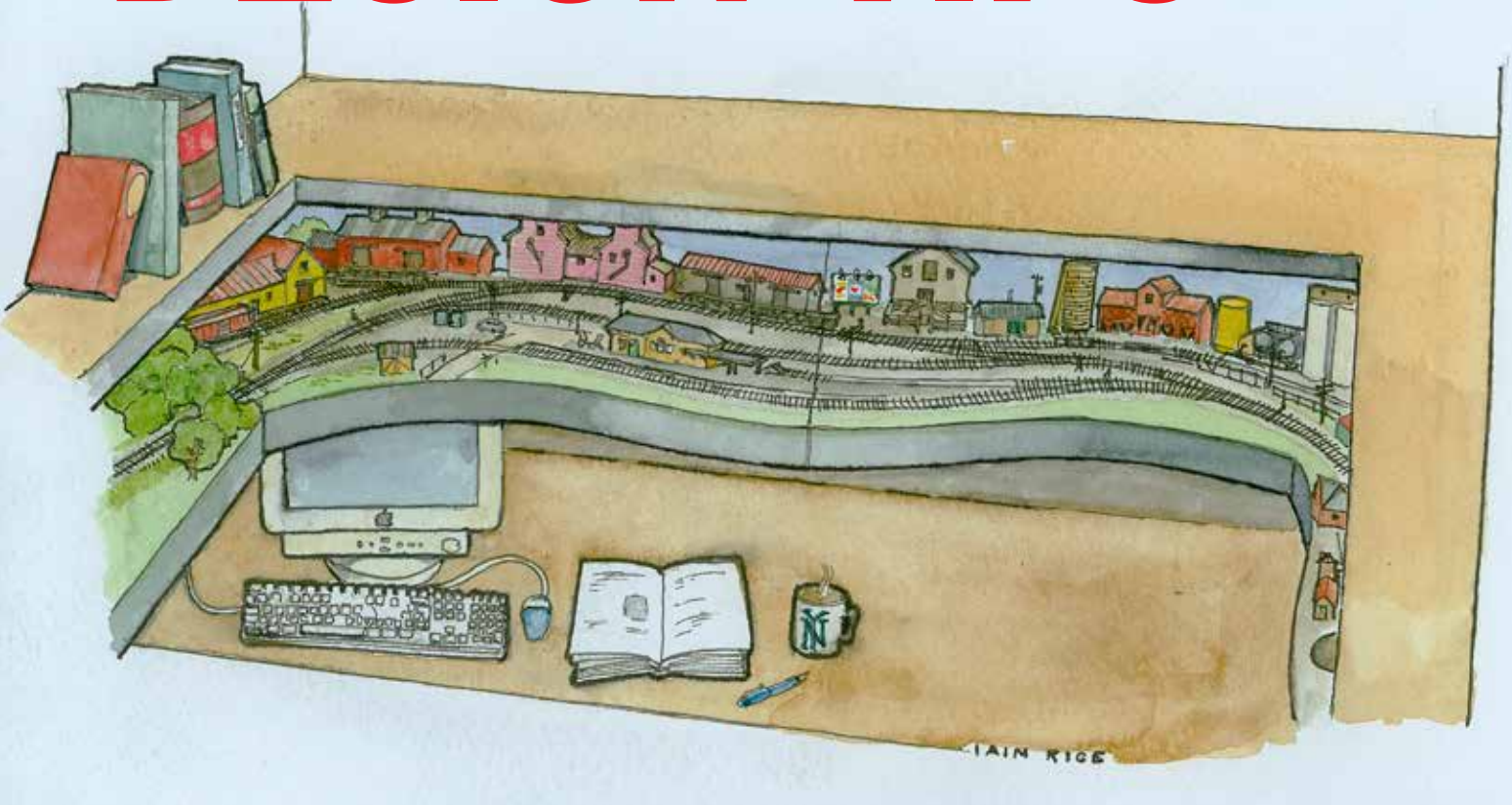
Dominoes 13 through 21 provide distinctive scenery elements that are lacking in the previous phases. There's also room to add the small station at Ray Brook, another stop for passenger trains.

TIMETABLE OPERATIONS

At the time this article was being prepared, phase 1 was nearing completion. It would be wonderful to report how an actual operating session works and how many operators I need to accomplish the task. However, I already know this about the design: It accurately depicts part of the New York Central's Adirondack Division, so it will support realistic operation. I have timetables for both passenger and freight trains, which also include consists and destinations.

Moreover, the plan has been seen through the eyes of many other rail hobbyists. Ours is a hobby meant to be shared, and the gain is enormous when we allow others to lend their input and talents. I personally am indebted to Mike Curtis, Brandon Baxter, Bruce Metcalf, Michael Kudish, and others for the help along the way. SMR

SHELF LAYOUT DESIGN TIPS



And an N scale plan for the Burlington Route

BY IAIN RICE • ILLUSTRATIONS BY THE AUTHOR

RAILROADS, BY AND LARGE, are long, thin things. So are shelves. Putting one atop the other, therefore, has a kind of inescapable logic.

In effect, almost all model railroads are built on a shelf of some kind, usually a large and very solid one hiding under the title of benchwork. What I want to consider here, however, is the model railroading potential of the kind of shelf they understand at The Home Depot – the everyday domestic variety. As long as you can put a strip of right-of-way at a suitable height along a wall or several walls, you can build a shelf railroad.

All you need to go shelf-railroading is a space a foot or so high, as long as possible, and somewhere between 4 and 5 feet

above the floor. Not such a tall order, surely? And it's surprising just how much railroading you can accommodate on a shelf as narrow as 6".

SHELF WIDTH AND LOCATION

How wide a shelf you finish up with depends on a number of factors. The maximum width in practical terms is about 2 feet – not many shelf supports go wider than this, and at a decent display height, that's about as far as you can reach comfortably. Moreover, people considering shelf layouts generally have in mind something a good deal narrower.

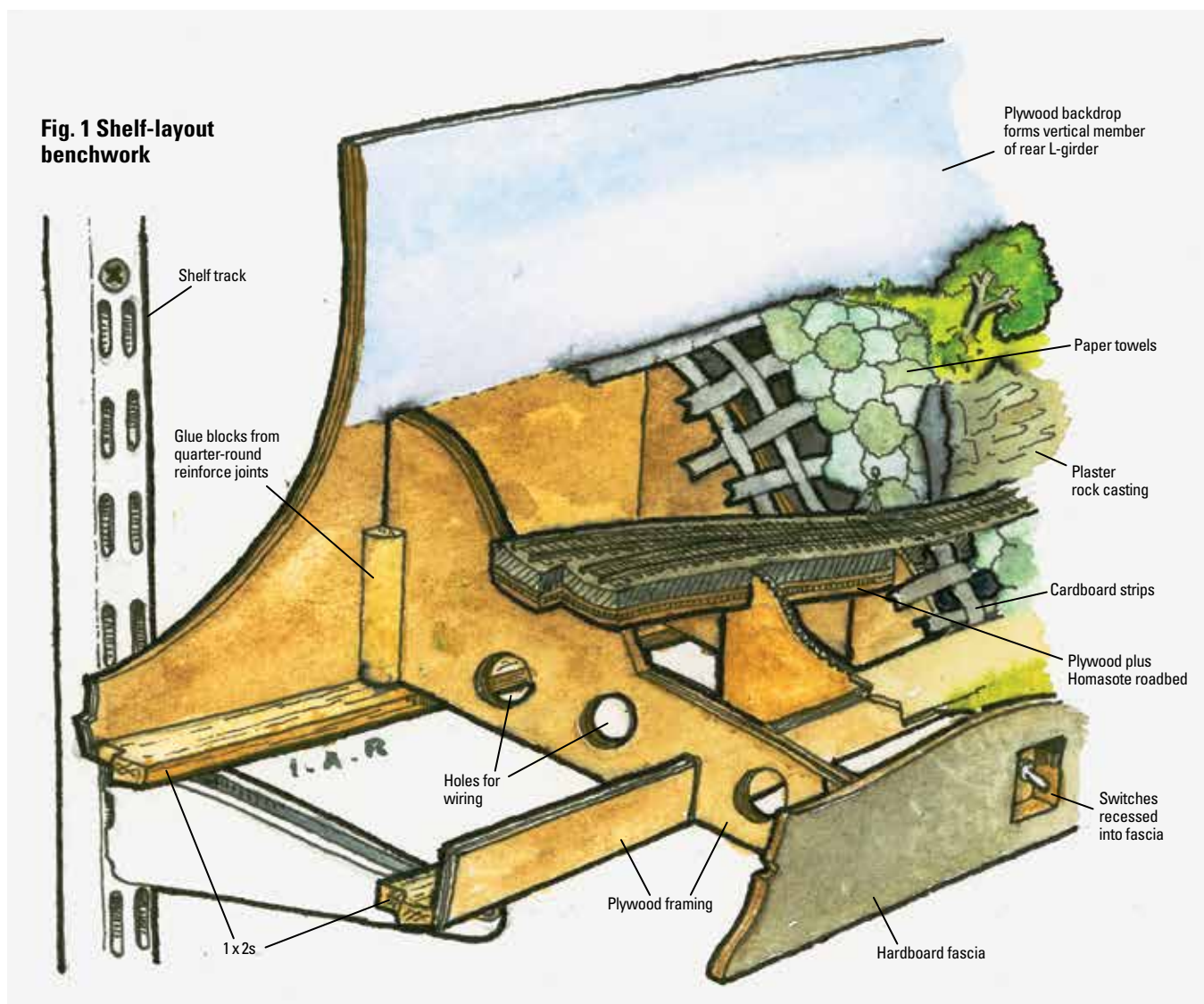
A 2-foot-wide shelf is, after all, a rather unwieldy beast, and I have found that a width of 12" to 15" typically works

much better. That's deep enough to accommodate several tracks or structures and a modicum of scenery while remaining compact enough not to intrude too much into the room.

Visually, the shelf layout works best at about eye level. At this height, you're looking across the shelf rather than down onto it, so the narrowness of the scene isn't so apparent. Eye level is also an effective viewpoint for a backdrop, which visually expands even cramped layout sites. How else do you compress miles of apparent real estate into the thickness of a sheet of paper?

Shelf layouts can be sited in parts of the house – hallways and corridors, garages, narrow basements, and so on –

Fig. 1 Shelf-layout benchwork



that might not easily accept more conventional model railroad formats. Shelves are also readily integrated with other room uses in studies, home offices, bedrooms, or family rooms. Shelf layouts are somehow more acceptable in domestic settings.

The layout shelf need not be a stand-alone feature; it could simply be one shelf along a wall that's part of a library or storage system, using the same supporting hardware and not impinging significantly on the space. This can be a key factor when negotiating rights to build your railroad.

SUPPORTING SYSTEMS

One of the great things about shelves is the amount of hardware that's out there to help you build them. There are some neat shelf-mounting systems with brackets that snap into slotted vertical tracks. They could have been designed with model railroading in mind.

Shelf-track, as a basis for benchwork, is quick to erect and plenty strong, spreads the load over a greater span, gives plenty of scope for adjustment, and makes it easy to get a level base for the railroad. Also, shelf-track has a minimal impact on a building's structure; it needs nothing more than a few easily filled screw holes, making it an ideal approach for railroading in apartments or other temporary accommodations.

Most brands of shelf-track systems work fine, but the John Sterling Fast-Mount line at The Home Depot is my choice. Made of steel with a zinc or white finish, it offers sturdy brackets for shelves from 12" to 24" wide, the most useful sizes for layouts. These brackets are available with triangular braces to make them rigid and stable under heavy loads. The twin-hook-and-slot system is also stable. The vertical tracks screw to the studs of normal interior walls or, by using anchors, to concrete or brick. The locating

slots are spaced 1 1/4" apart, which provides convenient steps for height adjustment or different levels of terrain.

It pays to use full-height tracks (Fast-Mount track is sold in pieces 6 feet long) for layout shelves. They spread the load over nearly the entire length of a wall stud and make it easier to adjust the tracks to be vertical (ensuring that the shelves are level side-to-side). A long track allows a wide range of height adjustment or the use of two mounting positions for the layout – the normal display height and a lower working height. It also makes it easy to integrate the layout with other uses of the space, such as bookshelves.

To ensure that the layout is well supported and level, don't space the shelf-tracks too far apart; about 16" to 24" is good, with the tracks lined up with wall-stud centers. Longer spans can be used if the roadbed is supported by benchwork atop the brackets.

Fig. 2 Single-deck layout lighting

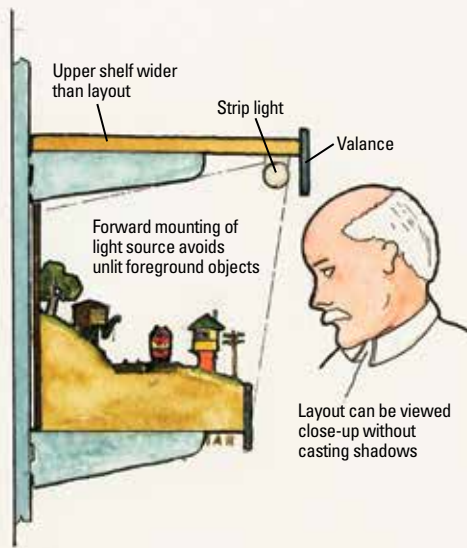


Fig. 3 Ceiling-mounted light source

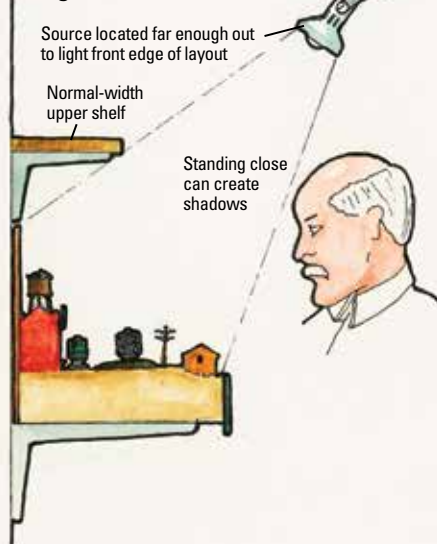
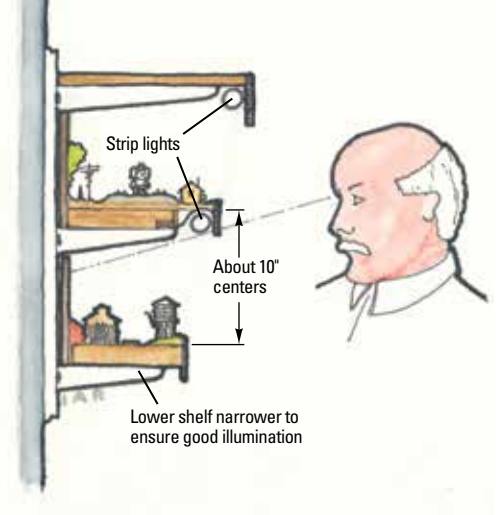


Fig. 4 Double-deck layout lighting



To ensure the shelf tracks are at the same height, use a level to align them. Attach one track to the wall, slot a bracket into it and another into the corresponding slot in the next track to be mounted, then lay the level across the brackets to determine the correct height for the second track. Fix that track with a single screw somewhere near the center and true it vertically before you finish securing it.

To check for level over several tracks, use a straight piece of lumber to span the brackets and check with the level.

SHELF BENCHWORK

Shelf layouts are, by their very nature, easy to move. I'm always inclined to build things in chunks of manageable size, and designing a shelf layout in sections has a lot of advantages.

In particular, you can take down sections to work on them; even a layout designed to live 5 feet off the floor can descend to tabletop height when required, using a lower set of brackets.

I find sections from 4 to 6 feet long work well, and I make them mechanically and electrically self-contained. This allows me to test-run equipment with the section on the workbench and also keeps jumpers between sections as simple as possible. Joints between sections should be placed close to a support bracket.

At its simplest, benchwork for a shelf layout could be a plain plank of wood, but that has a lot of limitations both from the practical and the esthetic viewpoints (even the Corn Belt isn't that flat!). My usual approach is to use a miniature version of conventional L-girder, made with small-section lumber or a mix of lumber and plywood strips.

The sketch in **fig. 1** on page 27 shows how I typically make shelf benchwork. I use thinner grades of plywood (around 1/4") to make the sections lightweight and easy to handle. Avoiding benchwork sags between supports is the key requirement, so vertical stiffness is the main objective of the design. Making the backdrop part of the shelf also helps, since it acts like a girder.

LOSING THE SHELF LOOK

Just because you build your model railroad on a shelf doesn't mean that it has to look like a shelf. It's possible to vary the width and to use a fair degree of verticality for scenery and structures.

Another dead giveaway on shelf layouts is the tendency for everything to be too straight and parallel. Just because the shelf is straight doesn't mean the track has to be. Avoiding trackwork that's always aligned with the shelf edge is a big help in creating a natural look.

With the "mini L-girder" benchwork system I've suggested, there's no need for the front edge of the shelf to be straight. You can install fascia with flowing curves that follow the scenery, making the shelves more esthetically pleasing. And, it's quite possible to vary the width of a shelf to accommodate tracks, structures, or scenic features.

At the rear of the shelf, by blending the scenery and structures carefully into the backdrop, you can go a long way toward hiding the rear edge of the scene, preventing it from feeling cramped. Low-relief structures, background flats, well-placed mirrors, and a tad of perspective modeling can add life and depth to a narrow site.

Another problem to avoid is always having the tracks and trains along the front edge of the shelf. Placing structures, rising (or falling) ground, fences, trees, or even static industrial spur tracks between the viewer and the main running lines adds visual interest.

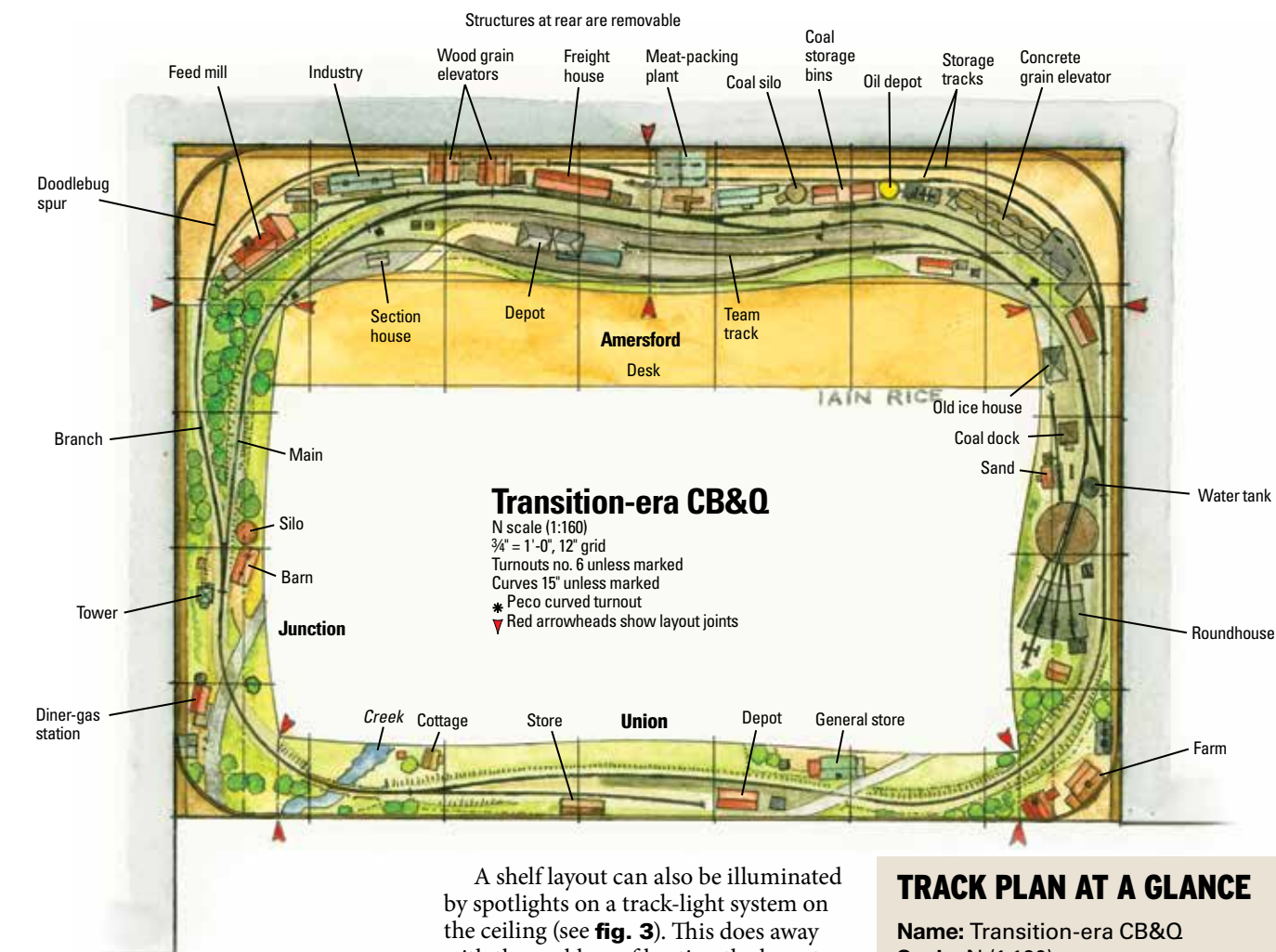
It's also useful to be able to vary the amount of foreground to protect the trains from accidental knocks where the shelf butts up against other uses – storage, entryways, and places where folk might need to pass. *Model Railroad Planning's* editor Tony Koester recommends maintaining a 6" elbow margin between tracks and fascia, but this may have to be reduced on narrow shelves.

LIGHTING AND INTEGRATION

One of the great advantages of building a layout on a shelf supported by slotted tracks is that it's easy to add shelves above and below the railroad. Lighting can simply be hung from a higher shelf that will also serve to protect the layout from dust. Shelves below the railroad can support essentials like control system components, spare equipment, tools, books, magazines, and modeling supplies.

Being able to readily install shelves of different widths by selecting appropriate brackets is useful. For starters, light fixtures should ideally project into the aisle an inch or two more than the modeled scene. This allows the lights to properly illuminate the front of scenes and avoid having foreground objects lost in shadow.

I've found the best type of lighting for shelf layouts to be miniature fluorescent strip lights intended for use under kitchen cabinets. I install them behind a



fascia at the front edge of the lighting shelf, as shown in **fig. 2**.

I prefer fluorescent or light-emitting diode (LED) strip lights for lighting shelf layouts. Both tend to diminish multiple shadows, which are difficult to avoid with a series of point sources such as low-voltage halogen spots or down-lights. The heat output of halogen lights is also a problem, especially where the fixtures are mounted relatively close to the models, as is they are on many shelf layouts.

Close-mounted lights let you keep everything self-contained and independent of the building structure and main wiring circuits. You also get greater efficiency, as the light from a point source (a bulb) diminishes by the square of the distance. A lamp 4 feet from an object illuminates with an intensity only $\frac{1}{16}$ as great as it would a foot away.

Put another way, if you mount your lighting close, you can use a much lower-powered light source for the same effect. Less power means less heat. Better yet, light from a linear source (fluorescent tube) drops off linearly, providing another gain in efficiency. And fluorescents run cooler.

A shelf layout can also be illuminated by spotlights on a track-light system on the ceiling (see **fig. 3**). This does away with the problem of heating the layout, but the layout room may have to be cooled in the warmer months. It also means that the lighting will need to be wired into the house circuits rather than fed via a plug from an outlet, and there's a chance that the presence of operators will cast unwanted shadows.

MULTI-DECKING MADE EASY

When using track-supported shelf brackets, you can readily create multi-deck layouts simply by adding more shelves. However, you still have to get from one deck to the other. That's fine if there's room for a helix or around-the-room grade, problematic if not. I offered some ideas on how this might be done in *Small, Smart, and Practical Track Plans* (Kalmbach Books, 2000, out of print).

The big bonus of a shelf-format multi-deck is that with a typical scene depth of 12" to 15" mounted close to eye level, you don't need anything like the 18" or more vertical separation that's the norm for conventional double-deck designs using deeper scenes. In HO scale, as little as 10" between levels can work, and 12" is plenty; in N scale, or for a very narrow site, you can make things even tighter.

TRACK PLAN AT A GLANCE

Name: Transition-era CB&Q

Scale: N (1:160)

Layout size: 5'-0" x 7'-0"

Theme: Chicago, Burlington

& Quincy RR

Period: 1950s

Mainline run: 24 feet

Minimum radius: 12"

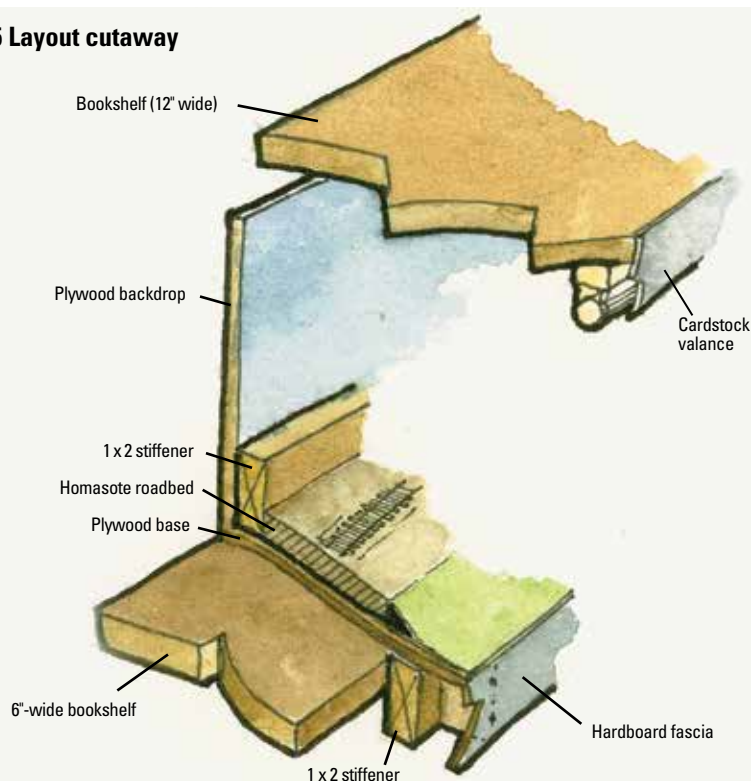
Minimum turnout: no. 6

Maximum grade: none

One of the reasons close-stacking works is that you typically stand closer to an eye-level shelf than you do to a normal cabinet-height layout, and your focus is correspondingly tighter as you follow a train through the scene, as shown in **fig. 4**.

There is one other multi-deck concept to which the shelf layout format readily lends itself: stacking independent layouts. Two shelf layouts mounted one above the other can follow different themes or eras and even be built in different scales. Where linear space is limited, stacking layouts can allow a surprising amount of model railroading scope. It's also a great idea if your modeling interests aren't set in stone – you can try a new subject or scale and still have an operating railroad.

Fig. 5 Layout cutaway



SUBJECTS FOR SHELF LAYOUTS

Most types of railroading can be represented in shelf format, although there are obvious limitations when it comes to things that require deep benchwork, such as turning wyes or turn-back curves. However, given that the vast majority of a full-size railroad's right-of-way consists of little more than one or two tracks flanked by cut, fill, fencing, or drainage, then a narrow shelf is all you need to model these essentials.

A shelf 12" wide will accommodate five or six parallel HO tracks, although there isn't much room for anything else. But a six-track yard can offer interesting switching. There's no need to compromise operation because of a narrow site.

The shelf format lends itself particularly well to three distinct layout types: the compact switching puzzle – typically a yard or depot fed by staging; the around-the-walls linear railroad – either end-to-end or continuous-run format; and the double-deck end-to-end out-and-back, which is really just a variant of my favorite style of model railroad, the "teardrop."

The first of these is very much the sort of thing I dealt with in *Small, Smart, and Practical Track Plans*, which includes a number of compact shelf-based industrial switching layouts (including a triple-decker). In the same book there's also a classic around-the-walls, shelf-

based point-to-point shortline design, and a double-deck point-to-point shelf railroad that fits in a small workshop over the workbench.

A PRAIRIE RAILROAD ON A SHELF

The accompanying N scale plan on page 29 is a good example of what you can do with a shelf layout. I designed it for a Dutch friend. The small layout measures 5 x 7 feet and is installed in the study alcove of a student's bedroom in a university residence hall. It's supported on a bookshelf about 4 feet from the floor, with more shelves above it and a desk below. There's a removable section that spans the open side of the alcove when the layout is in use. This section is stored on the shelf above the main layout.

The featured railroad is my old favorite, the Chicago, Burlington & Quincy (the "Q"). The focus is a junction and its depot where one of the CB&Q's numerous branch lines meets the main; the actual junction is a bit out of town. This mimics Culbertson or Huntley, Neb., on the southern route from St. Louis to Denver, but I dubbed my fictional example Amersford, an Americanization of a Dutch town's name.

The layout is set in the steam-diesel transition era, with steam engines and doodlebugs (gas-electrics) running on

the branch but diesels predominating on the high iron. The advent of good-running, general-purpose N scale steam power such as Kato's United States Railway Association (USRA) heavy Mikado, Model Power's light Mike and Pacific, and Bachmann's Mountain and Consolidation, has really opened up possibilities for steam-era modeling in N. The Kato 2-8-2 could be reworked into a Burlington O-4, the Model Power 4-6-2 into a believable S-1a, and the Bachmann 4-8-2 into a passable B-1a.

In spite of the layout's small size, it offers switching, continuous running, places for opposing trains to meet, a secondary whistle stop (Union), and a pair of staging tracks hidden inside or behind structures (removable) along the back of the yard.

The main section above the desk is 14" deep at its widest, but the other shelves don't exceed 9". The layout measures just 10" vertically. A cutaway illustration showing the layout's basic construction is shown in **fig. 5**, at left.

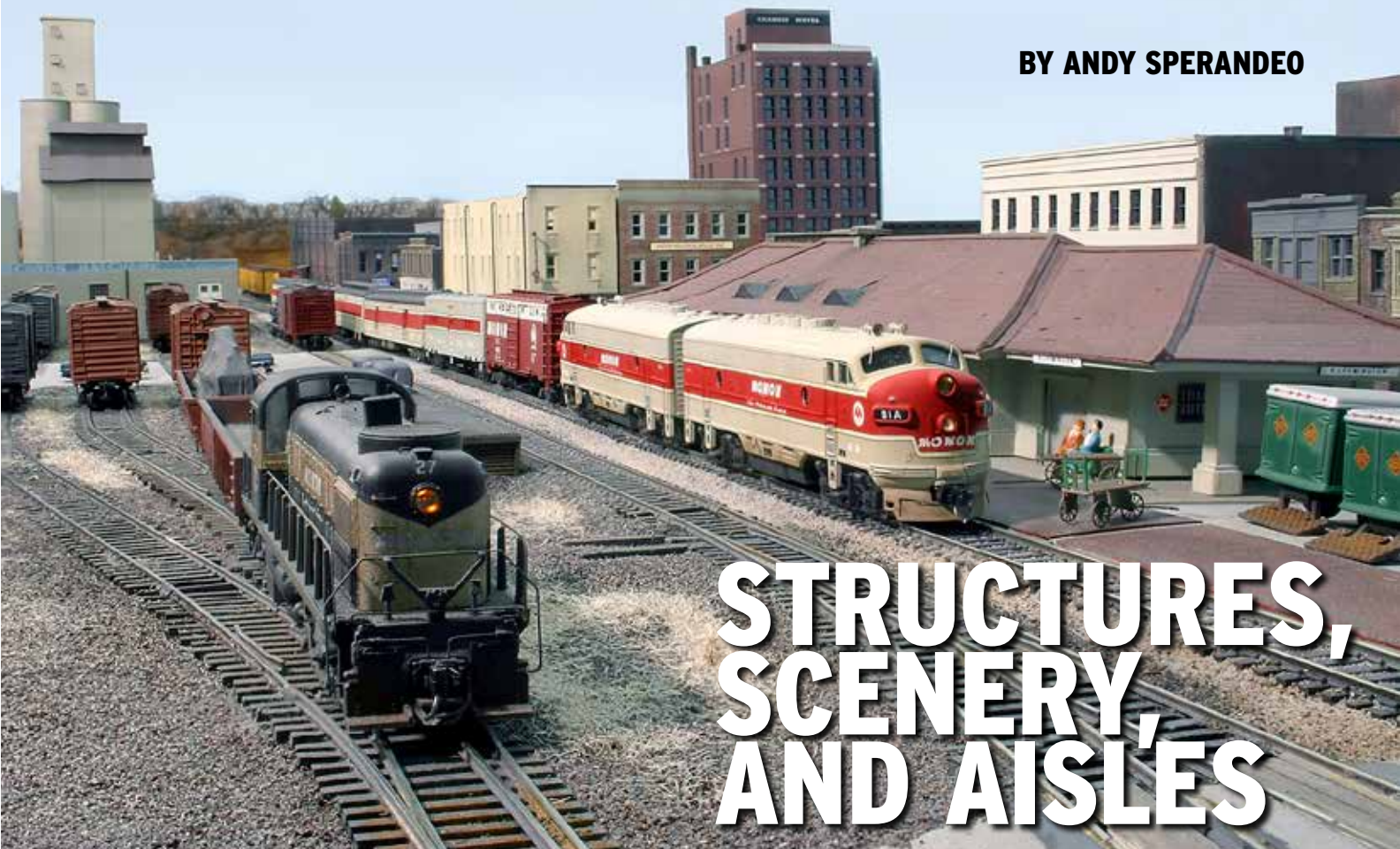
The benchwork couldn't be simpler. It uses a 1/4" plywood base set on the bookshelves and braced from above and below by 1 x 2s set on edge. The fascia is made from hardboard. The subroadbed is a layer of 1/2" Homasote glued to the plywood. This provides enough thickness to model low embankments found in a prairie landscape. The finished layout is portable, of course.

Lighting is from "slim-line" under-cabinet fluorescent fixtures fastened in place with adhesive pads. They give off a nice, even light without generating much heat. Thick cardstock pinned to a shelf serves as a valance.

The plan's hidden sidings have a dual purpose: staging tracks for a mainline train and a fiddle yard for real-time consist changes for the branch. The short spur holds a doodlebug while the other tracks are for a branch freight or a mixed train.

Mainline curves have 15" or greater radii, with 12" radii shown where curves are hidden. Most turnouts are no. 6, but I show several Peco curved turnouts (marked with an asterisk on the plan) in the yard. Surface-mounted switch machines can be concealed in structures.

The layout could be wired for either conventional DC control or Digital Command Control. Appropriate structures will most likely need to be kit-bashed or scratchbuilt. Despite that, the design demonstrates the premise of the versatility of shelf layouts. **SMR**



STRUCTURES, SCENERY, AND AISLES

Bloomington, Ind., on Lance Mindheim's N scale Monon layout included space for buildings and streets as well as the railroad and its downtown industrial tracks. The

investment in real estate helped to make passing through Bloomington a notable event in any train's trip across the layout's mostly rural landscape. Paul Dolkos photo

THERE'S MORE TO A MODEL RAILROAD than just the track, and typically you'll want a track plan to indicate the locations of at least the most important structures and scenic features. There also has to be room for people to build and enjoy the layout, or the plan won't be much use. It's easy to account for all this as you're designing a

layout – just leave room for other things besides track.

WHEN YOU DRAW A STRUCTURE on a track plan you need to know the size and shape of the building's footprint, and you need to keep it far enough away from the track. The first piece of information is often available from kit

makers, in their catalogs or on their websites. Kit reviews in *Model Railroader* and other magazines usually specify the footprint also. If you plan to scratchbuild a structure, use the dimensions from the prototype plan. When you draw in a building to scale, you know it will fit where you want it.

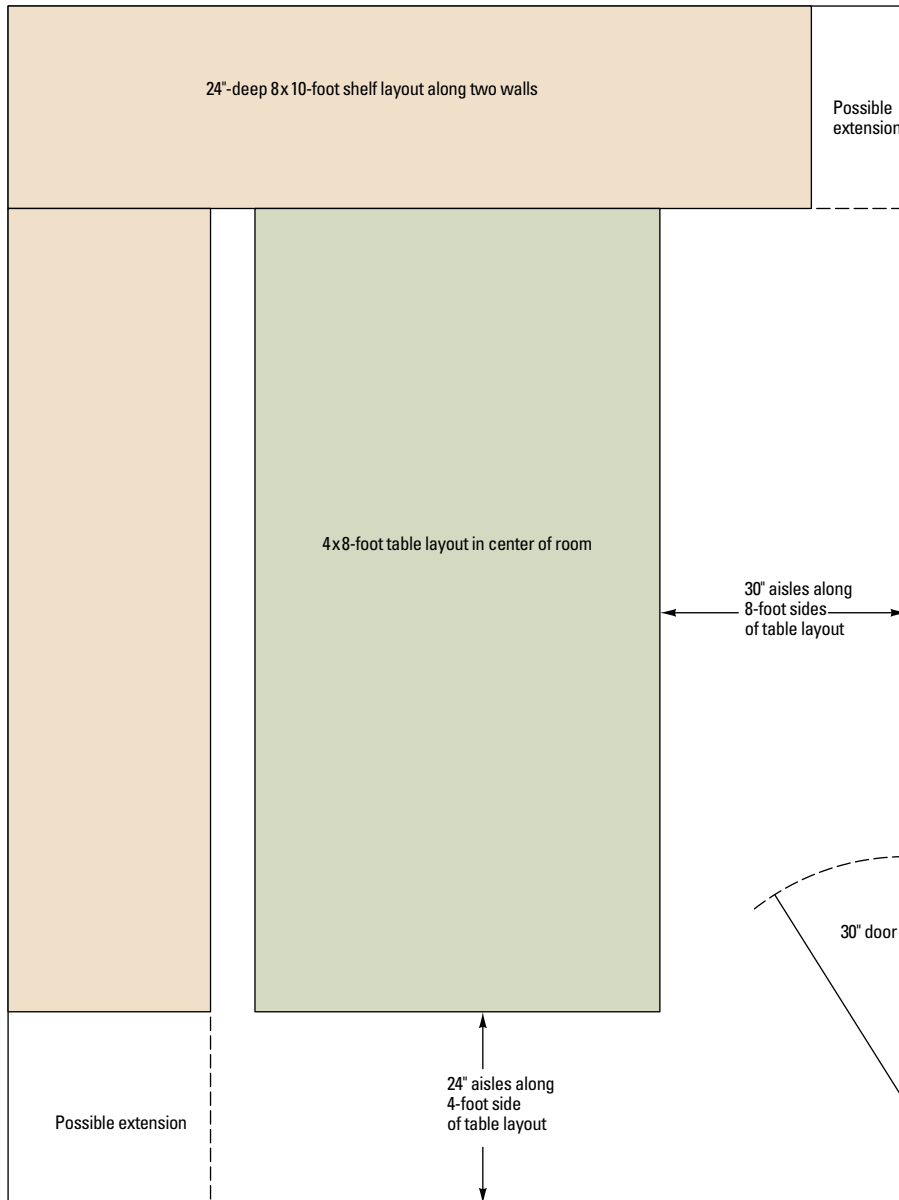
As long, that is, as you allow sufficient clearance from the track center line. It's a trap to cheat on this or simply not to consider that the track represented by a center line is wider than the pencil trace. The trains that will run on the track are wider still. Allow for this as shown in the "Structure clearance" diagram on the next page. You'll need to provide even greater clearance along curved track or where the building is to be set back from the track.

ROOM FOR SLOPES can be the key to realistic, believable scenery. This requires that you maintain some horizontal separation between tracks at different elevations. Except when you want to model an elevated roadbed through a city, avoid stair-stepped ledges and extensive retaining walls.



Realistic slopes along the bank of a creek contribute to a dramatic scene of Sierra Nevada railroading on Pelle Søbørg's HO layout. Pelle Søbørg photo

Two ways to put a layout in a 9 x 12-foot room



SUGGESTED READING FOR DESIGNERS

Planning Scenery for your Model Railroad, by Tony Koester

Realistic Model Railroad Design, by Tony Koester

The Model Railroader's Guide to Freight Yards, by Andy Sperandio (out of print)

Track Planning for Realistic Operation, 3rd edition, by John Armstrong

All published by Kalmbach Books. Ask for them at your Kalmbach dealer, call 800-533-6644, or visit www.ModelRailroader.com.

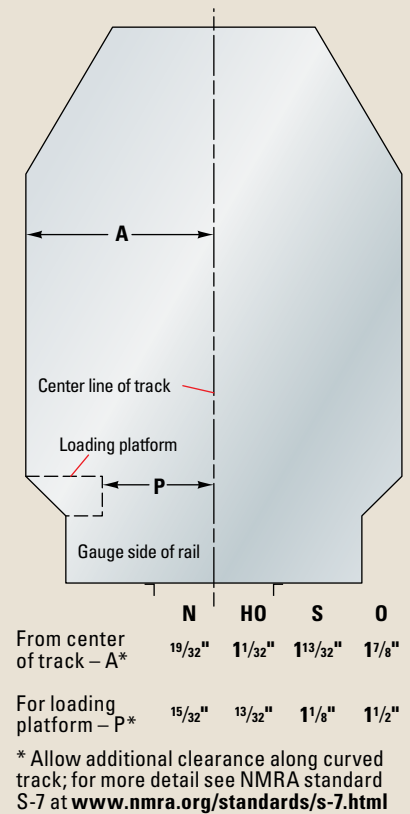
In open country, allow room for the cuts and fills the railroad uses to maintain a steady grade across undulating terrain. Allow for cuts especially as track approaches a tunnel, to keep the actual bore as short as possible.

Slopes are also important along streams. Outside of very rugged terrain, the banks of a river or creek should have

mostly gentle slopes. Meandering creeks may have steep banks, but then their curvature makes them fairly wide features in the landscape.

Streets and highways also take more space than you might think. A scale 20-foot width may look okay for a two-lane roadway in model scenes, but that's tight for modern vehicles. A 25- or 30-foot

STRUCTURE CLEARANCE



width will be more realistic for two lanes. And don't forget to allow for sidewalks.

Whenever possible allow room for scenery and even structures between the front-most track and the layout edge. This puts the railroad in the scene instead of in front of it, and seeing trains pass behind some features adds interest.

ROOM FOR PEOPLE is important too.

As the diagram shows, a 4 x 8-foot table layout can dominate a 9 x 12-foot room and restrict passage around it. That 4 x 8-foot sheet of material can be split down the middle to form an along-the-walls shelf layout that leaves much more free space in the middle of the room.

For walk-in layouts, try to maintain 30" aisles, with more width at frequent intervals to make it easier for people following their trains to pass each other.

(If you're using John Armstrong's sketching by squares method from *Track Planning for Realistic Operation*, allow a full square's width for an aisleway of an HO layout. The same aisle will be as wide as two squares in an N scale layout, and less than one square wide for O scale.)

Aisles 36" or even 42" wide make building, viewing, and operating the layout more comfortable. Wider aisles are a good idea at yards and other places where trains and operators congregate. **SMR**



Even a 1-foot-wide shelf is enough space to model prototypical railroading. Keith Jordan built his layout sections in his garage, then mounted them on the walls of his studio. Keith Jordan photo

SECTION 2

INSPIRATIONAL SMALL LAYOUTS

No matter the space, someone has built a layout to fit into it

BY STEVEN OTTE

NEVER UNDERESTIMATE the ingenuity of a model railroader. Presented with a lack of space that would make an outside observer throw up his hands, a model railroader will come up with a way to not only fit a layout into that space, but do it well.

Take a look at some of the layouts in this section. Keith Jordan, whose shelf layout is seen in our first article (and above), faithfully modeled a prototypical section of the Santa Fe on two 1-foot-wide shelves. Not only does his layout include prototype landmarks, it features realistic operations.

And small layouts don't have to mean small scales, either. Brian Rudko's Pender Iron & Supply Co. is featured on page 48. His layout combines a transfer table, a sector plate, forced perspective, narrow gauge, and industrial locomotives to pack a lot of operation in a 2 x 4 foot space – in 1:24 large scale.

Other layouts in the pages to follow use inspiring methods to increase operating interest. Removable car floats, mirrors, modular design, and moveable staging all mean the fun doesn't have to stop where the benchwork does. **SMR**



LOS ANGELES ON AN L-SHAPED SHELF

Modeling the Santa Fe's 'Patch' industrial district in a corner of a studio

BY KEITH JORDAN • PHOTOS BY THE AUTHOR

I'VE ALWAYS BEEN FASCINATED with small shelf layouts. I like that they fit in a small space and are compact enough to allow time to add a wealth of modeling detail. In fact, good small shelf layouts share the same elements in a

good short story: plot, motion, and character. For a shelf layout, that includes its purpose (plot), train operations (motion), and detail (character).

Even though I already had a basement layout (featured in *Model Railroad*

Planning 2009 and MRP 2004), I began thinking about building a small, urban-themed shelf layout in my upstairs studio (see *Great Model Railroads* 2009). It had to be based on a prototype location and operations-oriented. I also wanted it



This overview shows how Keith Jordan's HO shelf layout fits around an outside corner. Since valance lighting wouldn't work on the room's sloping ceiling, Keith used track lighting. Despite the scalloped light pattern on the walls and ceiling, the railroad is evenly illuminated.

to have a strong aesthetic and blend well with my Craftsman-styled studio.

CONCEPT

My research of the Atchison, Topeka & Santa Fe's operations on the Surf Line had led me to resources that detailed the industrial switching operations in and around Los Angeles. Most people don't associate this area with industry, but since World War II, Los Angeles has remained a major manufacturing center. Though I thought about modeling something other than the Santa Fe – perhaps the Southern Pacific or Pacific Electric – I chose to remain with my favorite road.

A possible prototype was an industrial area near downtown Los Angeles,



An Alco HH-1000 and a fuel tank car sit at the First Street Yard engine-service track, built in 1947 to accommodate the many diesel switchers working around downtown L.A. The overpass suggests the railroad continues off to the right.

served by the Santa Fe. The Santa Fe's original yard in this city, referred to as First Street, borders the Los Angeles River south of that road. Passenger operations moved over to the Los Angeles Union Passenger Terminal in 1939, but First Street Yard remained a focal point for freight traffic and many industrial-switching jobs until the 1970s.

One of those industrial jobs worked in an area near Seventh and Alameda Streets that was colorfully nicknamed "The Patch." As I researched the Santa Fe's industries and track arrangements in the area, I found not only a prototype on which to base my shelf layout but also a cool name for the project!

With this layout, I planned to be less rigid in my adherence to the prototype. This included track arrangements that only hinted at the real thing (without creating a toy-like appearance or any odd switching puzzles) and latitude in selecting the industries or buildings that would be on the layout. I chose industries that were located in the Patch but felt free to substitute ones that were a few blocks away if they better suited my tastes. I could then use off-the-shelf kits or kitbash or scratchbuild structures as desired. It was liberating!

DESIGN CONSIDERATIONS

As I thought about building a shelf layout, I had two possible areas in my studio where it could be constructed. One was atop the bookshelves that lined the longest wall and reached into a dormer. This would provide a surface that could easily support a layout, particularly

if I used David Barrow's "domino" approach with self-contained connecting sections. A potential drawback would be the loss of the top surface for lamps or to display various items.

Another potential area was along the wall opposite the bookshelves, which could also involve the knee wall created by the dormer. This would make an L-shaped shelf rather than a straight layout, but in this case that would be a plus because of the chosen prototype. In the Patch, the spurs curved to conform to the industrial structures they served.

At one interesting location, the track leading over to the Seventh Avenue alley curved 90 degrees and threaded its way between a pair of buildings with curved walls! This would be a perfect way to make the same turn at the corner where the room walls meet. Along with a scenic divider, such as a street viaduct over the tracks, this would allow me to functionally split the activity into two areas, one representing First Street Yard and the other the Seventh Street Alley, the heart of the Patch. Having a bare semblance of First Street Yard with just a few tracks would also serve as a place where cars originate or terminate, as there's no room for separate staging.

With the room location settled, it didn't take long to determine that a pair of 12" x 96" wings would fit perfectly and make good use of my plywood. The 12" shelf depth was enough to fit in the right number of tracks. A series of shallow structure flats about an inch deep would allow for five tracks in the yard (two for freight house, two for sorting, and one

running track) and three tracks in the alley (one drill and a spur on either side). Using just three tracks in the alley allowed for deeper buildings along the back. There are no structures across the front, so I represented the industries that should be there with small plaques stating each industry's name and the number of assigned car spots.

The height of these shelves was critical, particularly because of the knee wall. That meant that the dimension would be determined by the height of the tallest structure so it would fit where the slope

of the ceiling began. In my case, the tallest structure turned out to be a Walther's gas storage tank, which was similar to many gas-holding tanks near downtown L.A. Since this was a signature scenic element, I built one of the tank kits as a half-model and trimmed its external framework to fit on the layout against the slope of the ceiling. This placed the layout height at 56", with a 7" backdrop.

LAYOUT CONSTRUCTION

Because the layout is in a furnished room, its construction had to take place in our garage. Sawdust around a computer is not a good thing! Besides, construction, particularly wiring, could be done more comfortably in the garage.

I cut the entire benchwork from one 4x8-foot sheet of cabinet-grade 3/4" birch plywood, cutting the two tops, sides, and joists on my table saw. I assembled the 4" high frames with glue and screws. Next I attached the tops to the frame, forming two boxes that could be joined in an L shape. Then I drilled holes through the joists and the sides for the wiring.

I painted both boxes with two coats of a semi-gloss version of my wall color. This included the undersides as well. This made the layout shelf blend right in with the decor of my studio.

The next order of business was to draw the full-size track plan on the top surface. Since I planned on using some of Walther's Cornerstone building kits, I used taped-together kit parts to check clearances and serve as mock-ups. Placing the full-sized structures,

THE LAYOUT AT A GLANCE

Name: The Patch

Scale: HO (1:87)

Size: 8'-1" x 8'-10"

Prototype: Atchison, Topeka & Santa Fe

Locale: Los Angeles, Calif.

Era: early to mid-1950s

Style: shelf

Mainline run: none

Minimum radius: 18"

Minimum turnout: no. 4

Maximum grade: none

Typical train length: 10 cars

Benchwork: open-grid

Height: 56"

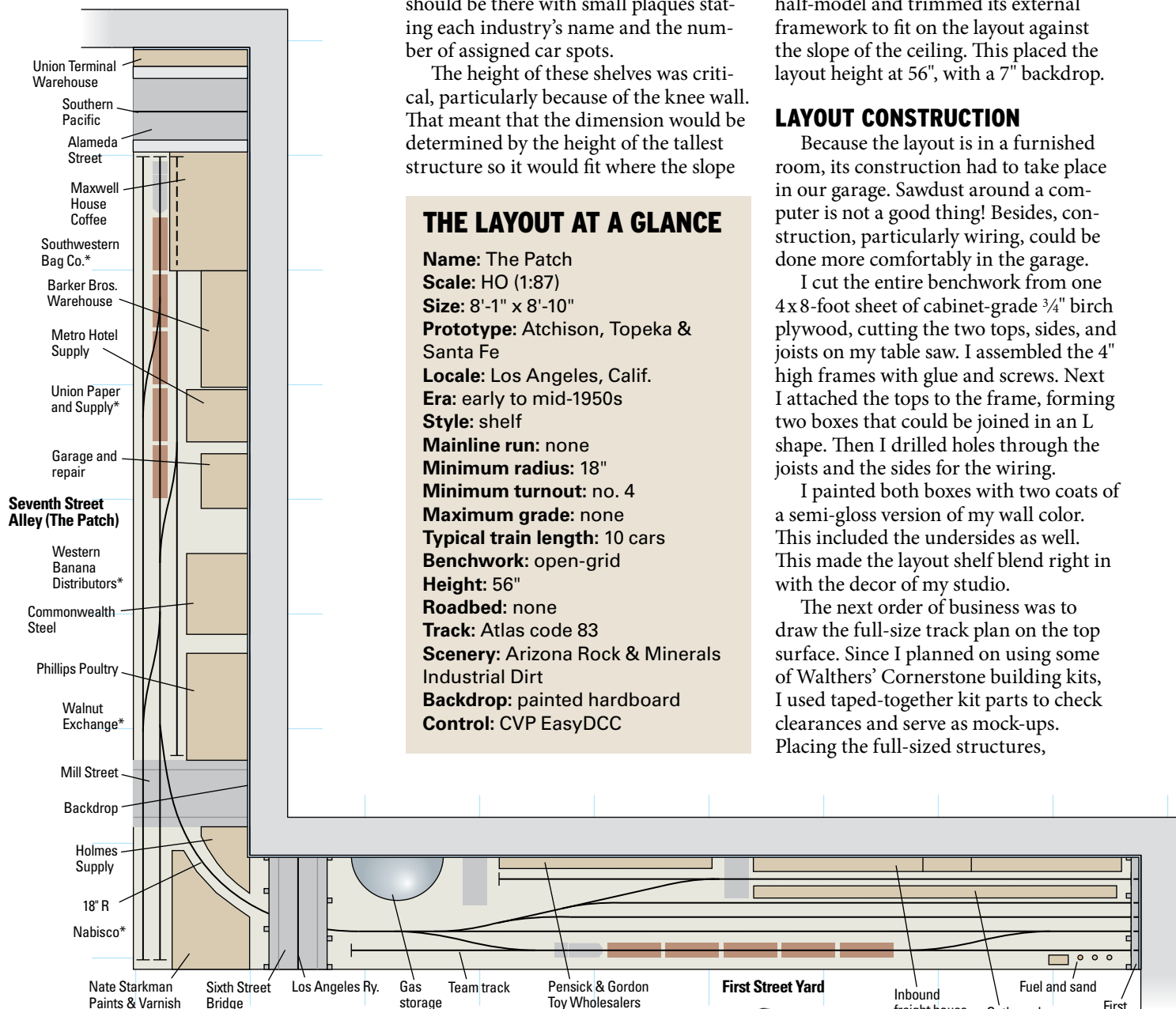
Roadbed: none

Track: Atlas code 83

Scenery: Arizona Rock & Minerals Industrial Dirt

Backdrop: painted hardboard

Control: CVP EasyDCC





This side of the layout is Seventh Street Alley, known as "The Patch." Only the structures on the backdrop side of the alley are modeled; those on the aisle side are represented by small engraved plaques. The backdrop is removable and will feature a painting of the downtown Los Angeles skyline.

turnouts, and flextrack on the layout made it easy to see if things would fit and still make sense. I could also determine industry spur capacities with actual cars.

Once I was satisfied with the track and building arrangements, I attached the track following Chuck Hitchcock's article on gluing track in the August 2003 *Model Railroader*. Both DAP Kwik Seal Tub & Tile Adhesive Caulk and Polyseamseal Clear All-Purpose Adhesive Caulk made by Henkel Consumer Adhesives work well with this method.

All turnouts are manually operated using Caboose Industries no. 206S N scale switch stands. If carefully placed, they work smoothly with HO turnouts and are closer to scale. I connected them to my Atlas Custom Line code 83 turnouts (all no. 4s), using a shallow U-shaped piece of brass wire with the ends projecting up through the switch rod and a hole in the moving bar of the switch stand. This put the stands closer to the turnouts. I also trimmed off the headblocks (the two long ties on either side of the switch rod) and replaced them with more realistic ties.



Keith built the shelf modules in his garage using $\frac{3}{4}$ " birch plywood assembled with cabinet screws. This let him lay out the track plan prior to installation to see how structures would fit, and to easily wire the layout. All of the exposed surfaces on both modules were painted the same color as the studio walls.



Santa Fe Alco no. 2314 threads its way between a pair of curved buildings as it enters “The Patch” (above left). Keith made this signature scene by kit-bashing Walthers Cornerstone kits to model how the prototype structures curve where the tracks went between the buildings (above). Note the bricked-up windows and graffiti.

Next up was wiring. By turning the benchwork boxes on their sides, I could comfortably sit next to them and connect the feeders to the buses. My buses are two 12-gauge stranded wires that run down the middle of each box. They’re tied to each end through eyebolts and pulled slightly taut. This keeps them out of sight by not letting them droop below the bottom of the box.

I soldered a 24-gauge feeder to every piece of rail and trimmed the wire just long enough to reach the bus without being pulled taut before soldering. I drilled a hole next to each connection point for the wire to drop through.

LAYOUT INSTALLATION

With the basic construction of the layout now complete, I took the boxes upstairs for installation. As I mentioned earlier, the layout’s aesthetics were important to me. I wanted it to blend with the rest of the room and be pleasing to look at. To me, that meant hiding the visible supports, a goal that turned out to be fairly simple to achieve.

By attaching the two layout pieces to the side walls and each other, then attaching them to the walls at each end, I had a rigid structure that didn’t flex, bend, or twist. I used heavy lag bolts and washers to attach the boxes to the wall.

The box along the dormer wall has a length of $\frac{1}{8}$ " hardboard along the back,



The lead track connecting The Patch to First Street Yard curves between two buildings, just as it did on the Santa Fe. These unusual kitbashed structures represent actual prototypes that still exist in downtown Los Angeles.

LIGHTING THE LAYOUT

THE SLOPED CEILINGS and narrow dormer made lighting the shelf layout a challenge. I couldn’t install a more traditional valance lighting system, and the existing room lighting wasn’t adequate.

I installed two sets of track lighting parallel to the benchwork. The track in the dormer is in the center of the ceiling, approximately 12" to 18" from the front plane of the layout. I spaced the other track similarly, and connected both legs

to a recessed electrical box in the ceiling. It’s wired so I can control the layout lighting separately.

The track lights are aimed at the back edge of the layout and use G-8 halogen lamps, which emit a bright white light. You can see the light scalloping on the ceiling and walls, but it falls evenly on the layout. I aimed all the lights in one direction to avoid conflicting shadows. The tracks and light fixtures are white to blend with the ceiling. – K.J.

sandwiched between it and the wall. This creates a gap along the back edge where I inserted a 12" x 96" piece of hardboard painted sky blue. I plan to paint the Los Angeles skyline and its landmark city hall on this board at some point in the future. I painted the narrower background along the knee wall sky blue without installing a separate backdrop.

The final touch for the benchwork was to nail on a hardboard fascia, filling and smoothing the nail holes, then painting it a semi-gloss gray-green that matches the room's wall color. Without any visible supports, the layout shelf appears to "float" in the room. Yes, it's still a model train layout in a home studio, but it has a greater degree of harmony than the more typical approach of a table with legs.

With the layout in place, I installed the DCC components. [See "Hiding the electronics" at right. – Ed.] Had I purchased them while I was still building the boxes in the garage, I would have done the installation at that time.

TWO-MAN OPERATION

I'm very pleased with how this layout project has progressed, and it's been a lot of fun. In fact, I've had more fun with this layout than any of my larger ones. In part that's because it's smaller and more manageable, and because it was more thoroughly planned. Big layouts tend to be built "on the fly" and are inherently more complex.

The Patch is operated somewhat regularly with a two-man crew. The Santa Fe numbered the daylight switch jobs in the 100 series, afternoon jobs in the 200 series, and midnight jobs in the 300 series. Jobs 121, 221, and 321 work the Canal District – the freight house area. Jobs 122, 222, and 322 work The Patch (Seventh St. Alley). The assigned locomotives are a pair of Overland Santa Fe 2310-series Alco HH-1000s with SoundTraxx Tsunami decoders.

My operating sessions typically last about 2½ hours, which is roughly an eight-hour shift on a 3:1 fast clock. The sessions are laid back with lots of conversation, and that's just fine by me. We operate as prototypically as possible, including the paperwork, but how we do that is a story for another time.

I've been fortunate to have input from some of the "old head" professional railroaders who actually switched The Patch. Their explanations of how they went about their daily jobs have been invaluable. **SMR**

HIDING THE ELECTRONICS



Keith hinged the EasyDCC command station (left) so he can swing it up and out of sight when it's not needed. The booster sits on a hidden shelf (right) that he built into the underside of the benchwork before the layout was installed. Keith also positioned the system's wireless base station beneath the benchwork so its antenna is concealed inside the gas holder.

WHERE THERE ARE electronics, there are wires. In an effort to minimize clutter, I installed a wireless computer network in my studio and have hidden all of its electrical cords and cables. My efforts to hide the wiring extends to the layout as well. I didn't want any visible fascia-mounted controls or control panels, throttle plugs, or exposed wires. That meant I'd have to go wireless with the layout control system as well.

Since I had used CVP Products' EasyDCC on the Surf Line downstairs and was very happy with it, I installed it on the Patch as well. EasyDCC's wireless system has four basic components: a command station with built-in throttles, booster(s), a wireless receiver, and a wireless throttle. The first three of these items challenged my concealed-wiring criteria.

In typical EasyDCC installations, the command station is set into the fascia, its booster is mounted under the layout, and the wireless receiver with its antenna is above the layout. My fascia wasn't deep enough for the command station, nor did I want it there. One idea was to purchase a small nightstand cabinet with a drawer and door, hide all the electronics inside, and connect the appropriate wires to the layout.

I wasn't able to find a suitable cabinet, so I considered mounting

the components on the layout. The booster and wireless receiver could be hidden within the framework, with the antenna poking up through the top inside the gas holder.

That still left the command station. It occurred to me that I could hinge this panel, allowing it to be hidden underneath, then swing down and lock into place. The panel is needed for decoder programming, but I'm using a separate programming track, so this seemed like a good solution.

I made a frame for the panel from birch plywood with finished edges. Then I attached the frame to the inside of the front edge of the layout with concealed hinges made for cabinet doors. When the panel is folded up and out of sight, a small wooden catch keeps it in place.

The booster and wireless receiver sit on small shelves attached to the underside of the benchwork. I routed the wiring through holes in the joists that keep the wires from sagging into view.

The command station, booster, and wireless receiver have separate transformers, so I routed all of their power cords to a power strip that I use as a layout on-off switch. The only cord that's visible is the one from the power strip to the outlet, and I ran that through a plastic conduit that's painted the wall color to make it less obtrusive. – K.J.



When Howard Scodras designed the HO scale Otabec Central, he wanted to re-create a big-city industrial area with lots of switching and street running. Here, OC Alco RS-1 no. 900 arrives at the Overbrook yard with a cut of cars.

BIG-CITY RAILROADING IN A SMALL APARTMENT ROOM

This HO scale shelf layout provides hours of model railroading enjoyment

BY HOWARD SCODRAS • PHOTOS BY PETER NESBITT

ONE REASON many modelers never build a layout is that they think they don't have the space. I've lived in apartments most of my life and can tell you that building a model railroad is

possible, even if you don't have much room to spare. I was able to fit my HO scale Otabec Central, a staging yard, a spray booth, and a small workbench into a 9½ x 11-foot spare room.

When my wife and I lived in smaller apartments, I built model railroad dioramas. Sure, the dioramas weren't layouts, but they kept my modeling skills sharp and let me try different techniques.

When I began work on the Ontabec Central in 1992, I was able to apply the skills I gained building dioramas to my layout. Even though most of my model railroad is only 2'-4" wide, I made it seem bigger by modeling a big-city industrial area that features tall buildings, street running, and plenty of switching spots.

A PLEASANT PROBLEM

When my wife and I decided to move into this apartment, I quickly commandeered the spare room for my model railroad. She agreed, but issued the following caveat: All train-related activities, including building, painting, and storage of materials, must be done in the layout room. With the ground rules established, I began planning how to most effectively fit all these elements into the 9½ x 11-foot room.

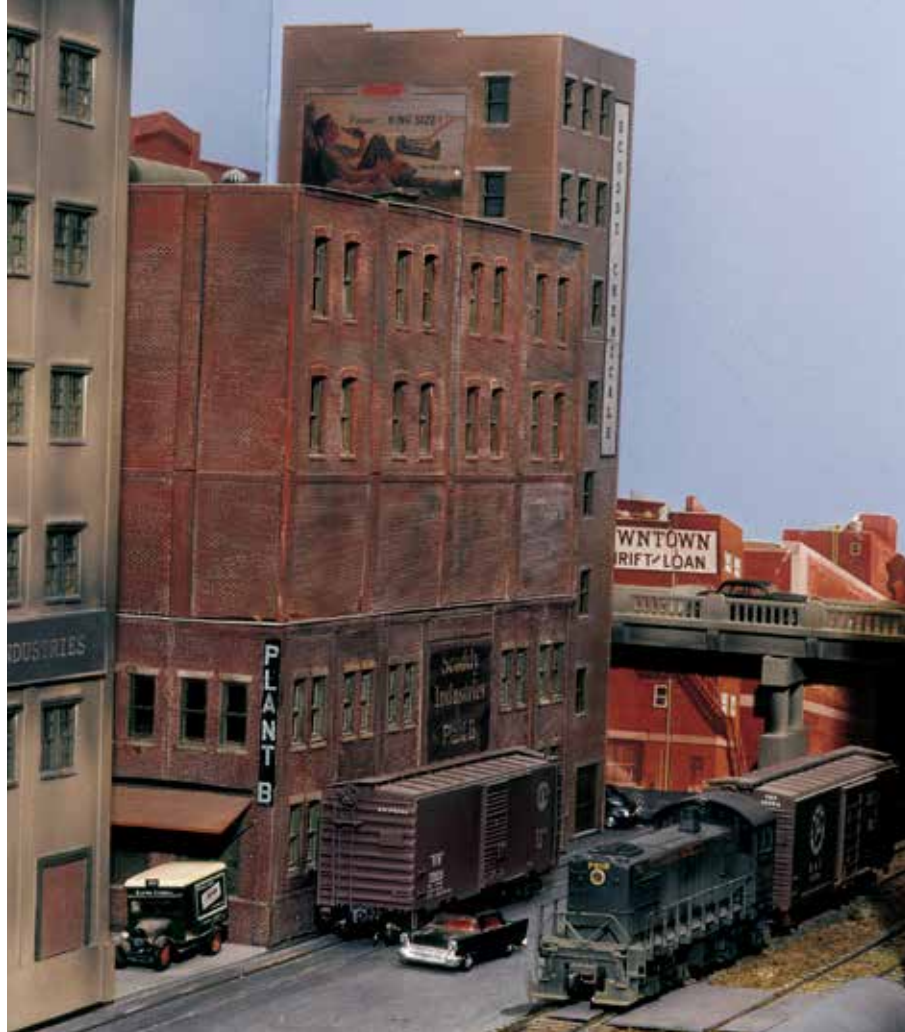
It quickly became apparent that I would have to use the space under the layout for storage. At first I was concerned that storing items here would make layout wiring and maintenance difficult. Those concerns were quickly put to rest, though. I wired my shelf layout as a single block, and connected all the track to two 14-gauge bus wires that terminate at a ¼" two-conductor jack installed on the fascia panel (see wiring illustration on page 43).

Since my operators have both DC and Digital Command Control (DCC) locomotives, I installed two matching ¼" phone plugs that are connected to the DC and DCC power supplies.

To make troubleshooting easier for the five turnouts powered by Tortoise by Circuitron switch motors, I extended the eight contacts of each motor to the front of the layout with eight-conductor ribbon cables terminating at screw-type terminal strips. The power supply for the switch motors also terminates here, but at a separate strip. This wiring arrangement makes it possible to reach all switch-motor connections without having to crawl under the layout. Even though my layout wiring is simple, I took detailed notes and drew diagrams so I wouldn't lose track of the circuits under the benchwork.

TAKING IT TO THE STREETS

As much as I take pride in the simplicity of the benchwork and wiring, the model railroad itself is the centerpiece of the room. I wanted the layout to be a re-creation of the scenes and type of railroading that I recalled as a child growing up in Montreal. The tall buildings, rail lines winding through the streets, and



Scoddy Industries is the biggest business in Overbrook, so it requires regular switching. Canadian Pacific Alco S-2 no. 7019 is assigned to switch the plant today. With only one boxcar to deliver, the crew's work shouldn't take too long.

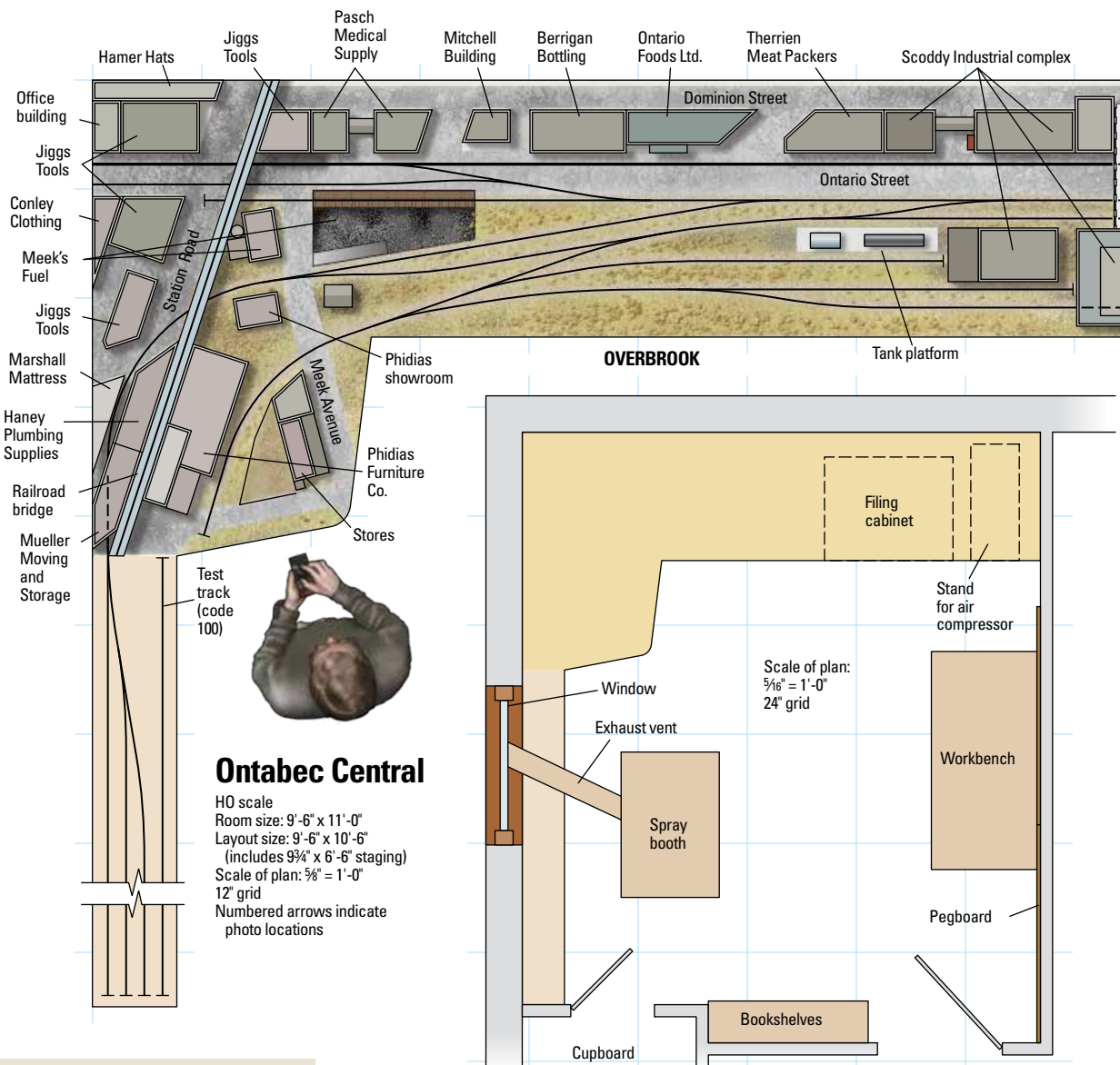
DISGUIISING HIDDEN STORAGE



SINCE MY MODEL RAILROAD, spray booth, workbench, and supplies are all in one room, I had to use the space beneath the layout for storage. However, I needed a way to hide the stored items.

Since I'm not a seamstress, I knew sliding drapes were out. Then, while purchasing a Venetian

blind for our kitchen, I thought, "These would also work great for the layout." I purchased enough Venetian blinds to go around the model railroad. The blinds add a touch of class to the layout, and they do a great job of keeping stored materials out of plain view. — H.S.



Ontabec Central

HO scale
Room size: 9'-6" x 11'-0"
Layout size: 9'-6" x 10'-6"
(includes 9 3/4" x 6'-6" staging)
Scale of plan: 5/16" = 1'-0"
12" grid
Numbered arrows indicate
photo locations

THE LAYOUT AT A GLANCE

Name: Ontabec Central

Scale: HO (1:87.1)

Size: L-shaped 9'-6" x 10'-6"
(includes 9 3/4" x 6'-6" staging)

Prototype: freelance

Locale: urban

Era: 1950s

Layout style: shelf

Length of mainline run: 12 feet

Layout height: 48 1/2"

Benchwork: open grid

Roadbed: cork on 5/8" plywood

Track: code 70

Turnout minimum: no. 4

Minimum radius: 20"

Maximum grade: none

Scenery: plaster covered with
ground foam

Backdrop: foam core

Control: DC and Lenz Digital
Command Control

ample switching opportunities were all a must for the Ontabec Central RR.

I was further inspired to model large urban scenes after seeing the work of George Sellios (of Franklin & South Manchester fame) and Earl Smallshaw (builder of the HO scale Middletown & Mystic Mines). However, I kept asking myself, "With my small space, how can I emulate the work of these modelers?"

The answer to the space issue was a small switching layout. The setting for my 1950s-era model railroad is the streets of an urban industrial area on the edge of a large city. I reused the Ontabec Central name (an amalgam of the two Canadian provinces I've lived in, Ontario and Quebec) from a 2 x 4-foot diorama I had built earlier.

Since my goal for the Ontabec Central was to model big-city

railroading, large urban structures needed to dominate the scenery.

I scratchbuilt, kitbashed, and modified buildings in a variety of heights, depths, materials, and colors to create a realistic urban environment.

BRINGING THE OC TO LIFE

A typical operating session begins with Ontabec Central Alco RS-1 no. 900 leaving the staging yard for Overbrook. The train has up to eight cars that it sets off at the Meek Avenue siding. The locomotive then pushes any cars left on the runaround track from the previous operating session back to staging.

After the OC locomotive is back in staging, Canadian Pacific Alco S-2 no. 7019 begins its work. The crew assigned to this job faces some unique challenges. For example, a number of

industries are served by a single siding that runs along Ontario Street. To reach these industries, other cars have to be temporarily moved off spot.

The inclusion of facing and trailing sidings offers additional switching problems as well. Crews must do some careful planning before they begin switching this area, as there are several industries located in and around the Meek Avenue siding.

SMALL LAYOUT, BIG BENEFITS

I learned very quickly that careful planning is important if a small layout is to be a success. When I was drawing the track plan I realized I needed a run-around track for the type of operations I wanted. After studying the layout, I decided the best location would be Meek Avenue siding because it gives crews the most room to work.

The lack of a long mainline run is the big disadvantage of a small layout like mine. On the other hand I've found that my small layout has some advantages. From a financial perspective my layout was ideal because it didn't require much benchwork material. I've also found cleaning and electrical troubleshooting to be much easier.

Another benefit is the limited amount of equipment needed. My motive power fleet consists of a Canadian Pacific Alco S-2 and an Ontabec Central Alco RS-1. These two units are enough to keep trains moving during operating sessions.

My freight car roster has approximately 30 cars. Since I knew early on I wasn't going to need much rolling stock, I purchased high-end kits and added details such as uncoupling levers, brake hoses, and underbody details. I also installed semi-scale wheelsets and Kadee no. 58 scale couplers before I weathered the cars and put them on the layout.

ALWAYS MORE TO DO

The Ontabec Central has turned out to be all I expected and more. Now that the layout is fully operational, I can complete other projects I've been meaning to do. This suits me just fine as I find the building aspect of the hobby most enjoyable. I let members of my Friday night operating crew run the layout.

Currently I'm adding details to structures such as fire escapes, roof vents and pipes, and signs. I also have to finish installing sidewalks and assorted street-related details. All of these projects will greatly enhance the layout's appearance and give the OC a big-city feel. **SMR**



To make his shelf layout appear deeper, Howard used a combination of structure kits, low-relief buildings, and backdrop cutouts. Examples of low-relief buildings and backdrop cutouts can be seen behind the structure kits. The terminal strips, control panel, and fascia boards are all visible in the foreground.

QUICK AND EASY FASCIA PANELS

THE WIRING for the switch machines runs to screw-type terminal strips mounted on the face of the benchwork. I didn't want the wiring exposed, so I concealed the terminal strips.

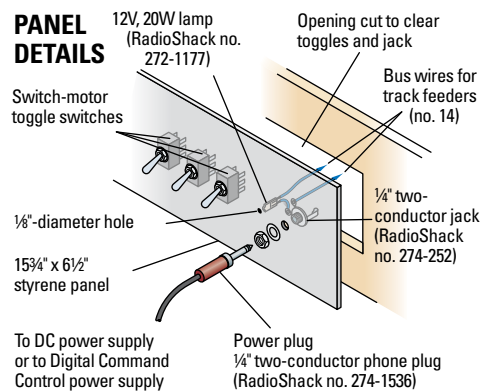
To get a wood-grain look without a lot of work, I used prefinished shelves with a simulated wood finish. I asked a friend to cut the shelves to size.

Before I could install the fascia panels, though, I had to install 1½"-deep wood spacer blocks. Next, I secured the panels to the blocks with brass finishing screws. To finish the project I covered the front of the 5/8"

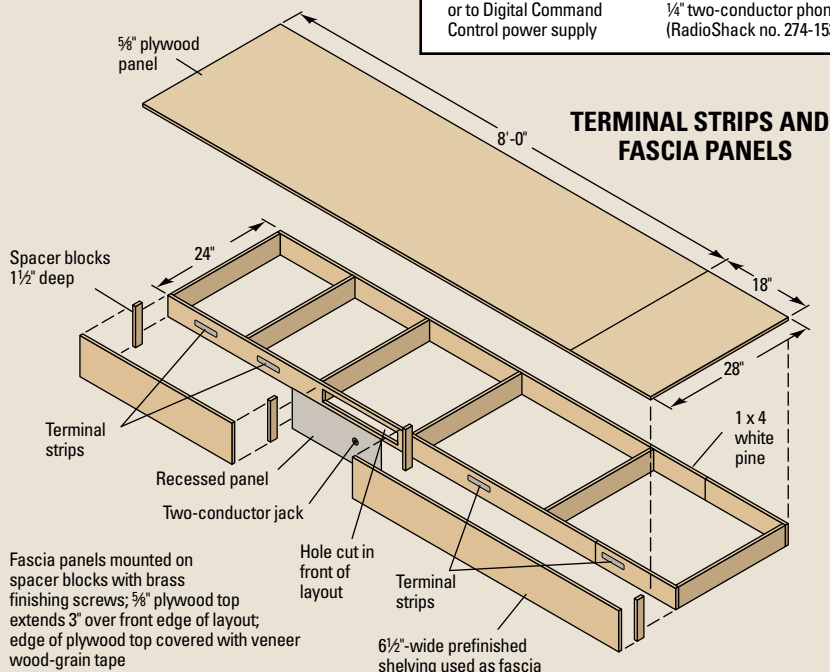
plywood layout deck with a veneer wood-grain tape.

The fascia panels look great and give the layout a finished, professional look. —H.S.

PANEL DETAILS



TERMINAL STRIPS AND FASCIA PANELS



Illustrations by Rick Johnson



Whasup Dock Co. no. 1 pulls an empty gondola from under the coal dock's traveling crane, while workers on the barge make repairs to the sea wall. This busy waterfront is the focus of Barbara Brunette's compact shelf layout.

RAIL-MARINE OPERATIONS ON A SHELF

This HO scale layout packs detailed urban structures and waterfront scenes into a compact space

BY BARBARA BRUNETTE • PHOTOS BY THE AUTHOR

ONE OF THE GREAT THINGS about model railroading is that you don't need a lot of space. My HO scale Whasup Dock Co. measures only 51" x 80", including aisle space, and is nestled at the end of a hallway in my apartment. Although it has a small footprint, my

layout features many multi-story city buildings as well as tugboats and other harbor craft working the waterfront.

Ever since seeing photos in *Model Railroader* of the car ferry *Annabel* on John Allen's Gorre & Daphetid layout, I've wanted to model a waterfront road.

My Whasup Dock Co. shelf layout is a subsidiary of my previous model railroad, the Central Rockland RR. I dismantled that layout in 1986 to make space in a spare bedroom. The Central Rockland was never fully completed. By 1995 I found that I missed the hobby so

THE LAYOUT AT A GLANCE

Name: Whasup Dock Co.

Scale: HO scale (1:87.1)

Size: 4'-3" x 6'-8"

Theme: freelanced

Locale: Northeastern U.S.

Era: summer 1956

Style: shelf

Mainline run: 8 feet

Minimum radius: 18"

Minimum turnout: no. 4

Maximum grade: 3 percent

Benchwork: 1/2" plywood on 1 x 4 frame

Height: 37 5/8" to 38 5/8"

Roadbed: Homabed

Track: code 70 handlaid and flextrack

Scenery: extruded-foam insulation board

Backdrop: tempered hardboard

Control: DC cab control

much that I began building another model railroad.

This Whasup Dock Co. is the best thing I've done in the hobby and is the closest I've come to finishing a layout.

BENCHWORK AND TRACK

I planned the layout on a piece of plywood, using Atlas Snap-Track sections and turnouts salvaged from my previous layout. This mock-up helped me visualize my track plan and check clearances and operation.

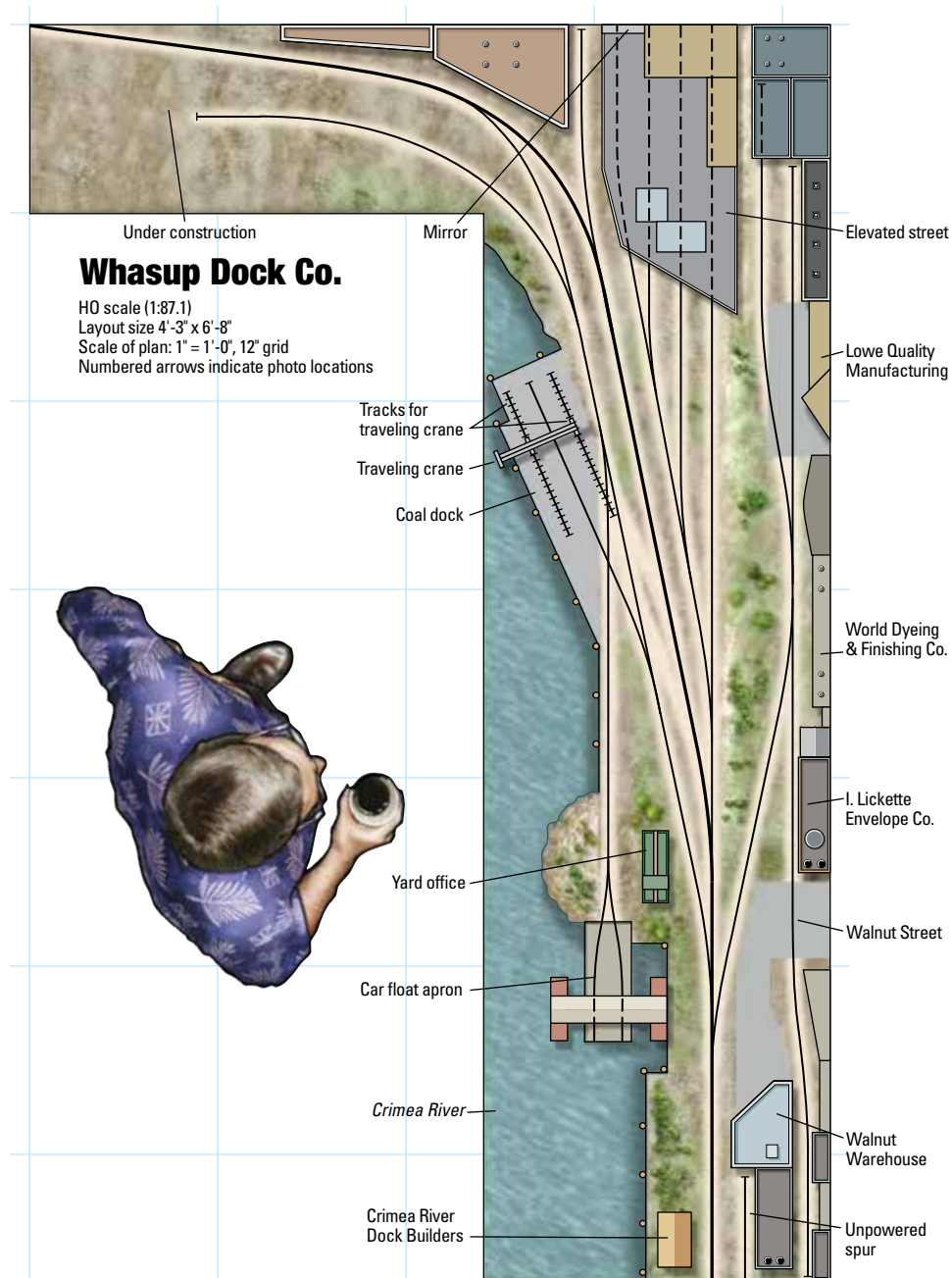
I built the benchwork using 1/2" plywood on a 1 x 4 frame. The benchwork sits on a ledger strip mounted along the wall. A single straight leg and L-shaped brackets that I made from 3/4" plywood support the benchwork.

Except for some temporary flextrack on the unfinished section of the layout, all my trackwork is handlaid code 70 rail on individual wood ties. A friend taught me how to handlay track and build turnouts 20 years ago, and although it's not my favorite task, I enjoy the results.

My biggest challenge was the crossover for the loading track at the coal dock. After two attempts I successfully installed and wired the crossover. I used parts from my first attempt to build a crossover on one of the unpowered tracks for the traveling crane.

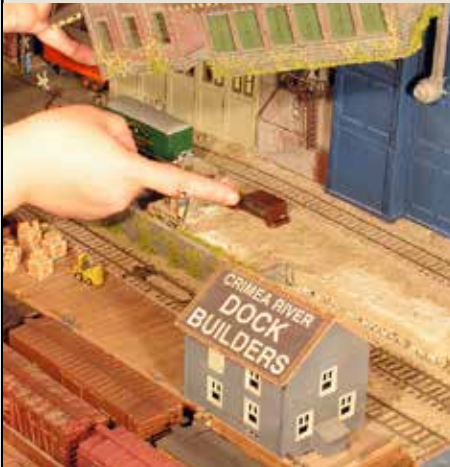
SCENERY

Most of the scenery contours are carved foam board. For ground cover I used real dirt and Woodland Scenics ground foam.



Whasup Dock Co. no. 1, an 0-6-0T tank engine, and no. 2, a boxcab diesel, switch cars along the waterfront. The tug *Oliver* and barge rest on a lift-off section of "water" that Barbara uses to widen the river for photos.

CABINET CATCHES ON STRUCTURES



For structures that sit away from the backdrop, Barbara mounts the cabinet catch on the scenery base and the plate inside the structure.

AS I BUILT the Whasup Dock Co., I struggled to find the best way to hold structure models in place. I didn't want to permanently attach them to the base with adhesive or screws, and most of the structures wouldn't stay upright for long if I set them loosely on the layout.

After some experimenting, I found that magnetic cabinet catches proved the ideal solution. The magnets hold the buildings securely on the terrain or flat against the backdrop, yet I can still easily remove any structure from the layout.

Cabinet catches consist of a magnet housed in a plastic case with mounting holes and a metal plate that sticks to the magnet to hold the cabinet door closed. On my layout, I use cabinet catches in a couple of different ways.

For low-profile structures against the backdrop, I glue the magnetic cabinet catch to the underside of the roof inside the structure and



For structures against the backdrop, she glues the cabinet catch inside a low-profile structure and attaches the metal plate to the backdrop.

attach the metal plate to the backdrop. For structures that stand away from the backdrop, I use screws to hold the cabinet catch on the scenery base and glue the metal plate to the interior of one of the structure's walls. [Double-sided foam mounting tape works well, too. – Ed.] Larger structures require two or more catches to hold the model securely.

If a structure is too thin for me to mount the entire cabinet catch inside, I open up the catch's plastic housing and remove the magnet. Then I glue just the magnet inside the structure.

Using this technique I don't have to worry about my buildings falling over, and I can easily move them out of harm's way when I have to fix a stretch of track or do other maintenance work. I also like having the option of being able to easily rearrange the locations of my buildings, which I've already done several times. – B.B.

Because the layout is on a narrow shelf, most of the larger structures are low-profile models. I varied the depth and height of the structures to make the city look more interesting. I also angled some of the buildings, such as Lowe Quality Manufacturing Co., along the backdrop. All of my structure models are attached to the layout with magnetic cabinet catches so I can easily remove them for maintenance or if I want to rearrange the structures in a scene. [See the sidebar "Cabinet catches on structures" at left. – Ed.]

One difficulty that I encountered when installing buildings against the backdrop was that rooftop details can cast shadows against the backdrop, ruining the illusion of a clear blue sky. Aside from careful planning, one technique that I used to avoid shadows was to make smokestacks half round, placing the flat side against the backdrop. I did this on the World Dyeing & Finishing Co. building.

A mirror mounted on the backdrop behind the city doubles the apparent size of the scene. I learned this technique from an article that I read about John Allen's layout. [Read more about using mirrors in the December 2014 issue of *Model Railroader*. – Ed.]

HARBOR CRAFT

One of my favorite things about setting my railroad along a waterfront is that I get to build some maritime models. All these models are removable so I can vary the scene.

A modified Model Expo kit, the tugboat *Oliver* is named after my late father, from whom I got my love of the hobby. I raised the deck house and pilot house to resemble a railroad tug. [The tall pilot house, a common spotting feature of railroad tugboats, gave the tugboat crew better visibility over freight cars on a car float. – Ed.]

Using plans from a Sheepscot Scale Products kit, I scratchbuilt the steel coal barge from styrene. I've recently completed two wooden coal barges for the *Oliver* to tow. Other structures include a traveling crane at the coal dock and the scratchbuilt car float.

My current maritime modeling projects include a tramp steamer, a diesel lighter, and another railroad tug.

BUILDING THE ROSTER

Although I have a few ready-to-run freight cars, I prefer to build my rolling stock from kits. I do all the work myself, including painting and lettering. I get a

All the seawalls along the waterfront are cast resin. I scratchbuilt the master for one wall section and used it to make my own molds.

To model Crimea River (pronounced Cry-Me-A-River) I first painted the plywood benchwork with dark gray acrylic paint. I then covered the painted area with gloss medium and added wave effects to the river's surface. I've also made a 19¾" x 28½" lift-out section that

normally rests on my workbench. I built this section to widen the river when I photograph the layout.

URBAN STRUCTURES

Most of the structures on my layout are kitbashed or scratchbuilt to fit a specific location. I learned a lot of my kitbashing skills from the book *Kitbashing HO Model Railroad Structures* by Art Curren. [Out of print – Ed.]



A Central Rockland 4-4-2 Atlantic leads a commuter train into the city of Whasup. Barbara built the locomotive from a Model Die Casting kit. The yard office made from a retired caboose was built from a Revell kit by her father.

lot of satisfaction watching a model that I worked so hard on pass through a scene on the layout.

I've built many freight car craftsman kits from manufacturers including Funaro & Camerlengo, Sunshine Models, and other firms. I've also superdetailed many kit-built models, including those from Accurail and Roundhouse, with separate grab irons, running boards, and brake rigging.

In addition to brake rigging, I added windows from New England Rail Services and air-conditioning ducts to my passenger cars. I built most of my passenger cars from Rivarossi, Funaro & Camerlengo, and Walther kits.

Motive power for the Whasup Dock Co. is provided by a Model Die Casting boxcab diesel and an MDC 0-6-0T "Dockside" saddle-tank steam engine. Both of these models have can motors. I upgraded the gears in the 0-6-0T and installed constant lighting. I also still have several locomotives lettered for Central Rockland RR that lead trains through the city.

I'm working on a few more locomotives for the Whasup Dock Co. I especially like tank engines, since their short length makes them perfect for a

compact waterfront layout like mine. A shelf above the layout lets me store and display my locomotives when they're not in service on the railroad.

I weather all my models using a combination of techniques. I use an airbrush for an overall weathering coat and apply paint washes to bring out molded-in details. Drybrushing is effective for weathering wood or textured surfaces. Applying weathering powders works well for simulating concentrated areas of rust, dirt, or soot. I'm always experimenting and stay on the lookout for a new technique that will make my models look more realistic.

OPERATION ON THE WATERFRONT

I operate the layout using direct current. The control panel is mounted on drawer slides so that the panel can be stored under the benchwork when not in use. The top of the panel is a piece of aluminum that I painted black. I made the layout diagram on the panel with white tape and use push buttons to trigger the switch machines.

I'm planning to convert the layout to Digital Command Control in the near future. Installing decoders and sound systems into my tank engines, boxcab,

and other motive power will be challenging but worthwhile projects.

I mainly operate the layout by myself. Freight cars arrive via the removable car float and are sorted at the freight yard or put on a siding for interchange with the Central Rockland RR. Other cars are picked up and placed on the car float to be shipped out.

There are also several rail-served industries along the waterfront as well as the coal dock. For more variety, I'll sometimes run a commuter train into or out of the city.

EXPANDING THE RAILROAD

Ultimately I hope to move into a house with a basement. Then I can expand the Whasup Dock Co. and connect it to a new and improved Central Rockland model railroad. Working on and operating my waterfront railroad has helped me hone skills that I look forward to applying to a larger layout.

However, I'm anything but bored with the Whasup Dock Co. I have the unscenicked section to complete and more rolling stock to build. There are still many details to add to the waterfront and city of Whasup, but the tinkering is all part of the fun. **SMR**



Industrial switcher no. 3 pulls out of Pender Steel & Iron Supply Co. on Brian Rudko's large scale micro layout. Brian built his 1:24-proportion industrial railroad, including several detailed structures, in just 2 x 4 feet.

AN INDUSTRIAL LAYOUT IN A BOX

This large scale layout packs a detailed scene and operation into a 2 x 4-foot space

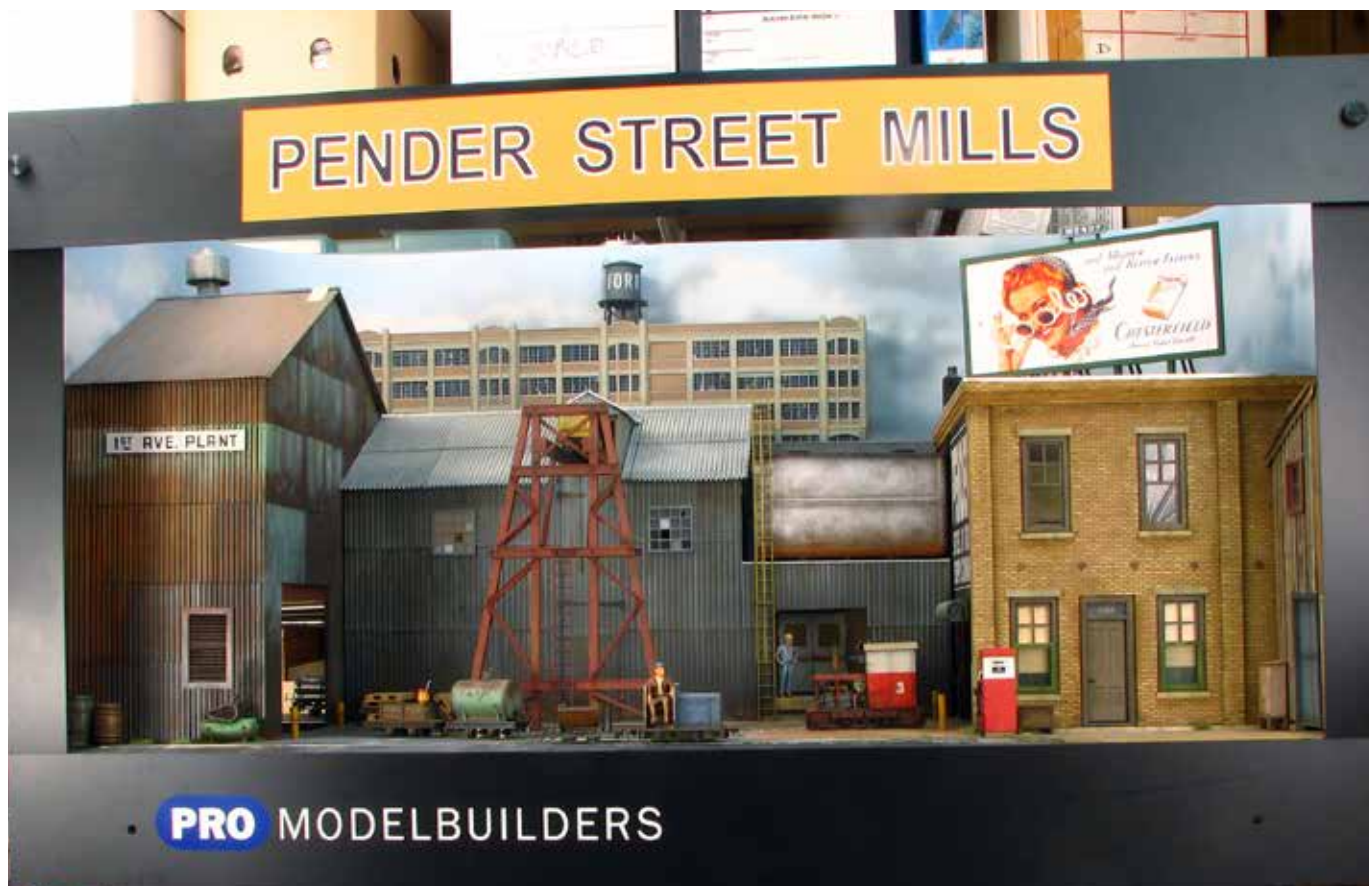
BY BRIAN RUDKO • PHOTOS BY THE AUTHOR

WHEN MODEL RAILROADERS think of big industry, most think of a large and expansive layout modeled in HO or N scale. Taking a different approach, I've modeled an industrial complex in a compact space using mainly large scale (1:24 proportion) equipment.

One advantage of my choice of size and scale is that the layout was small enough to be completed in a reasonable amount of time, rather than stay in a half-finished state. My 2 x 4-foot layout also gave me the opportunity to detail a single scene to the maximum.

I designed my layout after finding the Micro/Small Layouts for Model Railroaders website by Carl Arendt (carendt.com). This site hosts a world-wide community that shares track plans and ideas.

I restricted my Pender Street layout to a 2 x 4 footprint, but struggled with



Inspired by *Model Railroader* author Iain Rice, Brian enclosed his small layout in a shadowbox. This frames the scene and focuses the viewer's eyes on the front of the layout.

picking a scale and gauge combination. After searching Carl's site, I decided on 1:24-proportion equipment that runs on scale 15" gauge track. Although 15" gauge is an unusual prototype, it's used in small lines serving agricultural and industrial settings. More importantly, 15" in 1:24 proportion is about the same width as On30 (and HO scale) track.

TRACK PLAN

The setting of my layout is an in-plant industrial line for a freelanced metal foundry located in my home city of Vancouver, B.C., Canada. The metal foundry is named for the street where my business is located, Pender Street. The period of my layout is the 1950s.

Inspired by planning ideas from *Model Railroader* contributor Iain Rice, I enclosed the layout in a shadowbox so that the main point of view could be from the front.

Although my layout is compact and doesn't have a main line, I designed it for operation. There are two hidden staging tracks along the rear. A two-track transfer table in the office building brings



A switcher pulls a flatcar loaded with pipes across the plant. Brian scratchbuilt or kitbashed most of the rolling stock on the layout.

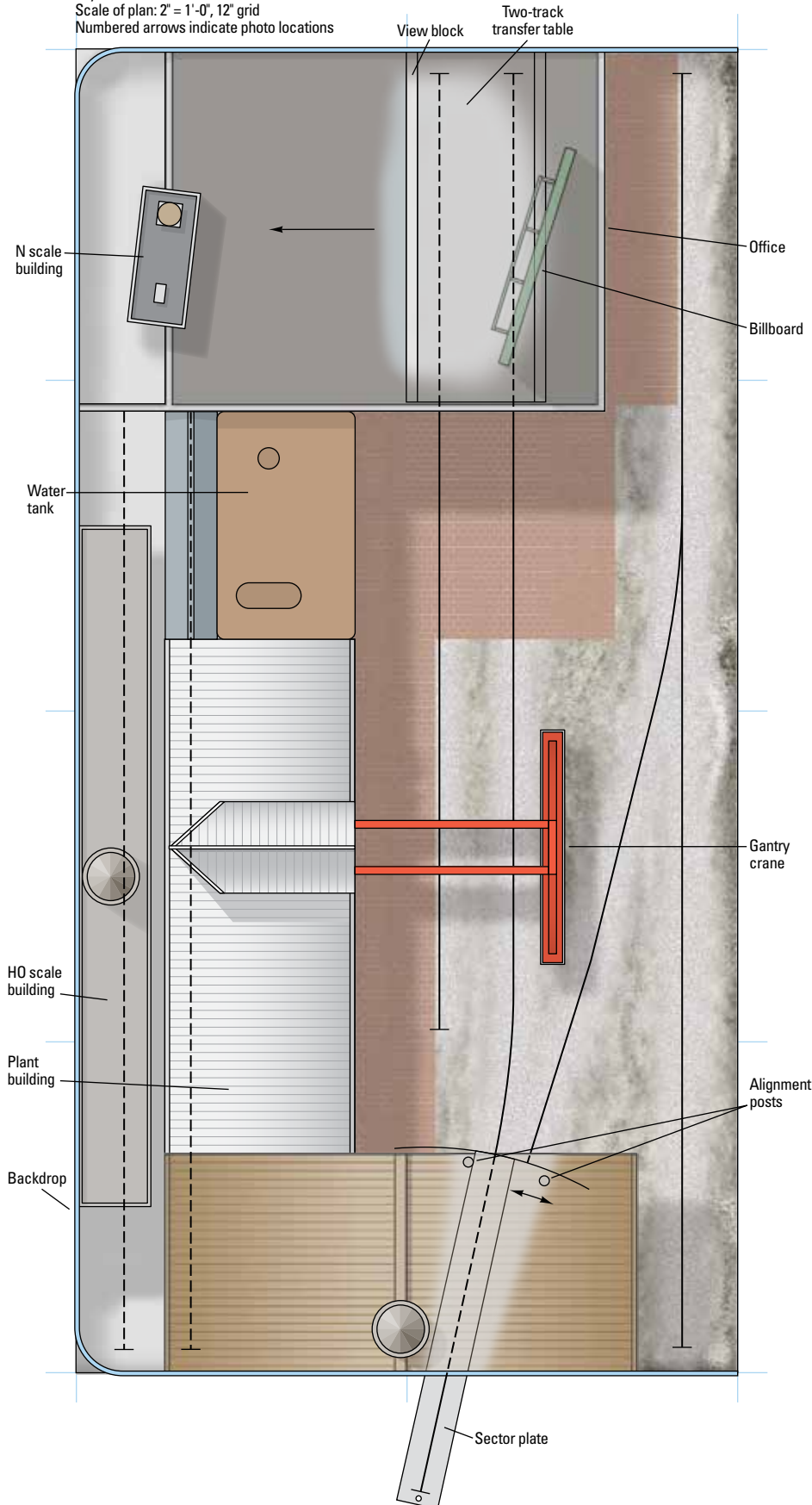
rolling stock from the staging tracks to the two visible tracks that run under the gantry crane. A hidden sector plate allows access to a track that connects to a stub-ended track that runs along the front of the layout. [See "Sector plate & transfer table" on page 52. – Ed.]

BENCHWORK

I made the benchwork from 1/2" plywood with 4" tall sides. It's a bit heavy, but I wanted a sturdy structure. Originally there was no bracing, but that was a mistake, and I added a cross brace underneath. I also raised the main sur-

Pender Steel & Iron Supply Co.

Large scale (1:24)
Layout size: 2 x 4 feet
Scale of plan: 2" = 1'-0", 12" grid
Numbered arrows indicate photo locations



THE LAYOUT AT A GLANCE

Name: The Pender Steel & Iron Supply Co.
Scale: 1:24 proportion, 15" gauge
Size: 2 x 4 feet
Theme: urban industry
Locale: Vancouver, B.C., Canada
Era: 1950s
Style: island
Mainline run: none
Minimum radius: 30"
Minimum turnout: Peco no. 4
Maximum grade: none
Benchwork: 1/2" plywood tabletop
Height: 50"
Roadbed: 1/2" foam board
Track: Peco On30 flextrack
Scenery: 1/2" foam board
Backdrop: painted styrene
Control: single DC throttle

face to align with the tops of the sector plate and the transfer table.

I made the shadowbox from 1/4" plywood pieces glued to the benchwork. For added reinforcement, I used 2 x 2s as needed. There is no top, and the sides have openings for track access.

My layout is 50" above the floor. I built a separate stand for it, made from hardboard and 2 x 2 lumber. While the layout is only 2 x 4 feet, it needs a couple of extra feet all around it so that it can be operated easily and comfortably, making its footprint closer to 6 x 8 feet.

BUILDINGS AND SCENERY

John Wright's Proto:87 Federal Street inspired the scenery and structures on my layout. You can see more of his layout in the May 2003 *Model Railroader*.

As much as possible, I chose to fill the shadowbox with building surfaces. The only visible painted backdrop is a bit of sky. I used buildings of three different scales (1:24-proportion as well as HO and N scales) to force the perspective and make the scene appear deeper.

I estimated the dimensions for the buildings and used foam core mock-ups to get all the proportions correct before I built the models. Commercial 1:24-proportion buildings are available but pricey, so I stuck to scratchbuilding.

First I made acrylic cores that I covered with various commercial styrene sheet sidings. The 1/4" acrylic sheet of the substructure is heavy and is best cut and shaped with power tools.

Finding 1:24 wall and detail parts took some research. Internet modeling forums provided me with a good start,



Brian incorporated forced perspective make his layout appear deeper than it is. He placed an HO scale warehouse (left) and N scale office building (right) along the backdrop.

and I found some information on 1:24 model websites. Dollhouse suppliers also sell some useful 1:24 details.

I kitbashed the office building using 1:24-proportion walls and detail parts from Main Street Heritage Models (www.mainstreet-heritage.com). The HO and N scale structures are also kitbashed to fit. The larger structure is a Walther's HO American Hardware Supply kit that I lengthened by laying the two long sides end to end.

The most distant building is an N scale Hilltowne Hotel kit from Design Preservation Models. I stacked the two sidewalls and two end walls together, making a taller structure. The back walls are blank plastic, since they aren't visible from the front. This building sits on the office roof behind the billboard to appear farther in the background.

ROLLING STOCK

Two locomotives run on my layout. I built switcher no. 3 using a resin kit

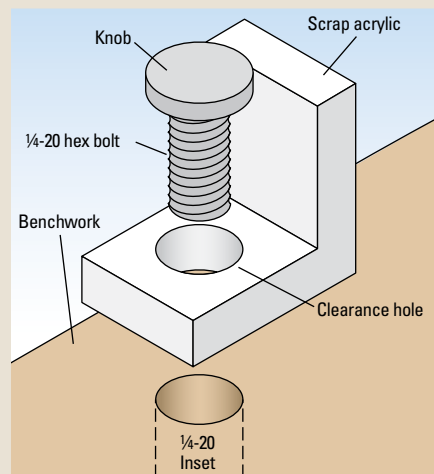
QUICK CONNECT HARDWARE

I USED LEE VALLEY 1/4"-20 quick connect hardware (www.leevalley.com) to attach the structures to the benchwork. All the components are the same size and designed to work together. Using this system, I can easily remove structures from the layout for maintenance.

First, I drilled 1/4" holes in the benchwork where I wanted to locate the structures. Then I added a 1/4"-20 threaded insert into each hole.

For each structure I made two L-shaped styrene brackets with a 1/4" hole drilled through one leg. Then I used cyanoacrylate adhesive (CA) to attach the mounting brackets to the structure.

I line up the holes in the brackets with the holes in the benchwork and



insert a plastic-knob-capped 1/4"-20 screw that I finger tighten until the structure is steady. – B.R.

from Thomas A. Yorke Design Studios (www.thomasayorke.com) and a diesel chassis from Model Power. The resin parts in the kit come with wear and tear detail marks cast into them. Though the

switcher looks great, I don't run it often, as the model's low pilots can hang up on the pavement.

My other locomotive is a Bachmann On30 gas-mechanical switcher, which

SECTOR PLATE & TRANSFER TABLE



Brian uses two locator posts to align his sector plate with the track.



The transfer table brings rolling stock from two hidden staging tracks to the front of the layout. The view block (right) moves with the table.

A SECTOR PLATE is a track or tracks mounted on a board that is pivoted at one end so it can match up with two or more approaching tracks. This easy-to-build device serves as a space-saving hidden turnout. For my sector plate, I used Peco On30 flextrack on a length of 1/2" thick PVC plastic, and the plate pivots on a 1/4" audio plug and socket that serves not only as a pivot, but also conducts electricity to the rails.

Rather than estimate the alignment to the tracks every time I moved the plate, I used inserts and 1/4" bolts to limit the travel of the

sector plate and locate the track accurately and efficiently.

The transfer table is on the opposite end of the layout from the sector plate and is made from two acrylic plates. One has grooves that I cut with a table saw. I glued brass channel into the grooves to guide the top plate. The top plate has two lengths of large Plastruc strips cemented to it that fit into the brass channels. The whole idea is that the plate slides freely. I also used some homemade latches as locators. Wires run through a slot in the base of the transfer table to supply power to the track. – B.R.

I modified for my 1:24 operator figure. This switcher runs quite well.

For my freight cars, I started by building a batch of underframes from laser-cut acrylic. I also cast my own truck journals. I used a jig to assemble the frames and then installed Kadee no. 58 couplers.

With the frames built, I made several different carbodies for them. So far I've built a few flats and a tank car. I've also shortened a Bachmann On30 flatcar and scratchbuilt a pipe load for it. I use On30 Bachmann dump cars as is – they're small, but seem to work visually with my larger-proportion cars.

TRACK AND CONTROL

I used Peco On30 flextrack but covered it with simulated asphalt or cobblestone so the small ties aren't visible. The asphalt is Sculptamold, and the cobblestone pavement is made from textured Plastruc sheet.

For layout control, I use a direct current power supply with a handheld throttle. Since I run only one locomotive at a time, I didn't need anything more. I soldered two feeders to every section of track and connected them to a central bus.

For sound on my layout, I installed a sound board filled with prerecorded machine-shop sounds from Miller Models. I mounted the module, an on-off switch, and a 3" speaker into a plastic electronics box that I attached to the backdrop. Appropriately, the sounds emanate from the plant building.

Eventually, I'd like to add sound decoders to the locomotives, and at some point, I'll design a formal operating scheme for the railroad.

NOT QUITE FINISHED

Though my layout is nearly complete, I still have several items on my to-do list. First, I want to model an interior office scene on the second floor of the brick office building. The space is quite visible through those large windows, and I've built a removable box for the interior scene, including working miniature fluorescent lights. I also enjoy detailing Preiser figures, so I'll add more of those to the scenes.

Finally, I look forward to building more locomotives. I have a Model Die Casting two-axle chassis, which will be perfect, as it's a smooth runner.

Even though my layout is limited to a 2 x 4-foot space, I'm sure I'll have a lot of fun operating and detailing it for years to come. **SMR**



Northern Timber Co. 0-6-0 no. 215 heads its small train off the main and onto the Terryton branch for a day of switching work. Jacques Thuot built the branch line as a series of HOTrak modules so he can use them not only on his home layout but also at his local model train club.

A LAYOUT THAT TRAVELS

This modular Canadian branch line goes from home to club and back

BY MIKE HAMER • PHOTOS BY PETER NESBITT

A SINGLE-TRACK MAIN LINE laid on a less-than-perfect grade linking small towns to the outside world is a hallmark of branchline railroading. That's exactly what Jacques Thuot had in mind when he built the most recent incarnation of his Northern Timber Co. RR for the Ottawa Valley HOTrak Club's modular layout (www.hotrak.ca).

Jacques wanted to add to the Canadian group's layout the look and

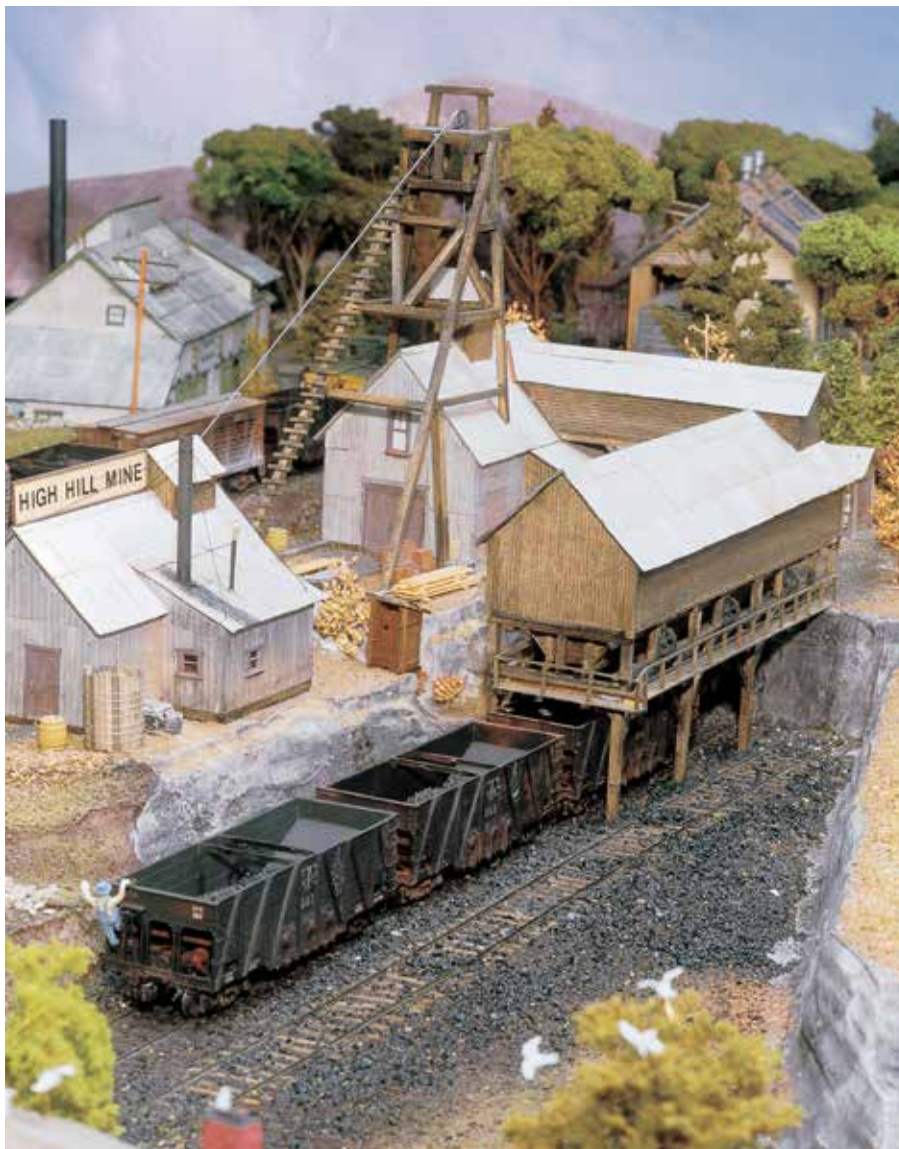
operating characteristics of a feeder railroad. When completely assembled, the Ottawa HOTrak layout can measure 40 x 80 feet or larger, and Jacques' set of four modules forms the beginning of a branch line that splits off from the rest of the club's main line.

The NTC branch modules serve a dual purpose, however, as they also form the major portion of Jacques' home layout. The branch line is the main operat-

ing peninsula for the layout, and it connects to a small L-shaped section that runs around two walls of his 10 x 16-foot spare room. Because of good planning, Jacques can enjoy operating his NTC branch line year round.

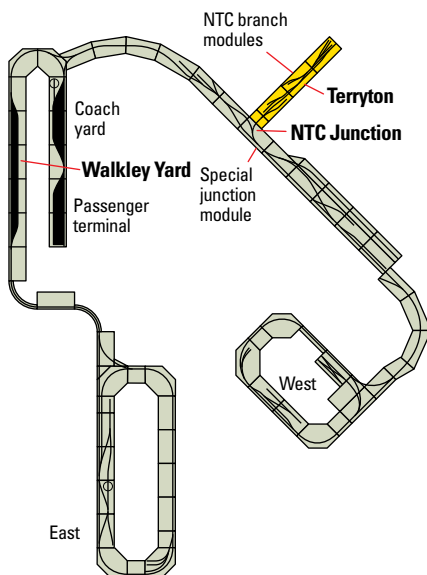
A TRUE BRANCHLINE OPERATION

This isn't Jacques' first version of the NTC. The original, featured in *Great Model Railroads* 1997, was also part of a



Another major customer on the NTC is the High Hill Mine, seen here after just receiving a cut of empty hoppers. The mine is a kitbashed Campbell structure.

A sample Ottawa Valley HOTrak Club setup



modular layout. The original NTC ran along the back of four standard modules, parallel to the double-track main line, so it never really seemed to be a separate line of its own.

This NTC layout is a true branch line, diverging from the main club layout (via a special junction module) onto its own single-track modules. When the club holds an operating weekend, specific trains are assigned to switch the branch and a few smaller mainline industries located near the junction. The HOTrak plan at left shows how the branch was included in the club's show setup in November 2000.

A train destined for the branch departs Walkley Yard, a major classification terminal, with six to eight cars and proceeds across the club's model Ontario landscape to NTC Junction. Here the crew leaves the main line and begins

THE LAYOUT AT A GLANCE

Name: Northern Timber Co.

Scale: HO (1:87.1)

Size: 10 x 16 feet

Prototype: freelanced

Period: 1935 to 1940

Locale: Ontario, Canada

Layout style: HOTrak modules

Layout height: 48"

Length of branch line: 14 feet from junction

Benchwork: HOTrak modules

Roadbed: cork and Homasote

Track: codes 83 (main) and 70 (branch) flextrack

Turnout minimum: no. 4

Minimum radius: 26"

Maximum grade: 1.5 percent

Scenery: foam insulation board

Backdrop: none

Control: Digitrax Digital Command Control

working its way up the branch, using the club's waybill system to determine the switching duties for the train.

When the setouts and pickups on the branch line are complete, the train returns to the junction and switches several nearby mainline industries. When finished, the crew returns their train to Walkley Yard.

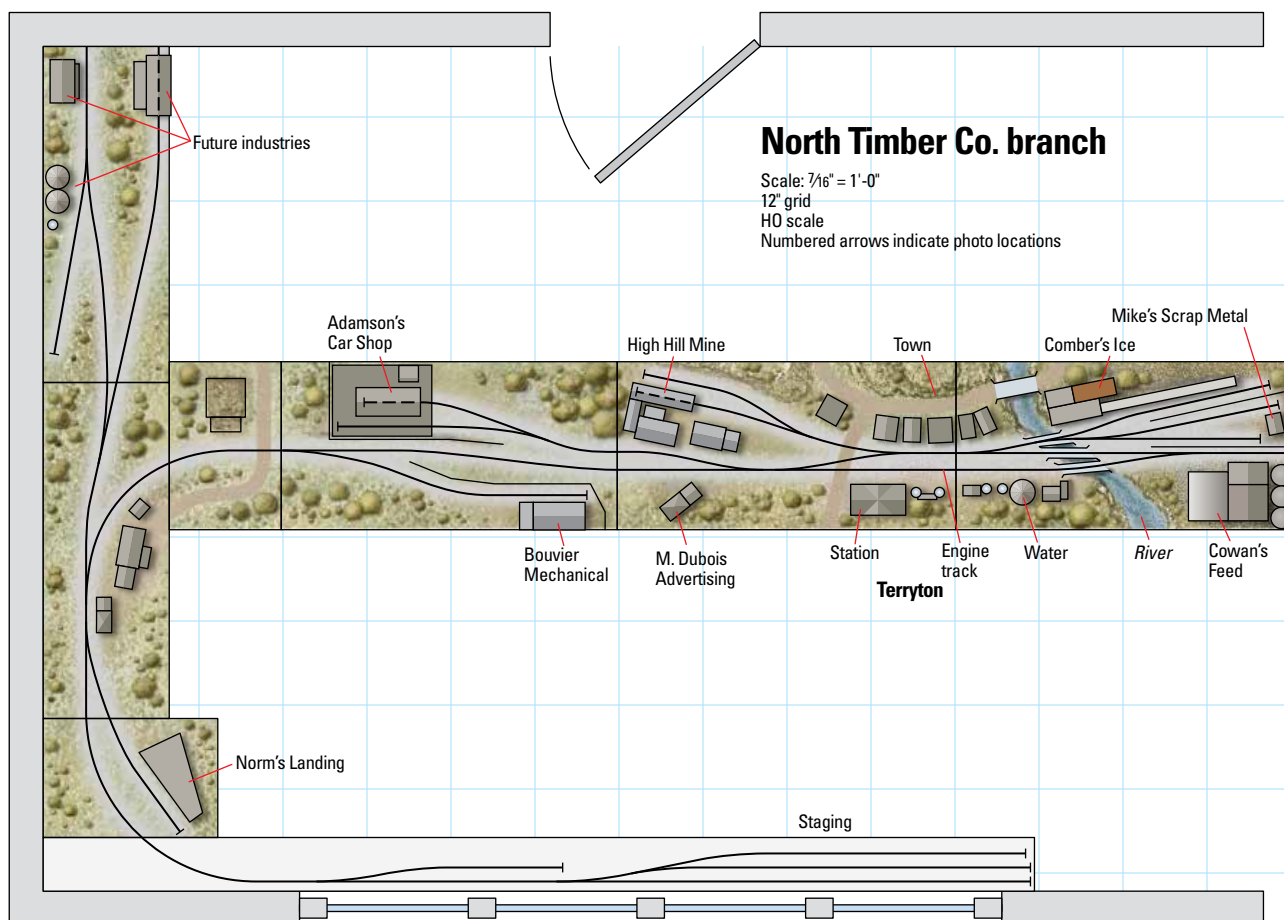
SETUP AT HOME

To achieve similar operations on the NTC at home, Jacques needed a staging yard. The basement of his home, however, offered little space for an HO scale layout, let alone one that could accommodate staging. After much deliberation, he decided that the sill on the bank of windows stretching the length of the layout room could offer sufficient room to stage several trains.

The only stumbling block to the window sill staging yard idea was that the sill was 48" above the floor, while HOTrak modules are supposed to be only 45" tall. Jacques solved the height dilemma by constructing a set of taller layout legs for home use.

The window sill proved to be large enough to accommodate a three-track staging yard. The staging tracks converge to form the single-track main which curves around to the next wall. Here, Jacques built a smaller junction module similar to the one used to connect the NTC to the club layout.

Beyond the junction, Jacques included another module, continuing the main line. This module features sev-



eral industries for added switching. When operating at home, just like on the club layout, crews need to switch these industries last because of their facing-point turnouts.

When the NTC is set up for home operation, Jacques typically has three trains staged and ready to go. The six sidings along the actual branch – three trailing and three facing – ensure that the runaround track sees a lot of use. To compound switching matters, the station track and engine track make up one of the sides of the runaround.

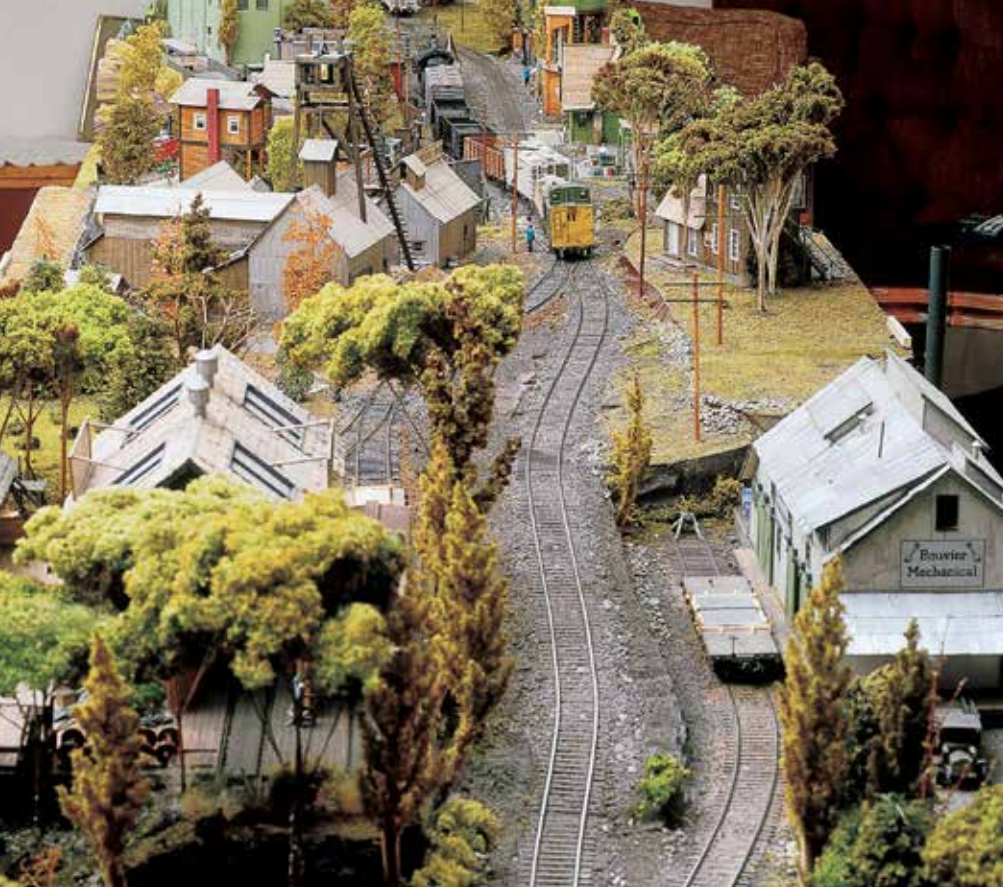
With all of these challenges, it takes a crew of two approximately 45 minutes to run a train out to the branch and back. Given that branch lines usually see only one train a day, a home operating session allows Jacques to simulate three days' worth of operations in one evening.

INDUSTRIES ALONG THE BRANCH

Jacques enjoys scratchbuilding and kitbashing structure models. He starts the process by constructing cardboard mockups of buildings to get a feel for how the structures will fit into the overall scene. For larger industries, he begins with a piece of foam and surrounds it with cardboard to make the mockup more rigid. When he's satisfied with the



One of the main customers on the branch is Adamson's Car Shop, a small but busy private rail car cleaning and repair shop. Jacques built the industry around a Fine Scale Miniatures kit.



This view shows most of the NTC branch. Part of what makes operation challenging on Jacques' layout is the cramped quarters in Terryton. The fact that the layout has only one small runaround track adds to the switching-puzzle fun.

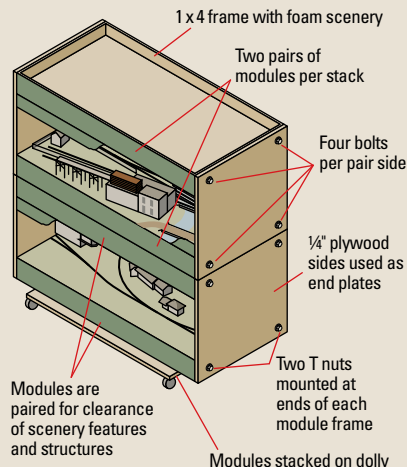
MOVING MODULES

THE NTC BRANCH is well known in the Ottawa region, and Jacques is often invited to railroading events and shows in addition to his club's regular HOTrak meets. Careful handling of modules is of the utmost importance to Jacques, so he's devised a transportation system that's safe, yet easy to use.

As shown in the illustration, each module has an assigned partner and is designed to nest together as a pair. Jacques says that placement and height of trees and structures are vital to make the pairs work properly. Where a stand of trees or a building resides on one module, a corresponding empty low area must be planned on its partner.

Because the modules are built with wood 1 x 4 frames and covered with foam insulation board, they're very lightweight – making them easy to carry in pairs. To stack them, Jacques uses 1/4" plywood end plates. He attaches these to each module with four bolts that screw into T nuts mounted in the modules' frames. This system makes a rigid

Transporting modules



supporting framework for each pair of modules. By stacking paired modules on a dolly, the entire railroad is very easy to move in and out of show halls.

With this method, Jacques can stack and roll two pairs of HOTrak modules at one time. It takes him less than 30 minutes to uncrate the modules, attach their legs, and put the layout together. – M.H.

building's general shape and location, Jacques scratchbuilds or kitbashes the structure for the space.

As a personal touch, Jacques has named many of the industries on his layout after model railroading friends and fellow club members.

TRACK AND SCENERY

Track on a branch line usually doesn't see the same high degree of maintenance as track along the main line. Ties are left to rot longer, sun kinks may develop in the rails, and grass grows unhindered through the ballast.

To model these details, Jacques avoided laying the track straight and planted weeds and taller field grass between the ties. The carefully placed field grass serves two purposes – it creates an overgrown look for the branch, and its stiffness acts as an anchor or wheelstop to prevent free-rolling cars from slipping away once they've been spotted by the train's crew.

Jacques uses a number of natural materials to make the scenery for his layout. The coal and gravel around the High Hill Mine are fine stones that had spilled from hopper cars at a local shingle factory. He also applied this stone along the main line to simulate the slag used in ballast for roadbed.

To ballast the track, Jacques used sifted stone dust for the main line and real dirt for the sidings. He likes the appearance of these finer materials, especially where the track is laid at ground level, as it looks very realistic.

For ground cover Jacques uses everything from dirt, cat litter, sand, and even tea leaves to commercially available ground foam. He made many of the conifer trees on the layout using the bottle-brush method.

With basement space at a premium, Jacques built himself a scenery-storage trolley that he hides beneath the layout when he isn't working on a project.

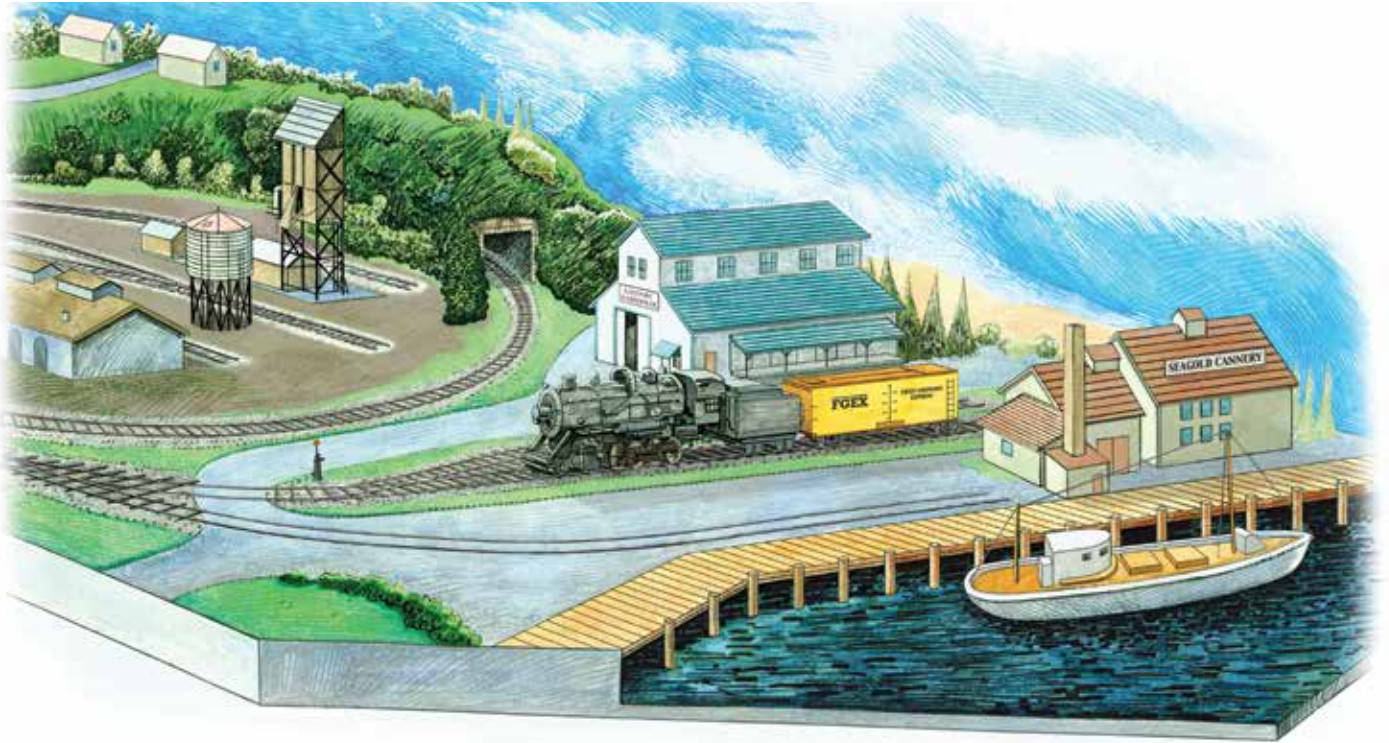
A GROWING BRANCH

Being built for use at home as well as the club, the NTC branch modules have given Jacques twice as much enjoyment. In fact, some of his fellow club members liked the branch idea enough to build their own branch modules. When the Ottawa Valley club assembles the layout for a meet, the NTC extends well beyond Jacques' four modules, greatly increasing the branch line's operating fun.

Perhaps a dual-purpose branch line would be the perfect addition for your home and club layouts. **SMR**

SECTION 3

SMALL LAYOUT STRATEGIES



The N scale Housatonic Valley track plan shown on page 65 packs a lot of action into a compact 8 x 9-foot layout footprint.

Think beyond the 4 x 8 when working with limited layout space

BY DANA KAWALA

MANY MODEL RAILROADERS build their first layouts using a 4 x 8 sheet of plywood. With no cutting required, it's an easy way to quickly get a railroad up and running. However, there are more interesting ways to get the most out of constrained layout spaces, as we'll explore in this chapter.

First up is Brad E. Smith's N scale Bristol Ferry Terminal, which features waterfront switching and two levels on an 18" wide shelf. Scot Osterweil provides an even more compact HO scale industrial railroad that fits atop a bookshelf.

When looking for a theme for his two track plans, author Ed Vondrak chose model railroading pioneer John Allen's "Timesaver" switching puzzle. Ed's two

plans show how to pack a lot of operating action into deceptively small spaces.

Associate editor Steve Otte designed his track plans by rearranging the rectangular footprint of the good old 4 x 8 sheet into three very different layouts.

Model Railroader Video Plus producer David Popp finishes up the section with a layout designed for an often under utilized part of the basement. David's Grand River Ry. fits behind and around a staircase.

As all these stories show, it doesn't take a lot of space to build an interesting and fun model railroad. When you think beyond the 4 x 8 tabletop, you might have even more room than you thought. **SMR**



Brad Smith's N scale Bristol Ferry RR track plan calls for two levels connected with a steep grade, typical of many interchange locations in New England's rolling countryside.

TWO LEVELS ON A SHELF

A pair of railroads serve this busy N scale industrial district

BY BRAD E. SMITH • PHOTOS BY THE AUTHOR

MAINLINE OPERATIONS held my interest for many years, but lately I've found that switching has become the most satisfying and downright fun part of my model railroading. With that in mind, I've designed and built a small N scale railroad that provides as much realistic switching activity as possible in my limited space. The plan I came up with can easily be expanded for use in other scales.

The N scale layout is 18" wide and 8 feet long, a size that's manageable for construction and still portable. I used a

conservative approach to design an industrial district that looks busy without becoming too cluttered. Filling the space with industrial spurs and railroad structures maximized my operating potential, but I had to forego most of the scenery and city buildings.

FEATURE CHOICES

Rail-to-water transfers have always intrigued me, so the car float provides a way to introduce new freight cars onto the railroad. The barge serves as a fiddle yard, so other cars from my collection

can cycle on and off the railroad between operating sessions.

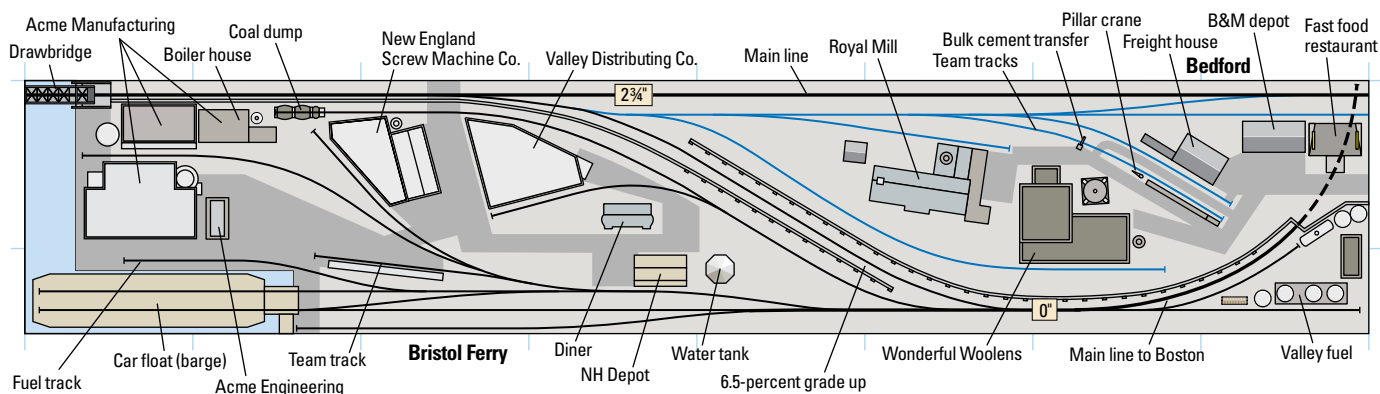
For added interest, I included two different railroads that interchange cars via the steep ramp track. This allows me to include both of my favorite railroads, the New York, New Haven & Hartford and the Boston & Maine. My choice of prototypes naturally led to a New England setting for the layout.

I wanted one industry per siding, with an emphasis on large textile mill and factory buildings. I know multiple small customers sometimes share a

Bristol Ferry Terminal RR

N scale (1:160)
Scale of plan $\frac{1}{8}" = 1'-0"$, 12" grid
Layout size: 1'-6" x 8'-0"
Numbered arrows indicate photo locations

— New Haven tracks
— Boston & Maine tracks



siding, but they aren't very common around larger industries. However, one location combines a team track and a bulk cement transfer system similar to one I remember from my youth.

FULL-SIZE PLANNING

My Bristol Ferry Terminal RR plan is based on the HO scale Iron Mountain Line that was published in the July 1967 *Model Railroader*. The IML provided the basic idea that I revised and adjusted the proportion for N scale.

As the plan took shape, I transferred it to a full size sheet of paper so I could test fit some of the actual track components and make any final adjustments. As I did these final revisions, I quickly realized I'd have to kitbash most of the buildings to fit the available spaces.

Then I set a few cars on the full-size plan to test the clearances and mentally envisioned each move. If things didn't work, I modified the track alignment until I had all of the bugs out of the plan.

Next, I went over each track with a black pen and drew in the building footprints with a red marker.

FITTING URBAN STRUCTURES

This layout offers many opportunities for structure kitbashing. I'm using the modular building systems made by Woodland Scenics' Design Preservation Models line and Walthers. I've also used some of the larger Walthers Cornerstone building kits as raw materials to construct full-size, flat, and low-relief structure models. Since space is at a premium, I eliminated the loading docks from all the industries except for the largest. Instead, I spot the cars at freight doors in the walls of each building.

ENHANCING APPARENT SIZE

To enhance the apparent size of the railroad, most of the streets and

structures angle away from the edges of the layout. Additionally, many of the buildings have asymmetrical shapes with corners that aren't square. I designed my plan to make the layout visually interesting and congested, yet open enough for an operator to easily reach its manual turnouts and uncouple cars with an uncoupling tool.

The car float carries 8 to 10 freight cars, although the layout has spots for more cars. This allows specific cars to be spotted and remain at each industry for more than one operating cycle. Since the upper level's rear track simulates a main line, I added a Faller drawbridge, set in the raised position, to indicate that the line continues on beyond the layout.

OPERATING POTENTIAL

Except for the B&M yard and industries at Bedford, the New Haven owns and serves all the track on this layout. The car float slip in the town of Bristol Ferry is served by the New Haven. Since track space is at a premium, the switch crew must pull its inbound cars off the float, sort, and distribute them at the same time they're picking up the outbound cars from the industries.

A storage track along the front of the layout holds outbound cars waiting for the car float. Next to the slip is a dual-purpose track that receives tank car loads of fuel for the railroad tugboats and locomotives. The rest of this track stores locomotives and cabooses.

A New Haven yard switcher or road unit is stationed at Bristol Ferry. From here, the main line to Boston disappears into a tunnel that passes under the B&M in Bedford.

The New Haven's local RDC (Rail Diesel Car) car is concealed in this tunnel until its scheduled arrival time at the Bristol Ferry depot. This arrival can tie up switching operations, as the switch

THE LAYOUT AT A GLANCE

Name: Bristol Ferry Terminal RR
Scale: N (1:160)
Size: 1'-6" x 8'-0"
Prototype: New York, New Haven & Hartford RR and Boston & Maine
Locale: New England
Era: Early 1950s
Style: Island
Mainline run: 8 feet
Minimum radius: 22"
Minimum turnout: no. 6
Maximum grade: 6½ percent

job has to be in the clear for this first-class train's arrival. Then switching can continue until it's time for the RDC's return to Boston (back into the tunnel).

The railroad still maintains a water tank at Bristol Ferry, so an occasional steam locomotive can serve as the New Haven's switcher. The NH rotated locomotives from its small outlying yards back to the major engine terminals for monthly federal inspections. Thus, I have a good excuse to operate different locomotives from my collection.

As the photo shows, the new railroad is under way, and its track is now fully operational. I'm already running trains and regularly operating the layout as I continue work on the railroad's structures and scenery. **SMR**

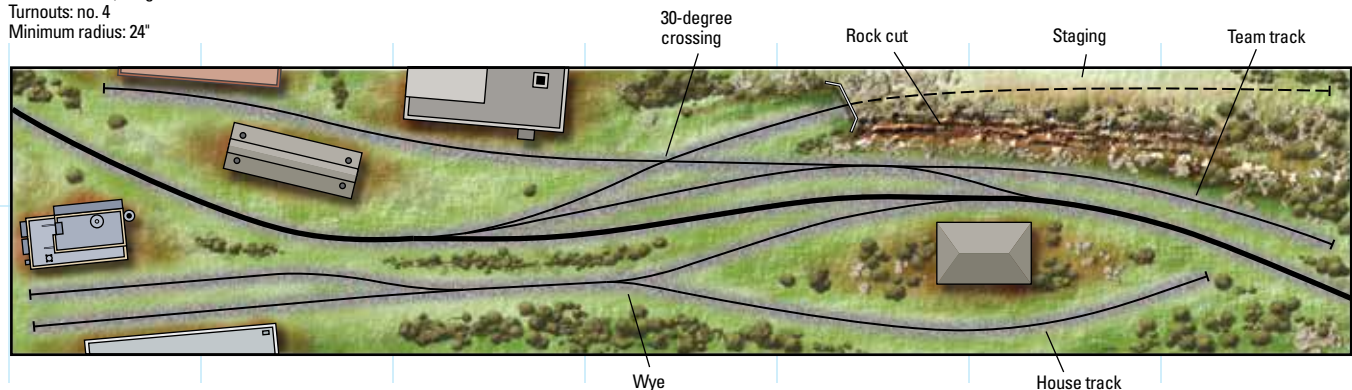
MORE LAYOUT IDEAS

Get inspired to build your own layout from the five compact HO and N scale plans in *Model railroads for small spaces*. It includes shelf, tabletop, and walk-in designs. Get it by clicking on the "Shop" tab at www.ModelRailroader.com.



Swartz Creek No. 1

Scale: 1" = 1'-0", 12" grid
Turnouts: no. 4
Minimum radius: 24"



JOHN ALLEN'S TIMESAVER

The classic switching problem along a wall or on a curve

BY ED VONDRAK

IN 1966, JOHN ALLEN, builder of the legendary HO scale Gorre & Daphetid RR [See the January 2003 *Model Railroader*. – Ed.] conjured up a small, fiendish switching track plan he dubbed the Timesaver. The original design, described in a 1972 MR article [November, pages 66-69 – Ed.], was intended to be a game – a switching problem.

The name “Timesaver” is actually a misnomer, since it can become quite a time-consumer. I design model railroads for my clients, and with their permission I fit some variation of the Timesaver track plan into the layout. For modelers who are interested in operation, the Timesaver provides some interesting operation in a small amount of space – the most “bang for the buck.”

A few years ago, a modeler wrote a letter to the National Model Railroad Association *Bulletin* [Now *NMRA magazine* – Ed.] asking for information about an article that had appeared in MR about a small narrow gauge switching layout patterned after John Allen's

Timesaver. I responded to that request by offering to provide two small layout designs using my enhanced versions of the Timesaver.

CHALLENGING SWITCHING IN A SMALL SPACE

The layout design for the first plan, shown above, fits along a wall in a family room. This track plan has a couple of extra spurs added to the basic Timesaver configuration. Most of the tracks have gentle curves to provide a more picturesque and less mechanical appearance, and I've indicated how a very limited amount of staging might be included. This version of the plan provides plenty of challenging switching in a relatively small space. If more space were available, the layout could readily be extended off one or both ends, as indicated on the plan.

BENDING THE TIMESAVER

Just about the time I finished the first track plan, my client moved into a new

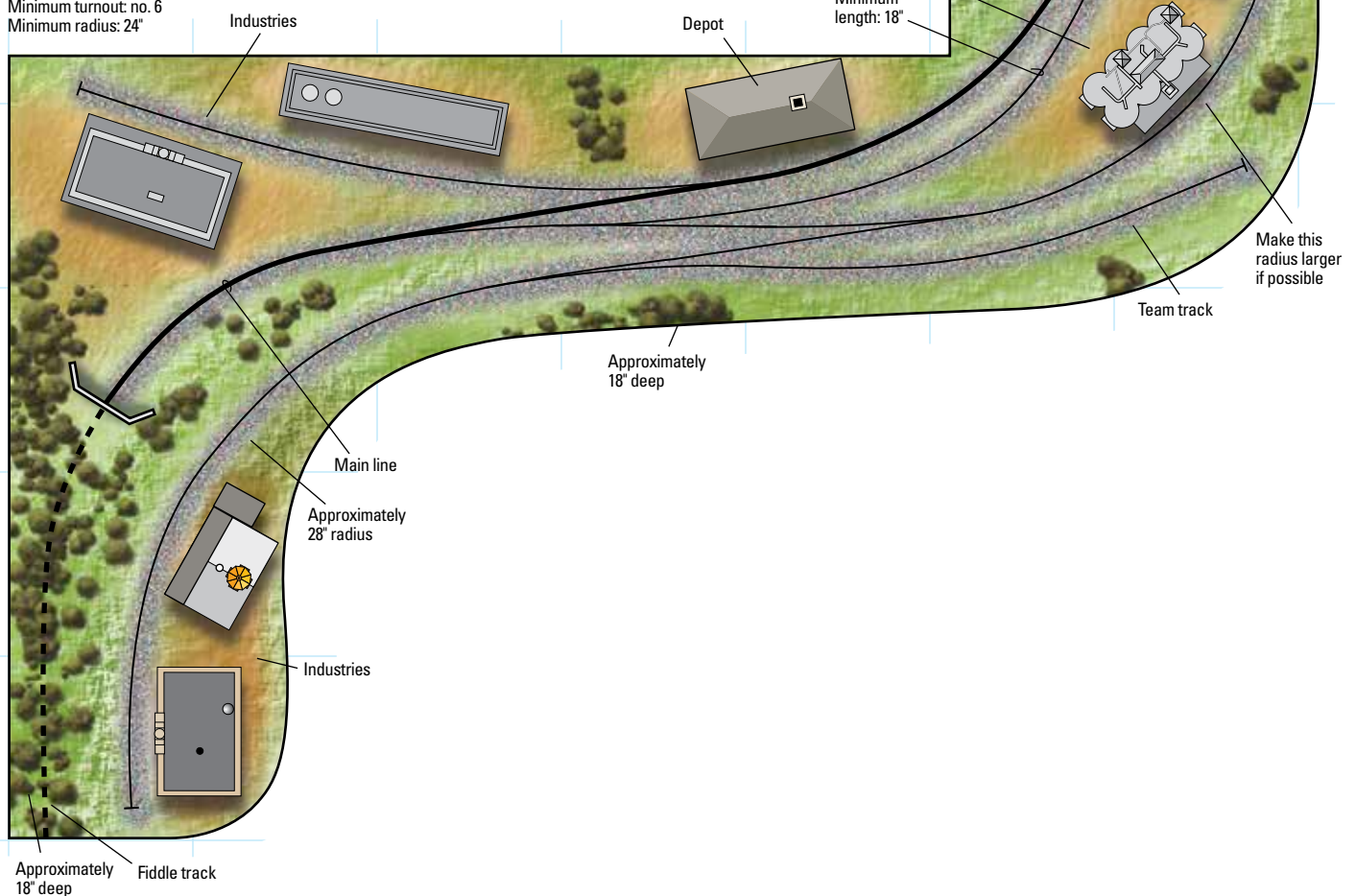
house, and the new available layout space was quite different, forming a Z shape along a stairway railing. I bent the second track plan (at right) to fit the space, this time with just one extra spur (the team track).

The left end of the main line can be operated as a fiddle track, accessible from the adjacent stairway. In fact, I suggest using interchangeable fiddle tracks so entire trains could be removed from the layout and stored underneath the benchwork.

Other variations are also shown with the second plan. The left end could be uncoiled to make the layout an outside L design. Similarly, the right end of the plan could be uncoiled to turn the layout into an inside L shape. The right end could also be bent toward the front, changing the entire thing into a U shape. You could also straighten both ends, allowing the layout to be placed along a straight wall. If more room were available, you could extend the tracks off either one or both ends. The success

Swartz Creek No. 2

Scale: 1" = 1'-0", 12" grid
Minimum turnout: no. 6
Minimum radius: 24"



I had in expanding and bending the Timesaver into a Z shape indicates the versatility of the basic design. Both layouts could be built in the dimensions shown or in different scale and gauge combinations such as Sn3, O, or HO_N3.

When you operate on a Timesaver layout, it doesn't take long to discover there's much more to this little plan than meets the eye. **SMR**

TIMESAVER DOWNLOAD

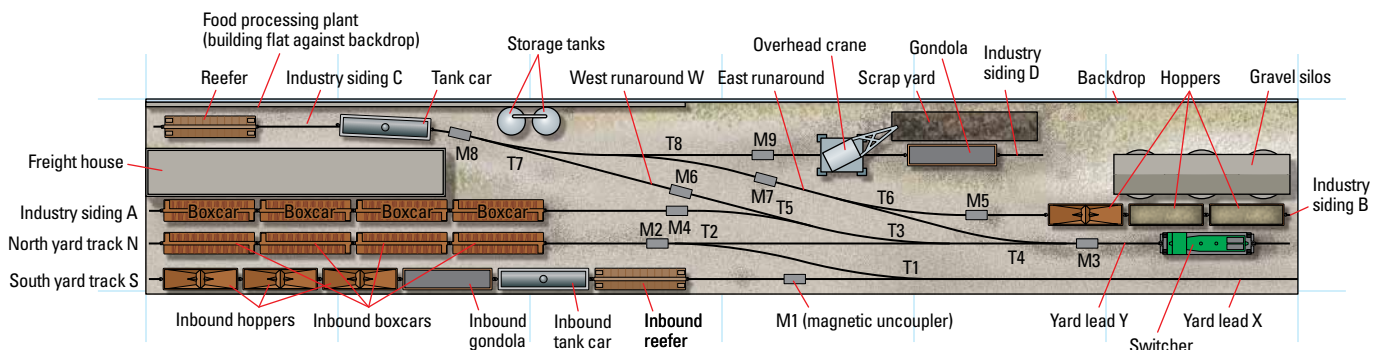
Want to see John Allen's original Timesaver? This digital download features the original article, operating tips, layout ideas, and more. Click on the Shop tab at www.ModelRailroader.com.



LOTS OF SWITCHING, SMALL SPACE

An HO industrial switching layout in 1 x 6 feet

BY SCOT OSTERWEIL



Inbound cars can be randomly sorted to increase difficulty.
There is the same number of inbound cars as outbound cars.

Industrial switching layout in HO

HO scale (1:87.1)
1x6 feet
12" grid
Scale: 1" = 1'-0"

OPERATING NOTES

- Engine should be able to run around two cars on either runaround track in the middle of the layout.
- Three cars should fit entirely between the end of lead track Y and T3's switch points.
- Four cars should fit between the end of siding C and T8's switch points.
- Five cars should fit entirely between the end of lead track Y and T5's switch points.
- Five cars should fit between the end of siding C and magnet M6.
- Magnets M1, M2, M3, M4, and M9 should be as close as possible to the adjacent turnout for maximum clearance.
- Magnets M8 should be positioned the minimum distance from the end of siding C while still allowing three cars on the siding to clear it (about 18½" from the end).
- M6 butts against the joint between W and T5.
- M7 butts against the joint between E and T8.
- It's very important for magnets M6 and M8 to be more than two car lengths apart so that when a string of cars is positioned over one of them for uncoupling, the couplers two cars away won't also uncouple. The same caveat applies to M5 and M7.

THE YEARS I SPENT GROWING up in New York City made me a life-long fan of the New York Central RR. It also helped me learn to appreciate the recurring challenges real railroads face when they operate in the congested confines of an urban environment.

With its dense trackwork and options for switching numerous industries, this freelanced HO track plan reflects my interest in big-city railroading. When

the model railroad operates at its maximum capacity of 20 cars, 10 inbound and 10 outbound, it can take more than an hour to complete all the challenging switching moves.

Although I designed this compact plan to fit atop a pair of small bookcases arranged side by side, there's still room for some scenery, mainly industrial structures that underscore the purpose of each siding. On a layout that's already

tight on space, it can be especially helpful to construct some of the industries in relief, using building flats set against the backdrop.

NAME EVERYTHING

The drawing above shows the track schematically, as center lines. All of the linear distances, such as track lengths and the distance between track centers, are shown to scale. Just as you'd find on

LAYOUT DETAILS

Flextrack length (capacity)

A: 34½" (5 cars)

B: 21" (3 cars)

C: 22" (3 cars)

D: 18¾" (2 cars)

N: 33¼" (5 cars)

S: 41½" (6 cars)

E: 6⅞"

W: 6⅞"

X: 23" (3 cars)

Y: 14" (2 cars)

Peco turnouts

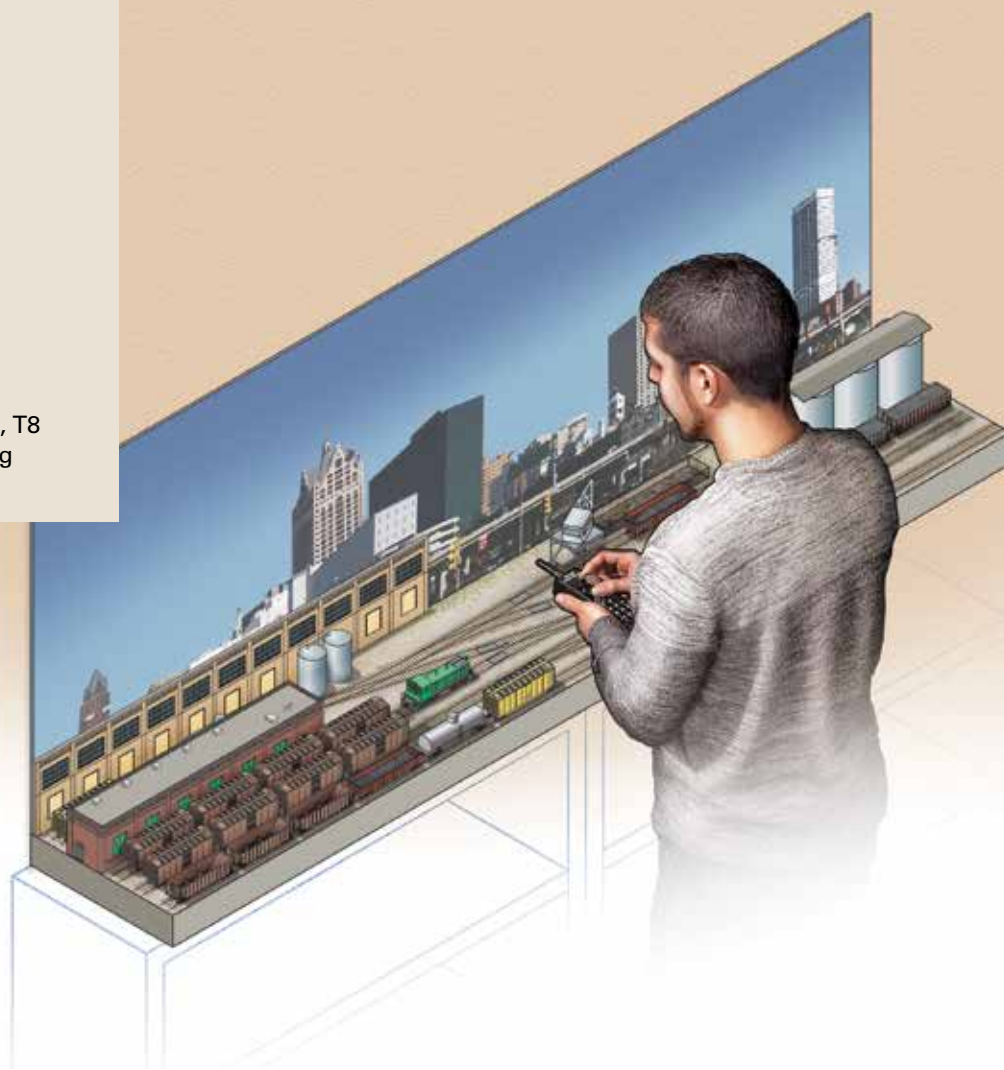
Short left-hand: T5, T6, T7

Short right-hand: T1, T4

Medium right-hand: T2, T3, T8

Short turnouts are 7¼" long

Medium turnouts are 8⅝"



the prototype, every track has a name to help switching crews place the cars in the proper locations. I labeled each track with a one-letter abbreviation for convenient reference. Turnouts are designated T1 through T8, and magnets for delayed uncoupling are labeled M1 through M9.

ALTERING THE PLAN

The layout is designed to accommodate HO scale 40-foot cars and small switch engines. If a siding is marked with, say, a four-car capacity, it will hold four cars clear of the uncoupling magnet or switch lead.

You could use the information in the accompanying boxes to adjust the plan for different car lengths. If you do attempt to alter the design, bear in mind that the location of each uncoupling magnet is precise. Changing a magnet's position may yield some unintended problems such as a car that's parked with

its coupler directly over a magnet, making it impossible to couple.

I actually built this layout using Peco flextrack and a mix of short and medium Peco turnouts. You could build the layout using all short or all medium turnouts, but this requires some adjustment to ensure that the car capacities don't change. Substituting other brands of turnouts should be okay as long as you maintain the same siding capacities.

SWITCHING SEQUENCE

One possible switching sequence on this layout begins with incoming cars spotted on the two yard tracks (N and S). The switch engine must move them to the five industries on four sidings while removing outbound cars.

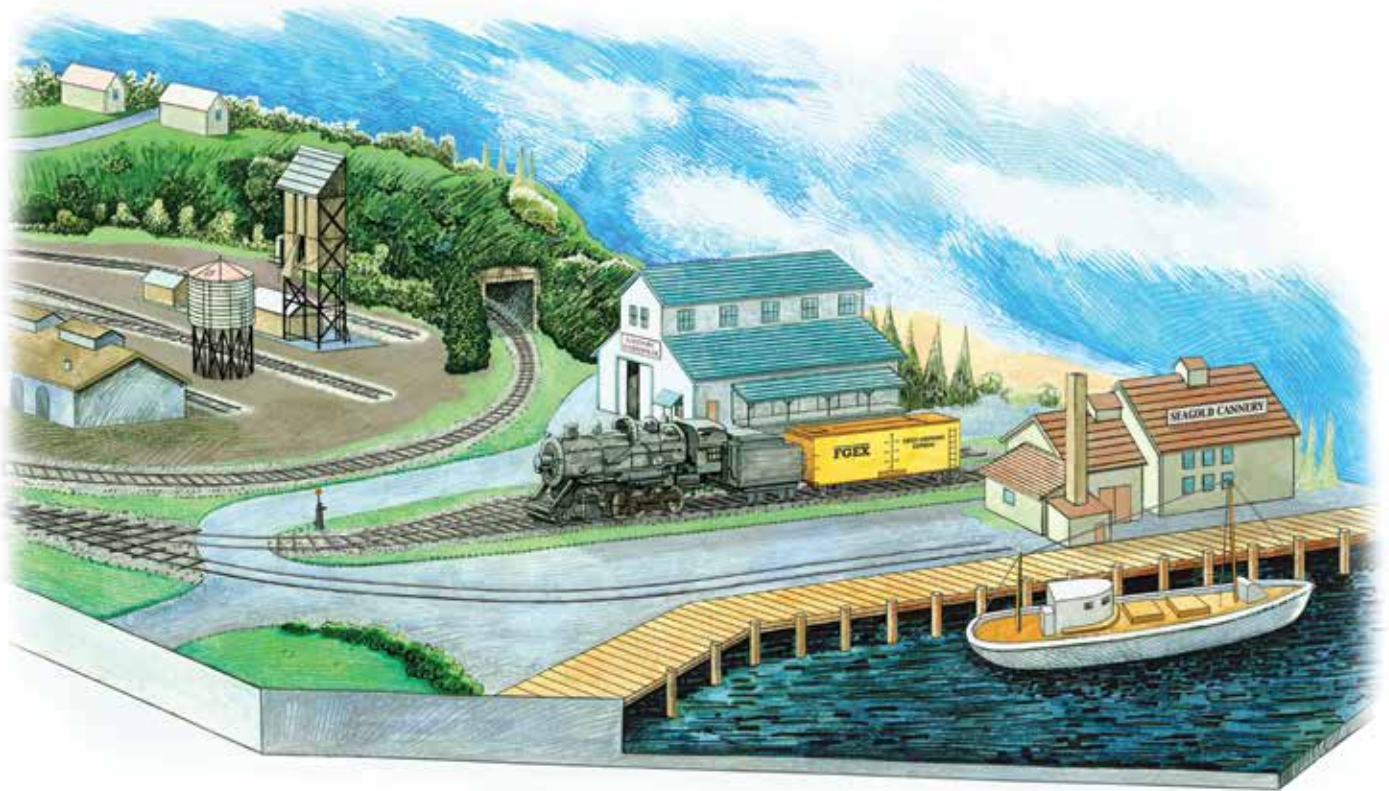
As the work begins, you'll notice how the switcher's initial position makes it much easier to switch the freight house and food processing plant. But even in

this position, it must still run around both pickups and setouts from the scrapyard and gravel silo. The sequence ends when the switcher places the outbounds in the yard for an imaginary engine to later pull through the yard lead (X).

HOW HARD CAN IT BE?

It looks easy, doesn't it? Four boxcars, one reefer, three hoppers, one gondola, and one tank car are all spotted on the layout. The inbound cars are of the same types and quantities but randomly arranged in the yard tracks. A run-around track in the center of the layout allows the switcher to get behind (to the left of) the inbound hoppers and gondola.

What makes this plan so devilish is the problem of the outbound cars. They must end up on the tracks from which you are drawing the inbound cars. Keeping them out of the way when there is so little excess trackage is a challenge. **SMR**



This illustration depicts the N scale Housatonic Valley RR, an N scale steam-era layout that packs a waterfront, engine terminal, and many other features in just 8 x 9 feet. The plan is one of three designed by associate editor Steve Otte.

THREE TRACK PLANS FOR ONE SHEET OF PLYWOOD

Cutting a 4 x 8 sheet into three pieces yields creative layouts in HO and N

BY STEVEN OTTE • ILLUSTRATIONS BY THEO COBB

MANY MODEL RAILROADERS base their first layouts on 4 x 8 sheets of plywood, for obvious reasons. A flat tabletop is a lot easier to build than L-girder benchwork, and almost any home has room for a 4 x 8 table at one side of a bedroom or den.

Great things have been done on a single sheet of plywood. However, that shape does impose certain limitations. Though the tighter curves usable in N scale open up more possibilities, in HO scale, a plywood sheet restricts you

to a few variations on an oval or figure eight. And being able to see your entire layout from a single vantage point limits the realism.

But what happens if we cut that plywood into three pieces, and reassemble them in a different shape? These three track plans use a few cuts of a saber saw to open up the possibilities locked in a 4 x 8, while keeping the benefits of compact size. Supporting and splicing together the odd shapes resulting from our jigsaw-puzzle technique will require

a bit more involved benchwork than a 4 x 8 table does, but it pays off in much greater visual and operating interest.

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HOUSATONIC VALLEY RY.

FOR THIS N SCALE PLAN, one straight and one S-shaped cut yields three long pieces of plywood that assemble into an 8 x 9-foot, U-shaped, walk-in layout. Using 9½" and 11" curves lets us plan loops at the end of the two peninsulas for a basic dog-bone design. Setting the railroad in the rolling terrain of New England gives us a rationale to conceal the return track, and even a couple of staging tracks, under forested hills along the outer edges of the layout. (If you build this layout along the walls, be sure to make your hills removable for access.)

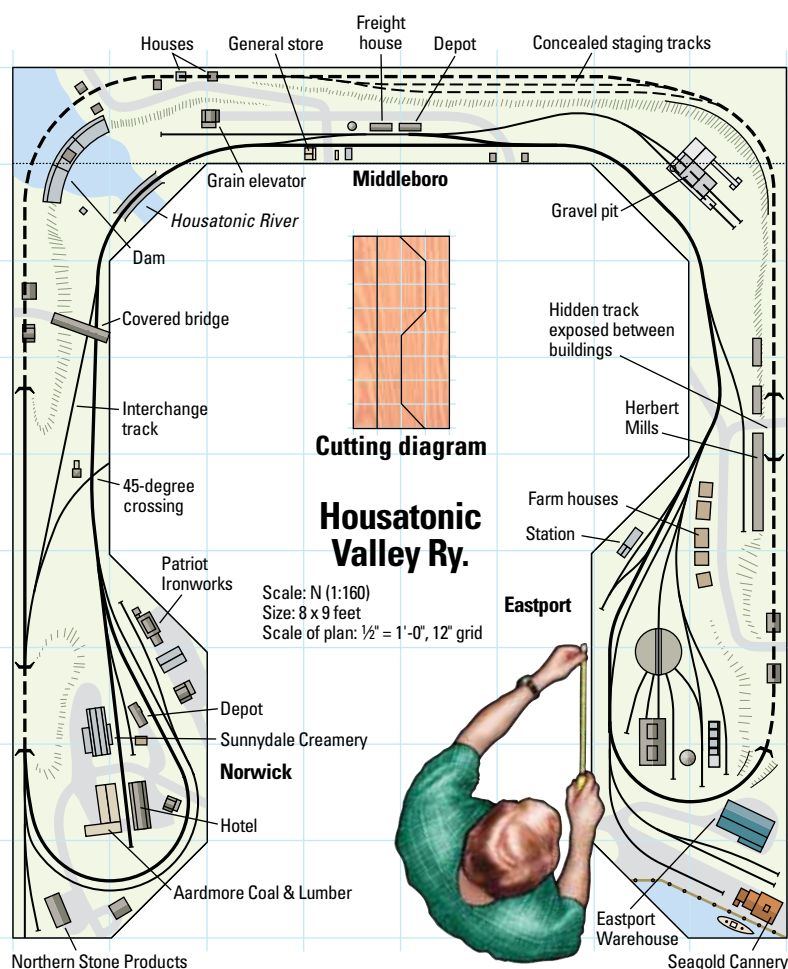
Rather than attaching the track and roadbed directly to the plywood, this plan calls for a layer of rigid extruded foam insulation on top of the plywood. The foam can then be cut away to model water features below the level of the track, like the Housatonic River and the docks at Eastport.

This design is for a steam-era road linking an industrial seaport to an inland agricultural town. Using the hidden track, you can run the layout as a continuous loop, or as a point-to-point road with the staging representing outside connections at both ends.

A cutoff connecting to a section of track exposed between two tunnels stands in for an interchange track with a second railroad. this interchange track lets the home road ship in or out any kind of cars desired. The cutoff can also be used as a reversing loop to turn a consist.

Industries on the Housatonic Valley help to establish a sense of place. The seaport in Eastport features a fishing boat docked at a cannery, a warehouse, a team track, a linen mill, a gravel quarry, an iron foundry, and a creamery represent industries common to the area, while autumn foliage, Cape Cod-style houses, and a covered bridge over the tracks near Middleboro evoke well-known New England sights.

One corner of the layout includes another common New England landmark, a small hydroelectric dam. The trick here is that the upper reservoir's water level is actually above the hidden track. The easiest way to model this water would be with commercial plastic water sheet. Just be sure to paint the bottom with a dark color or back it with opaque material, so your guests don't see trains moving through Davy Jones' Locker!



SUGGESTED STRUCTURES

Fishing boat: Sea Port Model Works H114N 83-foot sardine carrier

Seagold Cannery: GC Laser 507 Brennon Seed Co.

Eastport Warehouse: American Model Builders 604 transfer building

Herbert Mills: Wm. K. Walthers Modulars sets 933-3295 and 933-3283

Gravel tippie: Wm. K. Walthers 933-3241 Glacier Gravel Co.

Covered bridge: GC Laser 418

Patriot Ironworks: Model Power 1546 Holland Iron & Steel 1573 National Casket, and 2608 General Electric Co.

Aardmore Coal & Lumber: Branch-line Trains 893 Valley Fuel & Supply

THE LAYOUT AT A GLANCE

Name: Housatonic Valley Ry.

Scale: N (1:160)

Size: 8 x 9 feet

Prototype: freelanced

Locale: New England

Era: 1930s

Style: walk-in

Mainline run: 43 feet

Minimum radius: 9½"

Minimum turnout: no. 5

Maximum grade: none

OKLAHOMA & WESTERN RR

THE SIMPLEST OF THESE three track plans uses one straight and one diagonal cut to add a branch line and an interchange track to an HO scale oval. The double-ended track allows for runaround operations needed to switch the three industrial sidings inside the loop, but it's the eight-foot-long, tapered peninsula that breaks this layout out of the box.

Wrapping the lead for the branch line around the outside of the loop maximizes its length, while facing-point and trailing-point turnouts makes switching challenging. Note that the second track in front of the O&W depot can't be used as a passing track for the loop without a backing maneuver.

The track that crosses the main and the branch represents the Missouri-Kansas-Texas Ry., a real railroad with which the O&W interchanges. This doesn't just add visual interest, but also allows the O&W to ship any kind of car on and off the layout via the interchange track. Cars due for delivery to the O&W can be staged in front of the M-K-T depot before the operating session, and shifted to the interchange for pickup by a road switcher. Cars from online industries slated for destinations off the layout can be dropped off on the interchange track to be picked up by the Katy.

The locale is the foothills of western Oklahoma, represented on the model railroad by hills on two corners of the layout. The deep cut on the larger hill also serves to visually break up the main line, disguising the oval.

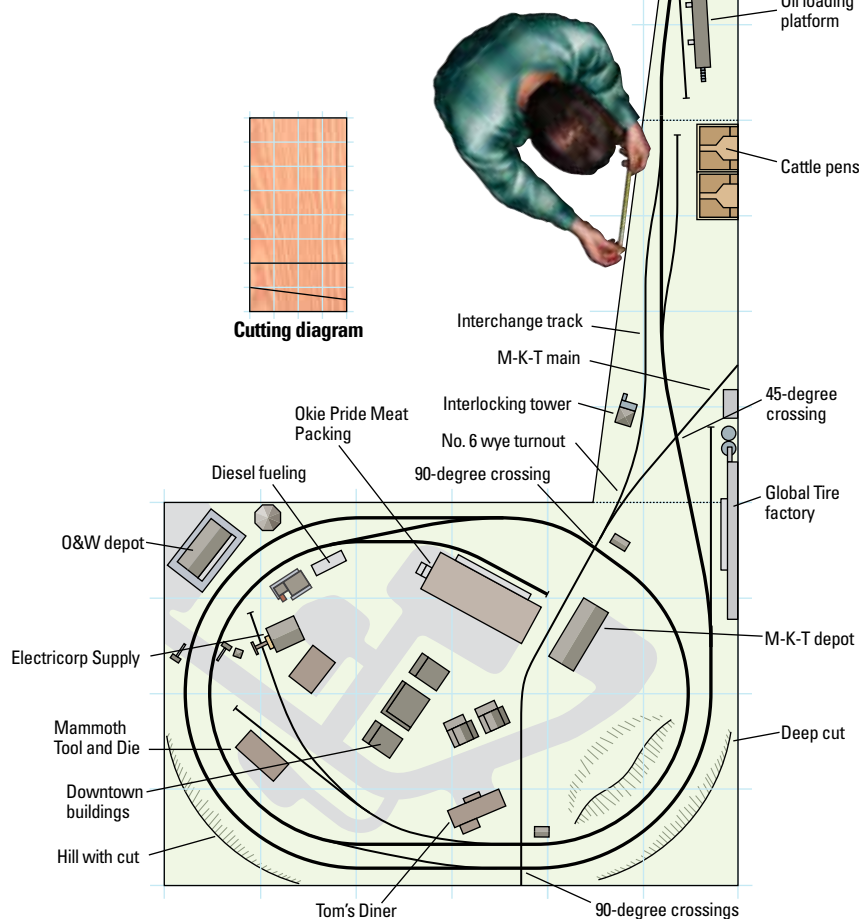
The major industries and resources of the region – cattle, tire manufacturing, and oil – are represented, helping to reinforce the layout's sense of place. A couple smaller industrial spurs branching off the main loop add even more options.

Setting the railroad in the transition era means that either early diesels or oil-fired steam locomotives would be at home on this layout. A Vanderbilt-tender 2-8-2 Mikado or an F unit could handle motive power duties on the O&W. For the M-K-T, an Alco RS-3 would be a good choice.

If you wanted to expand this layout later, the line at the end of the peninsula could be connected to a staging yard, or maybe a big city like Tulsa. You could also extend the Katy track into a new area.

Oklahoma & Western RR

Scale: HO (1:87.1)
Size: 6 x 12 feet
Scale of plan: 1/2" = 1'-0", 12" grid



SUGGESTED STRUCTURES

Okie Pride Meat Packing: Atlas 721 Middlesex Manufacturing Co.

Mammoth Tool & Die: Design Preservation Models 103 Cutting's Scissor Co.

Electricorp Supply: Wm. K. Walthers 933-3611

Tom's Diner: City Classics 110 Route 22 Diner

Global Tire factory: Wm. K. Walthers 933-3172 Armstrong Electric Motors (background building) and 933-3514 industrial tank set

THE LAYOUT AT A GLANCE

Name: Oklahoma & Western RR

Scale: HO (1:87.1)

Size: 6 x 12 feet

Prototype: freelanced

Locale: Western Oklahoma

Era: 1950s

Style: tabletop with shelf

Mainline run: 29 feet

Minimum radius: 19"

Minimum turnout: no. 5

Maximum grade: none

INDIANA & AURORA RR


THIS LAYOUT REPRESENTS a diesel-era short line serving a Mid-western city and the surrounding farmlands. Sliding apart the sections on either side of the S-shaped cut yields a layout that is still compact but has room for 24" curves needed by larger, more modern equipment.

Although the cutoff track leading past the grain elevator provides for continuous running, the staging tracks hidden behind the backdrop allow it to be operated as a point-to-point. A train could originate either in the staging yard (Chicago/Gary) or in the yard in front of the Rockland station. As it travels around the layout to the other end, the train would pass through the same urban scenery twice, but since the track is not connected at this point, for operating purposes it can be treated as two separate cities.

While Rockland has a couple of industry spurs, three station tracks and a team track, Fort Garth's two lineside industries share one double-ended siding. Switching these will require some careful planning by the yardmaster. On the other side of the layout, a farm, a couple of agricultural industries, and the flag stop station at Waynesboro represent Indiana's rural countryside.

Fort Garth's flour mill and brewery, both modeled as low-profile background buildings, and the businesses on the agricultural side of the layout, a grain elevator and a feed mill/farm supply dealer, represent the line's agricultural theme. The industries in Rockland – a bulk oil dealer, a small agricultural implement factory, and a team track – provide operating variety.

Though there are two depots on the layout, a line set in the 1970s like this one would see little demand for local passenger service. A short line like this might not have rated an Amtrak route, but you can increase operating interest by adding a coach or combine to turn a daily local freight into a mixed train.

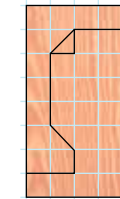
This layout is a natural for future expansion. Simply cut the track plan apart at the top and bottom of the D-shaped operating pit, pull the halves apart, and add new sections of benchwork and track in between to extend the main line. The tracks leading past the grain elevator and the seed and feed dealer could also be the connections for new branch lines. 

Indiana & Aurora RR

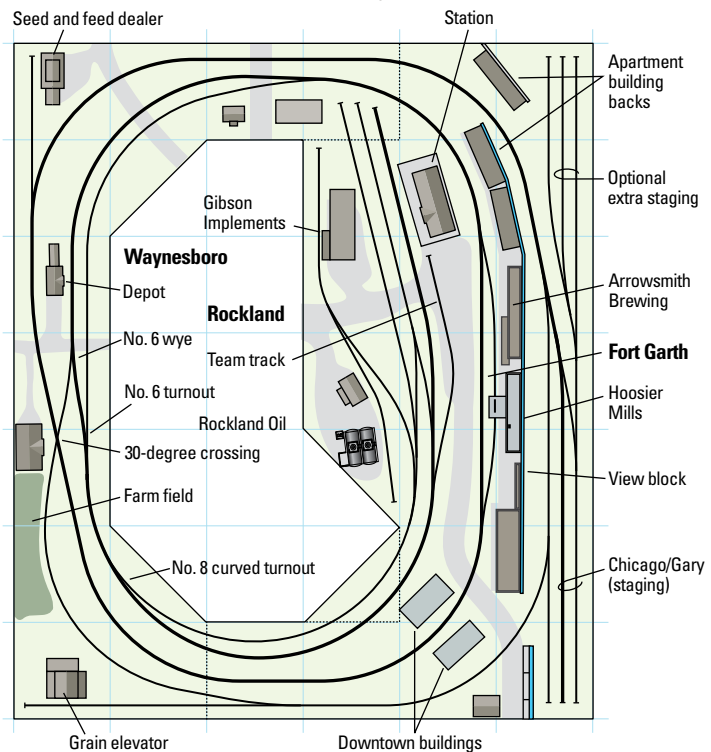
Scale: HO (1:87.1)

Size: 6 x 7 feet

Scale of plan: 1/2" = 1'-0", 12" grid



Cutting diagram



SUGGESTED STRUCTURES

Hoosier Mills: Wm. K. Walthers

933-3160 Centennial Mills

Arrowsmith Brewing: Wm. K. Walthers
933-3193 Arrowhead Ale

George A. Nickels Milling & Feed:
Branchline Trains 693

Waynesboro depot: Woodland
Scenics 239 flag depot

Givson Implements: Design
Preservation Models 106 Laube
Linen Mill

Rockland station: Wm. K. Walthers
933-2841 Clarkesville Depot

THE LAYOUT AT A GLANCE

Name: Indiana & Aurora RR

Scale: HO (1:87.1)

Size: 6 x 7 feet

Prototype: freelanced

Locale: Northern Indiana

Era: 1970s

Style: doughnut

Mainline run: 40 feet

Minimum radius: 24"

Minimum turnout: no. 5

Maximum grade: none

FOUND LAYOUT SPACE

An HO plan for non-traditional spaces

BY DAVID POPP

WHILE A LOT OF PLANS are designed for open spaces or spare rooms, that isn't always the space you have available for a layout. This plan is an example of what you can do when designing a model railroad to fit the space you have.

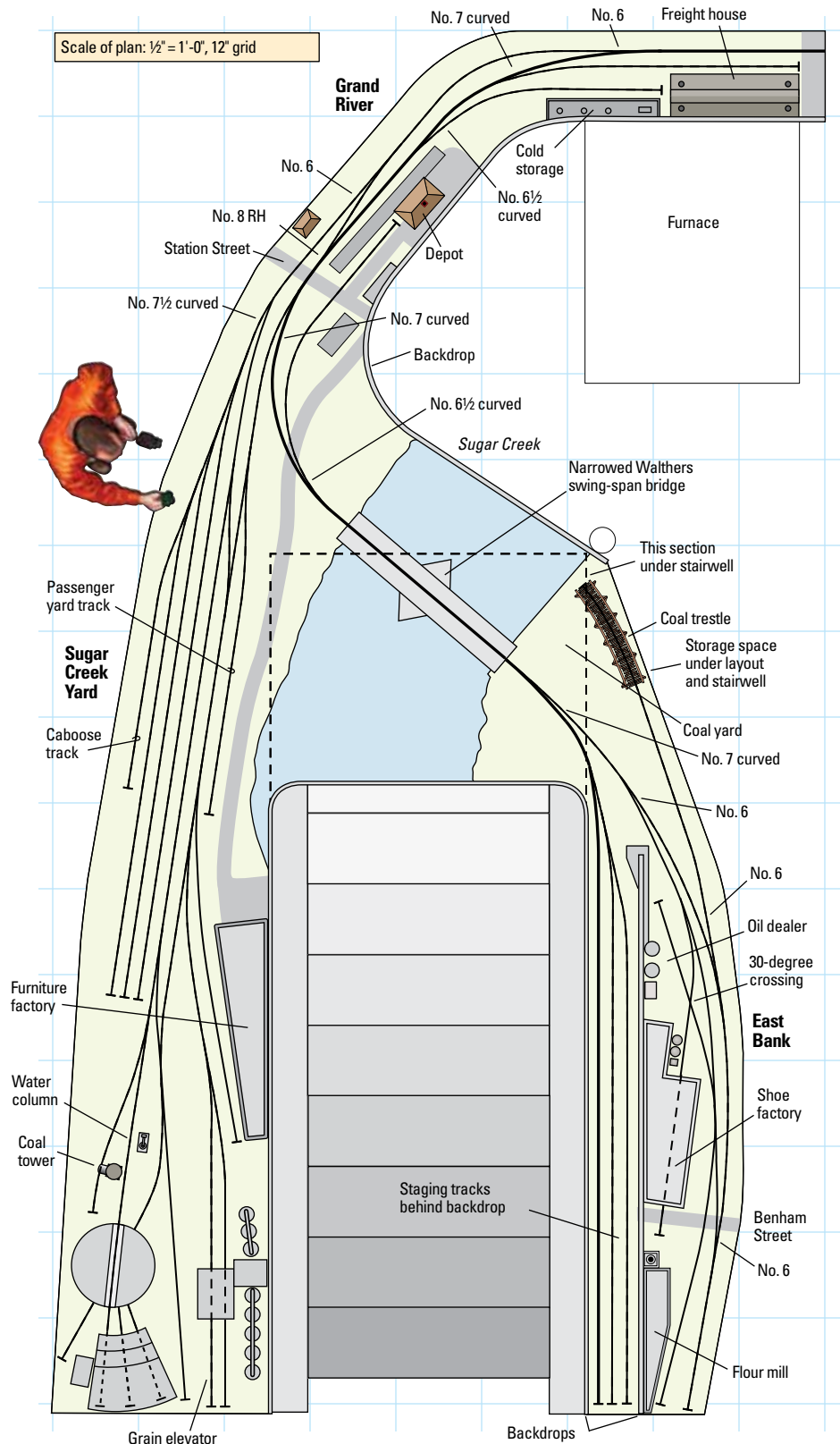
In this case, the HO scale Grand River Ry. is made to fit around a basement stairwell and wrap around a support post and a furnace. By keeping the area between the post and furnace open, you can still use the space under the stairs (and river) for storage. Also, the furnace remains accessible from three sides, making routine maintenance tasks easy.

The Grand River Ry. itself is set in the steam era and serves a terminal town along a navigable river. The industries on the river's banks, such as the grain elevator and coal yard, are served by barge as well as rail, making for some interesting operating traffic and modeling projects.

Because of the layout's 24" curves, smaller 2-8-0 and 2-8-2 steam locomotives, 40- and 50-foot freight cars, and short 60-foot passenger cars would work best on this railroad. You can use an 0-6-0 or an early diesel for a yard switcher. Despite its size, the layout could provide plenty of operation to keep three people busy for an entire evening. **SMR**

THE LAYOUT AT A GLANCE

Name: Grand River Ry.
Scale: HO (1:87.1)
Size: 9'-2" x 16'-2"
Theme: waterfront terminal
Locale: freelanced
Era: Early 1950s
Style: Island
Mainline run: n.a.
Minimum radius: 24"
Minimum turnout: no. 5
Maximum grade: none



TRICKS FOR SMALL MODEL RAILROADS



Sam Swanson made this scene look much deeper by having the road disappear into the backdrop.

Think beyond the 4 x 8 when working with limited layout space

BY CODY GRIVNO

THE DESIRE TO HAVE MORE layout space is high on the wish lists of many model railroaders. But if you don't have room for a basement empire, that's okay. In this section, we'll look at techniques for getting the most bang out of the space you have available.

In this section, Stuart Freeman kicks things off with an article on fold-away benchwork. Using his method, somewhat like a Murphy bed, you can build an 8 x 8 foot model railroad that folds neatly away into a cabinet that's less than 2 feet deep.

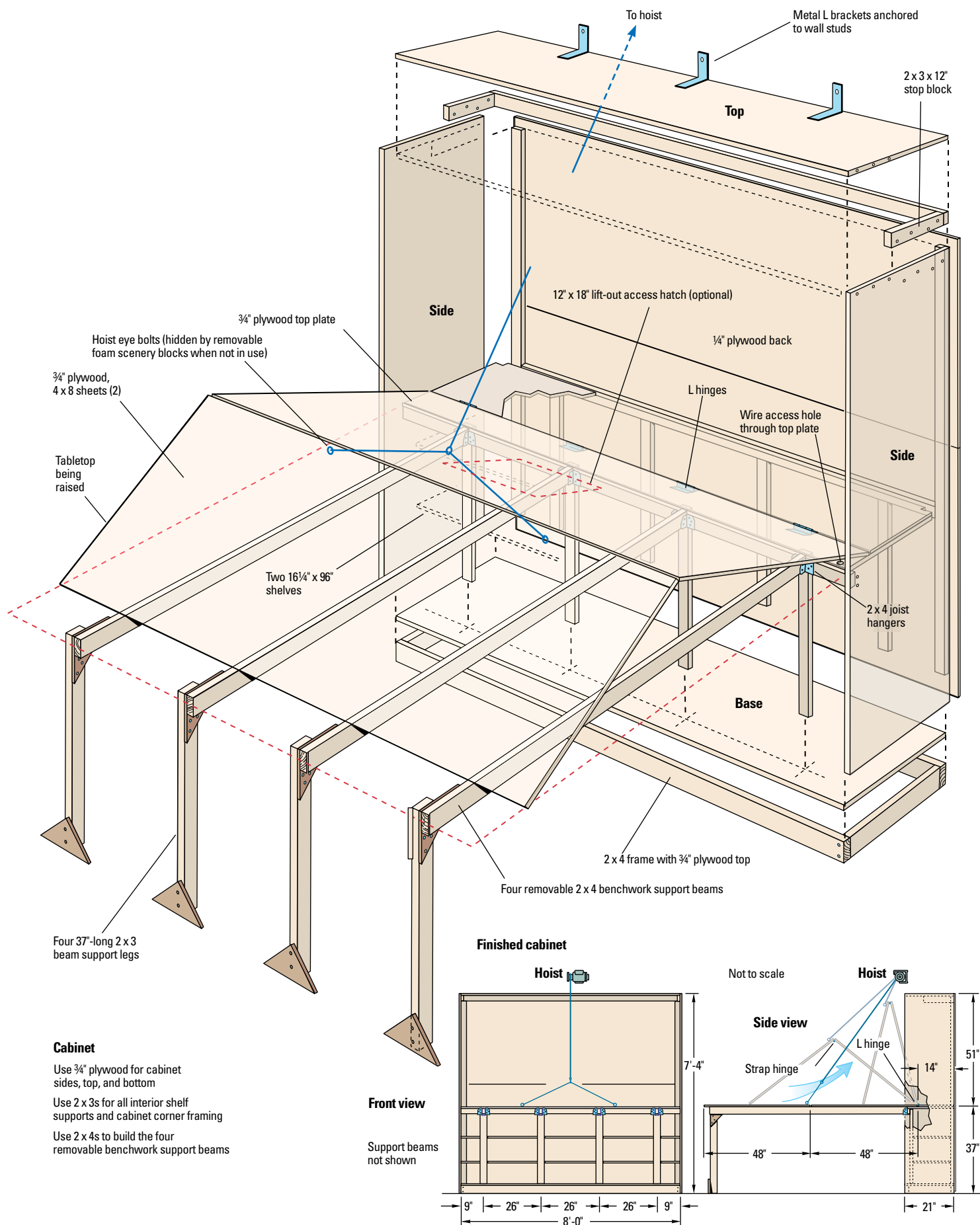
If you already have a small layout, we have stories that will show you ways to make them seem like one that is much larger. Veteran designer and builder Lance Mindheim shares tips for modeling a team

track, a universal industry that can greatly expand the operating potential of your model railroad.

Scenery can also be a useful tool for making a small model railroad seem larger. Sam Swanson shares techniques for adding broad backdrop hills to a narrow space, and making model roads look like they go "beyond" the boundaries of the layout by cleverly camouflaging where they end.

Equipment storage is another concern on small layouts, and Sam is back again to show you how to build a sector plate.

Having enough space is a challenge many model railroaders face. But with these techniques, you can make a compact model railroad seem much larger. **SMR**



BUILD FOLD-AWAY BENCHWORK

The ideal layout for anywhere that space is at a premium

BY STUART FREEMAN

MANY PEOPLE WOULD LIKE to have a model railroad but don't have space for a permanent layout. As a professional layout builder, I'm asked to solve this dilemma often. Recently, while working with a client with limited space, I designed and built an 8 x 8-foot folding train table for his garage. Though I've made other layouts that can be collapsed and stored, on this job I designed a layout that folds up into its own cabinet.

Follow along as I explain how you too can make a folding layout cabinet.

BUILDING THE CABINET

The finished cabinet measures 7 feet tall, 8 feet wide, and 21" deep. Think of it as a big wardrobe. The upper part houses the layout in its stored position. The lower part has shelves to hold electronics, scenery materials, trains, and other items. The cabinet is deep enough to accommodate low hills, trees, and structures when the layout is retracted.

I built the cabinet out of $\frac{3}{4}$ " plywood, cutting the materials following the construction diagram. If you can, have your local home center or lumberyard rip (sawing lengthwise) the plywood parts for you. I sealed the back of the cabinet with $\frac{1}{4}$ " plywood panels, using it as a backdrop for the layout. To ensure solid construction, use carpenter's wood glue and screws for all joints.

The cabinet is held securely in place by two L brackets screwed to the top of the box and the wall studs. Though I didn't include them, you could easily add $\frac{1}{4}$ " plywood doors to the front of the cabinet to protect the layout.

BENCHWORK

The supporting benchwork is removable for storage. The legs and support beams, made from 2 x 4s, plug into four joist hangers mounted on the front of the cabinet. The layout is constructed on an

8 x 8-foot flat table made from two 4 x 8 sheets of $\frac{3}{4}$ " birch plywood, a very sturdy material that won't easily flex or warp. Because of the way the layout folds, you can build up the subroadbed and scenery with foam insulation board. See the box below right for tips on wiring the layout.

ELECTRIC HOIST

The real key to making the project work is an electric hoist used to lift the folding tabletop. I used one from Northern Tool that has a 440-pound lifting capacity. The hoist needs to be bolted securely to the ceiling following the manufacturer's instructions, so this might not be an ideal installation for your living room. It will work well, however, in a garage, basement, or even a spare bedroom.

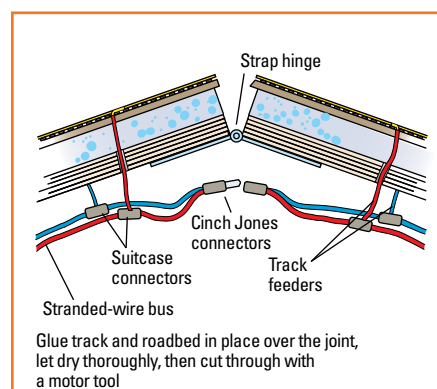
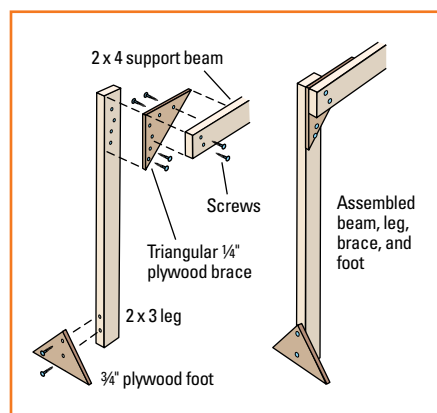
The hoist cable runs through a block and tackle and hooks onto another cable attached to the center of the layout with eyebolts. The finished layout is very heavy, so consult your local hardware store about cable and eyebolt weight ratings.

Because the cable needs to be on top of the layout, you can hide the eyebolts with removable pieces of scenery or structures. When the layout is folded up, you can store these pieces on the cabinet shelves.

When using the hoist to raise the layout, the tabletop slides along the support beams. When the hoist reaches its full height, you can gently push the tabletop the rest of the way into the cabinet until it touches the stop blocks. You can then remove and store the legs, clearing space for your next activity. **SMR**

BENCHWORK INFO

Get this great download on how to build benchwork for your layout. Click the "Shop" link at www.ModelRailroader.com.



TO KEEP THE TRACK ALIGNED

properly, glue the roadbed and track over the hinge joint. After the glue has set, cut the rails at the joint with a motor tool.

To power the rails on either side of the hinge, solder feeders to all rails and drop them through the tabletop. Connect the feeders to a bus made of stranded wire that bridges the hinge joint. Any wiring that crosses the hinged sections must be stranded so it can flex when the layout is folded up.

Next, cut the bus at the joint and install Cinch Jones connectors. Unplug the electrical connections before you fold up the layout. — David Popp, Producer, *Model Railroader Video Plus*



Team tracks don't take up a lot of space and serve a wide variety of freight traffic. This photo by Charles Shaw shows a load of Iron Fireman furnaces being unloaded from a Nickel Plate Road boxcar at the Chicago, Indianapolis & Louisville (Monon Route) team track in Bloomington, Ind., in the late 1930s. Monroe County (Ind.) Historical Society photo

ADD A TEAM TRACK

This space-efficient “industry” fits on any size layout

BY LANCE MINDHEIM • PHOTOS BY THE AUTHOR

EARLY IN THE MODEL RAILROAD

design process, we need to decide which industries to include on a layout. When making such choices, I focus on what I call “high-efficiency” industries – those that offer the most operating potential per square foot. Industries that ship and/or receive a variety of car types, handle a reasonable volume of traffic, and take up little space are ideal for model railroad use. One of the most space-efficient industries you can include on a layout is a team track.

ONE TRACK, MANY CUSTOMERS

Used for shipping freight since the earliest railroads, a team track is a spur or siding shared by businesses that don't have direct rail access. The name comes from the horse teams that once pulled wagons up to railroad cars spotted on these spurs to load or unload them. A paved or dirt road alongside a team track is therefore a required feature.

Team tracks see a large variety of car types and loads. Lumber, building materials, industrial and construction equipment, farm implements, plastic pellets, and large electrical gear are a few typical examples of lading shipped via team tracks. Within reason, these tracks can handle anything that can be unloaded into a wagon or, in more modern times, a truck.

In some cases, a team track isn't even a separate track but rather a spot on an industrial spur where there's direct truck access. You don't need to build a structure to serve this industry, although some team tracks feature unloading ramps, platforms, and overhead cranes. Many shippers today use portable ramps, forklifts, and front-end loaders.

If you can find a small open spot on your model railroad where you can add a turnout and a short spur that can be reached by a wagon or truck, you've just discovered a new destination for freight cars. And you can have this new industry in place in time for your next operating session. **SMR**

MORE ON FREIGHT

Need more information about how railroads move and deliver goods to customers? Frank Ellison's “Realistic Freight Operations” is a great resource on everything from fast freights to local switching. Download it by clicking on the “Shop” link at www.ModelRailroader.com.



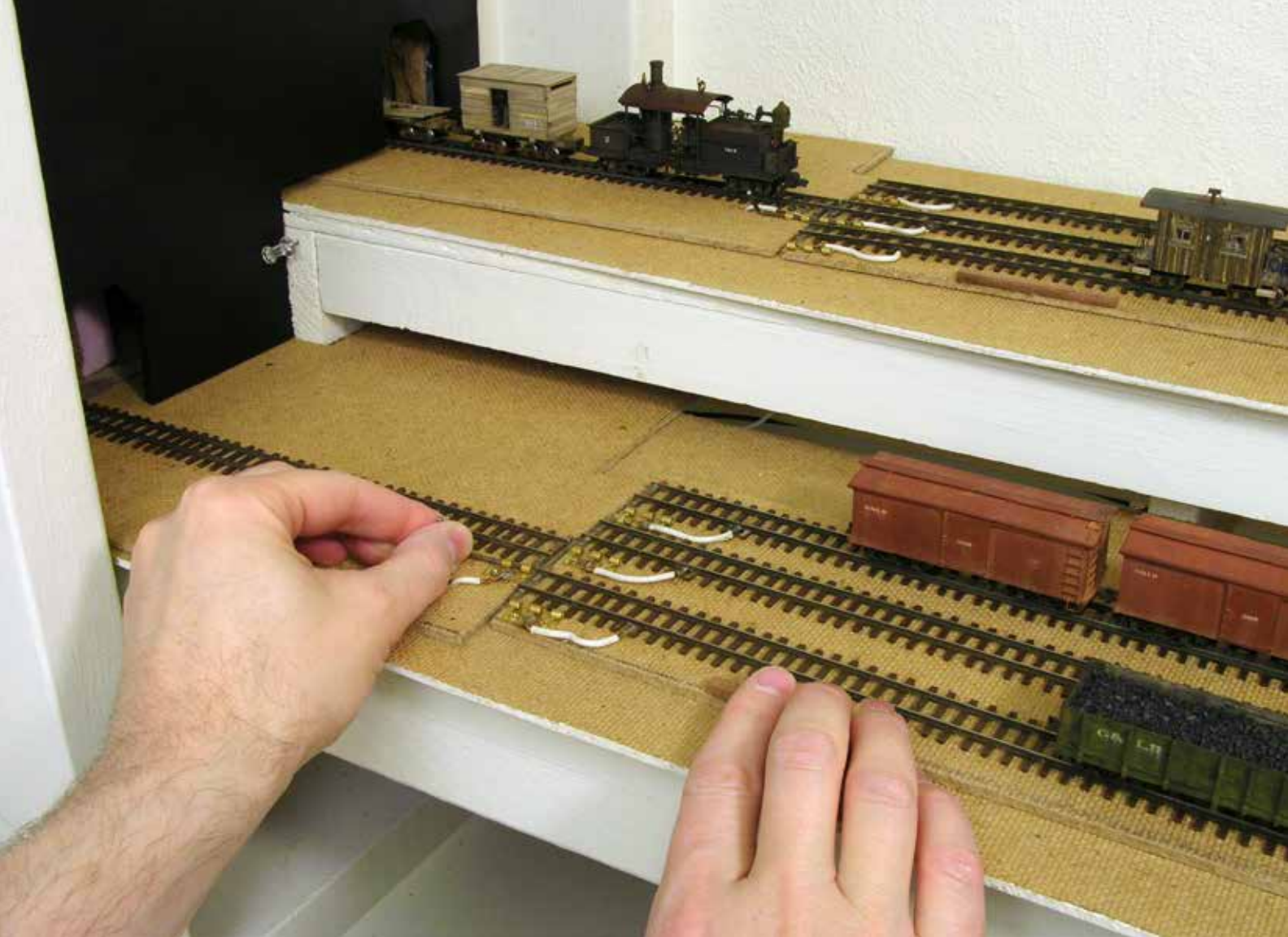
The two major features required at a team track are truck access and a means to load or unload cargo. Today, trucks are often equipped with unloading devices, as in this scene on the Lance's Florida-prototype HO East Rail layout.



Team tracks are used for more than just boxcars. Unloading a covered hopper or tank car may require little more than a hose connection to a truck. This scene on Lance's layout depicts plastic pellets being unloaded.



On Lance's East Rail layout, brick and concrete blocks are still shipped by rail and can be unloaded using a portable ramp if a platform isn't available.



Sector plates make it easy to stage cars in a compact space without the need for several turnouts. Sam Swanson shares the plans he used for the sector plates on his standard and narrow gauge HO scale layout.

BUILD SECTOR PLATES TO SAVE STAGING SPACE

These pivoting panels let you switch cars in a compact area

BY SAM SWANSON • PHOTOS BY THE AUTHOR

MY 11 X 12-FOOT HO scale layout has standard and narrow gauge lines, both of which terminate at sector plates. The plates allow me to transfer cars between staging tracks without lengthy turnout ladders. I built my plates with tempered hardboard and other materials I had on hand.

The key thing is to place the sector (and its plate handle and hinged electri-

cal connections) where it's easily accessible and can operate smoothly. The plate should move freely in both directions without disrupting any rolling stock or locomotives stored on its track.

ASSEMBLY AND WIRING

I have three sector plates on my layout, two narrow gauge and one standard

gauge. I placed the sector plates on top of the tempered hardboard shelves (unfinished side up for both components), so there's just enough friction between the surfaces to let me slowly and carefully position the sector plate tracks between moves. Plans for my narrow and standard gauge sector plates are shown on the opposite page.

Here's how I assembled the sector plates. First, I installed the shelf and approach tracks. Next, I built mock-ups of the full-size plates with corrugated cardboard. Once I was satisfied with the mock-ups, I cut the sector plates from tempered hardboard and secured them with pivot bolts.

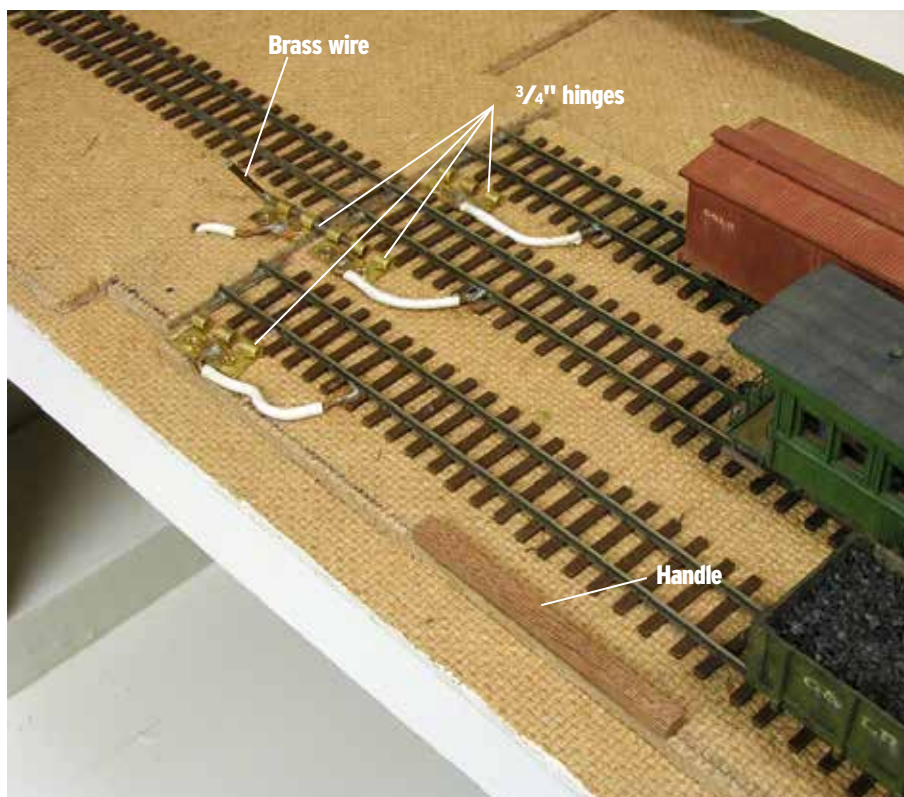
I then attached the tracks with track nails and checked the alignment. Both the fixed approach tracks and moveable plate tracks are segments of flextrack. Then I soldered a printed-circuit board tie about $\frac{1}{8}$ " from the rail ends. I spaced the rail ends for the approach tracks and sector plates about $\frac{1}{16}$ " apart, which allows for seasonal expansion and contraction.

Finally, I wired the sector plates. I used soldered connections at the back of each siding and hinge-based electrical connections at the front of each plate. See the photo on the previous page.

FRAMING THE SHELVES

I built the framing for the shelves from pine boards. After screwing the wood together, I attached it to the walls with wood and masonry screws. Then I secured the tempered hardboard to the frame with Liquid Nails and $\frac{3}{4}$ " brads spaced 6" apart.

Next, I attached the standard and narrow gauge track on the sector plates with Micro Engineering no. 30-106 track nails. I used a no. 68 bit to drill holes through the plastic ties. Spacing the holes roughly 5" apart worked fine. If the nails protruded from the bottom of the sector plate, I trimmed them flush with the hardboard's tempered surface.



MAKING THE ELECTRICAL CONNECTION. The sector plates are electrically connected to the staging tracks with $\frac{3}{4}$ " hinges and brass wire. In the foreground is the handle Sam uses to move the plate from side to side.

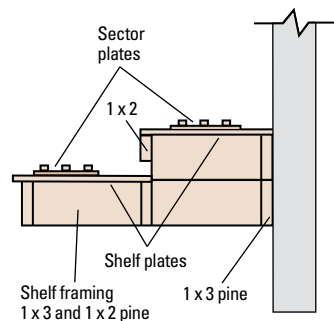
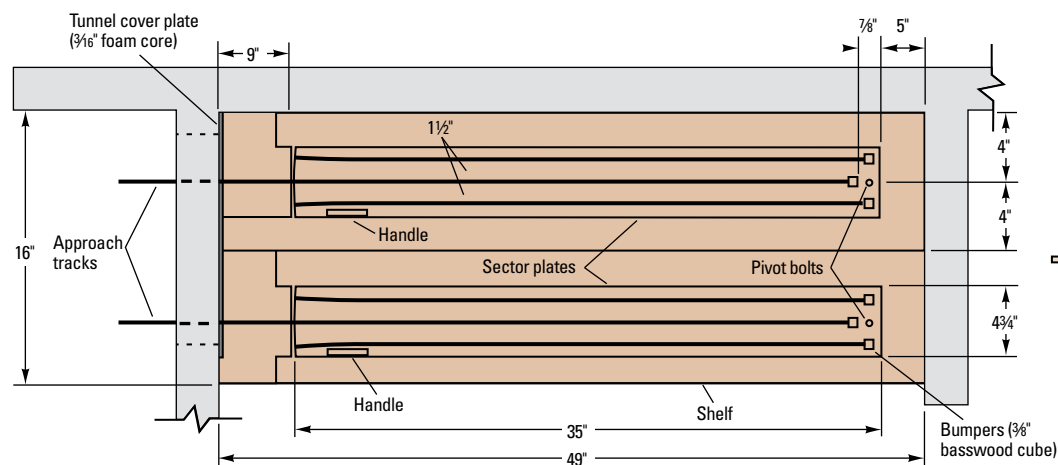
GET A HANDLE ON IT

A variety of handles can be used to move sector plates, but I used the simplest of push-pull implements. I used yellow glue to attach a $2\frac{1}{2}$ " length of basswood near the edge of each plate.

On the narrow gauge plate, I used $\frac{3}{16}$ " square handles, while the standard gauge plate has a $\frac{1}{8}$ " x $\frac{1}{2}$ " handle. As long as three or four fingers can gently push and pull the plate evenly, that's all you need.

SO FAR, SO GOOD

I've used the standard and narrow gauge sector plates for more than four years, and all three plates work as reliably as the day they were installed. Visitors often ask if the plates have warped or become misaligned due to seasonal humidity and temperature changes. I'm happy to report that I haven't had any problems with the plates since I installed them. **SMR**

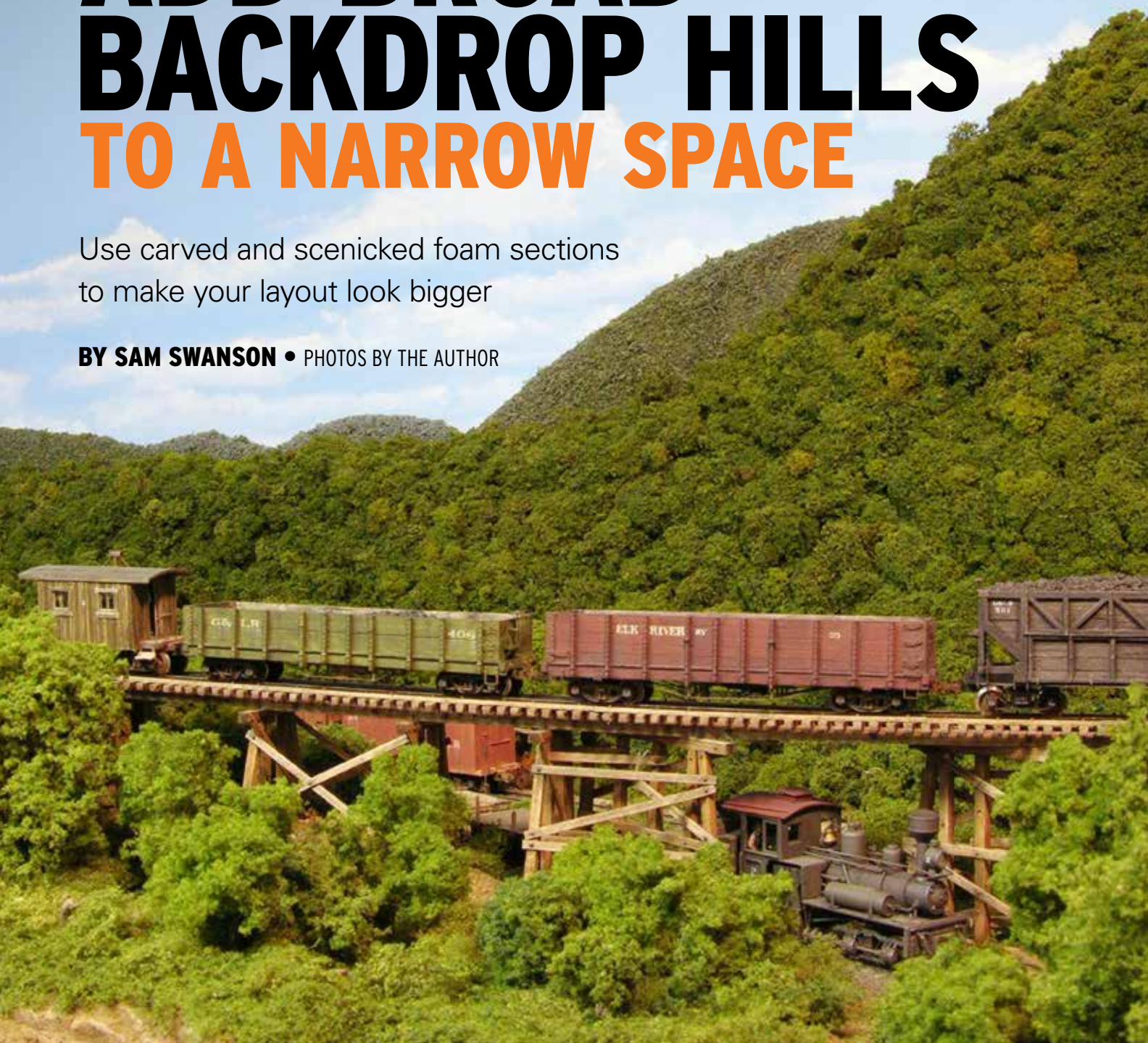


SECTOR PLATE PLANS. These drawings show the design of Sam's sector plates. Each plate has one track that aligns with three staging tracks. The pivot allows Sam to transfer cars between staging tracks without turnout ladders.

ADD BROAD BACKDROP HILLS TO A NARROW SPACE

Use carved and scenicked foam sections to make your layout look bigger

BY SAM SWANSON • PHOTOS BY THE AUTHOR



Even though space is tight on his layout, author Sam Swanson made his model railroad look bigger by blending a cloud-filled backdrop with low-profile, tree-covered hills made from scraps of foam board.

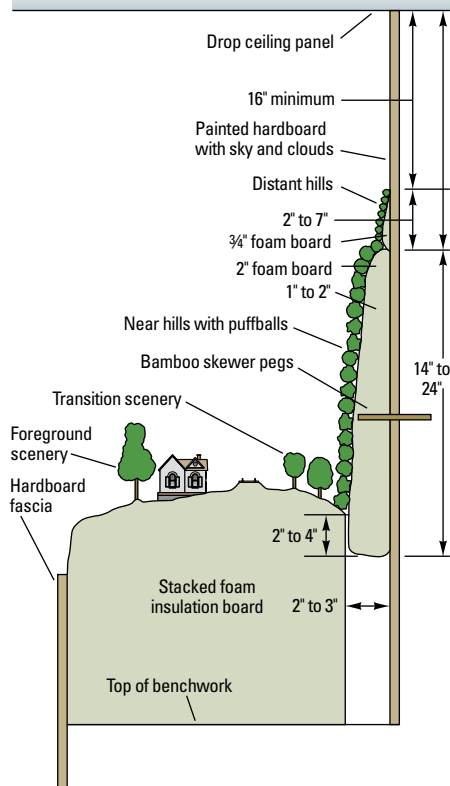
MY SCENICKED HO SCALE layout is set in Appalachia, where most of the mountains and hillsides are densely covered with deciduous trees. After observing many actual Appalachian vistas, I've found these settings often feature large hills closest to my vantage point and a

series of rolling hills in the distance. So to effectively model a backdrop with this degree of realism, I needed to replicate both the near and distant hills.

To create this illusion of depth in a relatively shallow layout space, I carved pieces of foam insulation board into

basic hill shapes and attached them to a painted hardboard backdrop. And by using the same scenery materials as those applied to the foreground of my layout, the backdrop scenery has the same texture and color, creating consistent and expansive scenes.

Backdrop components



1 INITIAL BACKDROP CONSTRUCTION



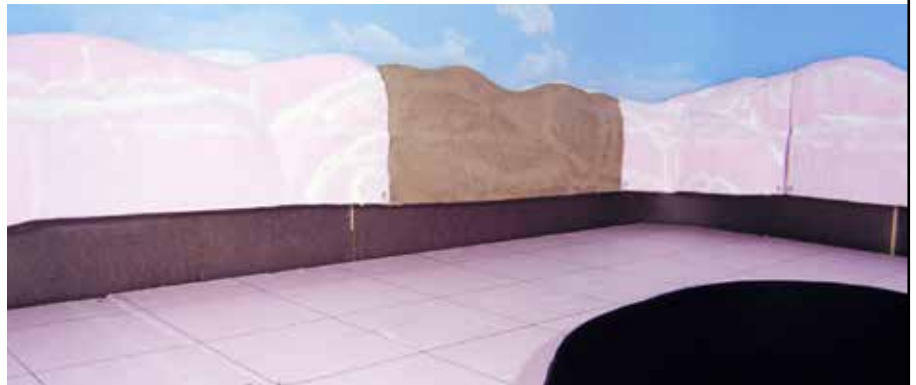
MY 11 X 16 FOOT LAYOUT has a backdrop of continuous hills, about 42 linear feet divided into 15 sheets of foam board. The key components and typical dimensions for my layout installation are depicted in the illustration to the left. The construction steps for my tree-covered backdrops include painting the sky and clouds, installing the hills carved from foam board, and finally adding and blending foreground and backdrop scenery elements.

After painting the hardboard backdrop, I use a hot wire cutter to carve the near hills from various pieces of 2" thick extruded-foam insulation board. Behind these hills, I add the distant hills, carved from 3/4" thick foam board. On my layout, these pieces can vary in length from 3" to 14".

2 INSTALL NEAR HILLS

TO INSTALL THE NEAR HILLS, first drill three evenly spaced holes into the hardboard backdrop for each foam section and use wood glue to secure three, 4" long bamboo skewers.

Next, use a Phillips screwdriver to make corresponding holes in the back of the 2" foam board and press the section into place against the hardboard surface. Repeat this process to install the remaining 2" foam-board sections.

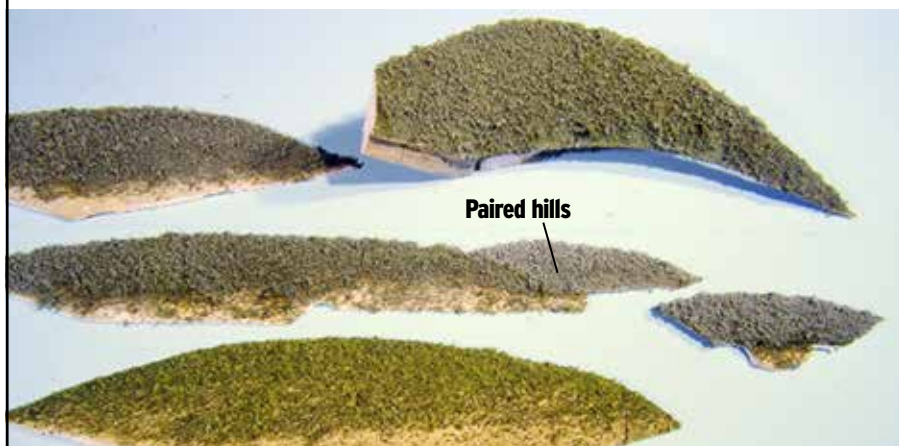


3 SHAPE DISTANT HILLS

NEXT, USE SCISSORS to cut cardboard or newspaper into templates that represent distant hills. As shown in the photo, use these cutouts to determine the arrangement of the distant hills and as a template for carving the 3/4" foam boards. After carving the distant hills, use foam-compatible adhesive to install the pieces atop the near hills and flush to the painted hardboard backdrop.



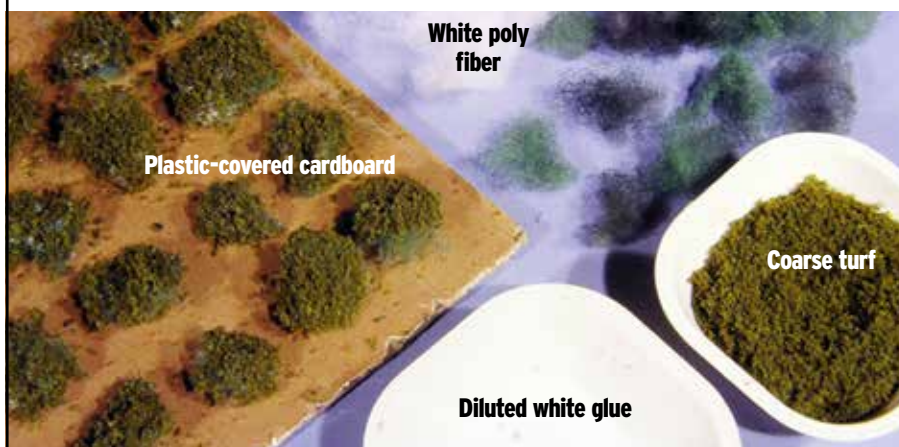
4 PREPARE DISTANT HILLS



FIRST, COVER THE DISTANT hills with flat tan latex paint. Allow the paint to dry, and then brush white glue over the painted area. While the glue is wet, sprinkle on enough medium and dark coarse turf to cover the foam board. Allow the sections to dry.

Next, mist the hills with a pale blue, flat latex spray paint. Apply the paint from 8" or more away, and build up the color gradually. A paired hill (two hills carved from one piece of foam), masked to vary the hill hues, is shown in the photo at left.

5 MAKE PUFFBALL TREES

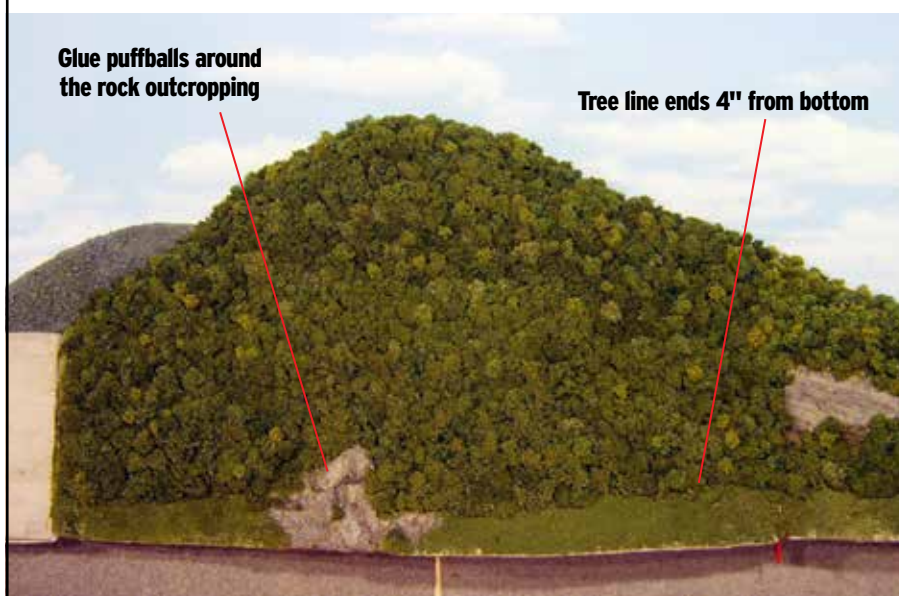


BEGIN BY SEPARATING the white poly fiber into shapes about 1/2" thick. Paint both sides of the poly fiber using brown and dark green spray paint and let it dry overnight.

Next, use scissors to cut the poly fiber into pieces about the size of cotton balls. Dip each ball into diluted white glue (1 part glue to 2 parts water), then into a bowl of coarse turf. Place the ball, foliage side up, onto the cardboard to dry.

Once several trees are complete, coat them with hair spray and sprinkle on a variety of fine turf colors.

6 PLANTING TREES



AFTER AMASSING several sheets of thoroughly dried puffballs, it's time to glue them into place on the near hills. First, paint the near hills tan and allow the paint to dry.

Next, starting at the top of the hill, use carpenter's wood glue to attach puffballs along the distant hills' periphery. Continue working down the hill, varying the puffball colors, and ending where the foreground scenery ties into the near hills. Slightly overlap the puffballs, and for additional texture and color variation, add some trees made from clump and fiber foliage.

The band shown in the photo is about 4" from the bottom of the hill panel, and the trees have been glued around the rock outcroppings.

7 FOREGROUND SCENERY

THE PHOTO shows how the necessity for using small puffballs became evident when I temporarily placed a diorama against the near hills. The diorama features hillside trees of small to intermediate size for foreground scenery, ranging in HO scale from 15- to 30-feet tall.

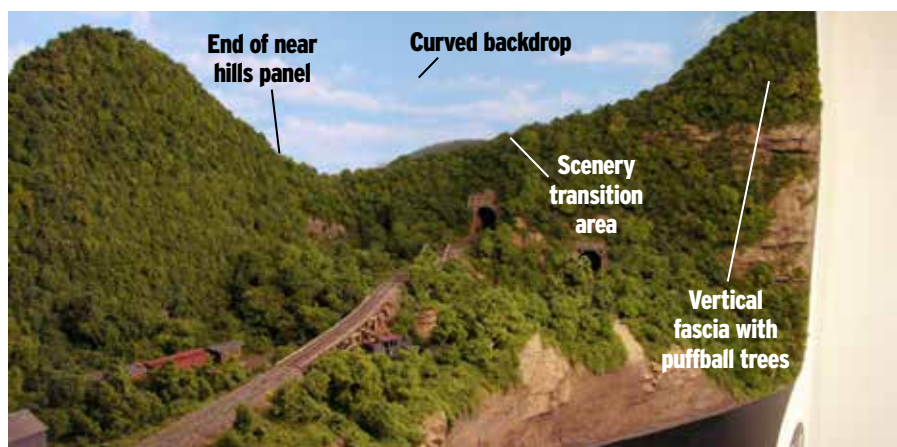
In a relatively short distance (25" from the front of the diorama to the hardboard backdrop), a sense of greater depth and distance is created by this combination of foreground scenery and puffball-covered backdrop hills.



8 SCENERY TRANSITION

THERE ARE SEVERAL WAYS to transition from the tree-covered near hills to the foreground. One method is to gradually increase the puffball sizes until they're the same as the foreground trees.

Another method, as shown at right, is to extend the fascia vertically and construct a curved, near hills backdrop section that spans the gap from the flat panels to the edge of this extended fascia segment. Add rock outcroppings and, along the top of the curved section, attach two rows of small poly fiber puffballs.

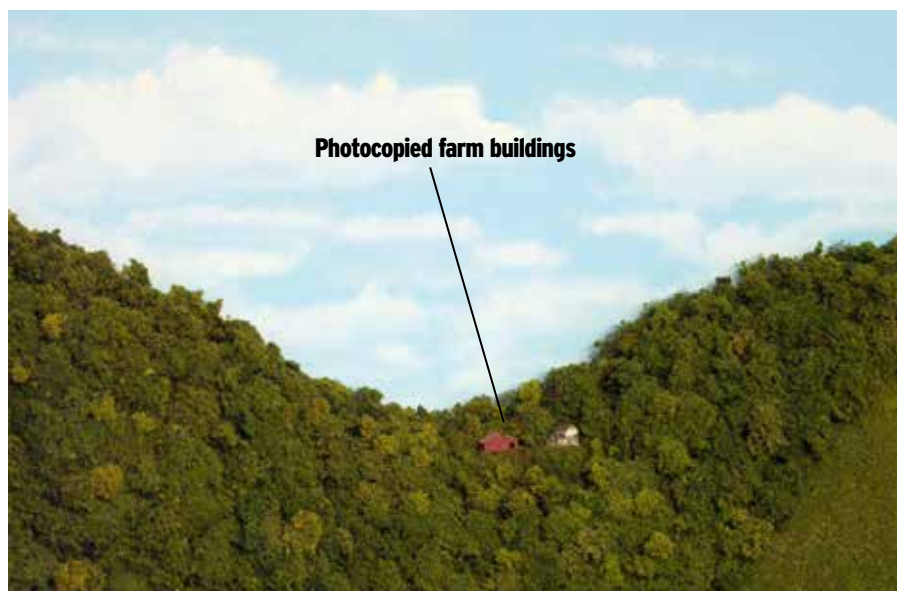


9 ADD DETAILS

IN ADDITION TO TREES, the backdrop also includes rock outcroppings and farm buildings. Use a sharp paring knife to carve rock outcroppings in the foam. Use tan or gray latex paint to cover the carved rock before highlighting some areas with dark brown or gray acrylic colors and drybrushed tan color.

For farms or other structures, use images of the buildings sized appropriately on a color copier or computer printer. Use a hobby knife to trim each image before attaching it to a backdrop hill with white glue.

Finally, apply small clumps of foliage around the image to help hide any gaps. **SMR**





Sam Swanson shares how he disguised the end of the road with a canopy of trees on his HO scale layout.

MODEL ROADS TO LOOK LIKE THEY GO ON FOREVER

Three tips for making roads appear to extend beyond the layout

BY SAM SWANSON • PHOTOS BY THE AUTHOR

I MODEL APPALACHIA, which has many packed clay and dirt roads. I've re-created several of these roads, which are primarily located along the railroad right-of-way, to provide leading lines to frame each scene. Having roads extend to the fascia is common and easy to model, but convincingly blending a road into the backdrop can be a little tricky. Here are some tips for disguising those roads.

When I start working on the roads, I try to convey a sense of depth and

avoid making a noticeable transition from foreground to background scenery. If you plan to have several of these roads on your model railroad, make each one slightly different to avoid uniformity.

VIEW BLOCKS

Horizontal view blocks, such as the wood trestle shown above, help obscure the transition from foreground to background. For roads that curve sharply near the backdrop, use a vertical view

block, as shown in the top illustration in **fig. 1**. A building or large tree would work well. Overhanging trees, as shown in the middle illustration, also suggest the road continues on.

If the road slopes before reaching the backdrop, as shown in the bottom illustration in **fig. 1**, use a vehicle to blend the transition from road to backdrop. To avoid crowding the transition, place the vehicle at least 4" from the backdrop. You can see an example in **fig. 2**. By

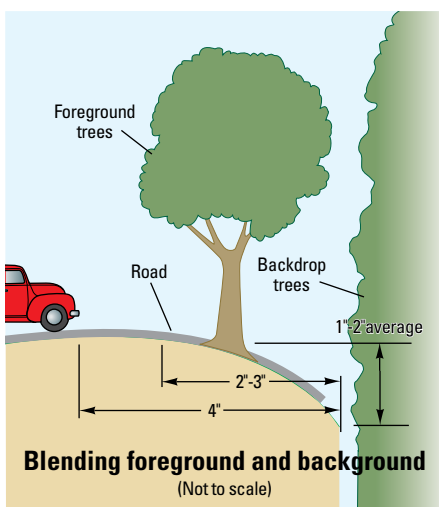
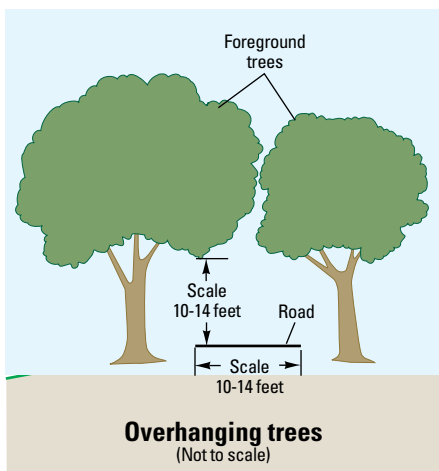
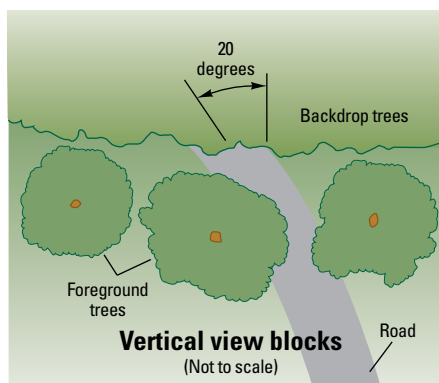


FIG. 1 TRANSITIONS. Vertical view blocks, overhanging trees, and vehicles can mask the end of the road.

using vertical view blocks, overhanging trees, and a vehicle, you'd never know the road ends inches past the bridge.

TEAM TRACK

Sometimes a siding can be justified with an addition of a road, such as a team track. All that's required is a short connecting road to the one paralleling the track, as well as the ability to hide the road's transitions. There's no need to connect the road with the front of the layout.



FIG. 2 VEHICLES. By placing a vehicle at least 4" away from the backdrop, it avoids crowding the transition from the foreground. The end of the road, just a few inches past the bridge, is masked by a grove of trees.



FIG. 3 TEAM TRACK. Angling from a canopy of trees, this road emerges to parallel a narrow gauge team track. The foreground trestle acts as a skewed view block and keeps the viewer a reasonable distance from the backdrop.

In **fig. 3**, I dropped the road about $\frac{1}{2}$ " before it enters the forest to help disguise the transition. I placed a dog in the scene (in front of the truck) to imply the road leads to the hill backdrop. Since it's walking toward the trees, the dog can take the place of a vehicle. You can achieve the same effect with people.

With the techniques presented here, seamlessly blending a road into the backdrop is not only easy, it's achievable.

When finished, your model railroad will have more depth to it and look more realistic than before. **SMR**

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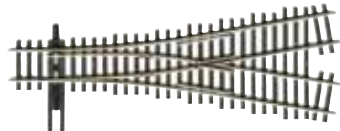
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