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SPECIAL ISSUE

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# Model Railroad Planning 2004

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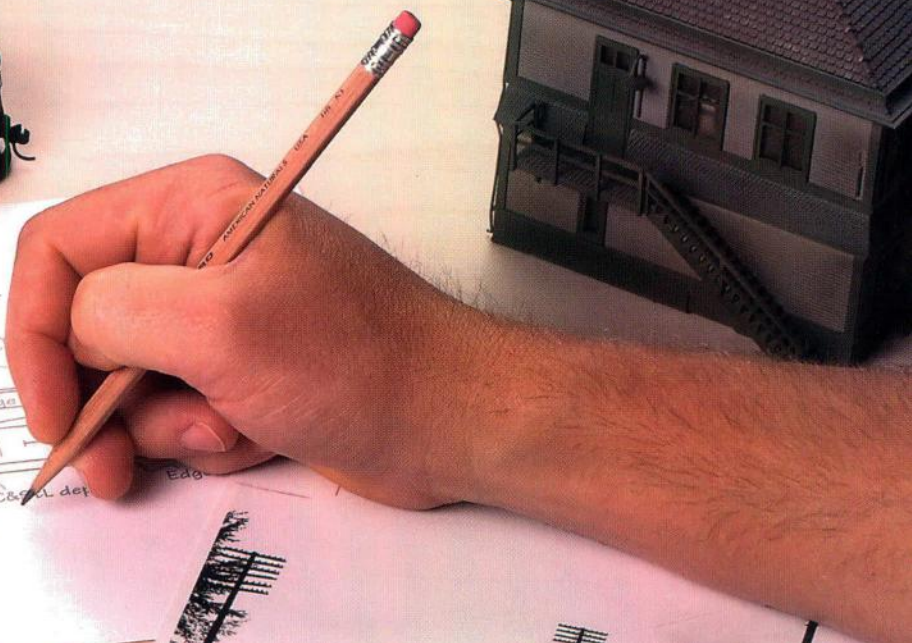


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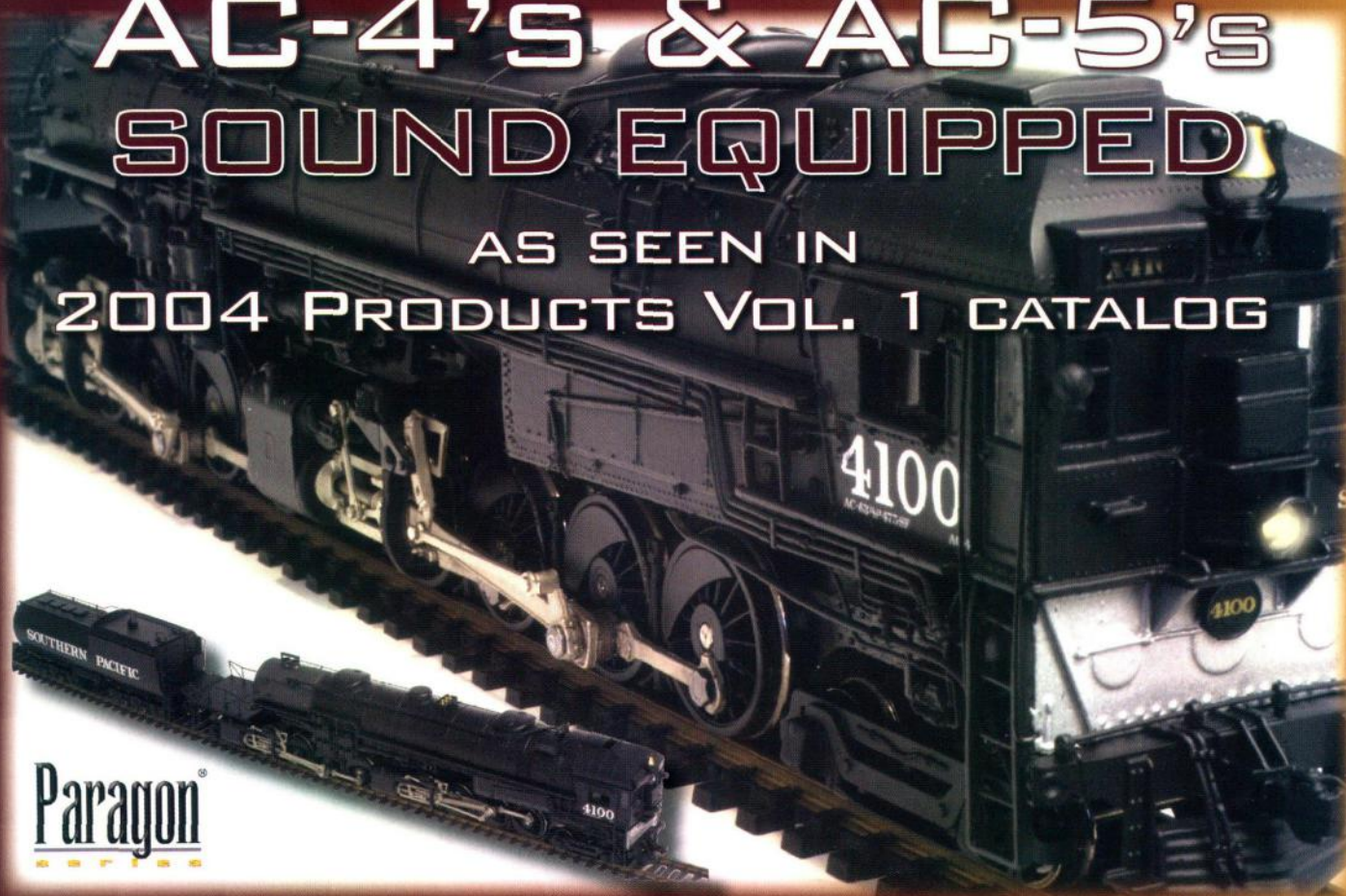




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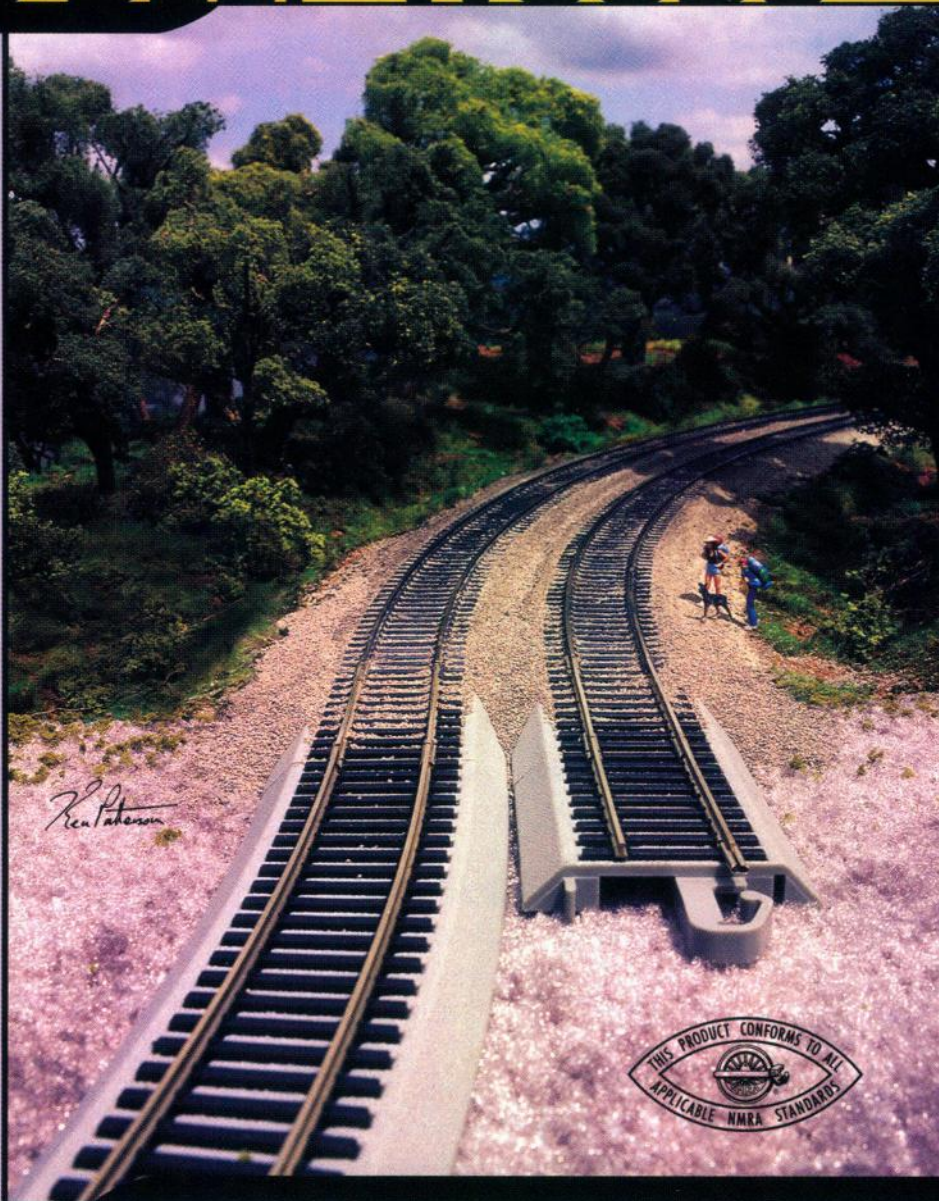


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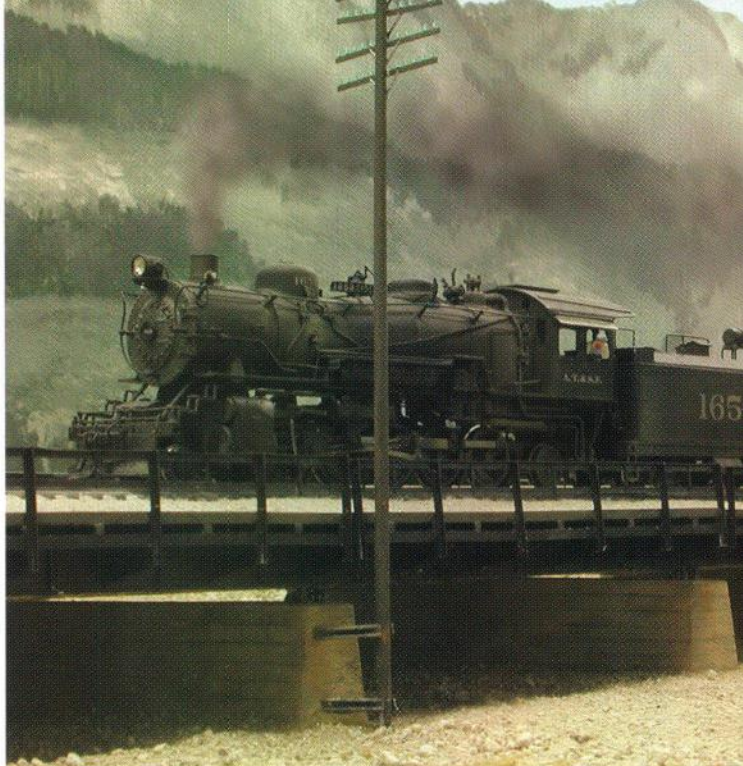
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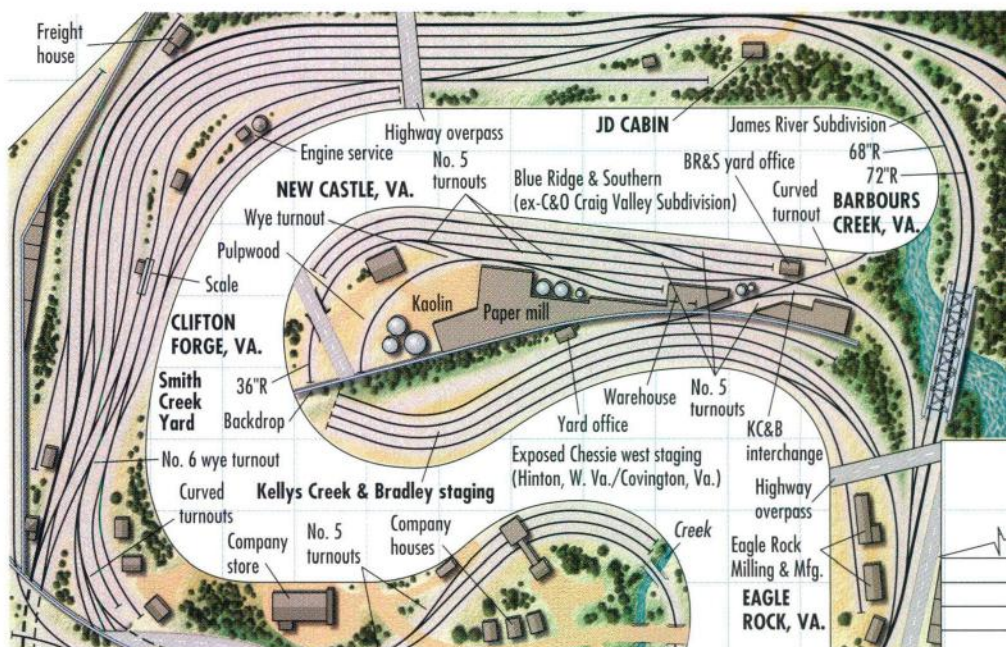
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# Model Railroad Planning 2004.

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## Editorial

# Genesis of an Issue

**M**ODEL RAILROAD PLANNING's content is gathered in a variety of ways. A quick review of how we selected the features in this issue illustrates the point.

As you would expect, regular contributors often call to ask if this or that might be of interest. Paul Dolkos's essay on layout size fits into that category. Veteran track planner and confirmed S scaler Bob Nicholson, a recently retired Iowa railroader, sent along his S scale 4 x 8 Illinois Midland track plan after a similar chat on the phone. (That was more than two years ago; even the "pros" don't always make the next issue.)

Byron Henderson's clever X-factor staging concept resulted from still another inquiry, as did Charlie Comstock and Don Mitchell's review of what it took to fine-tune a track plan for operation, and Rich Weyand's report on Bill Pistello's layout designed around authentic signaling. And we were delighted when David Barrow called to offer an overview of his new industrial switching layout's plan, along with several variations.

It's always a pleasure when we're able to feature several new (at least to MRP's pages) by-lines in an issue. When *Model Railroader* author Bruce Carpenter contacted me to ask about a piece on Nerska Tower, I told him it would tie in nicely with another piece about modeling a crossing (two New York Central lines crossing each other and the free-lanced Maumee Route at Edison, Ohio) that I had already asked Bill Darnaby to prepare. Ray Persing's railroad-you-can-model approach to a typical Midwestern interurban line is yet another case of someone stepping up to the plate. "You bet," I told Ray. "MRP coverage of a classic electric railway is overdue." Ray even gave me a tour of the line after a model railroad meet in Cincinnati so I would have a better idea of what it had to offer.

Like Bill Darnaby, John Roberts followed up on my request, in this case a review of his reasons for changing scales from HO to O. Popular as S and O scales are once again becoming, however, not everyone is moving to a larger scale. In next year's 10th anniversary issue of MRP, we'll tell you why a veteran HO prototype modeler changed to N scale.

Steve Lynch's piece on the Long Island RR's Oyster Bay branch was an eye-opener for me. I live in the Northeast, but I grew up in Iowa and Indiana, so I wasn't all that familiar with what the island's railroad had to offer. His report showed me, and I hope you as well, why quite a few modelers find the LIRR a compelling subject. Thanks for taking the initiative to share that story with us, Steve.

As you might imagine, all of *Model Railroader's* editors enjoy getting out into the field to visit other model railroads as often as we can. Some of these visits result in articles for MR or *Great Model Railroads*, and some of them wind up in the pages of MRP. After visiting Ted York's outstanding layout depicting the Cajon Pass area of the Santa Fe, MR exec-





There's nothing like a field trip to give you the flavor of a specific prototype railroad, or general type of railroad, that you may want to model, even if the line vanished decades ago. The Dayton & Troy Electric Ry. (page 26) is long gone, but lots of model-worthy lineside structures are still around, including this mill (top) and lumberyard (right) bracketing the former Pennsylvania RR overpass in Piqua, Ohio. The D&T ran down the street in the foreground.

utive editor and MRP editorial director Andy Sperandio let me know that he spotted some design features on Ted's layout that MRP readers would find of interest. An e-mail message to Ted confirmed that he'd be happy to work with us.

Each spring when I believe I have the makings of a well-balanced issue of both solicited and "walk-on" features in hand, the editorial staff gathers for a proposal meeting. Someone usually spots one or more aspects of layout planning that the proposed line-up doesn't cover adequately, as was the case with this issue. *Model Railroader* editor Terry Thompson observed that although there was solid coverage of relatively advanced model railroads as well as at least one basic plan – Nicholson's 4 x 8 – there was nothing to lead the beginner from a sectional-track layout toward a more advanced design. I therefore added staging to Bob's creative adaptation of what could have been simply a round-and-round hi-rail layout, and I drew a folded-open, point-to-point version of the same basic plan. Even designing a basement-size layout usually involves little more than reiterating this process. Tip: It's often easier if you base the towns on actual places.

I hope this demonstrates that there are many ways for your creative planning ideas to be shared with others through the pages of MRP. Much as we'd enjoy visiting with you personally, however, there's no need for you to wait



for one of us to drop by during a layout tour or open house and to twist your arm. Instead, send us a brief summary of what you're doing that you think others would enjoy learning more about. Include a drawing of your track plan or portion thereof that illustrates your point. Photos would also be nice, of course. You can do this electronically by sending an e-mail message to me at [mrmag@mrmag.com](mailto:mrmag@mrmag.com). Please type "MRP proposal" in the subject line.

Tony Koester, editor



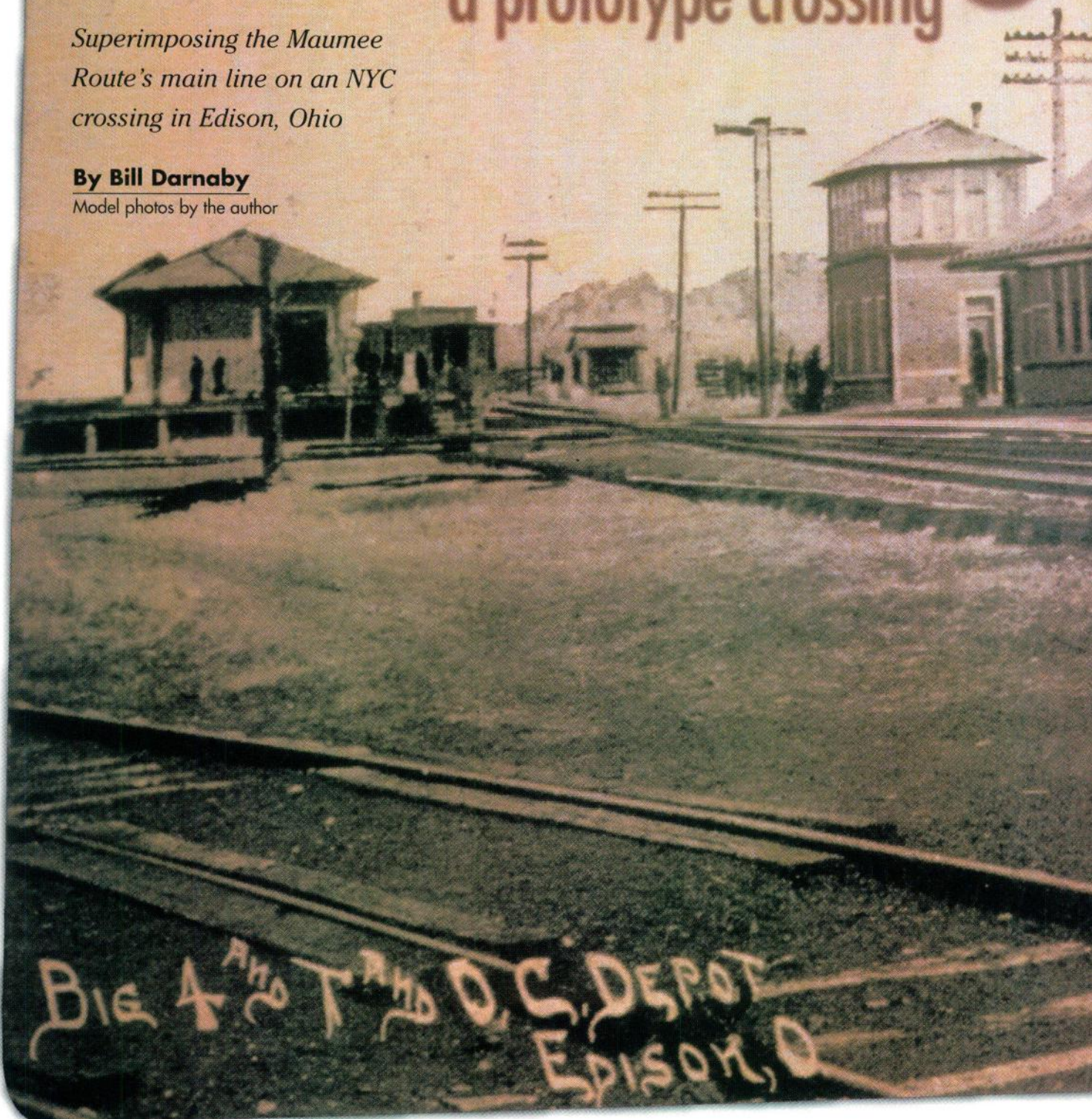
# Free-lancing

a prototype crossing

*Superimposing the Maumee  
Route's main line on an NYC  
crossing in Edison, Ohio*

**By Bill Darnaby**

Model photos by the author



BIG 4<sup>th</sup> AND T<sup>h</sup> AND O.C. DEPOT  
EDISON, O





Author Bill Darnaby used this old postcard to help him design his own version of the New York Central's junction at Edison, Ohio, for his free-lanced HO scale Maumee Route.



Edison, Ohio, proved to be an interesting modeling challenge while building my HO scale free-lanced railroad, the Cleveland, Indianapolis, Cincinnati & St. Louis – more commonly known as the Maumee Route. During the design phase, I had wanted my railroad to cross and interchange with as many prototype railroads as possible. To fulfill that goal, I chose to model northern Ohio in 1955, as its web of rail lines included connections with many of my favorite railroads such as the New York Central, Baltimore & Ohio, and Pennsylvania.

Edison was special, however, as it already had two NYC lines crossing through town, which turned out to be an exciting modeling advantage.

### Model real places?

I believe free-lanced model railroads should avoid depicting actual places, except when trying to fix a major point of origin such as Indianapolis or Peoria, to enhance believability. Modeling actual towns along the path of a free-lanced railroad runs the risk of diminishing believability, especially for viewers who are familiar with the territory. An extra railroad in a big city is no big deal; another railroad in a small town can really stand out.

That's why I gave most towns on the Maumee free-lanced names carefully chosen to reflect the region – Sciotovale instead of Sciotoville, for example.

### Too much of a good thing

When I drew the proposed route of the CIC&StL on an Ohio railroad map, I soon found that the Youngstown Division, the part I chose to model, encountered the NYC not once but six times! At this point, I was afraid that there were too many NYC crossings for me to accommodate on the layout. As it turned out, though they are all there,

some of them are modeled without interchange tracks.

Edison, Ohio, however, provided a unique situation as two of the NYC's six lines (the Toledo & Central Ohio's main between Charleston, W. Va., and Toledo and the NYC main from Columbus to Cleveland) crossed at Edison.

Breaking my rule about modeling real places, I decided I could model both these crossings in the same place on the layout by placing the Maumee's main line just north of the NYC's Edison diamond. As a bonus, I got the opportunity to do some of the site-specific modeling normally reserved for prototype modelers.

### Field trip to Edison

I visited Edison in 1992 while I was still designing my railroad. By then the tower and depot were gone, as was the T&OC with only a tree line and a couple of forlorn line poles to mark its passing. East of the former crossing, however, the T&OC line still existed to serve as an industry feeder towards Mt. Gilead, Ohio.

The connecting track to the NYC (by then Conrail) main appeared to be the former connection between the two lines. As the accompanying sketch made from field notes shows, I also spotted a north-south country road that would have cut across both lines just east of the diamond. The field trip was definitely worthwhile.



Illustrations by Kellie Joeger

### Locating the Maumee main

I now had enough data to design Edison: The T&OC ran northwest-southeast, the NYC northeast-southwest, making a roughly 90-degree, single-track crossing with the connecting track in the east quadrant. But should I locate the Maumee north or south of the “X” made by the two NYC lines?

One of the NYC books I have in my reference library yielded a 1947 photo of the crossing looking south. It

Even without an NYC F unit in view, the tower's architecture and color would still spell out New York Central Lines. Details of the tower and interlocking plant are evident.

showed a mechanical interlocking tower in the east quadrant aligned with the NYC main. The depot and platform were in the south quadrant and also oriented along the NYC rather than the T&OC. Other details such as signals, relay boxes, and a train-order stand were evident.

### CLEVELAND, INDIANAPOLIS, CINCINNATI & ST. LOUIS RR—THE MAUMEE ROUTE

#### YOUNGSTOWN DIVISION Detail of First Subdivision





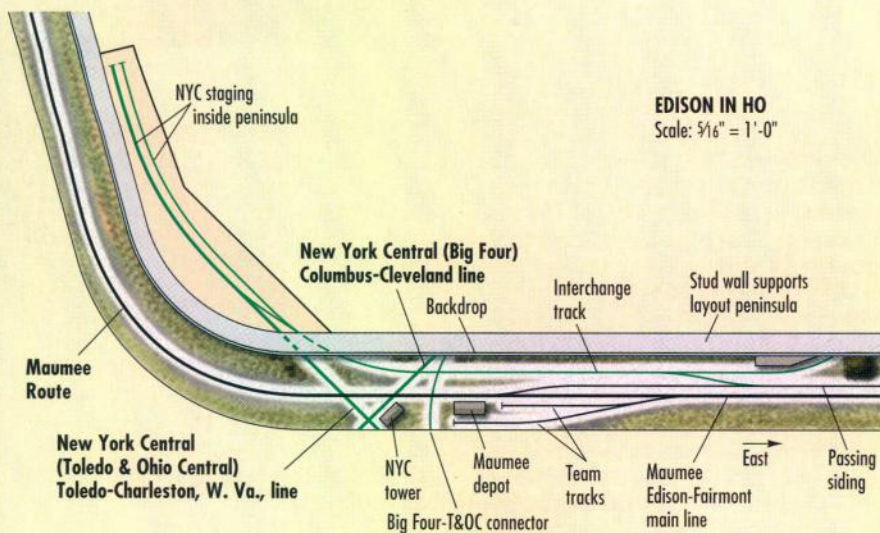


A 1913 postcard with a view looking north (see pages 8 and 9) showed other walls and details that proved to be helpful. Knowing where the tower and depot stood suggested that I should locate the Maumee north of the actual diamond to allow enough space to model the tower.

The 1947 photo also showed some of the interlocking rods, but it was evident that many had been removed when the signals were upgraded from semaphores to NYC-style color-light heads. I chose to use mechanically operated semaphores for the Maumee, and I expanded upon the prototype's

system of rods to accommodate the Maumee's home signals, switches, and locks within interlocking limits.

The NYC depot's location is marked by only a corner of its brick platform, an aesthetic loss but acceptable as the tower was the real prize. [See the January 2004 *Model Railroader* for the story



### Learning points

- Blatant revisions to well-known locations and prototypes can be confusing to viewers.
- Conversely, making subtle adjustments to prototype scenes can help to tie a free-lanced railroad to the actual rail network.
- Interchanging with one or more prototype railroads offers an opportunity for a free-lancer to do some prototype modeling.
- The appearance of prototype railroads on a free-lanced layout adds plausibility and hence realism to the fictional line.





An eastbound Maumee local waits as a Big Four freight rattles across the Toledo & Ohio Central and Cleveland, Indianapolis, Cincinnati & St. Louis diamonds at Edison, Ohio.

of how Bill built the interlocking plant details at Edison as well as at Sciotovalle and Miami Junction. – Ed.]

#### A live interchange

The benchwork is only 15" wide at Edison, so I had to make some adjustments to fit in the NYC/T&OC diamond and tower while still leaving room for the Maumee/T&OC interchange track. Unfortunately, there wasn't enough room for an NYC-Maumee interchange to be included.

For now, the T&OC and interchange tracks stop at the backdrop. But Edison's location near the end of the layout's free-standing peninsula means there is 20" of open space between the central backdrops. The T&OC main and Maumee interchange tracks will therefore pierce the backdrop with approximately five feet of hidden track on which to stage a short T&OC local to work the interchange. Having the tower positioned correctly near

#### The all-important interchange

Crossings with interchanges are important for several reasons. From an operating standpoint, they are excellent traffic generators, more so than almost any small-town industry. Crossings also offer opportunities to model structures and perhaps equipment of other favorite prototype railroads. Moreover, the appearance of prototype railroads and their equipment, especially on a free-lanced line like my Maumee Route, reinforces the illusion that the Maumee is a real railroad, not merely a figment of my imagination. – B. D. [For more information on constructing working interchanges, see Bill's article on page 60 of the October 2003 issue of *Model Railroader Magazine*. – Ed.]

the front fascia of the layout helps to divert the viewer's eye from the sudden termination of the NYC and T&OC lines at the backdrop. It will similarly provide a visual diversion when I punch a hole in the sky to reach the hidden staging tracks.

#### A slight revision of history

The NYC colors on the depot and NYC crossbucks of the style used in Ohio contrast with Maumee structures and details seen elsewhere on the layout. This serves to reinforce the CIC&StL's identity to the viewer.

At the same time, as a Maumee train approaches Edison, there's no doubt what railroads are being crossed there. And NYC fans familiar with Edison will see what they remember – and a little bit more. MRP

*Bill Darnaby recently retired from a 30-year career at the Electro-Motive Division of GM. He is now focused on completing his HO model railroad and taking all of those rail-oriented trips he never had time for in the past, including photographing the last of steam on Jing-peng Pass in China.*



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# Scale change a balm for burnout

*A shift from HO to O worked wonders*

**By John E. Roberts**

Model photos by the author

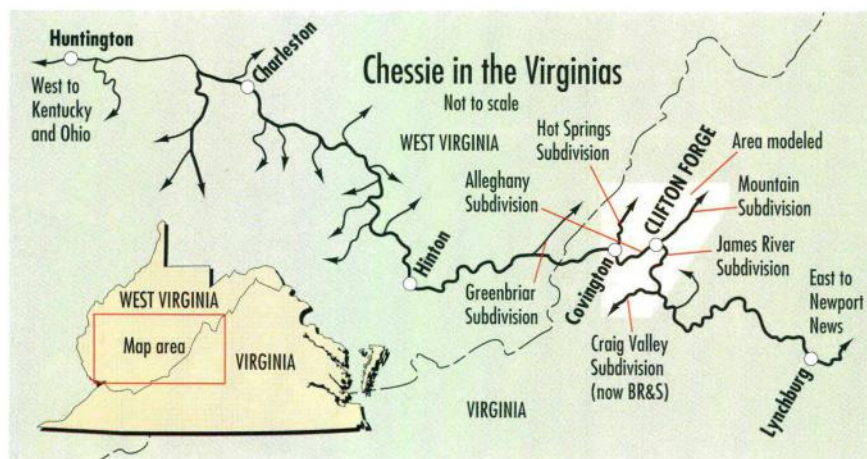


Illustration by Rick Johnson



**T**he temptation to try modeling in another scale grips most of us at one time or another during our journey through this hobby. In my case, O scale has always been attractive, yet seemed just out of reach – until relatively recently.

## Call of the coalfields

For the past quarter century, my modeling interests have been fueled by the Chesapeake & Ohio and successor Chessie System in the Appalachian coalfields. I enjoy some “prototype freelancing” as well as prototype modeling,

so beginning in 1975 I built a series of HO layouts depicting a mythical short line called the Blue Ridge & Southern that connected to the North American rail network via the C&O.

The first BR&S layout fit into a 12-foot-square space, and it interchanged with the C&O near Eagle Rock, Va., on the James River line. This operations-oriented railroad had command control and used car cards with waybills.

By the mid-1980s, my interests had shifted toward re-creating actual prototype locations, so I built a new layout with the C&O at Eagle Rock as the focal

point. By extending the railroad into my shop area, I was able to expand it to 12 x 17 feet. It included an interchange with Allen McClelland’s Kellys Creek & Bradley short line, which I had operated on Allen’s HO scale Virginian & Ohio. Shortly thereafter, BR&S traffic showed up on the KC&B in Allen’s basement as well.

## Moving on

We moved from Cincinnati to Pittsburgh in 1988 and bought a nice house to go over my dream basement. At last I had the space to model not only Eagle





C&O photo courtesy C&O Historical Society

Rock but the large ex-C&O yard at Clifton Forge, Va., and the Craig Valley Subdivision as well. The latter was abandoned in the early 1960s, so it was reasonable to argue that the BR&S had taken over the line in the post-Chessie-merger era I was now modeling.

I thoroughly enjoyed designing the new HO layout, and construction was soon underway. The goal was to have it open for the National Model Railroad Association's 1990 national convention in Pittsburgh. There's nothing like the impending arrival of layout-tour buses to spur construction!

### Reality check

As you might expect, a touch of burnout set in after the big push to have the main line running for the convention. Along with it came a harsh dose of reality as my business travel soon eliminated the idea of weekly work sessions with friends.

Could I actually finish building and, equally important, maintain all of this by myself? The number of turnouts in Clifton Forge Yard alone was daunting, and the size of the freight-car roster was approaching heroic proportions. What I felt I needed was something

John Robert's O scale layout design includes scenes along his favorite Chesapeake & Ohio prototype. He's also trying to capture the action as shown in this 1956 view of three Geeps leading a westbound manifest past JD Cabin into Clifton Forge, Va., while a local waits on the Jackson River bridge.





Bruce Fales (Jay Williams collection)



C&O photo courtesy C&O Historical Society

JD Cabin was just east of Smith Creek Yard, which was tucked between a ridge and the Jackson River (**top**) at Clifton Forge. Note the unusual yard ladder (**above**) with right-hand turnouts springing off a track parallel to the main instead of using left-hand turnouts from a track angling off to the right.

new that would rekindle my interest in the hobby by reducing the perceived height of the mountain I had to climb.

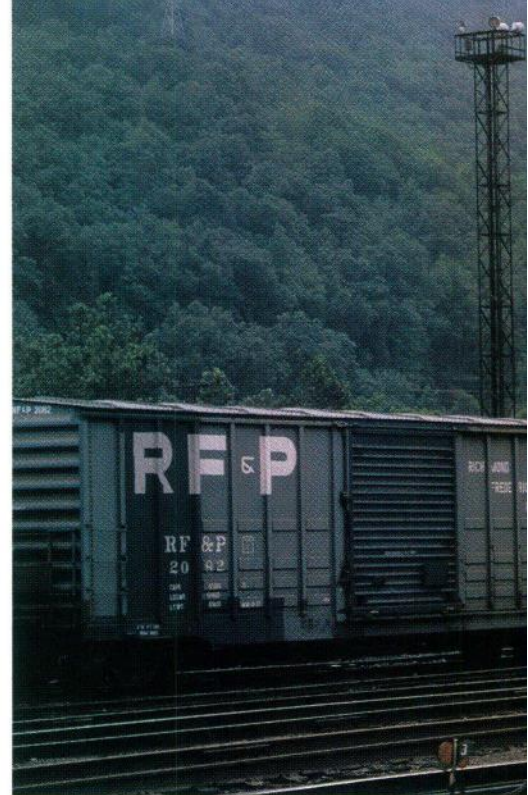
### O scale design challenges

What about changing to O scale? By good fortune, O scale was breaking free of its old "blacksmith" reputation. Weaver's line of cars and locomotives was expanding, and Red Caboose released a plastic-shelled EMD GP9 that really got my attention. Pecos River filled some major gaps in the freight car fleet, and several "hi-rail"

manufacturers such as K-Line, MTH, and Lionel were producing equipment that could be converted for scale use.

Then Atlas entered the O scale market with a wide-ranging line of products that has grown from rolling stock and locomotives to structure kits and many useful two-rail track components. Walthers also has an extensive line of plastic structures. O scale had become very attractive and practical for beginners and veterans alike.

The layout design challenges I faced included reusing as much of my existing HO benchwork as possible to save both time and money. To keep the scope manageable, more emphasis on branchline operations out of Eagle Rock was clearly warranted; the idea of focusing on a busy main line and sprawling classification yard was no longer feasible.



### Learning points

- Getting ready for an open house creates a flurry of activity, but can also lead to burnout.
- A change of pace, be it a revision of an existing layout or a wholesale change to another scale, gauge, or era, may rekindle flagging interest in the hobby.
- O scale is more accessible today than ever before because of the many excellent new products on the market and support from several major manufacturers.

For a railroad depicting the Chessie System of the 1980s, an era that's a good fit with available O scale rolling stock, I decided that each staging and passing track should hold up to two diesel units, ten 50-foot cars, and a caboose. Like modeling in  $\frac{1}{8}"$  scale, depicting the '80s was a major change from my earliest modeling days, but frankly I like it!

The new railroad was off the drawing board by 1993. It incorporated everything I had on my priority list, including being a simple design that supported a lot of operation. My goal was to keep at least three operators busy for a few hours.

Construction began at a snail's pace for the first year, as I was on the steep part of the learning curve. The sale of my HO equipment generated funds to acquire O scale rolling stock, and the





Photo by the author

In a scene that reflects the time frame of John's O scale layout, an eastbound Chessie System coal drag passes loaded boxcars from Westvaco Paper Co., at Covington, Va., as it arrives in Clifton Forge in July 1985.

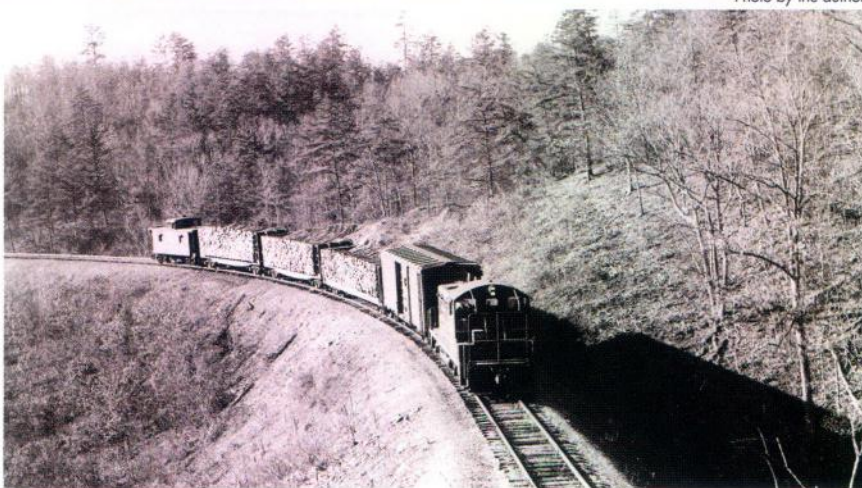
roster grew faster than I had expected. Thank goodness this isn't a one-size-fits-all hobby, as a friend who was converting from O to N had a Weaver Alco RS-3 and other rolling stock for sale.

### Back to the drawing board

The relatively slow progress on layout construction proved to be advantageous. I regularly attend operating sessions on Larry Kline's O scale Western Maryland layout, which is set in the 1950s. One of the jobs I often sign up for is yardmaster at Bowest Yard, a much-compressed version of the actual yard that still allows prototypical train movements.

I had a layout space similar to Larry's. I went back to the drawing board and discovered that I could fit in a similarly compressed Clifton Forge – not the sprawling main yard, but the smaller yard at the east end known as Smith Creek Yard. This would support enough switching to let a yard crew block east- and westbound cars and make up local freights.

The C&O's Craig Valley Subdivision hosted a local that provides an ideal prototype to model in O scale: an EMD switcher, a few cars, and a caboose, as shown in 1960 (above right). The local was photographed switching New Castle, Va., in the late '50s (right) next to a 1956 Ford hardtop.



Two photos: author's collection



## Where a trio of C&O subdivisions met

Scale:  $\frac{3}{16}" = 1'-0"$  24" grid No. 6 turnouts except where noted

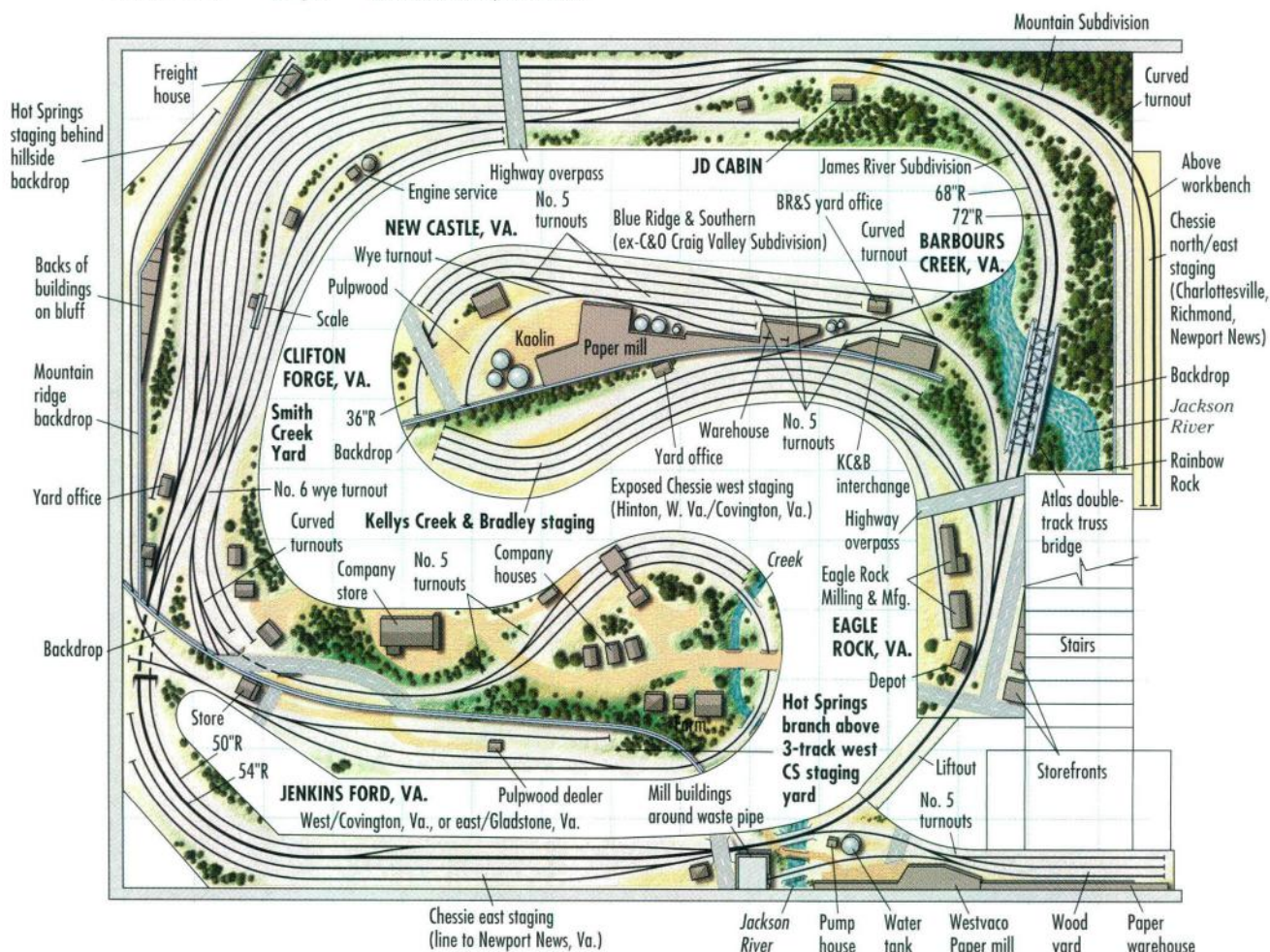
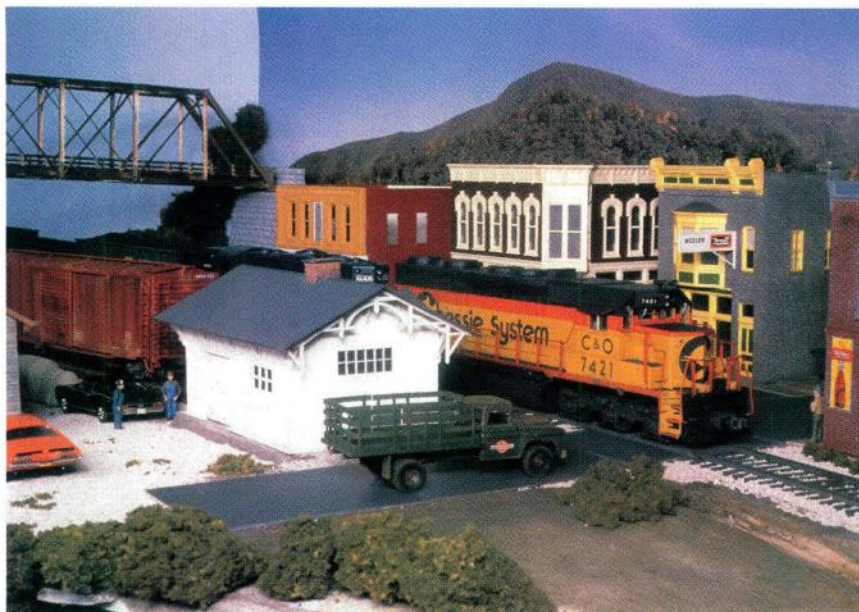


Illustration by Rick Johnson and Jay Smith



A Chessie System SD35 and a C&O Geep roll through Eagle Rock, Va., on John's O scale layout with an eastbound coal drag headed for the export piers at Newport News, Va.

During the 1980s, coal marshalling at Clifton Forge dropped in importance because of the growing number of unit coal trains. The yard's character therefore shifted from a sea of hoppers to more mixed traffic, particularly cars going to and from Westvaco's huge paper mill at Covington, Va. These changes nicely supported the type of operations I wanted to model.

The revised plan still has my old Blue Ridge & Southern short line running out of Eagle Rock, and I was able to add the C&O's Hot Springs (Va.) Subdivision, complete with its mixed train, to one of the peninsulas.

### Progress report

The construction of the main line is now almost complete, as are several scenes. Technology has passed by my old analog command-control system, so I purchased a new Digital Command Control (DCC) system from North Coast Engineering. Atlas's new track components and double-track truss



## The layout at a glance

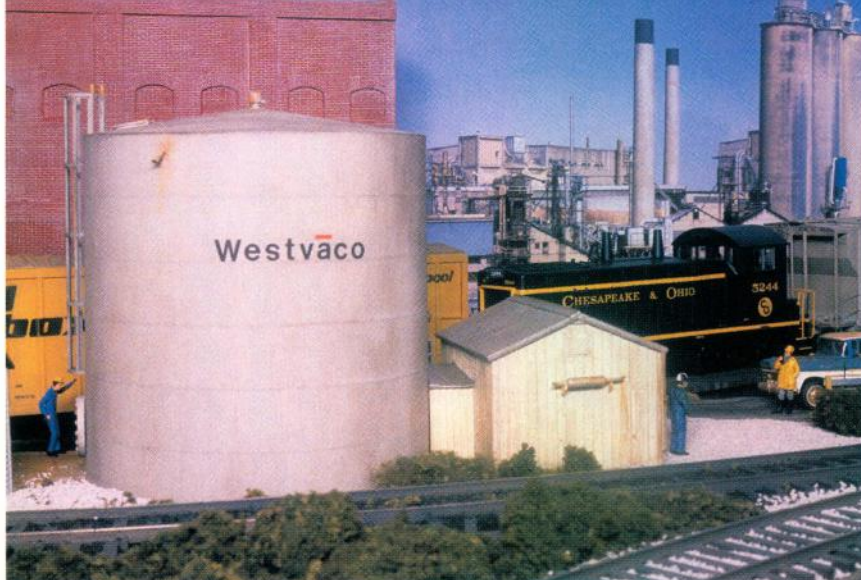
**Name:** Chessie System (C&O) and Blue Ridge & Southern  
**Scale:** O (1:48)  
**Size:** 24 x 29 feet  
**Prototype or theme:** Chessie System and Appalachian short lines  
**Locale:** west-central Virginia  
**Period/era:** late 1970s-early 1980s  
**Layout style:** walkaround along the walls  
**Layout height:** 46"-52"  
**Benchwork:** conventional grid and L-girder  
**Roadbed:** Homasote and 1/4" Upson Board  
**Track:** Micro Engineering and Atlas code 148 flextrack with Roco and Atlas turnouts  
**Length of mainline run:** 100 feet  
**Turnout minimum:** no. 5  
**Minimum curve radius:** 50" on main line  
**Maximum grade:** 1.5 percent  
**Scenery construction:** Styrofoam and Struco-Lite plaster  
**Backdrop construction:** Masonite hardboard  
**Control system:** North Coast Engineering Digital Command Control (DCC)

bridge fit right in. The latter is a reasonable, if greatly condensed, representation of the bridge at the east end of Clifton Forge where the James River line cuts off toward Newport News.

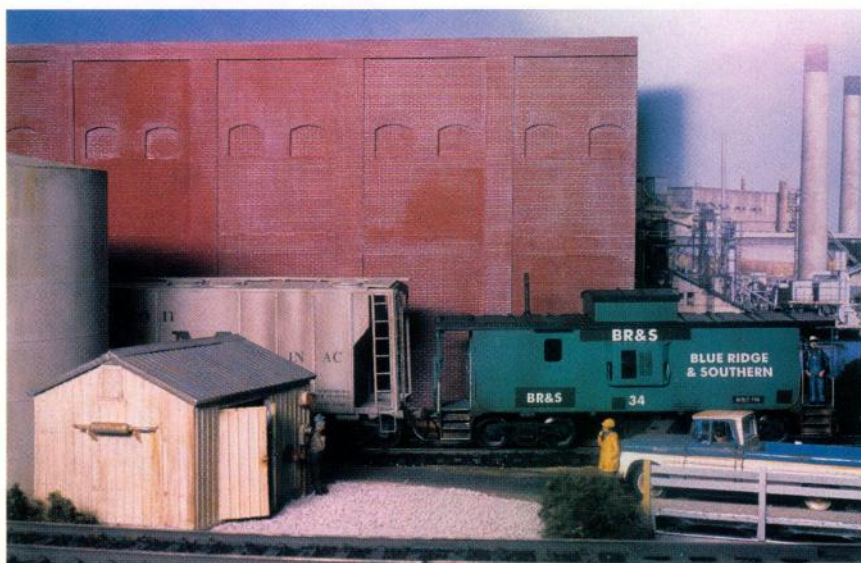
The main point brought home to me by my change from HO to O, coupled to more emphasis on prototype modeling, is that we shouldn't be afraid to make changes. It doesn't have to be a wholesale change of scale or era, or a shift from free-lancing to prototype modeling. Making changes to enhance even a small section of your existing railroad may reignite the passion you once had for the hobby.

The move to O scale has proved to be right for me. I have a large basement to work with, but I now believe O scale is also appropriate for much smaller projects such as a switching layout on a shelf. The visual dynamics of O scale are eye-catching, and the quality of products and materials now on or coming to the market is just what the doctor ordered. MRP

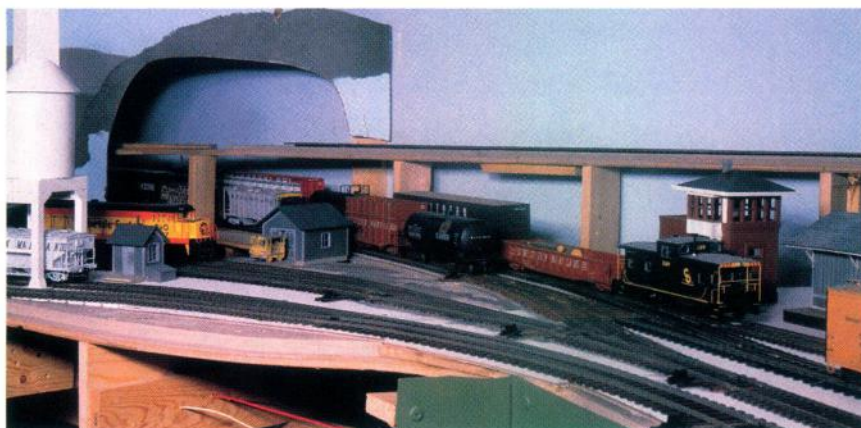
*John Roberts, a fire protection and safety engineer for an international insurance brokerage firm, is also the executive vice president of the National Model Railroad Association. He has been active in scale model railroading since the late 1950s.*



A C&O local is busy switching the Westvaco paper mill in Covington, Va. The water tank in the foreground is a Walthers HO model John reworked with O scale detail parts.



The Blue Ridge & Southern's switch crew has finished its work at the Westvaco paper mill and is now heading home for the day. Their caboose is a heavily reworked former Penn Central (New Haven) car the BR&S picked up second hand.



Modeling the C&O's coal country operations allows John to use the rugged mountain scenery to hide the elevated Hot Springs branch. In the finished scene, westbound train no. 91 will be disappearing into a tunnel behind the handcar shed as it enters the Covington staging yard.





# A domino industrial railroad

*This sectional switching layout replaced the mainline Cat Mountain & Santa Fe*

**By David Barrow**

Model photos by Tommy Holt





**M**y new model railroad is the Lubbock Industrial District of the Cat Mountain & Santa Fe, an HO scale switching layout built on domino benchwork sections. Some readers probably know that my CM&SF layouts were built and rebuilt in several benchwork and track arrangements from 1973 to 2001. Version 7 appeared in the September 1999 *Model Railroader*. As the new millennium began in January 2001, the existing railroad and scene-dividing walls were completely dismantled, and the new layout took its place.

I felt I'd accomplished everything I wanted to do with CMSF-7. It had a long mainline run, both yard and over-the-road industry switching, command control with walkaround throttles, and a Centralized Traffic Control (CTC) signaling system, all in an appealing, well-lit, and comfortable setting.

1. The focus has shifted from mainline running to industrial switching on the new edition of the Cat Mountain & Santa Fe. Track and buildings now reside on a "minimalist" infrastructure that's easy to build and even easier to revise and rearrange.

Moreover, during the past several years I've developed an even stronger interest in industrial switching, and I'd drawn up a number of plans for such a railroad using my existing space. Several years ago, I had the opportunity to visit the industrial switching railroad built by Linda and Dave Sand, an HO scale system called the Cedar River Terminal, and saw for myself that this style of model railroad would provide long-term interest.

I came home from that visit convinced that my ideas for a new industrial switching version of my CMSF were indeed practical. It was clearly time to refine them so I could begin work on a new railroad.

### Choices

As an architect, I like to draw up a list of desired or required features before embarking on any major design project. Among the choices I had in mind before starting on the new railroad were the following:

- Segmental benchwork construction, as I described in several MR articles on "dominoes" starting in 1995 and in *MODEL RAILROAD PLANNING* 1999.
- "Minimalist" design aesthetic rather than a realistic, scenicked railroad, fostered by eliminating a main line, plug-in throttles, signals, electric switch motors, radio communications, scenery, backdrop painting, painted and weathered track, and ballast. Even glue and screws were on my "hit list."
- Wide aisles.
- Finished, open room with carpeted floor.
- Off-the-shelf, unpainted code 100 flextrack and no. 6 turnouts operated by manual ground throws to minimize wiring and complexity.
- Command control using CVP Products EasyDCC with wireless radio throttles for walkaround operation.

- Locomotive sound effects with onboard Digital Command Control sound decoders.

- Chroma 5000 (near daylight) fluorescent lighting shielded by valances.

- 1978 time frame to reuse my existing locomotives, cars, and structures.

- Staging in another room that represents the yard at Lubbock, Texas, and connections to the North American rail network.

- Car-routing system based on the widely used, hence well-understood, four-cycle waybills and car cards.

### Lubbock Industrial District

I built the industrial switching railroad that resulted from these considerations between January 2001 and January 2002. See the track plan on page 22. It's still the Cat Mountain & Santa Fe, which has always been based on the prototype free-lancing concept of replacing the Atchison, Topeka & Santa Fe line between Brownwood and Lubbock, Texas. But the new railroad focuses not on the main line between those points but on industrial switching around Lubbock.

A major advantage of domino-based plans is that it's easy to draw up several "towns" or industrial complexes and then move them around in the room to increase aisle width, resolve access concerns, and so on. Before settling on the track plan on page 22, I rearranged industrial dominoes in a variety of ways to fit the 30 x 36-foot train room above our garage.

Some industries are named for actual businesses in Lubbock, and others include several models salvaged from previous Cat Mountain Line layouts. I used Santa Fe track diagrams of the Lubbock area as a basis for the admittedly free-lanced plan I created.

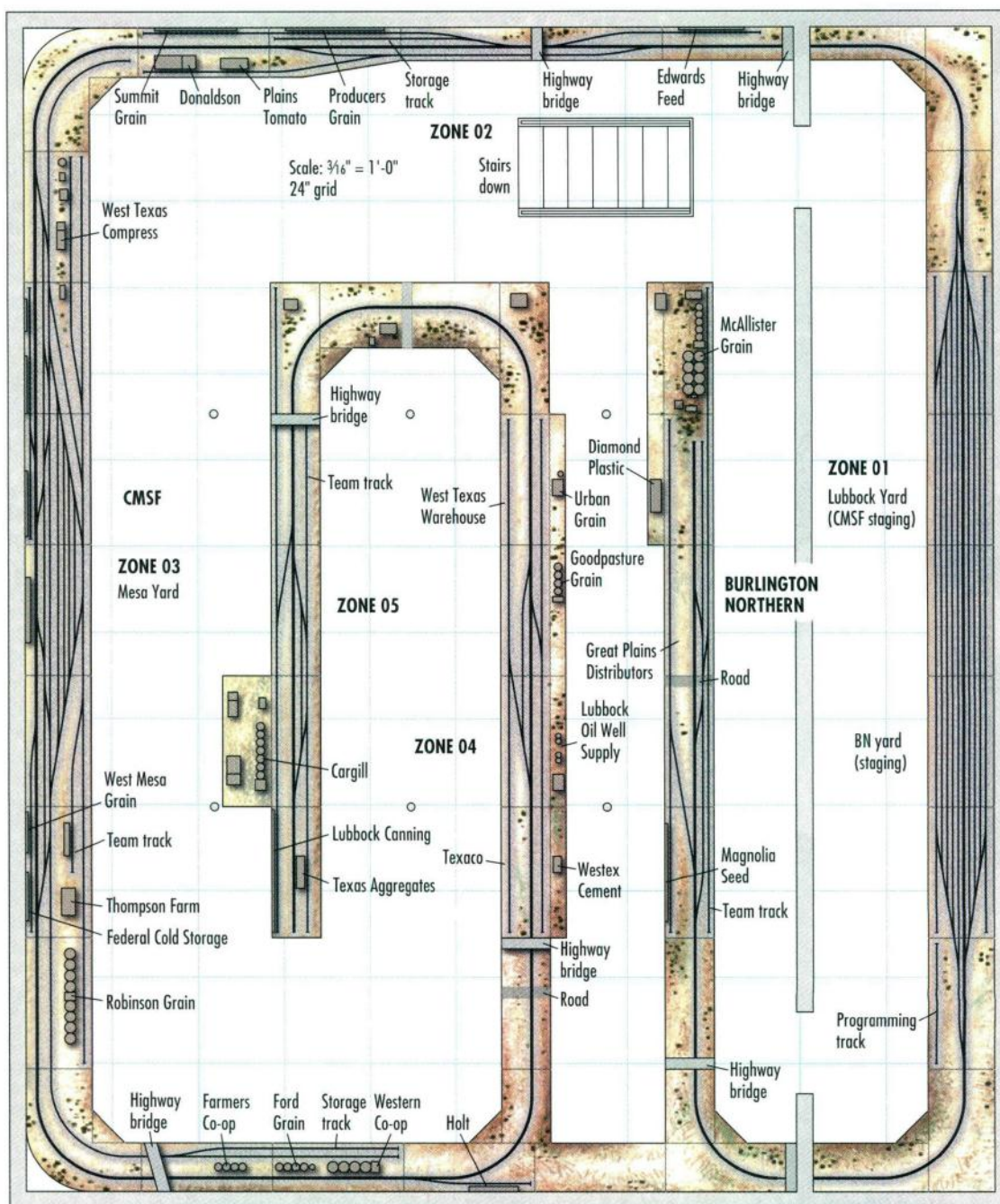
I was also fortunate to meet a Burlington Northern Santa Fe conductor and "footboard yardmaster," David Bunch. He showed me around the railroads in Lubbock and reviewed the switching operations carried out there in years past.

I've set my modeling in 1978, when the Santa Fe and Burlington Northern

*"Some modelers view the hobby as a means to re-create in miniature the operations of full-size railroads. Think of it as a game of chess with a large board and free-rolling pieces. Some of this group may even ignore scenery." – Tony Koester*



## The Lubbock Industrial District—CMSF



Illustrations by Terri Field and David Barrow

### The layout at a glance

**Name:** Lubbock Industrial District of the Cat Mountain & Santa Fe  
**Scale:** HO (1:87)  
**Size:** 30 x 36 feet  
**Prototype:** Atchison, Topeka & Santa Fe industrial lines  
**Locale:** Lubbock, Texas  
**Period:** 1978  
**Layout style:** linear walkaround  
**Layout height:** 55"  
**Benchmark:** sectional (dominoes)  
**Roadbed:** 1/4" lauan plywood  
**Track:** Atlas code 100 flextrack

**Length of mainline run:** 234 feet (Zone 5 through staging to Burlington Northern branch, but not operated as a main line)  
**Turnout minimum:** no. 6  
**Minimum curve radius:** 30"  
**Maximum grade:** none  
**Scenery construction:** none (minimalist approach)  
**Backdrop construction:** sky blue walls with caved corners  
**Control:** EasyDCC Digital Command Control with wireless throttles

were still separate railroads, and both served Lubbock. The plan allocates most of the railroad room to the Santa Fe, which comes out of one end of the staging yard. The BN emerges from the other end of that yard. There is no "onstage" connection between the two, and any interchange movements are handled in the staging yard.

### Dominoes

The railroad was built using 4-foot-long sections or dominoes varying in width from 12" to 30". Typical domino construction is shown in fig. 1 on page 24. Although open-grid dominoes can





be built to allow for scenery below track level, I'm using only flat tops as would be expected for the panhandle area of the Lone Star State. I used  $\frac{3}{4}$ " birch plywood for the domino frames and tops, and  $\frac{1}{4}$ " lauan plywood for the removable track-base layer.

I sealed the joints in the lauan "roadbed" with spackle and painted the plywood a pale desert tan in the main railroad room. In the staging area it's pale gray. I used serrated nails to join the base framing and 1" brads for securing the lauan top. There's no glue involved, or wood screws either, except to secure the cross bracing between the legs. The dominoes are held together with a single C-clamp at each joint. I set the track elevation at 55" for comfortable viewing and switching.

The fascias and valances are  $\frac{1}{4}$ " birch plywood. I paint them a dark brownish-green color in the main railroad room and pale gray in staging. The layout side of all the valances is painted white to reflect more light.

### Trackwork

My aim was to design a model railroad that could be built neatly (much as *Model Railroader* author Paul Dolkos envisions) and quickly by modelers of varying skills using off-the-shelf com-

ponents. Code 100 flextrack, for example, is a bit over scale size for most HO applications but is very forgiving and strong. That makes it easy to change track arrangements without worrying about kinking the rails. Changes don't damage the tough plywood underlay-ment, either.

I used Atlas code 100 track throughout, and Atlas no. 6 Custom-Line turnouts controlled by Caboose Hob-ies ground throws. The proof of the concept is that the railroad performed very well right after it was finished and needed very little tuning up. Anyone could accomplish the same thing with these materials and methods.

I used Atlas code 100 track through-out, and Atlas no. 6 Custom-Line turnouts controlled by Caboose Hob-ies ground throws. The proof of the concept is that the railroad performed very well right after it was finished and needed very little tuning up. Anyone could accomplish the same thing with these materials and methods.

### Lighting

I located continuous rows of fluo-rescent fixtures around the edge of the

room and in three strips down the cen-ter of the room. The fixtures, which are aligned with the front of the bench-work, are mounted on 1 x 4s to which the  $\frac{1}{4}$ " valances are attached.

I used General Electric's Chroma 50 fluorescent tubes, which produce a light that standard daylight film per-ceives as being close to sunlight, mak-ing whole-room photography easier. The lighting construction is shown in fig. 2 on page 24.

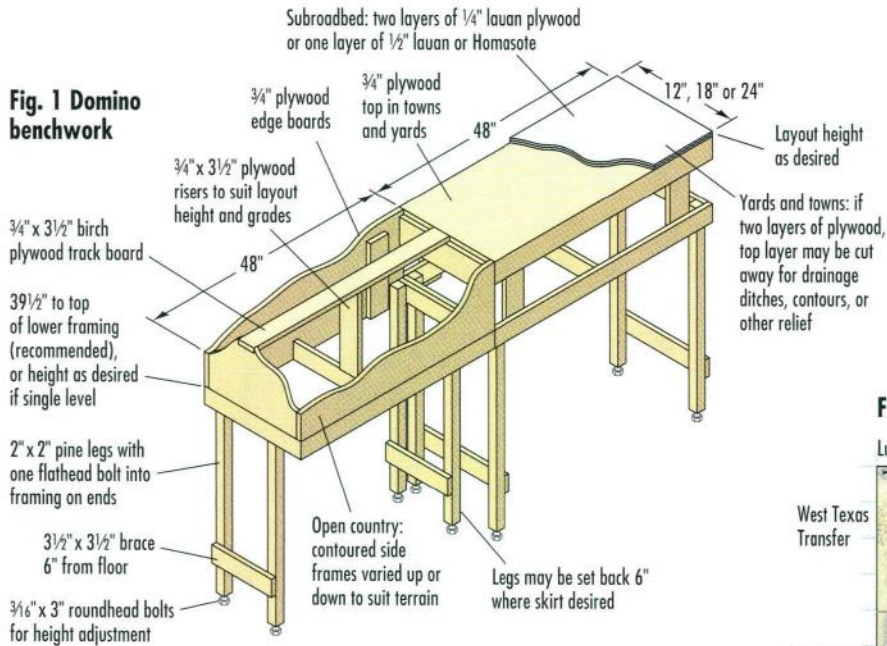
### Operation

I use a 4:1 fast clock ratio to repre-sent an 8-hour trick (shift) – 8 a.m. to 4 p.m. – in 2 actual hours. As suggested in *MODEL RAILROAD PLANNING* editor Tony Koester's comment on page 21, my operating sessions are really a complex board game, much like chess.

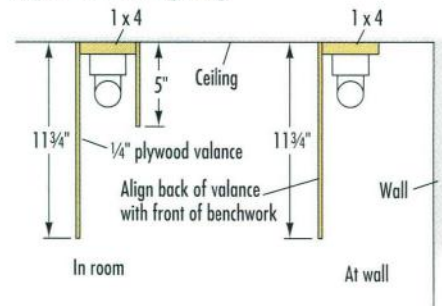
*"I envision a layout where the space is finished as an art gallery might be, clean and uncluttered. Every effort would be made to keep things neat." – Paul Dolkos*



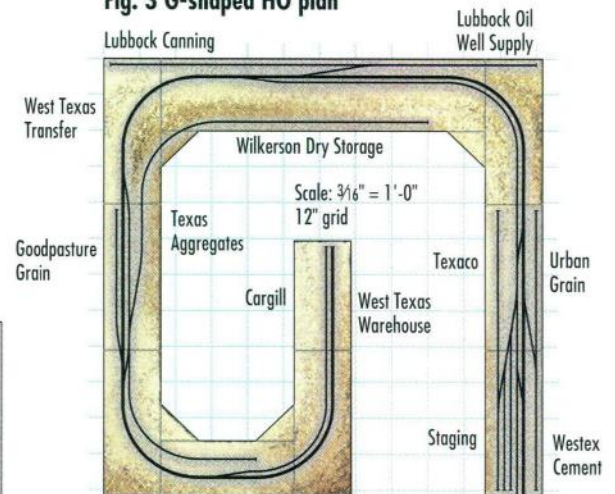
**Fig. 1 Domino benchwork**



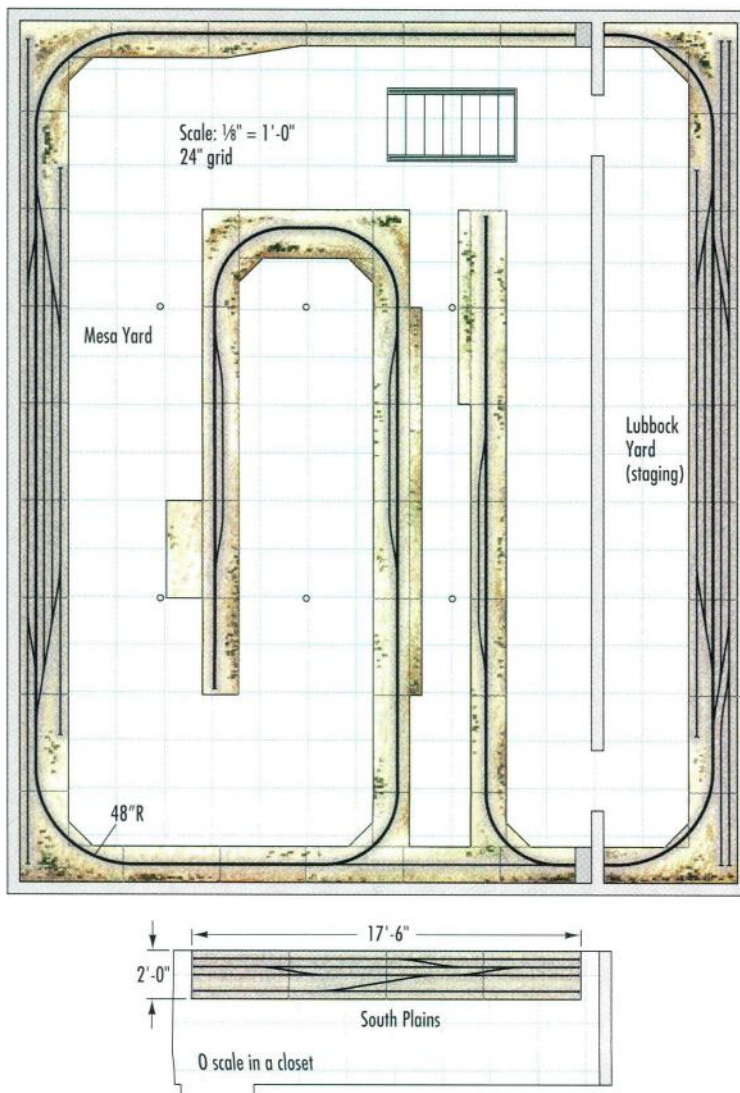
**Fig. 2 Valance lighting**



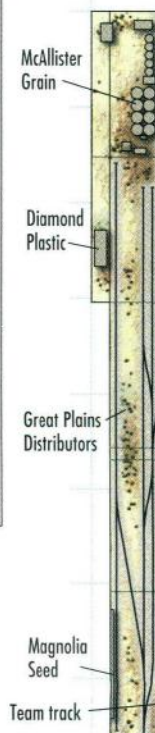
**Fig. 3 G-shaped HO plan**



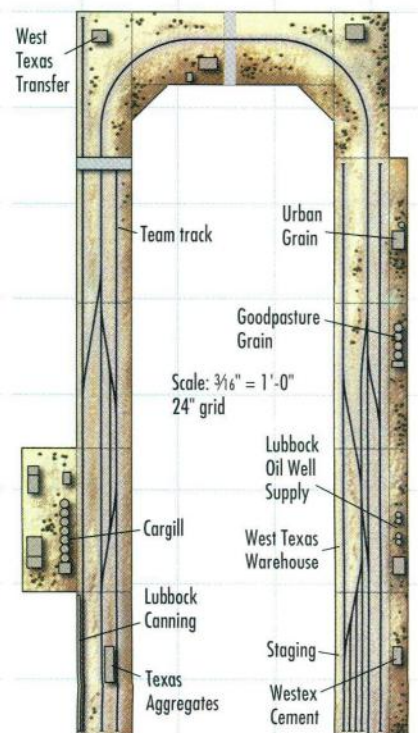
**Fig. 6 Dominoes in O scale** Same general industries as on HO plan



**Fig. 4 Along-the-wall HO plan**



**Fig. 5 C-shaped HO plan**







## Learning points

- Less may be more – consider the minimalist approach to layout design and construction.
- Urban industrial switching is proving popular among experienced operators.
- Subtle cues such as different fascia and valance colors may help to establish on- and off-stage layout areas even without scenery.
- It's never too late to try new ideas, even if this leads to the demolition of your current layout.

Santa Fe transfer runs from Lubbock Yard (staging) operate at various times starting at 8 a.m. These trains take cars from the “rest of the world” to Mesa Yard, where they are classified into switching turns going to the various local switching “zones.” These numbered zones reflect Santa Fe practice. Burlington Northern trains run out of the other end of the staging yard, which represents the BN yard in Lubbock, and back twice per session.

A typical day starts with a crew in each zone making the morning pickups. These crews take their cars to

3. McAllister Grain still requires lots of switching on the new layout but is now served by the Burlington Northern instead of the Cat Mountain & Santa Fe.

Mesa Yard and swap them for a cut of cars to be delivered to their zones. Each crew returns to its zone, makes the required setouts, then goes to work on the afternoon pickups. I select the cars to be picked up during the morning or afternoon of this fast-time work day before the session starts, so I don't have to turn any waybills during the operation.

If the Mesa Yard workload is heavy, a zone crew may continue on into staging with a cut of pickups instead of leaving the cars at Mesa.

As the operators become more proficient, I plan to add other complications to the “board game” such as situation cards, time constraints, and numbered industry spots. The latter will make one large industry equivalent to many smaller industries in terms of spotting requirements.

## Variations from HO to O

This style of railroad construction and operation can be carried on in small spaces as well as larger ones, and the components are endlessly reusable. Even a relatively large layout such as the one I built could start as a

single domino in an apartment or dorm room, or in a corner of a home office, bedroom, or garage. I've included a few suggestions for such plans in figs. 3 through 5 on the opposite page.

For those who insist on mainline running, the two peninsulas of my plan could be combined as a wide peninsula with a loop at the end. You'd lose the separate BN switching area, however. You could even employ the same concepts in a larger scale – fig. 6 shows an O scale version of my layout, along with an O scale plan to fit in a closet!

## An alternative approach

I'll cheerfully admit that I still admire highly prototypical renditions of actual places, trackwork, structures, and scenery. That said, I hope that my new CMSF Lubbock Industrial District provides the basis for some creative thinking about a “minimalist” approach to layout design and construction. MRP

*David Barrow, who continues to pioneer in domino benchwork construction, is a long-time student of model railroad operation and a frequent contributor to MRP and Model Railroader.*



A RAILROAD YOU CAN MODEL

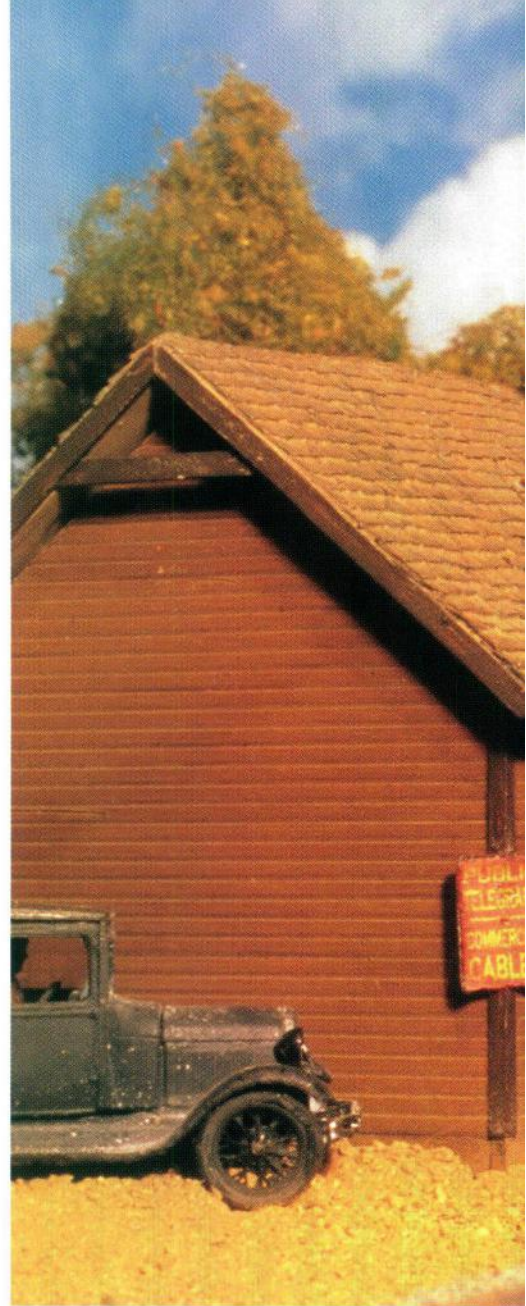
# The Dayton & Troy Electric Ry.

*An Ohio line formed when interurbans were the "dot-coms" of their time*

By Ray Persing



David P. Oroszi collection



Interurbans were the dot-coms of the late 19th and early 20th century. Any financier worth his salt either found an interurban to invest in or formed one himself. Hundreds of electric railway companies were formed, many of which failed to lay even a single rail.

As with the dot-coms, many interurban companies were quite successful – for a time. Between 1893 and 1917, more than 18,000 miles of track were laid for electric railways in the U. S. By the mid-1930s, most of these lines had disappeared, killed by improved highways and by electric utilities eager to get their hands on the interurban railroads power-generation equipment.

## An Ohio interurban

The Dayton & Troy Electric Ry. was founded in the waning years of the 19th

century by Dayton, Ohio, banker Valentine Winters, his associate Charles Clegg, and Clegg's son Harrie. The younger Clegg became the first president of the Ohio Electric Railway Association as well as president of the D&T.

Unlike many of its peers, the D&T was not solely a passenger operation. It made much of its revenue hauling freight. It interchanged with other traction lines in Dayton, Troy, and Piqua, Ohio, and it interchanged with the Cincinnati, Hamilton & Dayton (later Baltimore & Ohio) steam railroad in Tippecanoe City. The level of interaction with other railway companies, both steam and electric, creates wonderful modeling and operating possibilities.

With a total system length of 30 miles, the D&T is a good size for modeling. While that's still a hefty 1,800 feet in

HO, it translates to a more reasonable 300-foot run at a fast clock ratio of 6:1.

## The early years

The Dayton & Troy initially ran from downtown Dayton north to Vandalia, Tippecanoe City, and Troy. By May 1900, grading began north out of Dayton and reached Tippecanoe City in December. Despite the level terrain, a number of bridges and culverts and one trestle were required. The most significant grade was a 4 percent north-bound climb into Vandalia.

In November 1900, the first rolling stock was ordered from the Barney & Smith Car Co. in Dayton. Eight 55-foot wooden cars were ordered – six parlor cars and two express combines.

By spring 1901, crews were laying track in both directions from the shops





Photo by the author

in Tippecanoe City, a point about midway on the line where the D&T had an interchange with the CH&D. The first cars arrived in May, and by the 13th of that month, limited service began between Troy and Tippecanoe City.

In May 1902, the D&T acquired the Miami Valley Electric Ry., which ran between Troy and Piqua. After making some badly needed repairs to the MV right-of-way, full service between Piqua and Dayton began in July 1902 with trains running every 90 minutes. Stations, which had been located in drug-stores and other leased spaces, were replaced with brick or frame structures owned by the railway.

### Physical plant

The D&T had considerable trackage in Dayton, Tippecanoe City, Troy, and

Piqua (see track diagrams). Of particular interest are the number of other roads in the same area as the D&T. In Dayton, for example, the Dayton & Western Electric Ry., People's Ry., and Dayton & Xenia Electric Ry. crossed the D&T. The D&T also crossed the Erie, CH&D, and Big Four (Cleveland, Cincinnati, Chicago & St. Louis, a subsidiary of the New York Central) on the south side of the Mad River. A CH&D interchange was located at Tippecanoe City, where the D&T had its offices, car barn, freight house, and paint shop.

On the north half of the line in Troy, the D&T interchanged with the Springfield, Troy & Urbana traction line, crossed a CH&D branch line, and dug under the Big Four. In Piqua, along with the Western Ohio interchange, the D&T crossed a line belonging to

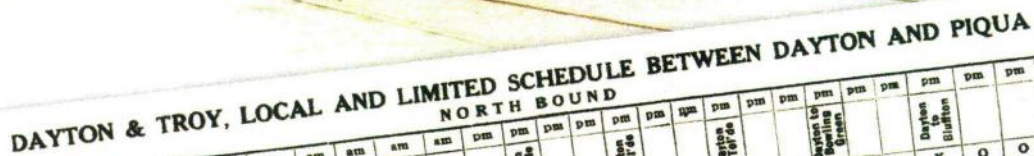
**Above:** The author's HO model of this Dayton & Troy freight motor was built from scratch except for the running gear and pole.

**Left:** A D&T car passes the Fort Piqua Hotel, which still stands in downtown Piqua, Ohio. The D&T shared a passenger station and interchanged with the Western Ohio here.

the Dayton, Covington & Piqua and went under the Pennsylvania RR.

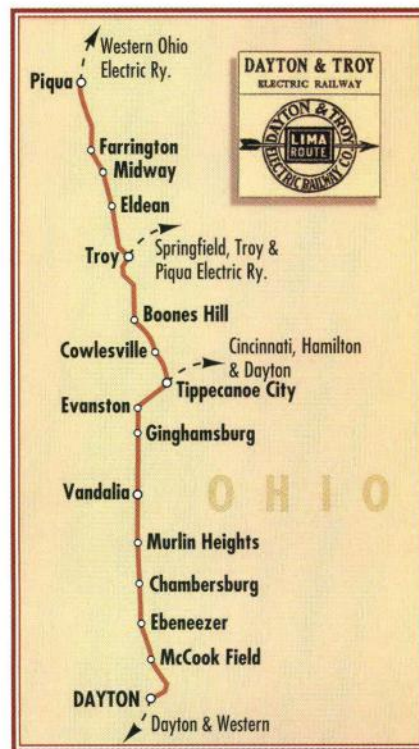
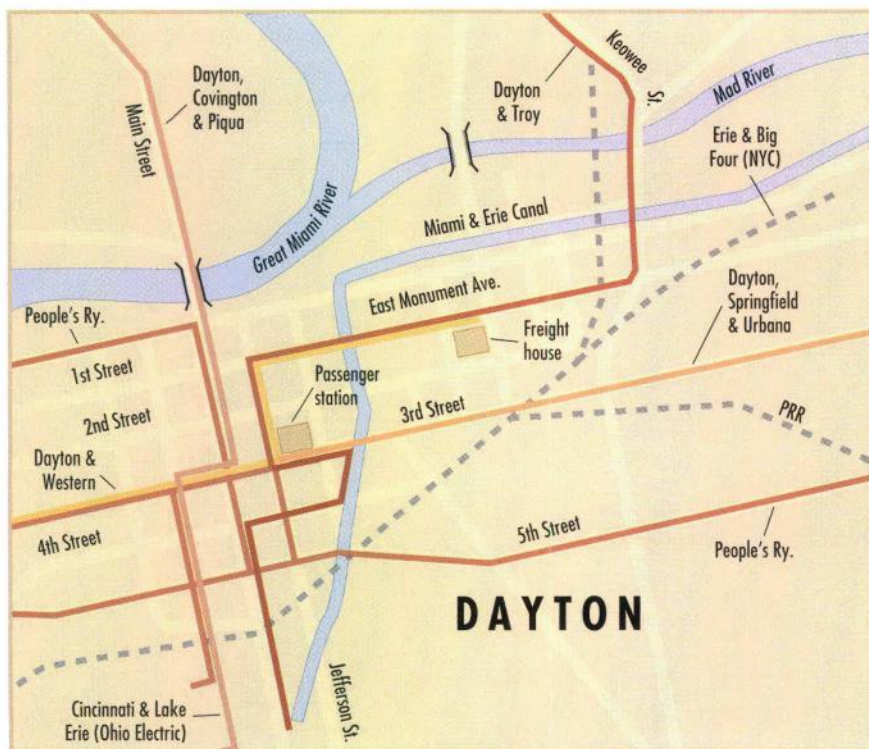
Much of the D&T line was double-tracked to allow for an aggressive service schedule. Construction was to a high standard, particularly in comparison to many other interurbans at the turn of the century. A dedicated telephone system was used to dispatch the railway, with every station tied into its phone lines. Station operators delivered train orders to train crews.



[illegible][illegible]

house and interchange with the ST&U, the D&T delivered coal to Hobart Brothers Manufacturing Co. In Eldean, the road provided boxcars to a grain elevator. Another stone quarry was located in Piqua. Business was good. In fact, Troy residents protested the





Illustrations by Jay Smith

heavy frequency and high speed of D&T's gravel trains from Piqua!

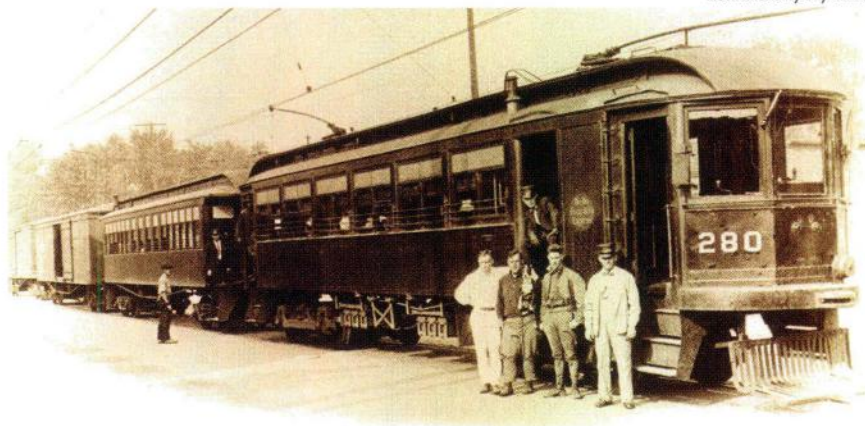
A dedicated morning freight ran from Dayton to the ST&U depot in Springfield, returning in the afternoon. There were 25 automobile manufacturers in Dayton prior to a devastating 1913 flood. Afterward, many of them supplied parts to assembly plants in Detroit, and the D&T handled a considerable amount of traffic in autos and auto parts between Dayton and the Western Ohio interchange. A depressed track at the Dayton freight yard made the process of loading and unloading automobiles much easier.

Freight was so important to the D&T that it would spot a car on a segment of the double-track main line to pick up and deliver livestock for farmers – anything for a load!

### The Lima Route

The D&T was a successful operation for many years, sparked in part by special passenger runs. In 1904, for example, the line carried 15,000 passengers to and from the Miami County Fairgrounds for an Independence Day celebration. An amusement park at Midway was a popular summer destination.

In August 1904, the D&T and the Western Ohio – its primary connection in Piqua at the north end of the line – reached an agreement to inaugurate "The Lima Route." The agreement provided through service for cars of each company between Lima and Dayton.



Both photos: David P. Oroszi collection

The running time of just over 2½ hours with limited stops was competitive with steam railroad schedules.

By 1906, the agreement was extended to other roads stretching north from Lima, so D&T cars could run all the way to Toledo on Lake Erie and as far east as Cleveland. In fact, by 1910, competition from the Lima Route had led CH&D to drop its steam-powered local service along the route.

Times were good on the D&T. Unpowered trailer cars were purchased from the New York, New Haven & Hartford's elevated line in 1908. A New Haven trailer was rebuilt into the D&T's business car, *Muriel*, with one end enclosed for a kitchen. In 1912, the D&T received two Jewett combines seating 66, compared to the 44-seat configuration of the earlier combines.

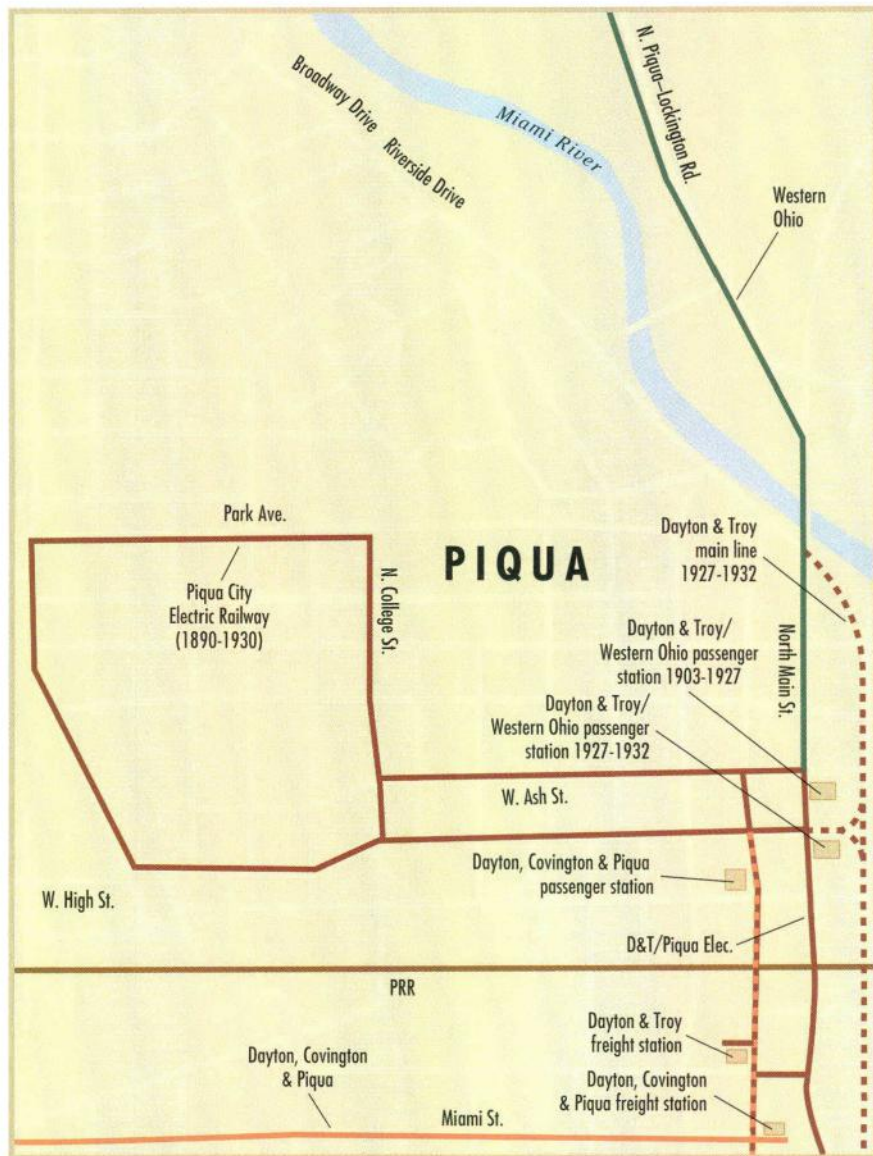
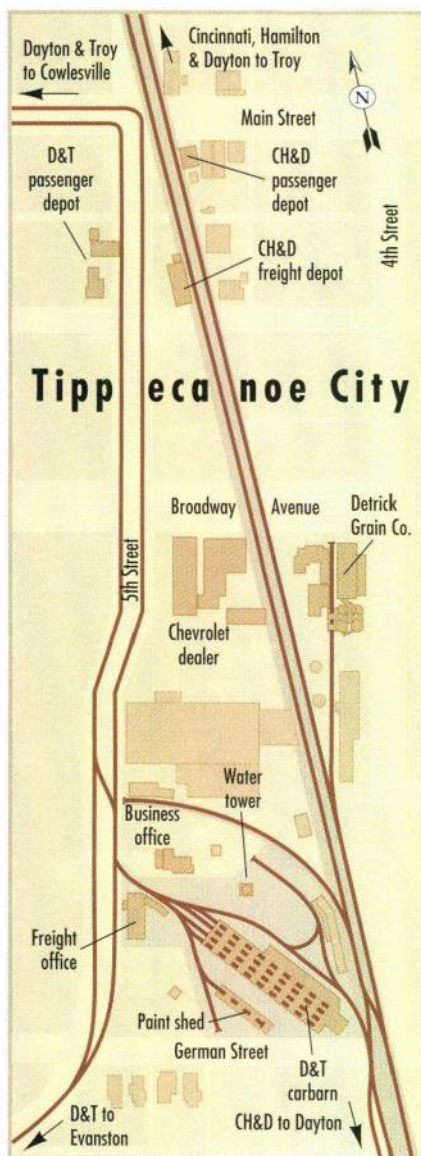
An ex-New Haven trailer and two American Car & Foundry-built D&T boxcars follow car 280, which still has its original J-type trucks.

The company increased its capital stock to buy new cars and to double-track more of the line to improve safety and schedules. The D&T built a new freight depot in Dayton, dramatically increasing its ability to handle freight at the southern terminal.

### Fire!

In 1920 the line was dealt a major blow when the carbarn in Tippencanoe City burned to the ground. A car had come in with a hot journal that went undetected. The journal's oil-soaked packing caught fire, and the flames spread to the car and ultimately the carbarn itself. The powerhouse had





Illustrations by Jay Smith

## Learning points

- Interurban lines are hard to beat when it comes to action-packed operations.
- Rosters may change dramatically at one point in time due to a fire, modernization program, merger, and so forth.
- Commercial kits and imports often can be adapted to specific rolling stock needs, but the limited roster leads to interesting scratch-building projects.

The end came swiftly as temporary supports for the Miami River bridge gave way under a D&T freight on August 3, 1932. All service on the D&T ended a week later.



David P. Oraszi collection



been shut down for the night, so the watchman was unable to move the other cars out of harm's way. Eight powered cars (six B&S and the two Jewetts) were lost, along with four trailers, a flatcar, and the line's sole business car – the bulk of its passenger equipment. Fortunately, the equipment that supported the profitable freight business was largely untouched.

Harrie Clegg called other interurban lines. Soon, two cars from the Western Ohio, two from the Ohio Electric, and three from the Toledo, Bowling Green & Sidney were on their way to Tippecanoe City. Four hours after the fire, the D&T operated its full schedule!

Barney & Smith, also feeling hard times, built its last order of cars for the D&T as replacements for those burned at Tippecanoe City. The new cars were 62 feet long and were perhaps the last wood interurbans built in the U. S.

### A forward-looking company

The line returned to profitability after the new cars arrived, but not at the level it had achieved in the past. In 1929, in an attempt to improve its image and reduce operating costs, the D&T took delivery of four cars from the Cincinnati Car Co. These lightweights sported a new paint scheme and were immediately popular with riders.

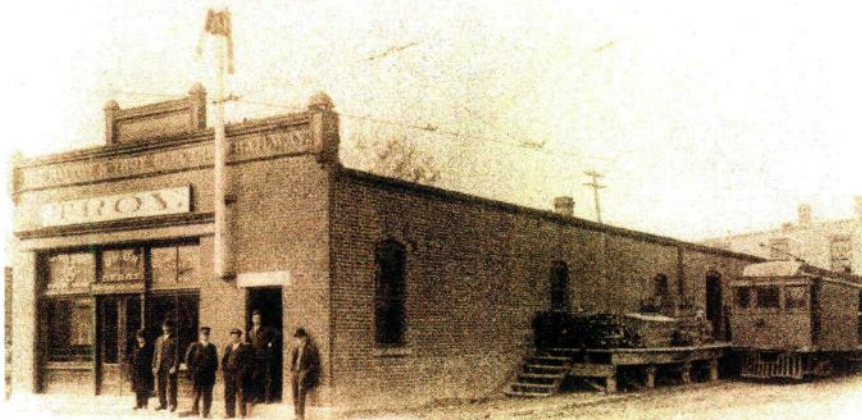
The Dayton & Troy remained marginally profitable through the early years of the Depression and served as a link in the still-extensive midwestern interurban network. Automobiles and bus lines – and the taxpayer-supported highways they ran on – were nevertheless taking a toll. In late 1931, the Western Ohio – the key D&T link to the north – petitioned for abandonment.

The D&T continued to fight for its survival, trying to reposition itself as a feeder line in Dayton and plying its local freight traffic. But the interurban entered receivership in February 1932.

### Bridge collapse

The end came suddenly. On August 8, 1932, the D&T bridge in Dayton slid

A freight motor leads a string of new or very well-maintained boxcars on a snowy day. Interurban freights were often comprised of such specially built cars that would negotiate ultra-sharp curves.



Author's collection

**Top:** The freight loading platform along one side of the Troy, Ohio, "union station" can be seen in this photo. **Above:** In this heavily retouched photograph, northbound local car 200 stops at the Troy station circa 1907. Note the lower-quadrant train-order signal.

off its supports and landed in the Miami River, carrying with it a D&T freight motor and two boxcars. The bridge was sitting on temporary pilings – ironically, it had been moved to allow for construction of a new automobile bridge.

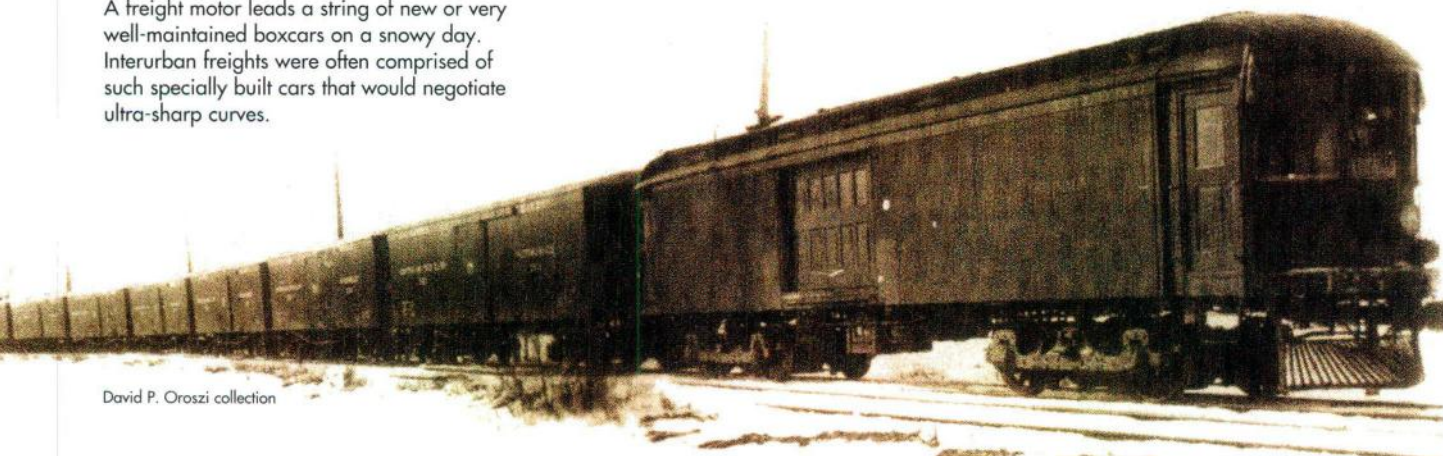
Service continued for a week by running a car from the Dayton station to the foot of the bridge, having the passengers walk across the nearly complete road bridge, and then continue their trip in another car on the north side of the river.

The line didn't have the money to replace the bridge. A judge granted an

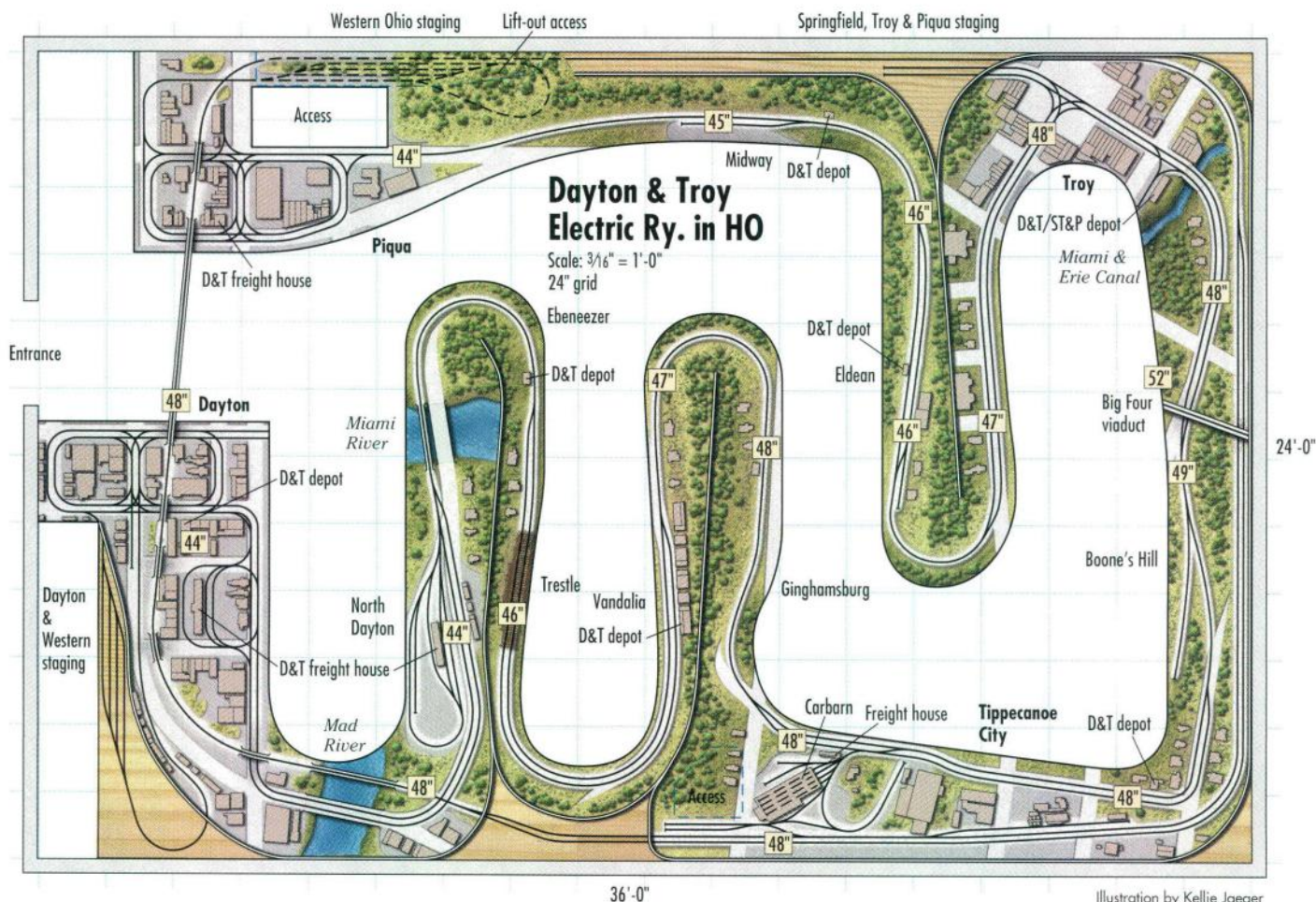
abandonment petition, and the D&T ceased operating on August 15, 1932. The equipment was auctioned except for the new Cincinnati lightweights. They were returned to the builder, and five years later they went to work on the Lehigh Valley Transit line in eastern Pennsylvania.

Not much remains of the D&T. The car barn in Tippecanoe City, built in 1920, still stands, as does the 1922 Dayton freight depot and the Piqua terminal D&T shared with the Western Ohio.

No D&T cars survive, although a Dayton & Western car, built by B&S,







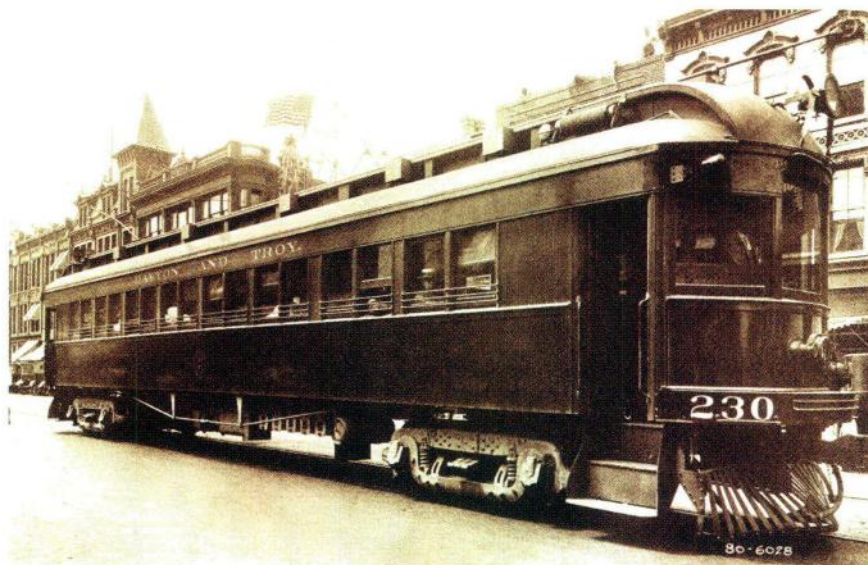
stands along the old D&T right-of-way between Troy and Piqua.

### Modeling the D&T

The track plan shows one approach to modeling this interesting electric line. The interchanges with steam and other electric lines are, as on most mid-western railroads, a major attraction for modeling the Dayton & Troy. On even an abbreviated model of the D&T, the dispatcher and several train crews would be challenged to keep everything on schedule. Perhaps an "order waiting" light could be used at each station to alert approaching train crews of the need to pick up a train order.

For a fastidious D&T modeler, the equipment is somewhat problematic. Bowser's Jewett combine is similar to the D&T 1912 Jewetts, and in 1963-64 FM Models imported brass models of the 1929 Cincinnati lightweights. No models of the B&S cars are offered commercially. A LaBelle Sacramento Northern combine is close (but about 10 feet too long) to the 1901 D&T cars. LaBelle also offers interurban boxcar kits that could serve as D&T cars.

Drawings for the NYNH&H cars purchased by the D&T appear in Carstens



David P. Oroszi collection

Publications' *Traction Handbook*, as do drawings of the Cincinnati lightweights.

An important reference book is *The Lima Route* by Scott D. Trostel, published in 1998 by Cam-Tech Publishing of Fletcher, Ohio. MRP

Ray Persing is building the free-lanced Cincinnati & Western Ry. in HO

Dayton & Troy 230, a 66-footer, was one of the last cars built by Barney & Smith to replace interurbans lost in 1920.

in a 14 x 30-foot area while continuing to research the D&T. Ray, an aerospace engineer for the U. S. Air Force at Wright-Patterson Air Force Base, and wife Tracy have four sons.



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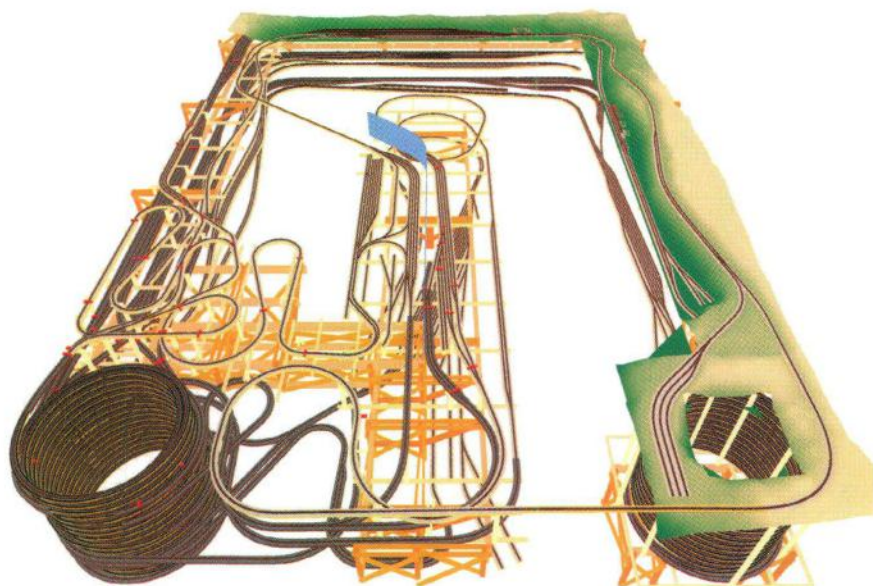


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A detailed photograph of a large-scale model train layout. The layout is built on a wooden base and features multiple levels of tracks. The tracks are arranged in a complex, winding pattern, with several switches and points visible. Various miniature trains, including passenger cars, freight cars, and locomotives, are positioned on the tracks. The layout is illuminated by warm, yellow light, possibly from trackside lighting. In the background, there are some shelves and papers, suggesting a hobby room or workshop setting. The text "How BIG should your LAYOUT be?" is overlaid on the image in a large, white, sans-serif font.

How  
**BIG**  
should your  
LAYOUT be?





*Be careful what  
you wish for!*

**By Paul J. Dolkos**

Photos by the author

**W**hen we learn that someone has a model railroad, one of our first questions is "How big is your layout?" The bigger it is, the more we seem to be impressed. Bigger is better, the thinking usually goes.

But before you start filling a barn with benchwork or dismiss a spare bedroom as being too small, let me review some of the factors you should consider, such as time, scope or theme, availability of skilled helpers, relocations, money, and maintenance.

### **Finding a balance**

Having time for layout construction may be the biggest factor when you're deciding how large a layout to tackle. It's often a matter of using spare hours wisely and being diligent about proceeding from phase to phase of layout construction. You may have no more than a few hours per week to work on the railroad, but if you ensure that at least one task, no matter how small, gets done, even large layouts will progress nicely over a two- or three-year period.

Those with limited time for the hobby due to pressing responsibilities and competing interests will likely find that trying to build a several-hundred-square-foot layout is ill-advised. Even in those cases, much can be accomplished with good time management and the use of flextrack, ready-made turnouts, assembled structures, and other easy-to-install products. Be honest with yourself about balancing work habits with hobby aspirations.

### **More than meets the eye**

A lot of satisfaction can be derived from creating a well-running, nicely scenicked layout in 500 square feet or less. The effective implementation of a plausible theme is usually more important than layout size. One can

J.D. Smith's sprawling HO layout, which depicts the Rathole Division of the Southern Ry., fills a 2,900-square-foot basement. The lower-level staging access area where J.D. is standing is the future location of a verdant mountain ridge that will completely hide the staging. The layout extends back 60 feet and runs 40 feet off to the right.



focus on quality instead of quantity and enjoy building a reasonable number of fine freight and passenger cars, locomotives, and structures.

You'll find, as I have, that even a limited number of sidings can provide an amazing amount of operation. I recently operated on Rich Steinmann's 300-square-foot layout, and my initial impression was that the track plan didn't offer much operating potential. Four hours later we had finally run all the scheduled trains and switched every town – and had a great time in the process.

I see that reaction over and over again as I visit layouts. When someone switches just a handful of simple sidings (not even a "switching puzzle"), they invariably remark, "I had no idea how long that would take or how interesting it would be!"

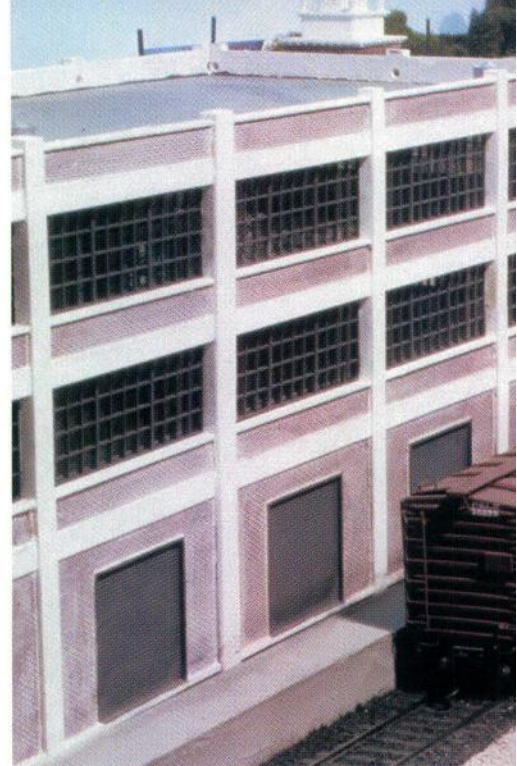
John King started his work by getting his in-progress depiction of the Baltimore & Ohio in downtown Winchester, Va., operational. This section

of his HO railroad measures 2 x 30 feet and is the first stage of the Shenandoah Branch layout planned for his 2,000-square-foot basement.

Rather than getting bogged down on this massive project, John wisely decided to build benchwork and lay track only in the Winchester area, making it fully operational with structure mock-ups before pushing on.

John thinks he is a slow worker, but in just two years he built enough of the railroad to support formal operating sessions. Several visiting operators have said that there's no need to build the rest of the railroad, as there's plenty of work to do in this one town. After operating Winchester, a veteran railroad engineer observed that he'd never bid on this job in real life, as it was "too much work!"

John can now employ a phased approach to building the rest of the railroad while he enjoys operating what he has already completed.



### Estimating time required

When Mat Thompson started to plan a new 18 x 21-foot layout featuring a long mainline run and extensive scenery, he compiled the chart shown below. He's using flextrack and enjoys building and detailing structures. He typically works alone and figured he could spend 10 hours per week (1 hour per weekday, 5 on weekends) on the railroad, or 500 hours per year.

Mat estimated that it would take two years to get the railroad running, four years to complete all track and wiring, and 13 years to finish the layout. Obviously, "your mileage may vary." – P.D.

### You need help!

Forming a work group with other modelers can help to expedite construction. For example, John Breau is working on a 2,800-square-foot HO railroad with a 500-foot main line. He began work in late 1998 and set an ambitious goal to be running before the year 2000. His first dictate was to use reliable but easy construction methods. "Cabinet-grade benchwork would not help me reach the ultimate goal of running trains," John said.

John was able to take Tuesday afternoons off from work, and several experienced model railroaders who are retired joined him to work on the railroad. At 7 p.m. another crew came. Over time, some 13 experienced modelers participated in the Tuesday work sessions. John counted 1,128 person-hours of "donated" work plus another

1,450 hours of his own time, the equivalent of 64.5 40-hour work weeks.

Together, they reached John's goal: Although the layout lacked scenery and was far from "finished," the first formal operating session was held December 31, 1999. John rewarded those who helped the most by assigning them highest seniority; i.e., first choice of operating jobs.

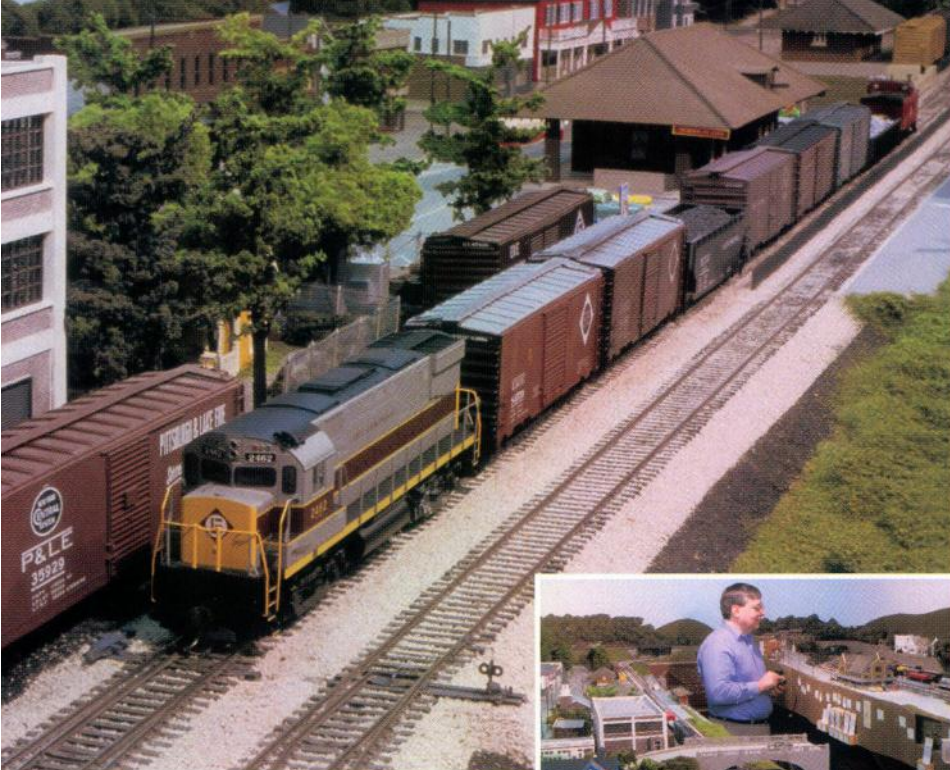
Such an approach requires helpers whose skill levels, standards of craftsmanship, and personalities are compatible with your own. Many modelers simply prefer to do all or most of the work themselves, as managing helpers can be hard work.

### On the move

If you're subject to frequent relocations for professional reasons, a large layout may be impractical unless you're a really fast worker. Even then,

| Component  | Work required                                                              | Hours/item                                                                                                    | Total hours |
|------------|----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------|
| Benchwork  | Legs, joists, backdrop, subroadbed                                         | 100                                                                                                           | 100         |
| Track      | Plot route, lay roadbed and track, wire, paint                             | 1 hour/foot, 600 feet                                                                                         | 600         |
| Turnouts   | Locate, lay roadbed and turnouts, install switch machines, wire, paint     | 3 hours/turnout, 50 turnouts                                                                                  | 150         |
| Scenery    | Shape, mask, and paint track, install rocks, trees, and ground cover, etc. | 2 hours/square foot, 300 square feet                                                                          | 600         |
| Structures | Assemble, detail, paint, weather, install                                  | 10 large buildings, 100 hours each<br>15 medium buildings, 50 hours each<br>15 small buildings, 20 hours each | 2,050       |
| Total      |                                                                            |                                                                                                               | 3,400       |





Rich Steinmann's U-shaped HO Erie Lackawanna measures 8 x 30 feet overall with staging at both ends. A handful of industrial sidings, three interchanges, and a sequence of 10 trains keeps four to five operators busy for a four-hour session.

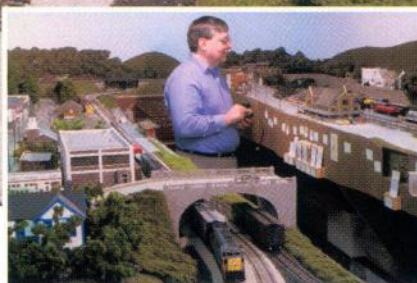
will there be time to enjoy each railroad before it has to be dismantled?

You might want to build a sectional layout, perhaps using the domino-style construction that David Barrow has espoused or a series of Ntrak or other standardized modules. Each major section could be all or part of a layout design element, which is a visually and operationally recognizable version of a prototype town, scene, industry, yard, or engine terminal. Incorporating those sections into a new layout should be far less time-consuming than starting from scratch at each new location. Only those sections that readily fit into the new site would even have to be unpacked.

### Money matters

Like most worthwhile things in life, model railroads are not free or even cheap. One custom builder estimates raw costs of about \$150 per square foot for benchwork, track, scenery, and a control system. The number will go down when salvaged materials are used, but it can climb if you install, say, a working signal system.

The good news is layout construction expenses are usually spread out over a long time. The dent in a monthly budget is therefore slight. Nonetheless, doing a reality check on estimated cost versus disposable funds is worthwhile.



### Keep it running

Maintenance is usually proportional to layout size. Cleaning scale miles of main and yard track can be a chore, to say nothing of coping with malfunctioning switch machines, cold solder joints, or warped roadbed. And dealing with dust is like paying taxes – an inevitable and ongoing process.

Quality construction, even if somewhat below cabinet-grade, pays large dividends as the railroad ages. It's all too easy to create a "maintenance Frankenstein," a cautionary term veteran layout planner John Armstrong uses. All track and turnouts should be easily accessible, for example. What you can't readily reach will fail.

Rolling stock also requires ongoing maintenance to clean wheels, adjust couplers, and so on. One large layout I'm familiar with is projected to have 3,500 freight cars on its roster. That's 7,000 couplers to keep swinging freely at the correct height, not to mention 28,000 wheels to clean. A bedroom-size layout suddenly seems a lot more manageable, even appealing, doesn't it?

### Space considerations

Space for a layout is usually at a premium, and we tend to run track into every nook and cranny. Keith Jordan, who is modeling the railroads in and around San Diego [MODEL RAILROAD PLANNING 2001, page 58], planned this sort of configuration for a 24 x 25-foot room plus an 8 x 14-foot extension. He was going to build an industrial switch-

## Metrics of a large layout

Big layouts are not just about square feet. The various pieces it takes to create them begin to add up. What follows is a summary of J. D. Smith's HO Southern Ry. Rathole Division, which is being built in a 2,900-square-foot basement. The staging is extensive to accommodate the prototype's long trains, and several junctions allow multiple routes and interchanges. – P.D.

**Track:** 1,920 feet total (main, yards, sidings, staging)

**Turnouts:** 203 (this with limited industrial sidings!)

**Minimum radius:** 42" (46" average)

**Hidden staging:** 790 feet of track

**Mainline run:** 370 feet

**Main yard:** 35 feet long with 50 turnouts

**Locomotives:** 33 operational, 88 eventually required

**Rolling stock:** 558 cars in service, 920 eventually needed

ing area in the extension, but he found the railroad in the primary room was more than enough to meet his goals.

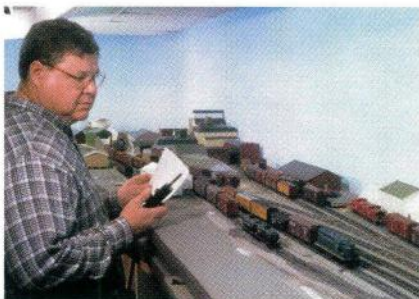
What he needed was more workbench space, as he enjoys kit assembly and scratchbuilding. So he used some of the space originally planned for the railroad for a larger workbench, a paint spray booth, and storage. He also moved a staging yard with limited accessibility from under the stairs to a convenient shelf in the new shop area. A slightly downsized railroad gave him a comfortable model-building environment and excellent operation.

Building less layout to provide more aisle space can also pay dividends. You may have to narrow some benchwork, give up some scenery, or reduce the minimum radius, but it may be a good trade-off to avoid 2-foot-wide aisles, which are bad news during an operating session or open house. Three-foot or wider aisles are a much better choice.

Bob Madison steadfastly resists the urge to fill the upper floor of his house with a layout. His 24-foot-long L-shaped shelf railroad, scheduled to appear in *Model Railroader* later this year, occupies only ten percent of the available area. Several years ago, Bob built a much larger railroad in a former residence, but it proved a bit large for him to operate alone, and its remote locale made it hard for Bob to recruit operators. This led him to realize a smaller railroad would be better.

Bob completed the new, smaller layout in just 18 months. As he runs the





John King has reproduced the B&O track layout at Winchester, Va., in a 2 x 30-foot area. It's only the first phase of a larger layout, but it already provides enough activity to keep a crew of three busy for a couple of hours. Structure mock-ups provide an effective preview of what's to come as well as a more-realistic setting for operation.

railroad, he focuses on the quality and details of each operating move. He's printed a full set of prototypical paperwork for the lone switching run, including train orders, waybills, and switch lists. Bob feels this allows him to get into the mindset of a professional railroad crew and station agent on his fictional New Haven branch line set in Rhode Island.

But what does he do now that the railroad is "complete"? Bob works on rolling stock, sometimes repainting cars into more-accurate schemes. Extra cars (20 are needed for operation) are cycled on and off the railroad for variety. Bob and some of his modeling friends are also building modules based on Pennsylvania RR branch lines in Delaware.

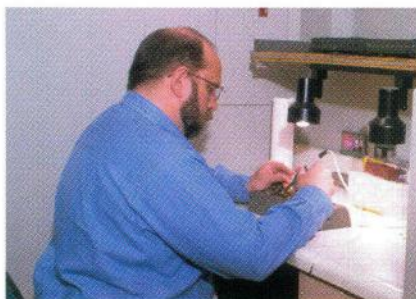


Photo by Chuck Hitchcock

Keith Jordan originally planned to build an industrial switching area in a room off to one side of his main layout. He found that the main layout provided enough operation, so instead he used the space to install a larger workbench, paint booth, and storage cabinets as well as staging tracks. Now he can more comfortably work on other projects.

space may require multiple decks, helixes, or other complex construction techniques. If such features provide what you're seeking, understand that they may give you many of the complexities and negatives of a large layout, often with awkward access and tight aisles.

A way around this may be a smaller scale or a narrow gauge railroad with smaller equipment and tighter curves. But resist the urge to squeeze more and more track into the space. While adding a branch line may look great on paper, often it just adds complexity.

### When bigger is better

There will always be modelers who dream of huge layouts because they feel their modeling objectives cannot

**There will always be modelers who dream of huge layouts because they feel their modeling objectives cannot be attained in small spaces.**

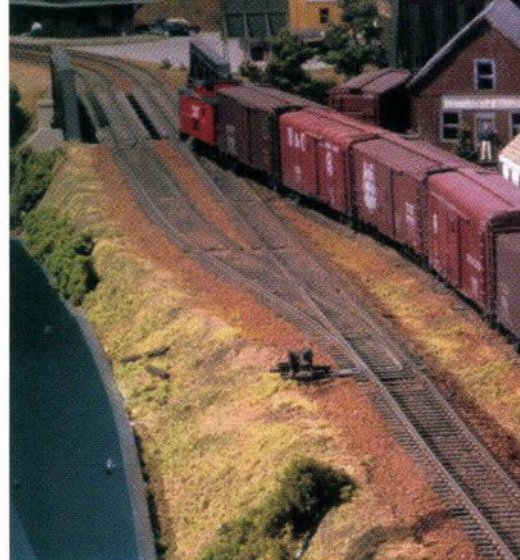
British modelers often have little or no space for permanent layouts, but still excel at small exhibition railroads. Like Bob Madison, they finish each one in a reasonable time and display them. After a few years, they tear down or sell the layout and start again. Despite a lack of space, they can still fully enjoy the planning, construction, operation, and social aspects of the hobby.

### Small needn't mean simple

Small spaces don't necessarily need to lead to simple layouts. The lack of

be attained in small spaces. With time, good organization, well-honed skills, dedicated resources, and perhaps some good helpers, a big layout is possible, even manageable.

It's great to follow your train along a ten-mile-long main line as it negotiates a large railroad room and takes you far from the teeming activity of the division-point classification yards. Imagine the thrill of successfully taking an 80-car freight or 20-car passenger train over the road using only a timetable, train orders, and your own



wits to keep on schedule! That's what happens on the San Diego Railroad Museum's spectacular La Mesa Club HO layout [in the January 2004 *Model Railroader*], which suggests another avenue to achieve lofty goals without having to do it all on your own or even in your own home.

J.D. Smith, a retired army general, committed to build a "big" layout without even knowing it. When he was 12, he was captivated by an article on the Southern Ry.'s notorious Rathole Division, a busy multi-tunneled line linking the Midwest to the Southeast.

He built a medium-size layout based on the Rathole Division using information gleaned from books and magazine articles, but he had never visited the region. When he finally had time to explore his chosen railroad in person, he came face-to-face with the shortcomings of his layout. The Southern Ry. (now Norfolk Southern) ran long merchandise hotshots and coal trains of 100 or more cars with midtrain helpers, and it ran lots of them! This, however, was not what happened on his HO layout.

Fortunately, J.D. was able to purchase a new home with a 2,900-square-foot basement. Now into the sixth year of construction, Rathole II is operational, and a portion of it is scenicked. He can now run those hot auto-parts trains, such as the "Spark Plug," and long coal trains with midtrain helpers. He beams as he points out how closely modeled scenes compare to the prototype photos displayed nearby.





Bob Madison created a fictional New Haven branchline town setting on his 24-foot-long, L-shaped HO layout. The track and basic scenery were completed in 18 months. Bob enjoys taking time to add details such as the stone fences and to build typical New England "signature" structures.

What's the key to accomplishing such a lofty objective? J.D. observes that you not only need the space and funds, but you must diligently allocate time to work on the railroad.

Bill Hirt, who models the former Chicago, Burlington & Quincy (now part of Burlington Northern Santa Fe), is another large layout builder who is well on his way to achieving his goals. He previously had a 10 x 22-foot layout room, but couldn't convince himself that he could build a satisfying railroad in that amount of space. A duckunder entry that showed up in his track plans deterred him from getting started.

A job relocation created the chance to build a new home over an ample basement. He convinced the builder to extend the basement under the garage, netting another 440 square feet. What resulted was a 1,300-square-foot living space that keeps the rain and snow out of a 1,700-square-foot basement.

Bill's primary motivation to build a large layout was his desire to run 30-car trains over a lengthy main line, with each engineer being somewhat isolated from other activities on the railroad. Yard crews would be unaware of approaching trains until they arrived at outlying holding tracks and called for permission to enter the yard.

"Having a large space let me 'decompress' the layout," Bill said. "More space let me stretch out the distance between yards and towns so the locomotive wouldn't be in one town

while the caboose was in an adjacent village." Curving but linear benchwork further fosters the illusion of distance between activity points. And plans for individual towns aren't very complex, which keeps the layout manageable.

"The size of the layout also gave me more flexibility after construction was under way," Bill said. "At times I was a bit sloppy in the planning process. I've been able to change or add concepts as construction progressed because I have ample space." Contrast this with a friend's model of a Missouri Pacific branch set in the 1920s built in only 80 square feet. He wisely developed a precise plan before starting construction. The relatively small layout keeps six operators busy for three hours!

Friends coached Bill about the need to make sure the railroad ran well. Nothing spoils the enjoyment of a layout as much as derailments and electrical problems. Bill reports excellent service from his Micro Engineering weathered flextrack laid on Vinylbed roadbed. The latter seems to give as benchwork expands and contracts, minimizing rail kinks. Bill also observed that the weathered track hasn't had to be cleaned since being laid three years ago. Putting a railroad in a clean environment, such as a basement with a ceiling and painted or carpeted floors, is an important contributor to cleanliness.

And what was the key factor in getting Bill's railroad built and operating

## Learning points

- A large layout may be a blessing or a burden. Take time to compare your goals to your capabilities and resources.

- Small layouts allow more time for detailed work and require fewer operators, which may ease people-management concerns.

- Large layouts can be built by one or a few people if the resources are available and time is allocated on a regular basis.

- It's helpful to visit other layouts to compare your assumptions to the rewards and liabilities of small, medium, and large railroads.

- Visiting the full-size railroad you plan to model may change your perceptions about how best to model it.

in less than five years? "Time," Bill said. "I've had help from friends, and I allocated sufficient funds to ensure we had what we needed. Spending was relatively high when I started construction, but it has dropped off substantially for the past year or two."

Large layouts are often built as venues for operating sessions that keep a dozen or more people relatively busy. But the logistics of regularly gathering a large group for a session requires a lot of coordination by the host and dedication by the crew members. And the possibility that personality conflicts will develop grows in proportion to group size. Smaller layouts that require smaller groups may provide more satisfying operating sessions.

## Matching goals to reality

The key to a successful layout may not be so much a function of its overall size as one of insightfully matching your life and work styles to reality. If you're a fast, decisive modeler or have well-honed management skills, you can probably complete a layout while the rest of us are still agonizing over track plans. If you like to fiddle with every detail or work at a measured pace on your own, then a small shelf layout probably makes more sense.

One size doesn't fit all. Be sure the size you choose really fits you. MRP

*Paul Dolkos is an experienced layout builder and operator who enjoys spending the time required to ensure that every aspect of his medium-size HO basement layout reflects his penchant for quality, plausibility, and flawless performance.*





Richard Steinheimer

# The Union Pacific

## through Wyoming and Idaho in HO scale

**M**y decision to model the Union Pacific's Overland Route in western Wyoming with a connection to the Oregon Short Line was a challenging, but easy, one to make. Several layouts have been built depicting Sherman Hill, but few modelers have ventured farther west.

Yet western Wyoming proved an ideal area to model. The Green River basin was rich in coal and soda ash, commodities that provide freight traffic and revenue to this day. The line was and is primarily a bridge route, with many high-speed through trains (both passenger and freight in the 1950s!).

### *Part double-track Overland Route, part single-track Oregon Short Line*

**By Steven Orth**

Model photos by the author

Approximately 60 miles west of Green River, at Granger, Wyo., the Oregon Short Line breaks off the Overland Route and heads northwest toward Oregon. Completed in 1884, the

OSL established Green River as a major terminal for the interchange of freight and passenger trains originating in the Pacific Northwest.

Traversing a sagebrush-covered desert, the OSL drops into the fertile Bear River valley, passing through Montpelier and Soda Springs, Idaho. These towns are home to several grain elevators and businesses that support the local agricultural economy. Soda Springs is where one of the world's largest phosphorus-processing plants is located, and 15 miles north lie some of the largest phosphate mines in North America. This agriculture and





Illustrations by Rick Johnson and Kellie Jaeger



**Left** – The distinctive Green River, Wyo., depot, shown in July 1952 as the westbound City of Los Angeles glides to a stop, includes a tower. Note the horizontal rock strata of the Green River formation in the background.

**Above right** – Big Boy 4013 is ample power for this eastbound train heading toward Rawlins on the UP's Overland Route main line. The author crafted the scenery on his circa-1958 HO layout to reflect the Wyoming landscape.

**Right** – One of UP's several varieties of gas-turbines is on the servicing pit at the Green River engine terminal on March 1, 1953.

mineral business, along with the large quantity of fruit traffic from the Pacific Northwest, makes the single-track OSL a busy section of railroad.

### What to model?

The fact that Green River was a major engine terminal caught my eye. Through the steam era and into gas-turbine times, Green River was the motive-power change point in western Wyoming, with the system's largest power operating west on the Wasatch grade and the smaller power operating east to Cheyenne. Changing power on freights at Green River provided a reason to host locomotives and to model servicing structures.

To the west of Green River are the Wasatch Mountains with Echo and Weber canyons – lots of scenery but very few operational opportunities. To the east, however, is Rock Springs and its large coalfields. A number of deep coal mines at Rock Springs, 15 miles east of Green River, began producing rail traffic almost immediately after the railroad arrived.

North of Rock Springs is the Stansbury Branch, which served several large coal mines. (From the 1960s to the 1980s, it provided a rail link with U.S. Steel's Atlantic City iron ore mines). East of Rock Springs is Thayer Junction, where the Superior Branch heads north to the Superior Coal Mine. These indus-



Wallace W. Abbey

tries would provide switching for local freights and reasons for my through trains to set off and pick up cars.

### Selecting a yard

I selected Green River as the site for my HO layout's main yard. I included engine terminal structures such as a coal chute, turntable, and 20 of the 29 roundhouse stalls. The five-track yard will accept 18-car trains, along with a caboose and the massive motive power that characterizes Union Pacific trains of almost any era.

A variety of engines were seen in Green River in 1958. The largest power on the system ran between Green River and Ogden. The 8,500-hp gas turbines were exchanged at Green River for their smaller 4,500-hp brothers, 4-8-8-4 Big Boys, and 4-6-6-4 Challengers. Inbound power was serviced at the engine terminal and turned. Passenger trains stopped and had head-end cars switched before continuing on their journeys.

Practical considerations were also taken into account when selecting a yard. For example, I included a cut-off track to return trains to Rawlins, which supports continuous running and simplifies restaging trains.

With Green River and Rock Springs being logical selections for major towns, I needed to pick an eastern end to the railroad. The late Terry Metcalfe, a highly respected UP modeler and historian, suggested Rawlins, Wyo., as it was the eastern end of the subdivision. All trains stopped in Rawlins to change crews and take on fuel. Rawlins is not often modeled, but after studying it I discovered that it lends itself well to modeling on a narrow shelf.

### Wide-open spaces

These key sites nicely filled my available space. Although an additional town could have been inserted, one of my goals was to capture the flavor of western Wyoming's vastness.





Looking like an S or even O scale model in an HO scene, one of the UP's huge 500,000-gallon water towers (an Overland Models import) can be seen in the left foreground of this photo of the coal tower at Rawlins. The author recently finished constructing the coal tower and painted and weathered both structures.



George N. Bisenius

A key locale on both the UP and the author's HO layout is Rawlins, Wyo., where Union Pacific Challengers 3957, 3930, and 3965 pause for fuel and water on August 11, 1951.

To aid in this impression, one long wall contains no towns. Instead, it includes a signature feature to help locate the scene. Just east of Green River, the railroad crosses Bitter Creek twice in one mile. The creek crossings are made with a pair of identical double-track Pratt truss bridges built in 1910. These bridges are easily seen from Interstate 80. Overland imported HO scale brass models of them in 1984. I didn't have room for both bridges, so I modeled the west bridge at milepost 814.82.

One aspect of the layout's design tends to confuse some visitors: All scenes are viewed from the north side of the tracks. This puts west to the right, which is backwards from what we are accustomed to on maps. However, if you drive along this portion of the Union Pacific, you're always on the north side of the tracks. I thought it was important to model this orientation.

#### Changing sides

I was forced to compromise directional accuracy in one area. Thayer

### Data sources

My desire to model portions of the Union Pacific in a prototypical fashion led me to U.S. Geological Survey topographical quadrangle maps. The 7.5-minute maps showed the location of almost all railroad tracks, roads, and structures, as well as the contours of the land.

Also useful were Form 70s, railroad records that list facilities at all the towns in detail, and employee timetables. — S.O.

Junction and the Superior Branch actually fork off the main to the north. This would have put the branch line out in the aisle, so I switched sides and had it branch off to the south.

Thayer Junction and the Superior Branch deserve some explanation. The original track laid in 1868 made several curves as it followed Bitter Creek, presumably to avoid building bridges and fills. In 1906, the track was realigned to straighten its paths using several cuts, fills, and bridges.

At Thayer Junction, the UP dug a cut to straighten the railroad, and the original route became a siding. The UP also built a wye off this siding, and the Superior Branch went north nine miles to the Superior Mine. There was no provision for turning locomotives at its terminus.

I was able to take advantage of this wye and put a loop on the inside of my peninsula, creating a "wyeless" wye. The track comes off the siding at both ends and crosses; then it goes inside the peninsula and forms a loop. From the aisle, the track appears to be a wye, as the cut hides the crossing. Operationally, empties enter staging and the power is cut off. Then the locomotives are coupled onto loads that are staged on one of the three tracks in the loop. The locomotives can then be turned using the loop and the siding.

#### More branch lines

The Stansbury Branch goes north out of Rock Springs to Winton Junction. I once again used the inside of the peninsula, this time to model Winton Junction as a staging area. Several coal mines were served by this branch. In 1962, three years after my layout's era, U.S. Steel opened an iron ore mine at Atlantic City, Wyo., approximately 100 miles northeast of Winton. Another private railroad was built to connect to the UP at Winton Junction.



## Learning points

- Choosing which part of a railroad to model is easily as important as deciding which railroad to model.
- Different parts of full-size railroads may have different personalities and offer different modeling opportunities.
- Most of the information needed to replicate part of a railroad is available in published documents and by interviewing professional railroaders.
- Viewing a railroad from the north side (east to the left, upside-down in map terms) may better depict familiar scenes.

U.S. Steel EMD F7s hauled loaded unit trains to Winton where UP picked them up and transported them west to Geneva, Utah. Empties were returned to Winton by UP, where the U.S. Steel train took them back to the mine. This continued into the 1980s until the ore supply was reduced to the point where it was no longer economically feasible to mine.

I included the Stansbury Branch out of Rock Springs and into the peninsula on hidden tracks. This allows both coal and iron ore trains to run empties-in/loads-out. I change the U.S. Steel power at Rock Springs for extra operational interest.

I also modeled the Sweetwater Branch, which heads south out of Rock Springs to Quealy Mine, a unique shaft mine still in operation today.

### The Oregon Short Line

Staging for the Wyoming Division is a two-level arrangement with a 12" separation. I accomplished this by having the railroad climb from Green River to Rawlins. In hindsight, I could have reduced the separation to 8", thereby minimizing the grades.

Below the Wyoming Division on the lower level is the Oregon Short Line. The OSL breaks off the main at Granger, Wyo., which is part of the staging area. The OSL is a single-track railroad until Montpelier, Idaho, where the line is double-tracked for several miles before returning to single track.

The modeled portion of the OSL includes Montpelier and Soda Springs, Idaho. I was able to schematically represent the track in both towns using UP switching and car-spotting books. Because of limited space, I didn't model the parallel sidings, but the



R. S. Plummer

Train no. 18, the *Portland Rose*, rolls eastbound under the circa-1943 coal chute at Rawlins on March 14, 1954.



Details of the Cheyenne-Ogden staging yard show the notched brackets that hold two levels of the railroad above a third – and above the washer and drier (not shown).



There's no sense waiting to operate your railroad until the scenery is finished, as this scene at Green River clearly suggests. The roundhouse is just around the bend to the right.

businesses served by the railroad are correctly located except for S.F. Chemical in Montpelier, which I moved from the east end of town to the west end.

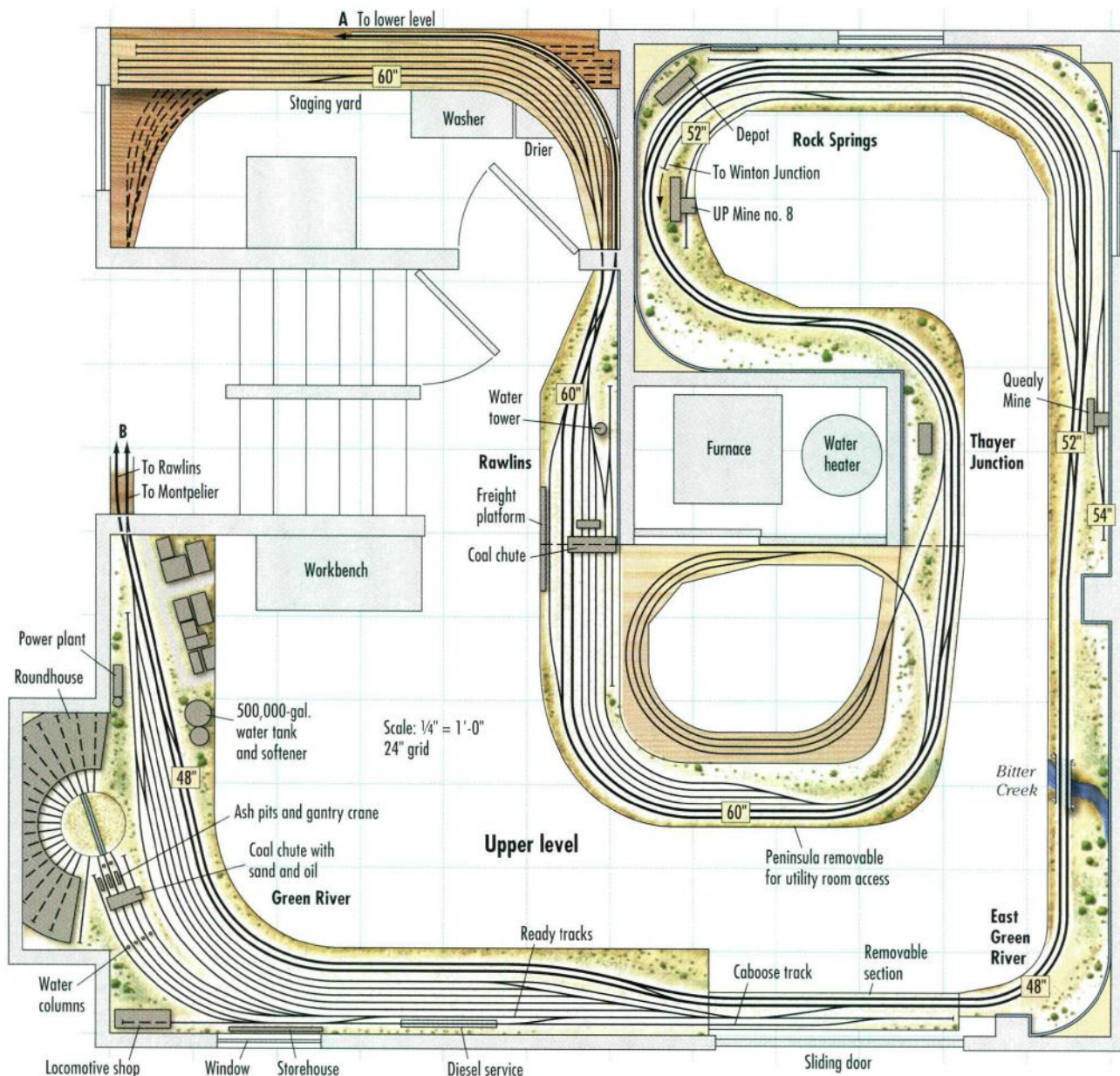
Montpelier features two grain elevators and a chemical plant, depot, and freight house. When I traveled to Idaho in August 2002, many of the structures were still standing, making modeling easier. However, because the OSL had dieselized by the era I'm modeling, I didn't include a steam engine terminal.

### Too much authenticity?

I modeled Soda Springs in the same way by referring to track schematics and business locations I found in UP switching and car-spotting books. I had to adjust some business locations to fit the available space.

Soda Springs is home to five grain elevators, and at one time the town had a stockyard, which I included on the layout along with the depot. In my efforts to keep the track schematic accurate, I initially wound up including sidings that were so compressed





## The layout at a glance

**Name:** Wyoming Division Third Subdivision & Oregon Short Line

**Scale:** HO (1:87.1)

**Size:** 24 x 24 feet

**Prototype or theme:** Union Pacific

**Locale:** Wyoming and Idaho

**Period/era:** 1958

**Layout style:** multi-level linear walkaround

**Layout heights:** 36" to 60"

**Benchwork:** open grid

**Roadbed:** cork on 3/4" plywood

**Track:** flextrack (code 83 main, code 70 branch)

**Length of mainline run:** 240 feet

**Turnout minimum:** no. 6

**Minimum curve radius:** 36"

**Maximum grade:** 2.7 percent

**Scenery construction:** foam board

**Backdrop construction:** painted hardboard

**Control system:** North Coast Engineering Digital Command Control (DCC)

in length as to be operationally useless. In fact, two of the sidings would hold only one car each! Obviously, some compromises were necessary. This included moving turnouts to lengthen sidings and eliminating other sidings altogether.

## Phosphate trains

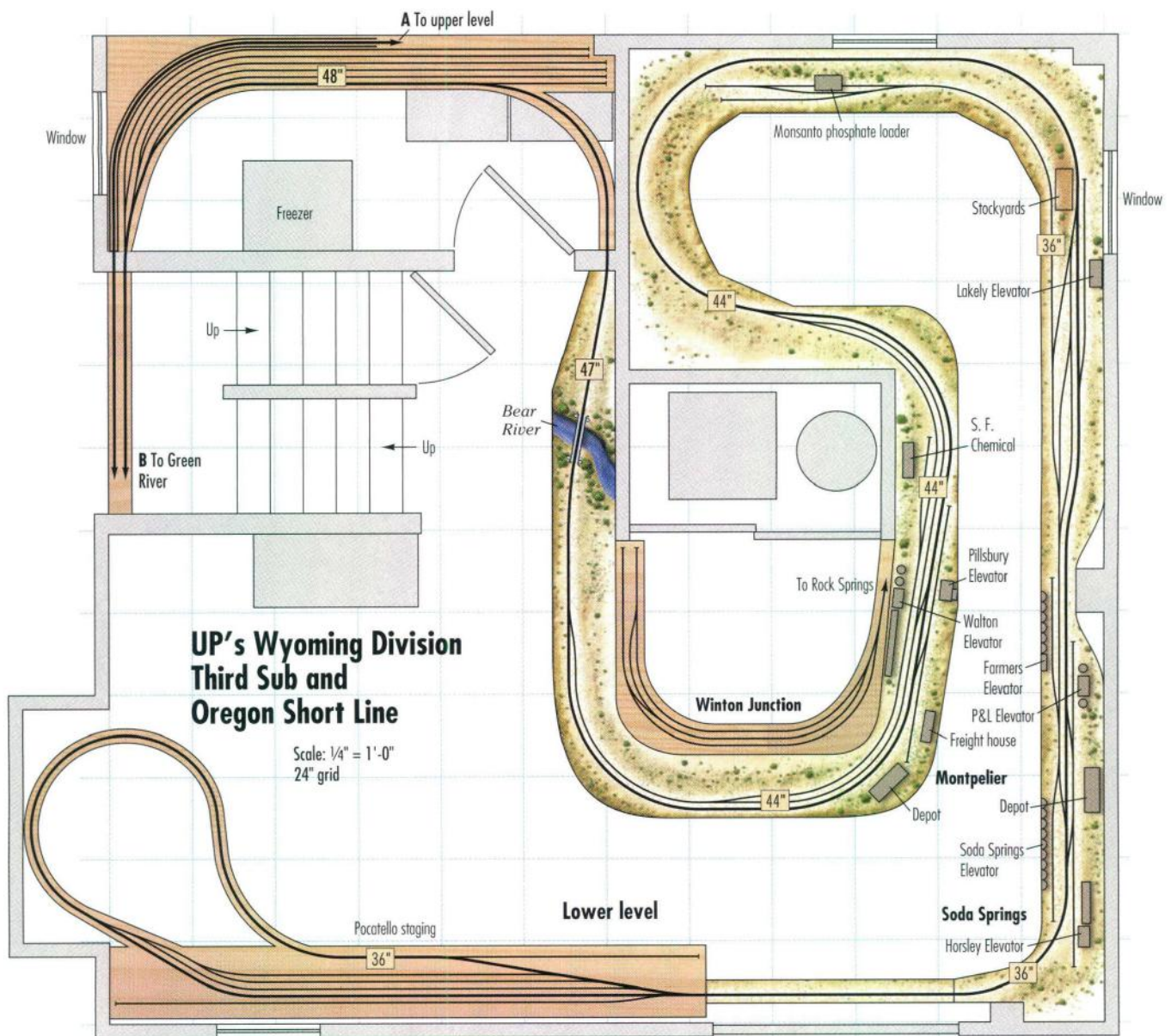
The Conda Branch heads north out of Soda Springs to a phosphorus processing plant owned and operated by Monsanto. Phosphate is mined north of the plant at Conda, Idaho, home of the largest phosphate

mines in the world. Until the mid-1980s, UP trains hauled phosphate ore out of Conda to phosphorus plants in other parts of Idaho and Montana. The ore is now transported in slurry pipelines.

In my era, phosphate ore trains were still running. While researching the phosphorus operation, I stumbled onto an unexpected prototype operation that I could incorporate in my layout. The Monsanto phosphate plant north of Soda Springs gets high-grade coke from a mine and coking plant in Rock Springs. Additional research revealed that it's none other than the former Quealy Mine, now owned by Monsanto!

There's open country just beyond Soda Springs. However, since I was out of room, I included another five-track staging yard with a return loop to represent Pocatello, Idaho. This





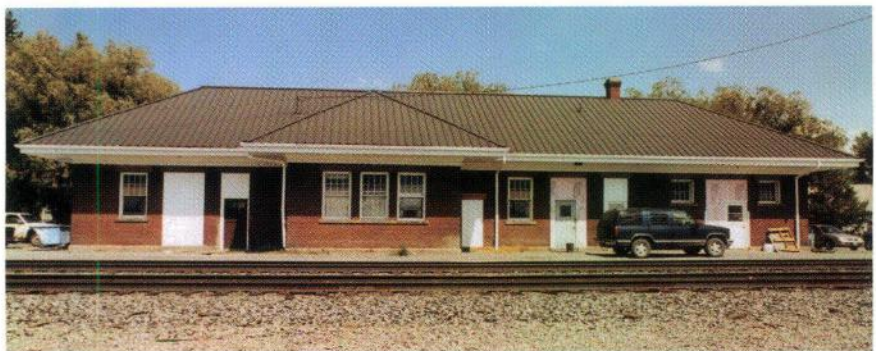
area, as with the other staging yards, isn't scenicked.

### Progress report

Scenery is still under construction and will be for some time, but all the track is in and I can run trains over the entire railroad. For ease and flexibility of operation, I chose a Digital Command Control system made by North Coast Engineering. Several of my locomotives are already equipped with SoundTraxx sound decoders.

Although the railroad is still far from complete scenically and operationally, a number of visitors remarked that I've already managed to capture the look and feel of the UP. This is especially pleasing feedback considering that was my goal from the very beginning. MRP

Steve Orth, a modeler who's written more than 20 articles for model



Steven Orth

This recent view of the depot at Montpelier, Idaho, reflects the UP's extensive use of low-maintenance brick construction in this region.

railroad magazines, began his current layout in 1997. He's an electrical engineer and an engineering manager for a major defense contractor in the Denver, Colo., area, where he lives with his two teenagers. Steve enjoys motor-

cycling, electronics, woodworking, and skiing with his children. He'd like to thank the following people for their support, advice, and prototype information: Bill Metzger, Chris Johnson, Rich Penissi, and Dave Krumenauker.





# ACTION

## at Nerska Tower

*A busy crossing near Chicago provides access to staging yards*

**By Bruce Carpenter**

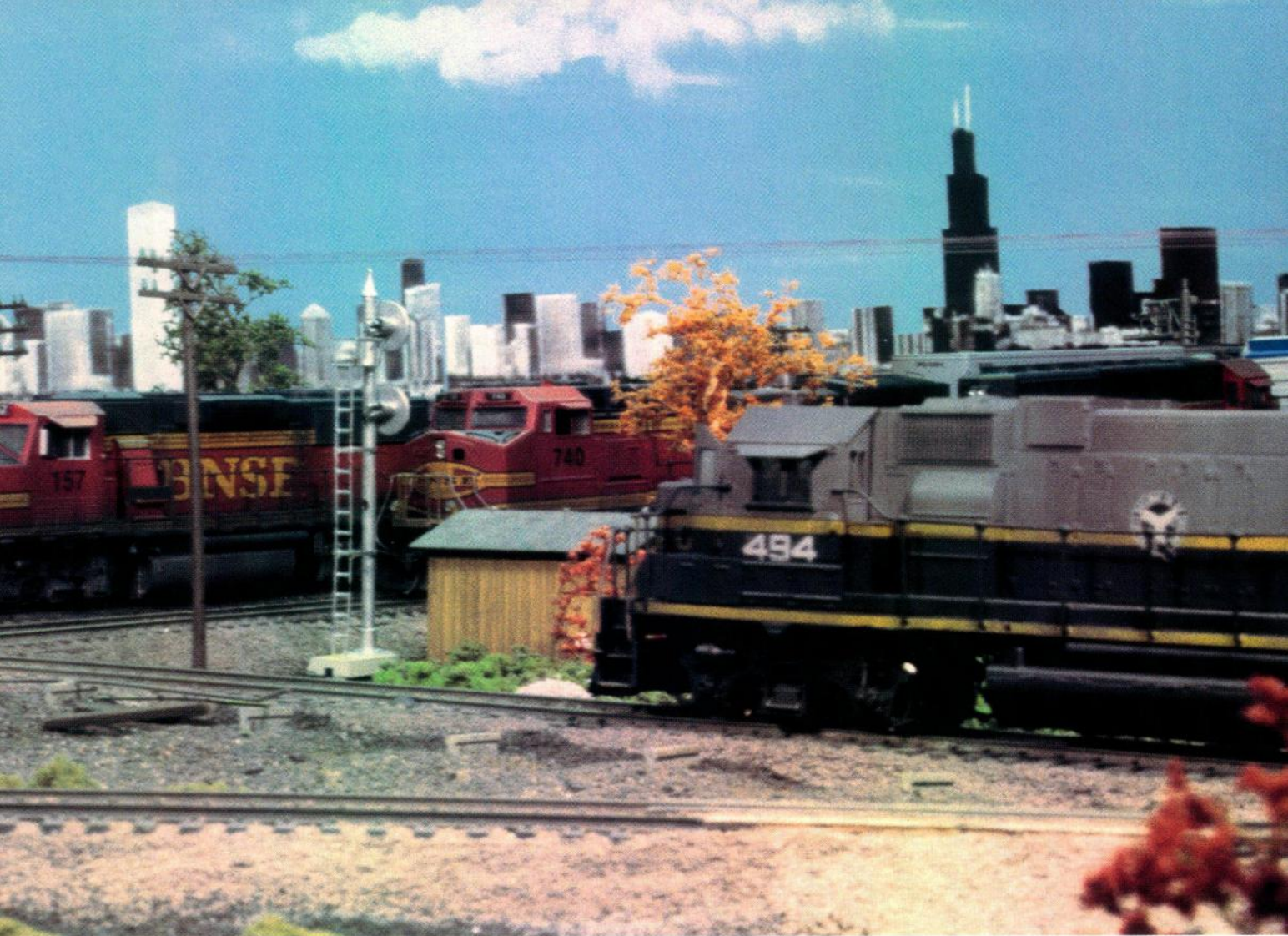
Photos by the author

When it came time to design my HO model railroad, my goal was to have a fully functioning diamond (a junction where two or more railroads cross). But, as Paul Dolkos documented in *MODEL RAILROAD PLANNING 2000* ("Railroad crossing solutions," page 18), a crossing at grade can be problematic. If the crossing line is to be fully functional, locating a route that doesn't penetrate the backdrop or cut across the aisle can prove to be a challenge.

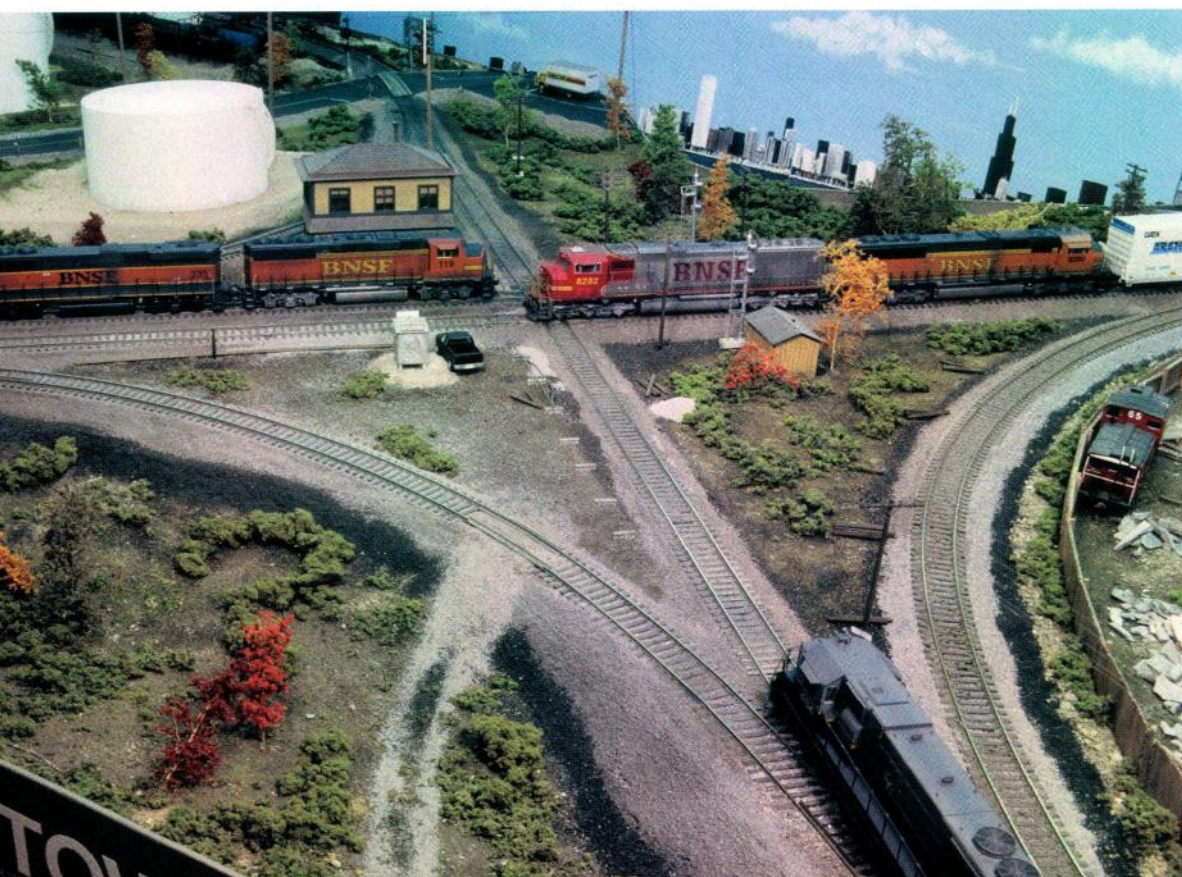
For my HO Burlington Northern Santa Fe Chillicothe Subdivision layout [see "Mainline railroading and real-life interchange" in the February 2002 *Model Railroader*, page 54 – Ed.], I chose a location just west of Chicago called "Nerska" in the BNSF timetable. This is where the BNSF's main line from Chicago to Kansas City crosses the Belt Railway of Chicago.

I took some liberties with the prototype (fig. 1) to make it fit the needs of my railroad's operations. The result is a crossing with three wye tracks (legs) and a small, four-track interchange





**Above:** Burlington Northern Santa Fe 701, a GE C44-9W, leads a westbound mail train past a manifest freight at Nerska Tower near Chicago. Once the traffic clears on the former Santa Fe main line to Kansas City, the Belt Ry. of Chicago freight at right will head north.



**Left:** This high-level view of the Nerska Tower trackage shows how it was set at an angle to the wall, allowing the use of one wide "stoop-under" and no wall or backdrop penetrations.



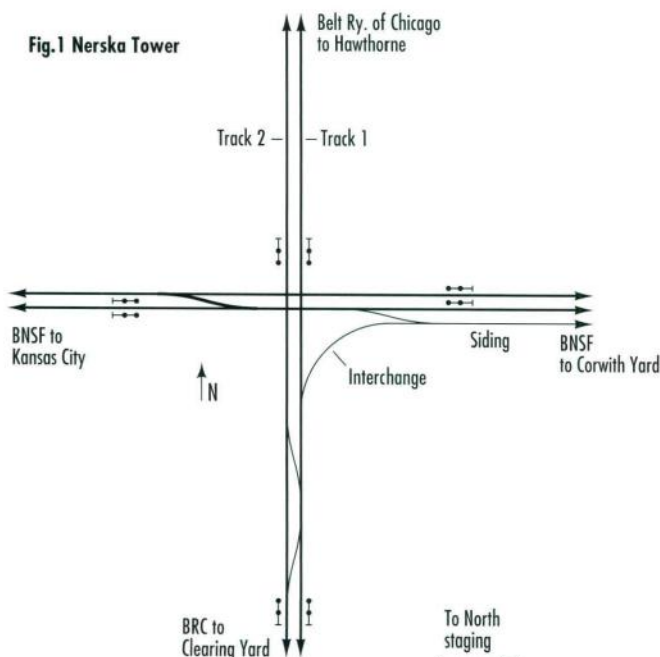
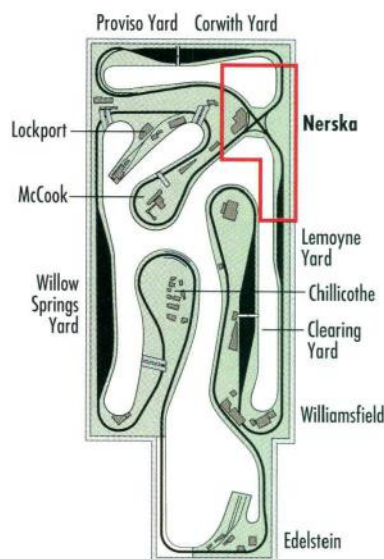
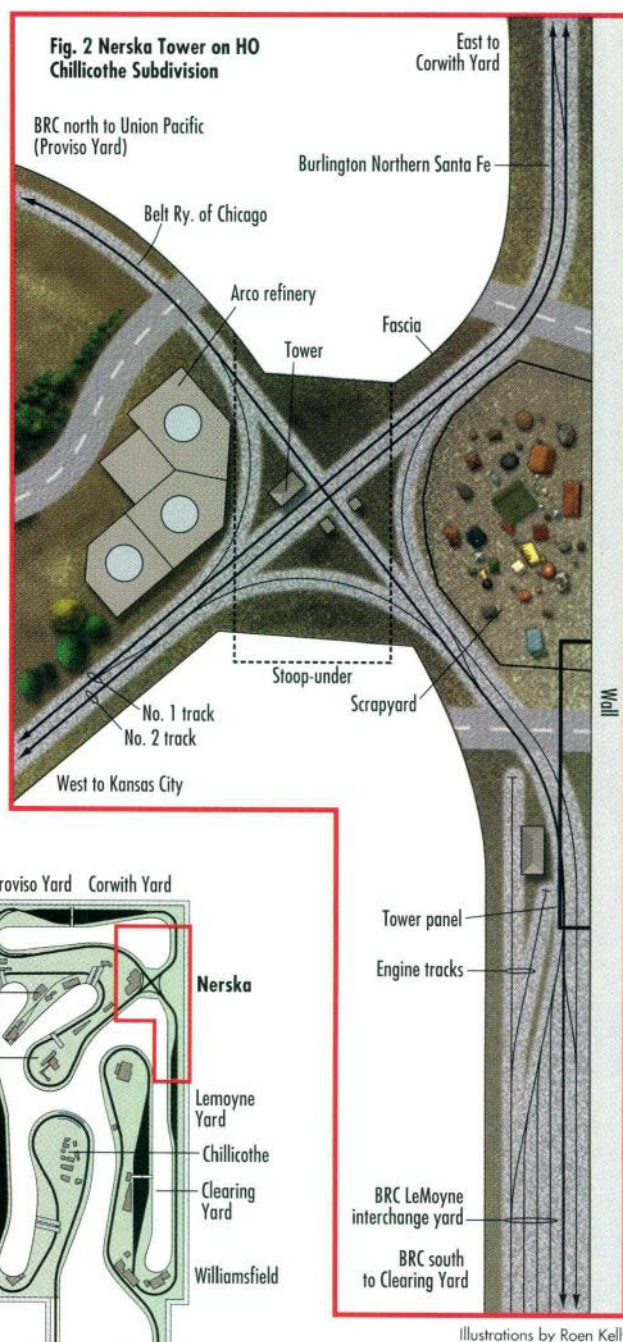
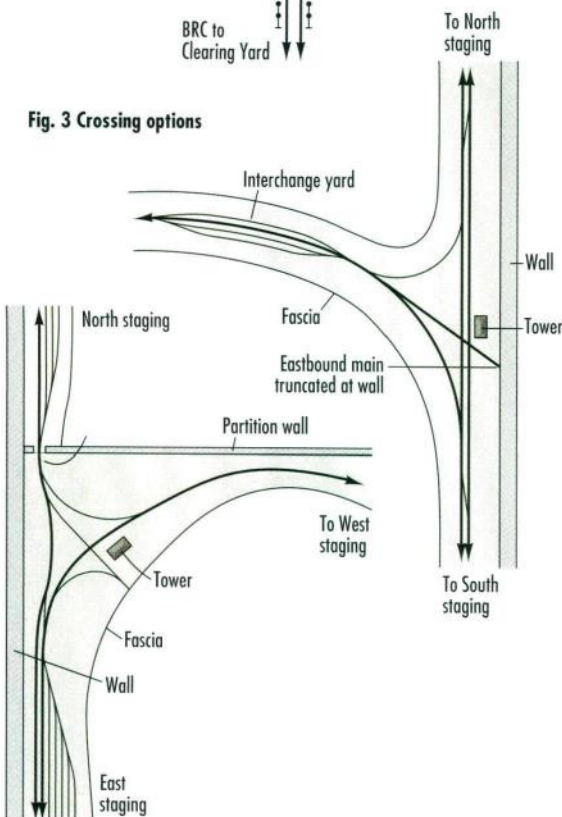


Fig. 3 Crossing options



Illustrations by Roen Kelly

yard (fig. 2). The crossing is fully functional in all directions and connects four separate staging yards.

Having wye tracks in only three quadrants is typical of many prototype crossings. On my layout, it presents operational challenges for train crews and the tower operator. This serves to slow down operations, which effectively adds "distance" to each run, a major plus on a model railroad.

### Junction elements

Even though I model present-day operations, I wanted an open tower, which is increasingly rare on 21st century railroads. The tower is a stock IHC plastic kit based on a Baltimore & Ohio prototype, but I detailed and painted it to reflect Atchison, Topeka & Santa Fe standards.

This junction began as a mechanical "armstrong" plant, evidenced by

the rods running alongside the tracks. It has recently been converted to use electrically powered switches, as the new electrical equipment shed attests. Communication line poles, antennas, maintenance vehicles, and spare track parts round out the scene.

### Traffic patterns

I planned my layout as a major bridge route linking nine different





This view of Nerska Tower shows the BRC staging yard with a pair of Alco Century 424s heading north for the Union Pacific's Proviso Yard.

model railroads built by friends. Expecting to operate 40 or more trains per session, I thought I would need more than two staging yards to keep things within reach from the aisles. For this, I built four 12-track staging yards that are about 18 feet long by 26 inches wide. Each has enough capacity to hold a dozen 48-car trains – 48 trains total.

To save space, I stacked the staging yards, leaving about 12" of vertical separation for access. This has worked well, but I think a foot of vertical clearance is a bare minimum.

### Coordinating train movements

The need to coordinate 40 or more train movements between two different railroads was the next challenge. The BNSF dispatcher would deal only with trains originating or terminating on the BNSF. The Nerska Tower operator, on the other hand, would have to cope with 95 percent of all train movements on the entire layout, as most BNSF trains and BRC cross traffic pass through Nerska. The \$64,000 question: How would the movements

### Junction basics

Most junctions are designed to allow maximum flexibility of train movements. Track arrangements are the key to making everything work smoothly, but space limitations often dictate what can and cannot be incorporated.

When a double-track main crosses another single- or double-track line, crossovers should be placed so any train on any track can go in the desired direction around a wye track or to reach an interchange yard without making a complex reverse move. Such reverse moves are rare and often indicate traffic flow changes that were not anticipated.

Wye tracks are omitted from one or more quadrants because the traffic pattern would not make sense and the track would not be used often (fig. 4). Junctions with four wye legs, one in each quadrant, are rare.

On my layout, I purposely left out one quadrant of the diamond to create additional interest. With this setup, I knew that traffic moving in that direction would be limited. At most, only a couple of trains per operating session are required to make the resulting runaround move. If you are certain of what your traffic patterns are going to look like, you can "short-circuit" the diamond by leaving out one or more wye legs. But if you overlook something, the junction will become a nightmare! – *Bruce Carpenter*

of all these trains be coordinated?

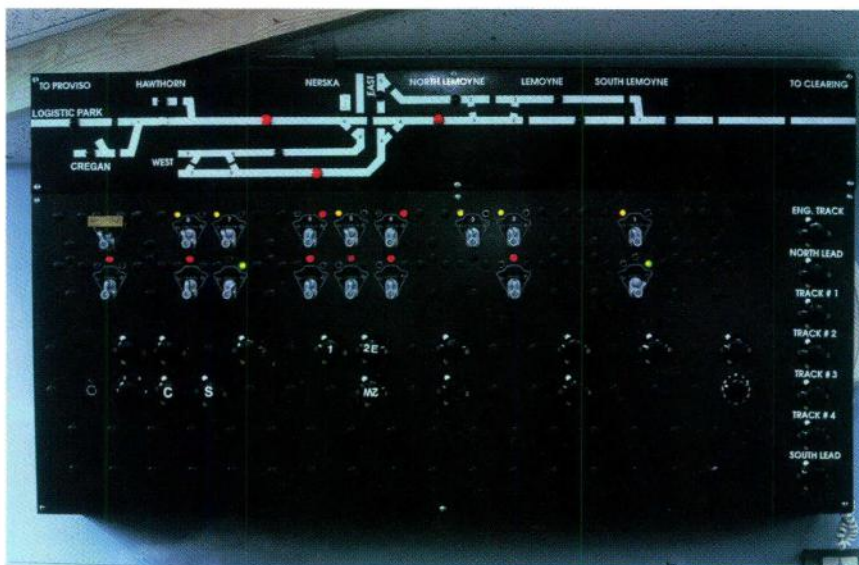
We tried a timed schedule, but that turned out to be a nightmare as the layout quickly turned into a parking lot. We tried drawing train numbers at random, but this too created total gridlock at times.

The solution came in the form of a simple sign-up list. Tracks in all four staging yards are listed, with the tracks staggered from division to division.

Operators simply sign up for trains in the order they fall on the list, report to that division, and pick up a car-card/waybill pack for their train.

Operators then contact either Nerska Tower, if they're starting on the Belt Ry. of Chicago, or the BNSF Chilli-cothe Sub dispatcher if they are running BNSF trains. The space that is needed for inbound trains steadily opens up as outbounds depart from





## Learning points

- A level crossing between two or more railroads can be the visual and operating highlight of a model railroad. In fact, a layout could be nothing more than a model of a busy crossing fed by staging yards.
- Making all routes through a crossing fully functional often forces one line to bridge an aisle, creating a duckunder unless the benchmark is kept high – five feet above the floor on the author's layout.
- Some adjustments to the prototype track arrangement may accommodate modeling needs without losing the essence of the base prototype.



## Alternatives

There are always alternatives, and I sketched a couple of them for you in fig. 3. They require a smaller amount of space than my version uses, but note that not all routes through the crossing are active. Paul Dolkos discussed some other approaches to solving crossing design concerns in his MRP2000 article.

## Recommendations

Based on my experience to date, I strongly recommend that any benchmark that crew members must frequently go under be kept at least 5 feet above the floor. To give a similar break to the trains, I also recommend the use of no. 8 turnouts wherever possible. I used a 30" minimum radius for the wye legs, which may seem a bit tight for modern equipment but has worked well.

An added benefit of a busy crossing like Nerska is the additional job for a crew member to operate the tower. While it doesn't involve running a train, it is easily as challenging as switching a major classification yard and therefore appeals to modelers who enjoy a mental challenge. It also offers a front-row seat to most of the action. Moreover, the tower operator's job fits right in with the current trend toward more faithfully modeling a wider variety of actual railroad jobs. MRP

*Bruce Carpenter, an engineering manager for an appliance subcontractor in Ohio, is a memorabilia collector and an active railfan who operates restored Fairmont track speeders. Bruce shares his enjoyment of all aspects of railroading with his wife.*

**Top:** The Nerska Tower panel, mounted above the layout, is the heart of the railroad, which is operated using DC cab control.

**Above:** The key to avoiding gridlock turned out to be a staggered job assignment list, which helped ensure that trains were operated only when crews were available and after inbound staging tracks opened up.

each staging yard. Trains flow smoothly between the staging yards, pausing to interchange cars near the tower.

There are occasional tie-ups, but this is prototypical! When the tower operator is really on the ball, train movements over the diamond are an awesome sight, truly a railfan's delight.

### The "stoop-under"

No matter how exciting the tower operations may be to watch, the main problem with a fully functioning cross-

ing remains: At some point, at least one crossing line has to cut across the aisle to reach another section of benchwork. Compounding the problem on my layout is the fact that Nerska Tower is obviously the busiest point on the railroad. Moreover, the benchmark is 48" wide at this point, the result of positioning the crossing at approximately 45 degrees to the backdrop to avoid having either route punch through it. This width would make a true duckunder even more inconvenient.

I dealt with this concern by keeping the railroad as high as I thought practical: 60" from the floor to the bottom of the benchmark. This created a "stoop-under" rather than a back-breaking duckunder. I covered the underside of the benchmark with dry-wall and padded the corners with foam rubber to avoid banging noggins.



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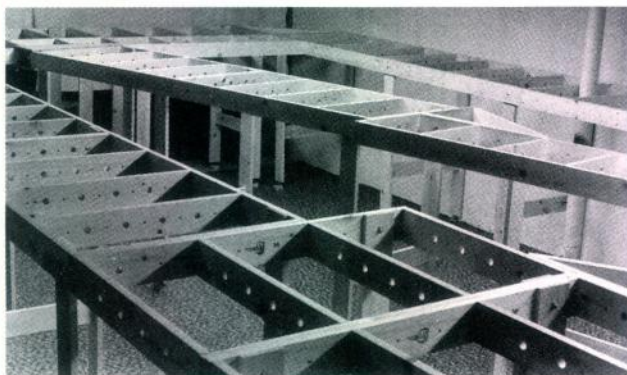


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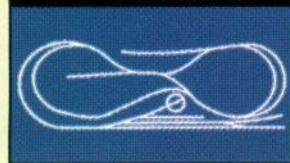
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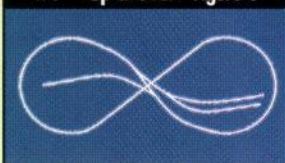
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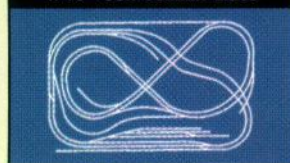
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A detailed HO scale model of a freight train, led by a dark green RS-3 locomotive with its headlights on, pulling several silver freight cars. The train is traveling on a track that curves through a dense, dark forest. Tall, thin trees frame the scene, and some trees on the right have autumn-colored foliage. The ground is covered in moss and small rocks, and a small, rusted metal structure is visible in the lower left foreground.

A preview of  
Charlie Com-  
stock's new HO  
scale Bear Creek  
& South Jackson  
RR is provided by  
several photos of  
his previous lay-  
out, including this  
dramatic view of  
a Spokane, Port-  
land & Seattle  
RS-3 hauling a  
local freight and  
framed by tower-  
ing trees.



# Fine-tuning a track plan for operation

*Two heads are often better than one when it comes to layout planning*

**By Charlie Comstock and Don Mitchell**

Model photos by Charlie Comstock

**W**hat follows is an account of the give-and-take between an experienced layout builder and a veteran layout designer that resulted in significant improvements to an already carefully thought-out track plan. Charlie Comstock first reviews his goals, and then Don Mitchell reviews suggestions he felt would enhance the layout's operating potential. — Ed.

## Charlie's druthers

The Bear Creek & South Jackson provides a connection from Oregon's central Willamette (will-LAM-et) Valley to the east over the rugged Cascades. It's best described as a "prototype free-lanced" railroad strongly influenced by the Southern Pacific and the Spokane, Portland & Seattle. Indeed, most of my motive power is lettered for one of those two railroads instead of my own.

As is often the case, a move to a new home spurred a new design for my HO scale BC&SJ. Experience with the previous BC&SJ suggested the following list of desirable features for the new layout.

- **Design for operation:** I like to build models and enjoy model photography, but I also like to run trains in a prototypical manner.

- **Single-track main line:** I enjoy dispatching single-track lines where trains meet and overtake one another.

- **Single-level construction:** Out of necessity, the previous layout was an around-the-walls helix design. With 1,100-square feet available for the new layout, I felt there was no need for a multi-deck railroad.

- **Division-point yard:** I want the layout to feed a main classification yard where trains originate, terminate, and are classified. A yard big enough to handle all of this will provide work for

a yardmaster, a pair of switch crews, and an engine hostler.

- **Engine terminal:** The main yard will be big enough to need a large locomotive facility to accommodate the motive power for those trains.

- **Helper grades:** The previous BC&SJ had to climb up a ruling grade of 2.7 percent that was more than 40 feet long. Trains of 30 cars or more usually required a helper. With Digital Command Control (DCC) independent helper operation is easy. I really enjoy coordinating helper operations, especially now that sound-equipped locomotives allow modelers to use all the proper whistle signals!

- **Branch lines:** The junction of a branch line with the main line is usually an interesting place for road and branch crews where cars are picked up from and set off for the branch. For the dispatcher, it's usually a point of congestion.

- **Industrial areas:** I enjoy operating a local and switching the night away.

- **Hidden but accessible staging:** For division-point operation, an ample staging yard will be needed. All of the trains originating or terminating in the main yard will need a place to come from or go to. I can't see using up valuable open space for staging, however, so it will need to be located under the visible part of the railroad, yet be highly accessible. I also want the staging to be arranged so I can run a train or two between operating sessions without causing restaging headaches.

- **Mountain railroading with long, scenic runs:** I want the towns to be far enough apart to preclude crews from easily seeing the next town down the line while they're passing through or working at another town. And helper grades are more fun when it takes a while to climb to the summit.

- **Broader curves:** My previous layout had a 30" minimum mainline radius, but that proved problematic for some of the longer-wheelbase brass

steam locomotives. The new railroad needs to have a 40" minimum radius to accommodate SP 2-10-2s.

- **Command control:** Having several crews work together in a yard and having independent helper operations is so much easier and more fun using command control.

- **Timetable-and-train-order operations:** I want a layout that will realistically support timetable-and-train-order operation in "dark" (unsignaled) territory. Though this will require that my train crews and I learn more about timetable-and-train-order operation, the effort should pay off in interesting and more-realistic operating sessions.

- **Variable crew sizes:** I know from experience that attendance at operating sessions will vary. The layout will therefore have to be operable with as few as four crew members yet capable of keeping up to 16 railroaders busy.

- **Aisle width:** I want to keep most aisles at least 36" wide, but a few pinch points are tolerable.

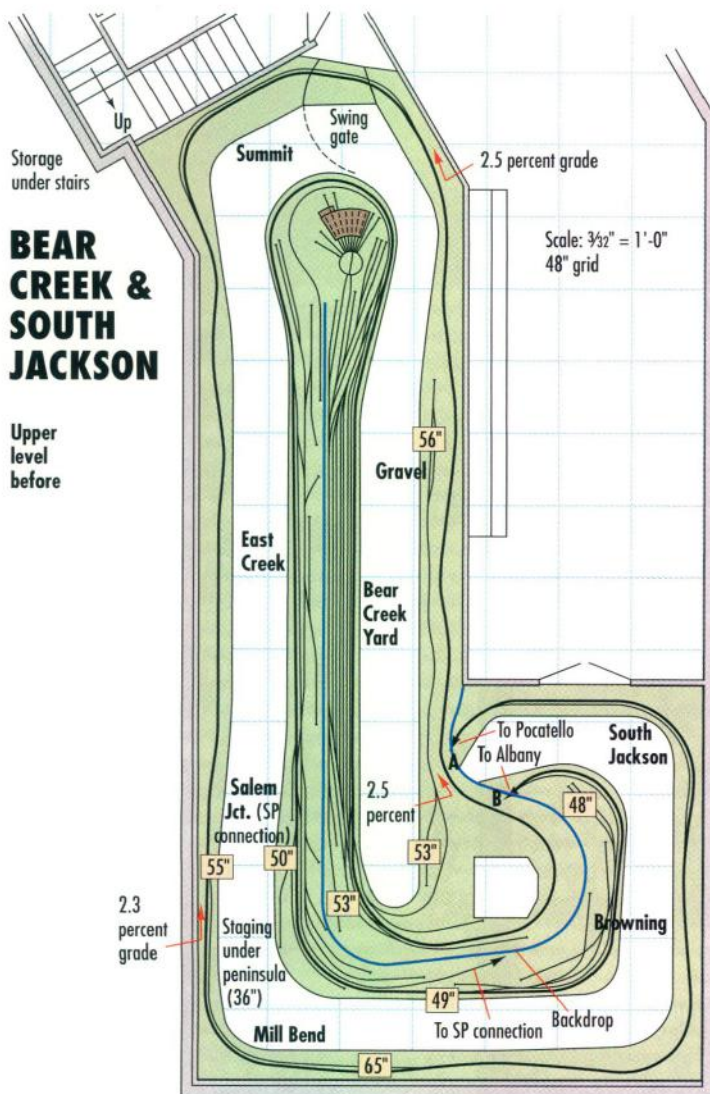
- **"Buildability":** Last but not least, I will be building the new layout mostly by myself, and I prefer to hand-lay all turnouts. The scope of the project therefore needs to be reasonable in terms of both time and cost. Benchwork should be reasonably straightforward to build and trackwork not overly complex.

My first attempts to design a railroad based on these objectives is shown in the "before" plans. I didn't commit to construction, however, until I'd asked Don Mitchell to critique my plan and suggest ways to enhance its operating potential.

## Don's recommendations

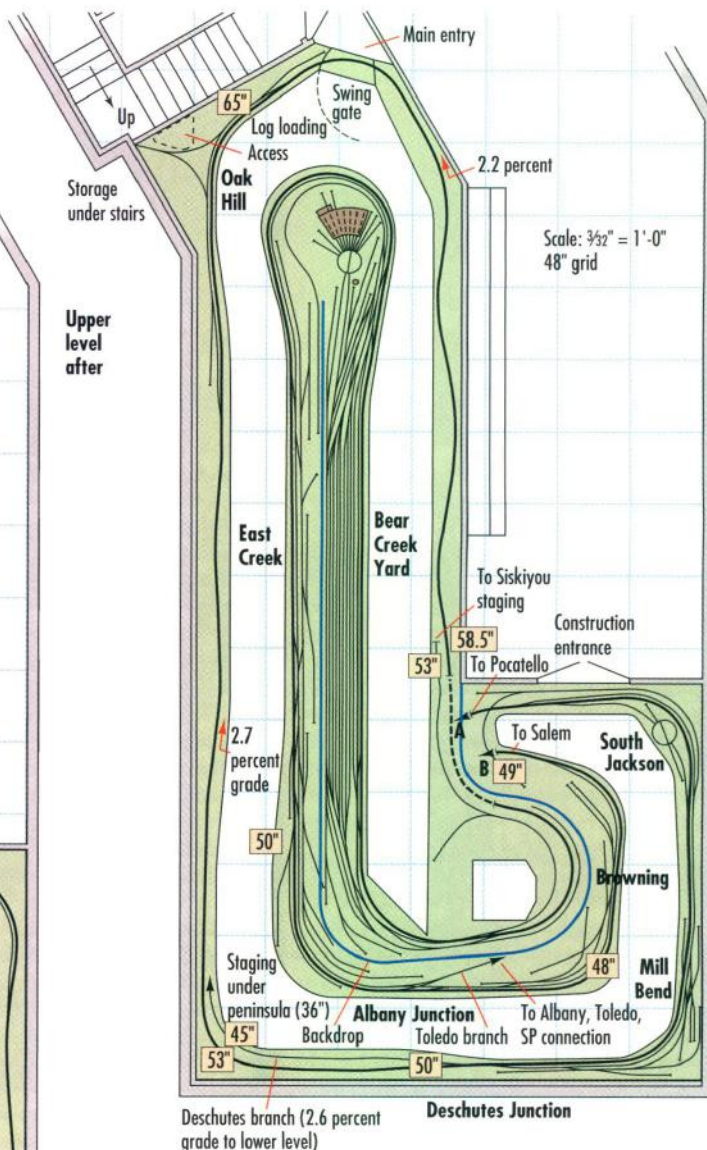
My suggestions were aimed at improving the operating traffic flow for either a timetable-and-train-order railroad or a less-formal operating scheme. To that end, the first step was to find a place to put desks for the dispatcher and telegraph operators.





## BEAR CREEK & SOUTH JACKSON

Upper level before



Upper level after

Illustrations by Rick Johnson

• **Dispatcher and operator desks:** The crew lounge (Charlie knows how important it is to have a place for off-duty crews to relax) was one obvious place for a dispatcher's desk. The dispatcher or an operator could also be located under the stairs, perhaps passing orders through the stoop-under entrance to the layout. Having the operators outside the layout has the disadvantage of requiring some train crews to walk back from the most distant locations on the layout, such as South Jackson, to get orders (or forcing the operator to walk out there to deliver them).

Another location for an operator is inside the helix. It would require a low duckunder entrance, but it puts the operator near many locations where train orders would be issued: one end of Bear Creek Yard, South Jackson, Mill Bend, Browning, and Salem Junction. The in-helix location would also allow an operator to act as towerman for the hidden junction at the top of the helix that controls the entry and exit for all staging tracks.

• **Accommodating people:** Next I looked at the "people load": the flow of crew members through the aisles as operations progressed. The greatest

congestion will be in the aisle facing Bear Creek Yard, so that aisle should be as wide as possible. Room for widening that aisle could be gained by eliminating the gravel branch. This wouldn't have much effect on the overall traffic pattern, as the gravel branch would logically have been served only once or twice per operating session, and with just one type of car.

• **Bear Creek Yard:** This yard will have the highest traffic density because of the combination of through trains, classification activities, industrial switching, engine changes, hostling, and helper movements. It needed





to be redesigned with more tracks, longer leads, and better separation between the main line, arrival/departure tracks, and yard body tracks.

• **Main-track changes:** Eastward (to the left when facing the yard) from Bear Creek, several track changes were in order. Summit needed to be relocated counter-clockwise so that there was only one track, rather than two, on the swing-out gate that bridges the room entryway. (Having a train parked on the siding when the gate needs to be opened presents some rather obvious problems.)

Charlie also needed a way to turn helper locomotives. A wye is less complicated than a turntable, but access would have to be provided to the wye's remote tail track. The complete redesign of this area resulted in Summit being renamed as well, to Oak Hill.

Mill Bend also needed to be moved counter-clockwise so that it would not be visible from Oak Hill. This change would make adhering to timetable rules more meaningful to train crews.

Retaining South Jackson after Mill Bend was moved meant combining the two into what is essentially a section of bi-directional double track. Putting that area within yard limits helped keep things fluid under timetable rules, as train orders aren't needed for movements within a yard. The turntable at South Jackson was retained for the use of steam helpers on this side of Oak Hill summit.

The author's enjoyment of local switching operation ensures that the new layout will also feature scenes such as this one of an SP&S Alco RS-3 working Bear Creek Salvage on his former HO layout.

#### • **Westward from Bear Creek:**

To the west (right) of Bear Creek, more track changes were called for. For example, reorienting the crossovers in East Creek provided better access to the industrial tracks. The main change, however, involved moving Salem Junction around the corner to the point where the SP diverges from the BC&SJ, and then adding double track between Salem Junction and Bear Creek. Here, as in some prototypical situations, one track belongs to the SP, the other to the BC&SJ, but they are operated as two main tracks under the control of the BC&SJ dispatcher.

• **Staging:** Staging needed to be completely redesigned to increase capacity and smooth out the expected heavy flow of traffic. Instead of two essentially separate staging yards sharing a common reversing loop – with a hidden, virtually unreachable crossing along the center line of the peninsula – I suggested placing the yards one after another with a one-way traffic flow. I revised the leads for both yards, placing all turnouts near the aisle for easier maintenance and operation.

The helix connecting to the staging yard was reworked to provide a one-way flow with left-hand running to

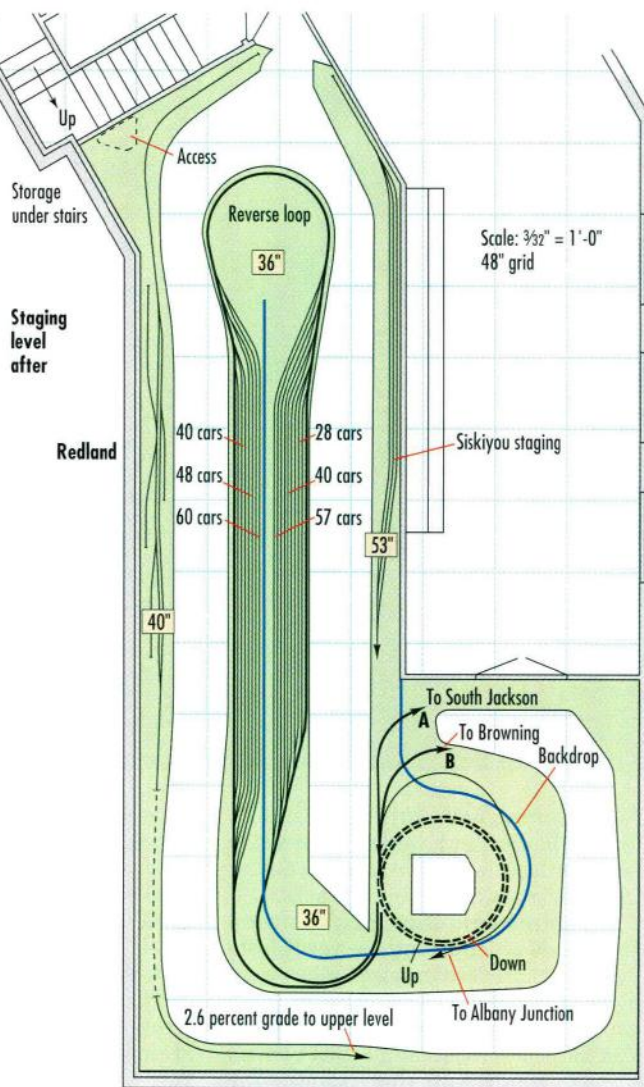
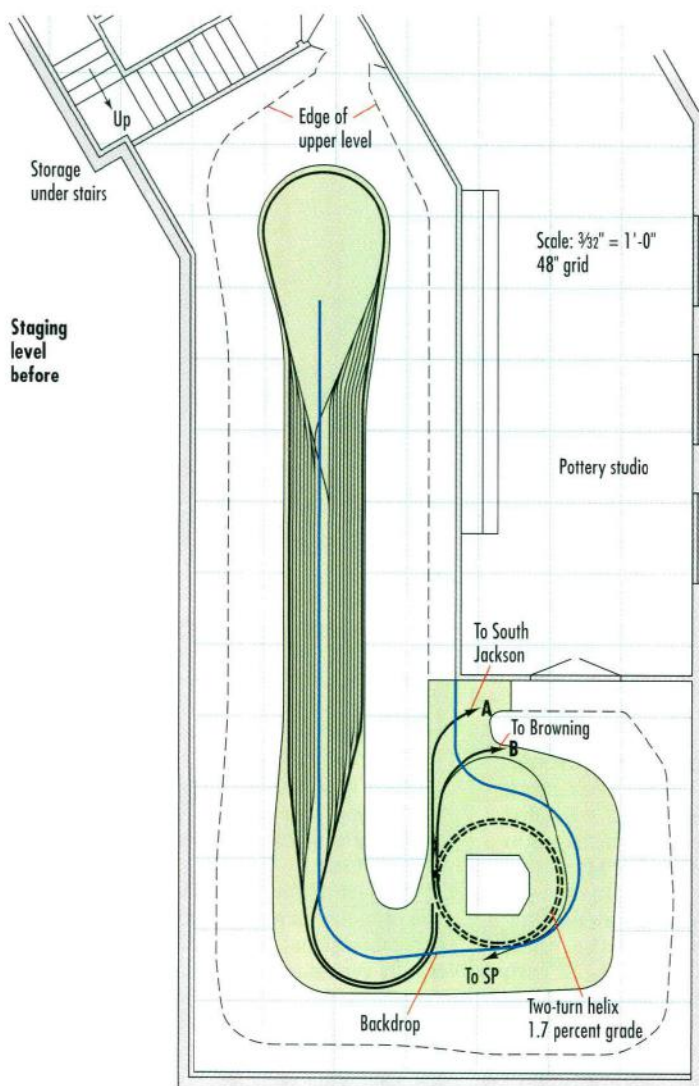
### Learning points

- Experience gained on a previous layout is invaluable when designing a worthy successor.
- Combining the freedom afforded by a free-lanced railroad with a healthy dose of prototype modeling often taps into the best of both worlds.
- Enlisting the frank advice of one or more knowledgeable friends or a professional layout designer who is fully versed on your hobby interests, such as timetable-and-train-order operation, allows additional opportunities to be identified and improvements to be made on paper instead of with a saber saw.

achieve a slightly easier uphill grade. More importantly, one-way movement on the helix allows those tracks to temporarily store trains awaiting entry onto the layout or into staging. Like a surge tank, the helix provides a significant gain in staging capacity without any new tracks. The inevitably long track distance in a helix is a terrible thing to waste!

The cost of this staging redesign is a hidden junction at the top of the helix to allow trains to arrive and depart from staging through three locations: South Jackson, Browning, and Salem Junction.





### Charlie's reaction

I found Don's recommendations both thought-provoking and useful. Putting a chair and small desk in the closet just outside the layout room door, for example, would make an ideal location for the dispatcher, as I'm concerned that chit-chat in the crew lounge might be distracting. Locating an operator inside the helix sounds feasible despite the need to crawl under 36"-high benchwork to reach it.

I did redesign the Bear Creek Yard ladders and throat, as the "after" drawing shows. The east end of Bear Creek has a longer drill track (lead) so the switch crew can handle longer cuts of

cars. I also added more industries and an icing platform, and I increased the aisle width at Bear Creek from 36" to 40". I added a new track leaving the main line at the east end of Bear Creek to provide a connection to the SP's Siskiyou line, simulated by three stub-end staging tracks under the main.

Oak Hill was shifted a few feet counter-clockwise. I also shoehorned a wye into Oak Hill without violating the minimum radius. Salem Junction moved counter-clockwise and became Albany Junction with routes to Corvallis and Toledo (staging). This junction will have a tower with train orders handled by the inside-the-helix operator.

I completely redesigned the staging yards and the junction at the top of the helix. This junction will be hidden and therefore require signaling to prevent conflicting movements. I'm making the scenery above it removable. A key point is that the helix is on a 1.5-percent grade, so this hidden climb is not the ruling grade. Crews can peek under the benchwork to watch their trains going to or from staging.

Despite my earlier mandate for a single-level design, I couldn't resist using the open space under Oak Hill. I added a branch from Mill Bend that leads to a lower deck under Oak Hill. This line represents the Oregon Trunk



A Bear Creek & South Jackson caboose trails behind its train while making its way along the lush valley. The rear brakeman is taking in both a heady mix of diesel fumes and the rich aroma of pine needles. Charlie's new layout will also feature this type of highly detailed northwestern United States scenery.

heading to the SP&S at Wishram on the Columbia River and could accommodate two towns and another staging connection. Unfortunately the second town and staging connection would require another swing bridge across the room entrance – this one would be only 36" above the floor.

### Don's response

In my view, running the branch all the way under Oak Hill is not a good idea for several reasons. One is the second swing bridge across the entrance, of course. Doing so would also require access hatches on both levels to reach the tail track of the helper wye on the upper level. Another reason is that continuing the line towards the helix would put a third track level into an already tight space. We'd just removed the gravel branch from the same area to open up the aisle for operators at Bear Creek Yard.

It would also add a hidden connection to staging in addition to the already complicated hidden junction. Both of these things could create an overload of work for the already busy towerman/train-order operator inside the helix. And controlling meets on the branch would add to the dispatching burden on a layout already somewhat densely packed for timetable-and-train-order operations.

I'm confident that the other changes Charlie made to the original plan will definitely increase the enjoyment of building and operating his new Bear Creek & South Jackson. I look forward to operating on it myself! MRP

*Charlie Comstock became interested in trains at age 5 while watching the Long Island RR behind his boyhood home. He joined the East Bay Society of Model Engineers in the 1960s but didn't start what he calls "serious HO modeling" until 1997. Charlie is a programmer for Synopsys Inc. in Portland, Ore., where he lives with his wife and two children.*

*Don Mitchell's interest in railroading was also forged at an early age in the Chicago area. He started with a tinplate set during the Depression and changed to HO during World War II. He and wife Gretel are enjoying active retirement at their island home near San Diego.*





THREE LAYOUT DESIGN ELEMENTS

# Long Island's Oyster





# Bay branch

*Three busy towns offer lots of freight and passenger action*

**By Steve Lynch**

It's 5 a.m. on a chilly morning in October 1955 as the Long Island RR begins to stir once again in preparation for another busy day of commuter and freight operations at Oyster Bay, N.Y. This small north shore community, the terminus of the Oyster Bay branch of the LIRR, is perhaps best known as the former home of Theodore Roosevelt, the 26th President of the United States.

Over at the turntable, engineer Dave Brinkmoeller is getting ready to move engine 40, a G5-class 4-6-0, across the table to position it for the morning's first run after fireman Steve Rothaug finishes filling the tender with water. The Ten-Wheeler then rumbles west past the depot via the runaround track, stops, and backs up to couple onto the Railway Post Office car. The car had been spotted overnight in front of the station so it could be loaded with mail for New York City and points west.

At about 5:30 a.m., stationmaster Dave Morrison gives the go ahead. Engine 40 with the RPO in tow chuffs off to the overnight storage yard to pick up train 507's consist – a string of ten P54 commuter coaches waiting on the “fence track.” (It's named for the fence between the yard and Roosevelt Memorial Park just to the north.)

By 6 a.m., the first light of dawn glints off the rails as engine 40 moves west far enough to clear the coach-yard switch lead. The switch is lined, and train 507's conductor signals for Brinkmoeller to back up to the depot just in time to load passengers for the first run of the day.

Rothaug has the fire burning hot and there's plenty of water in the glass, so right on schedule Brinkmoeller whistles off and cracks open the throttle of the lively and capable 4-6-0. Commuter train no. 507 will be shown leaving for New York promptly at 6:12 a.m. as advertised.

An eclectic mix of motive power: Fairbanks-Morse H16-44 no. 1509 (left), G5 4-6-0 no. 24, and Alco RS-1 no. 465 bask in the afternoon sun at Oyster Bay, N.Y., in 1952.

## **A tour of Oyster Bay**

Train 507 is the first of more than 20 trains scheduled to arrive or depart on a typical weekday from this compact yard, detailed in fig. 1. Located 35 miles east of Manhattan (see the map on page 60), Oyster Bay sits on Long Island Sound at the end of a single-track branch. Fig. 2 is a drawing based on Sanborn fire insurance maps showing the track and structure arrangement that prevailed in the 1920s.

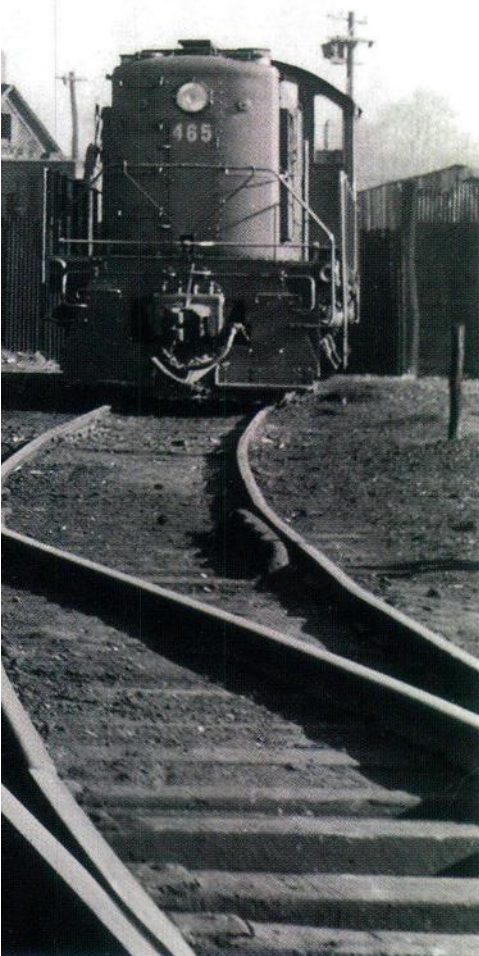
This branch was completed in 1889 and handles more than 150 trains each week, excluding freights and extras. It also serves as a storage site for 50 to 80 pieces of commuter equipment.

Approaching from the west, the branch crosses Mill Race on a masonry arch bridge that dates to the branch's earliest days. As the line crosses Bay-side and Shore avenues, the harbor is only a quarter mile away. The depot, built in 1902 to replace an earlier wooden structure located a bit to the west, sits south of the tracks. To its north is the storage yard and Roosevelt Memorial Park, a destination for city dwellers seeking a day in the sun.

The yard itself is of the familiar tree pattern branching off the main track. The runaround track accommodates the longest commuter train, and the five-track coach yard is ample for local requirements. Two team tracks are at the south edge of the terminal, with the remaining trackage comprising the turntable lead, engine servicing facilities and storage tracks, and the customer sidings. [See the box “Customers at Oyster Bay” on page 63.]

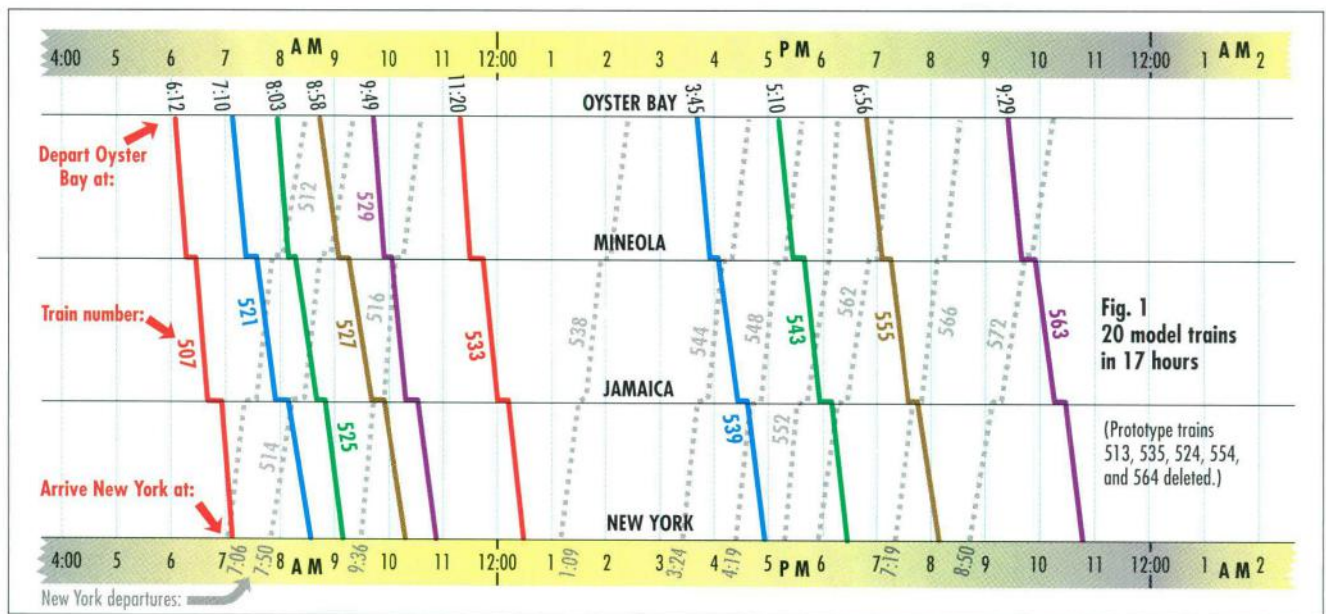
## **Layout design**

As I studied Oyster Bay, it struck me that little selective compression would be needed to build an accurate Layout Design Element – that is, a segment of a model railroad that faithfully reflects the appearance and operating patterns of its prototype. With its simple yard throat, few sidings, and small engine terminal, it is an ideal candidate for an along-the-wall shelf plan.



J. P. Sommer, David Keller collection





These two 1952 views of Oyster Bay look east. The depot is barely visible to the right of the water tower in the view at left. The closer view from the depot platform shows the 2006, one of the LIRR's nine FM CPA20-5s, peeking out from behind the Railway Express Agency building.



My plan allows for a four-track storage yard holding 15 to 20 HO commuter coaches. That's enough to make up the first three trains leaving Oyster Bay for the Big Apple. The runaround is long enough for a six-car commuter train using full-length 85-foot cars, and the industrial sidings are scale length.

I reduced the length of the storage tracks and the distance from the depot to the westernmost shipyard area. I also reduced the width of the yard to 36" at the east end, which is as far back as anyone can comfortably reach.

## Operations

Westbound (toward New York City) trains on the Long Island, as on most railroads, are designated by odd numbers. Eastbounds are even.

Action would start on the modeled Oyster Bay in just the same way as it



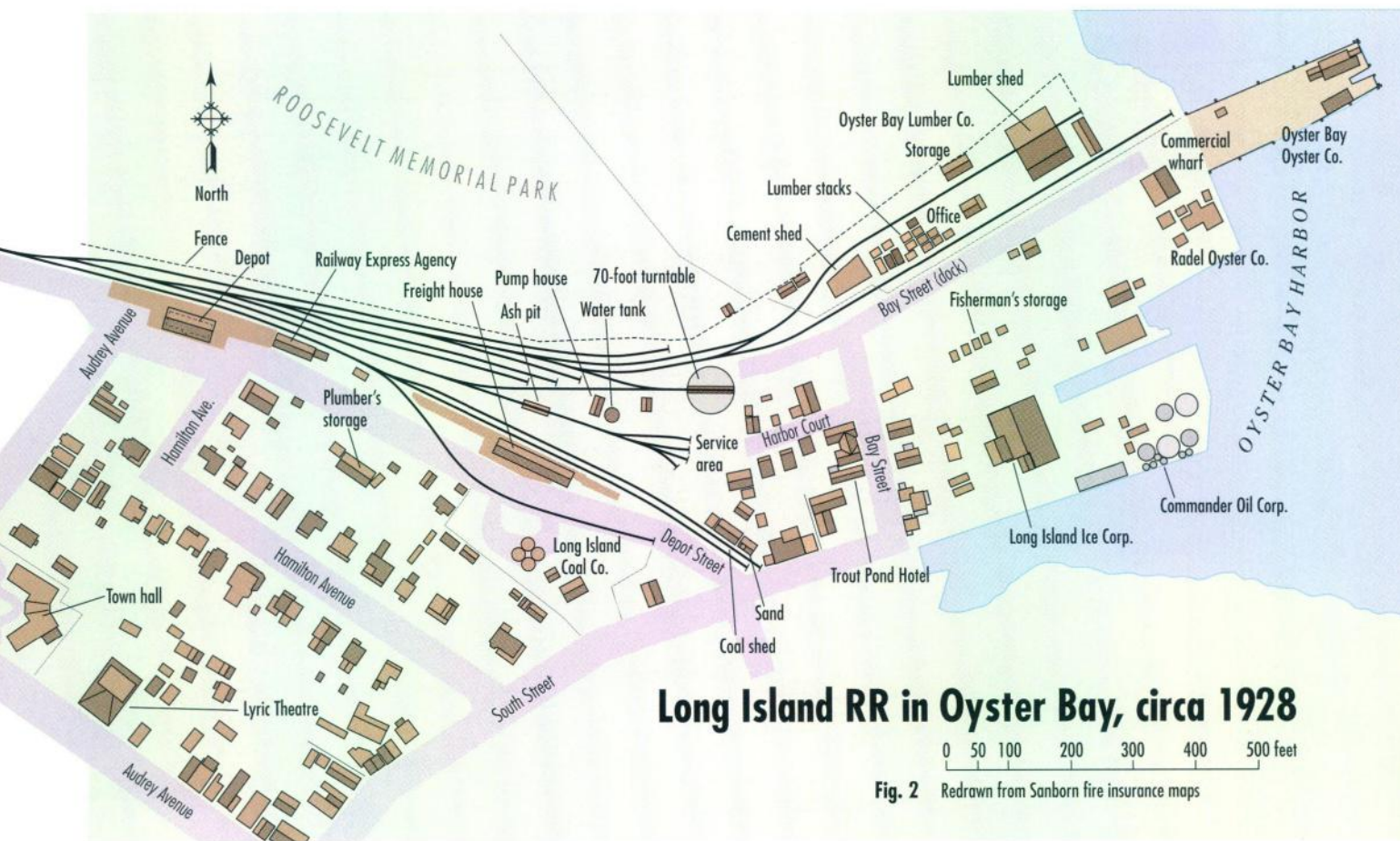


Fig. 2 Redrawn from Sanborn fire insurance maps

did on the prototype, with engines being prepared for their morning runs and trains being assembled. As shown in fig. 3, trains 521 and 525 leave about an hour apart, following 507's 6:12 departure. The action would continue to heat up as six trains arrive and depart about 30 minutes apart until the morning rush ends with the departure of no. 533 at 11:20 a.m.

The local freight has a three-hour window during the midday period without having to be concerned about clearing the main and runaround tracks. Likely as not, switching the various industries here will take a couple of fast-clock hours.

Starting in mid-afternoon, another 11 trains arrive or depart in a mirror image of the morning's pattern. The last train is 572, scheduled for a 10:06 p.m. arrival in Oyster Bay. The commuter coaches are spotted in the storage yard with a locomotive attached when it's cold outside, or simply uncoupled and left in the yard alone with the locomotives on the engine storage tracks.

That constitutes an 18-hour day with ten departures and ten arrivals, and a local freight to work the industries. Not bad for a small shelf layout.



Henry Maywald

No spit and polish here: Alco RS-1 461 rides the turntable at Oyster Bay as an LIRR G5 Ten-Wheeler waits for another westbound run on January 23, 1955.

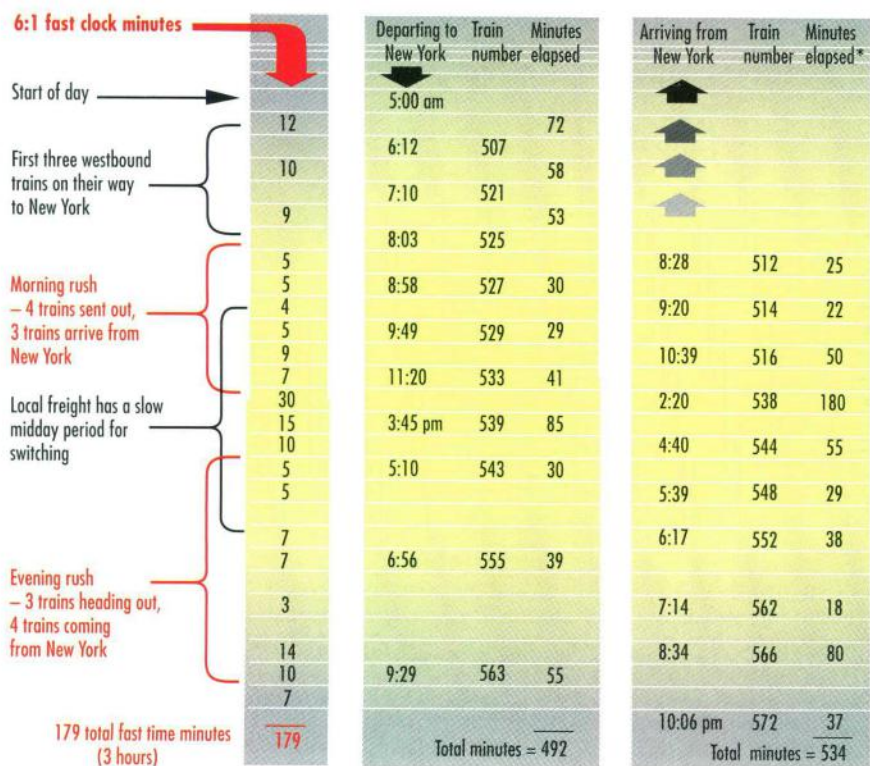
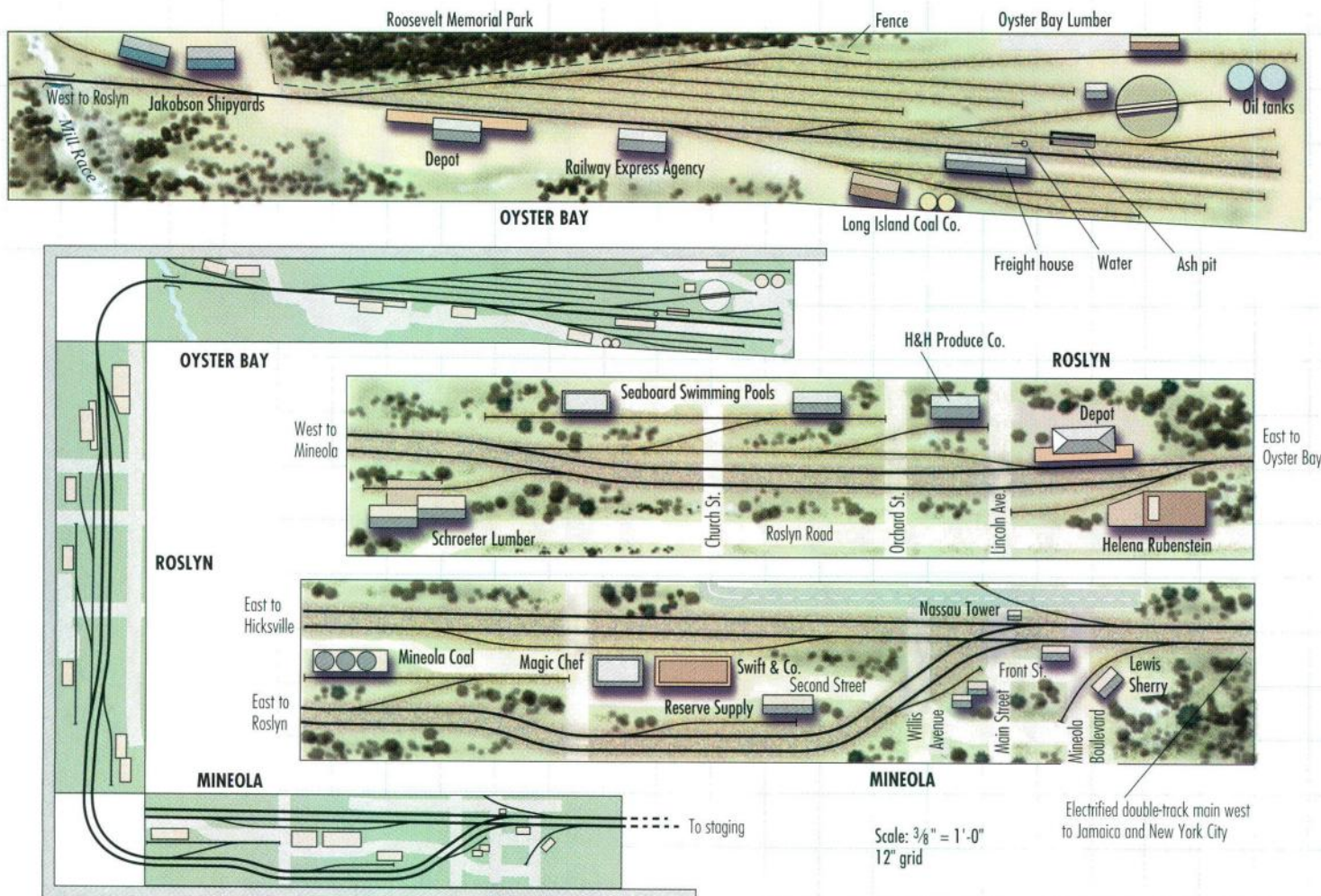
### Recycling the trains

One major objective was to balance westbound and eastbound train movements so as to recycle the consists. The first trio of morning westbounds returns later as eastbounds. Each inbound train can become another outbound by turning the locomotive. The last three eastbounds are stored overnight at Oyster Bay to become the

first three westbounds for the morning rush. A minimum of three trains with four to five coaches each can simulate the day's activities.

In HO scale, the Model Die Casting (Roundhouse) or the Bowser PRR 4-6-0 would make a reasonable starting point for an LIRR G5. Leased PRR K4s, perhaps Bachmann's retooled Spectrum 4-6-2s, might do in a pinch, but





## Learning points

- Mixing frequent commuter trains with local freights on a single-track branch line is a sure way to provide lots of morning and afternoon action.
- Look-alike commuter trains can be recycled via a return loop or fiddle yard to save on storage and equipment needs.
- The steam-to-diesel transition era on the Long Island RR offers a mix of small Pennsy-style steam with Alco and exotic Fairbanks-Morse cab and hood units.
- Using LDEs, which are condensed but recognizable versions of actual towns and other rail facilities, ensures that the model will look and operate like its prototype.
- Historic Sanborn fire insurance maps provide considerable information on the track and structures in many cities and towns, although the number of tracks and their locations may be simplified in complex areas.

Fig. 3 Condensed Oyster Bay model schedule

Total real hours: 17.1 (5:00 am – 10:06 pm)  
\* Elapsed time since last arrival or departure



## Customers at Oyster Bay

- Jakobson Shipyards, which built several LIRR tugboats, has a three-car capacity and receives incoming parts in boxcars and lumber and crates on flatcars.
- Long Island Coal Co., a coal and heating-oil supplier, can accommodate up to five inbound hopper and tank cars.
- Oyster Bay Lumber has a five-car capacity for inbound lumber loads, paint, and other building supplies in boxcars.
- Oyster Bay Oyster Co. ships iced shellfish to New York markets.
- The free-lanced Water Barge Oil Terminal is a loading facility for outbound tank cars.
- Team and house tracks accommodate miscellaneous and less-than-carload-lot shipments for customers that don't have rail sidings. A hopper was occasionally spotted on the east end of the back fence track so oyster and clam shells could be loaded for use in road construction. — *Steve Lynch*

they were too large for bridges and curves on this branch. Freights should be handled by H6 or H10 2-8-0s.

Steam power got help during the transition era from Fairbanks-Morse H16-44s and CPA20-5 C-Liners (four-wheel trucks up front, six-wheel trucks on the rear) plus Alco RS-1 and RS-3 hood units. The Long Island RR also acquired a Budd RDC-1 3101 and RDC-2 3121 in 1955, and steam's reign ended that October.

## Expanding the railroad

Points west of the Oyster Bay terminus could be represented by a fiddle yard, where consists would be turned in real time for the trip back east. A return loop would allow turning entire consists without fiddling.

Between Oyster Bay and staging, the railroad could grow by building Layout Design Elements representing Roslyn and Mineola's Nassau Tower, where the west end of the branch joins the electrified double-track main line. Mineola is located 15 miles west of Oyster Bay. Like Oyster Bay, this area allows easy modeling with little compromise. Each new town would add work for the local and stops for the commuter trains on their way to and from a community that was Theodore Roosevelt's long-time home and "summer White House" during his presidency.



Don Wood

The influence of the Pennsylvania RR is clearly evident as G5 no. 24, one of only a handful of LIRR 4-6-0s with the air reservoir mounted on the pilot beam, gets the once-over at Oyster Bay in 1954, the last full year of steam-powered operations.



William E. Warden, Jr.

Nassau Tower stands on the south side of the electrified double-track main in Mineola, N.Y., with the Oyster Bay branch peeling off to the north at left. The Alco S-1 switcher is heading south toward Garden City with local work as a commuter train from Port Jefferson races toward Manhattan on the westbound main in March 1953.

For more information, visit the Web site at [www.trainsarefun.com/lirr/lirrcontents.htm](http://www.trainsarefun.com/lirr/lirrcontents.htm). MRP

*Steve Lynch, who now lives in Valrico, Fla., has spent the past 30 years in*

*the computer industry. He and wife Linda have three daughters. His prototype free-lanced New York & Western is based on LIRR freight operations and locales. His other rail-oriented activities include photography and Web site design.*



# The climb over Cajon

*As this HO layout gets higher, so does the floor*

**By Ted York**

Photos by the author







I decided I would model the Atchison, Topeka & Santa Fe line through Cajon Pass after a visit to that area in the mid-1990s. The scenery was even more spectacular than I'd imagined, there was lots of traffic, and it was exciting to watch trains working hard to climb up to Summit at the top of the grade.

The Santa Fe originally built a single track through the pass, with a grade of 3 percent above Cajon station. Between 1910 and 1913, a second track was added from San Bernardino to Summit. To hold the eastbound grade to the same 2.2 percent as the lower part of the pass, the new line diverges from the first track at the upper end of Cajon. The new track forms a horseshoe curve through striking sandstone formations, and this nearly 180-degree loop gains most of the distance needed to maintain the easier climb. The horseshoe became known as Sullivan's Curve, in honor of Herb Sullivan, a citrus rancher and a pioneer railfan photographer of the 1930s and '40s.

Trains run left-handed out of San Bernardino to take advantage of the lesser grade. The separate grades come together just below Summit, and the tracks run side-by-side again through Frost, where a flyover was built to return trains to conventional right-hand running. Westbound trains

1. A 100-class diesel locomotive, an Electro-Motive FT, **left**, fights an eastbound perishable train up the grade above Sullivan's Curve on the way to Summit as the 3800-class 2-10-2, **above**, pushes on the other end of the train. This is the main attraction of operations on Ted York's HO scale Cajon Pass layout.

continued to descend the 3 percent grade of the original line, which was designated the westward track.

I chose to model the line from San Bernardino to Summit during the transition from steam to diesel power. Although I never got to see steam in action in Cajon Pass during the days when steam and early diesel locomotives struggled to cope with an increase of 2,700 feet of elevation in 25 miles, I could re-create those days in 1:87 proportion in my basement.

### Helper theme

The operational theme for a railroad based on the climb over Cajon Pass is helper service. What makes my layout different from many other model railroads is that, aside from the yards at Summit and San Bernardino (the two onstage end points), the entire main line is the climb up the west side of the pass. There is no





2. Engine 1653, one of the Santa Fe's earlier 2-10-2s, assists train no. 8, the *Fast Mail Express*, over Cajon Creek at Devore on the long climb to the top of Cajon Pass.

descent on the east side of the pass or a helix climbing to a second deck.

My goal was a linear railroad that started at the bottom of the grade and ended at the top with nothing but the climb in between. I wanted engineers to be able to stay with their trains so they could maintain realistic speeds and keep a close eye on the trains during pusher operations. Eventually they

will also have to observe automatic block signals at trackside.

### The vertical challenge

Scaling Cajon Pass down exactly to HO proportions would require a 31-foot elevation change and a 1,500-foot main line, a bit impractical for a home layout. The HO version in my basement was therefore compressed to about three scale miles of climbing main line, but even then maintaining a 2.2 percent grade would gain 48" in elevation! I'd either have to start low and end high or find a more innovative approach to layout design.

Duplicating the exciting operations of Cajon Pass was my main objective. Dealing with the steep grade to Summit and the associated altitude gain was just one of several challenges that ensued. The layout's design started out pretty much like any other in that the track plan was developed by molding my goals to fit the available space. I developed standards for minimum radius and so on, then began moving circles and lines around my computer screen using Sandia Software's Cadrail to see what fit where.

A couple of the design goals I set myself affected how I handled the ver-





tical dimension. The first was my desire for a walkaround plan so engineers could stay next to their trains. The second was 18-foot passing tracks to accommodate trains that looked long enough to need a pusher.

In designing a walkaround layout I gave a lot of consideration to human factors – aisle widths and track locations along the aisleway. Less obvious but equally important was the height of the railroad above the floor. I started out by settling on the elevation for the lowest part of the railroad, the yard at San Bernardino, and that led to the first compromise.

I'm 6'-2", which means an ideal eye-level viewing height for me is in the 62" to 66" range, perhaps a bit lower to make it easier to reach across the layout to uncouple cars or line switches. But starting at that height and climbing 48" to Summit would push the top of the hill through the ceiling of the basement. Starting much closer to the floor to achieve the full 48" climb would have forced me to view San Bernardino on my hands and knees.

I considered using a benchwork level of 28" with yard operators seated in chairs. That seemed promising until I remembered that my San Bernardino yard would be 56 feet long, and that much of the parallel aisle would be fairly narrow. Chairs would be major roadblocks for road crews trying to get by yard crews. Moreover, yard crews would need to move around a lot, which even caster-equipped chairs wouldn't accommodate.

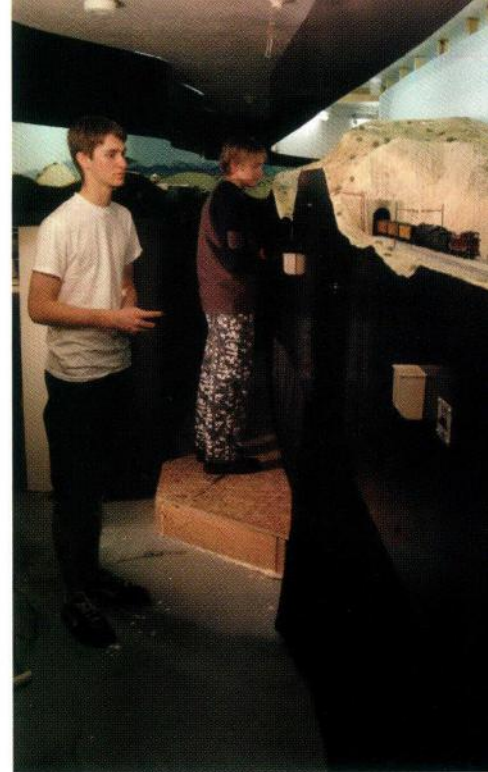
I finally decided on 44" for the lowest level. That height would not permit the 48" climb I wanted, but it did allow a decent amount of height gain to the summit while providing a reasonable view of the railroad at its lowest point. As it turned out, viewing the yard from the resulting higher angle makes it easier to handle switching chores. The 44" height also allows me to reach across the 30"-wide benchwork to uncouple or rerail cars, clean track, or whatever.

### How high is too high?

With the lowest level established, I turned to the task of setting the maximum height. One of the most important concerns turned out to be lighting. I planned to use fluorescent lights placed over the benchwork for layout illumination, with track lights along the aisle to highlight key areas. A 66" railroad elevation left 27" between the track and the ceiling, which worked out well. Less vertical distance would have required spotlights over the aisles angled close to horizontal, lighting the layout from the side rather than from the top.

Another important consideration was the ability to get my head between the layout and the ceiling, with lighting fixtures installed, to work on the railroad. This might not be much of a factor for a very narrow layout, which mine is not. At Summit, for example, I needed enough depth for five tracks and a wye. And even where the layout is only 20" wide, I still found it necessary to lean into the scene when I was handlaying track.

One additional problem affecting the height of the railroad was that the



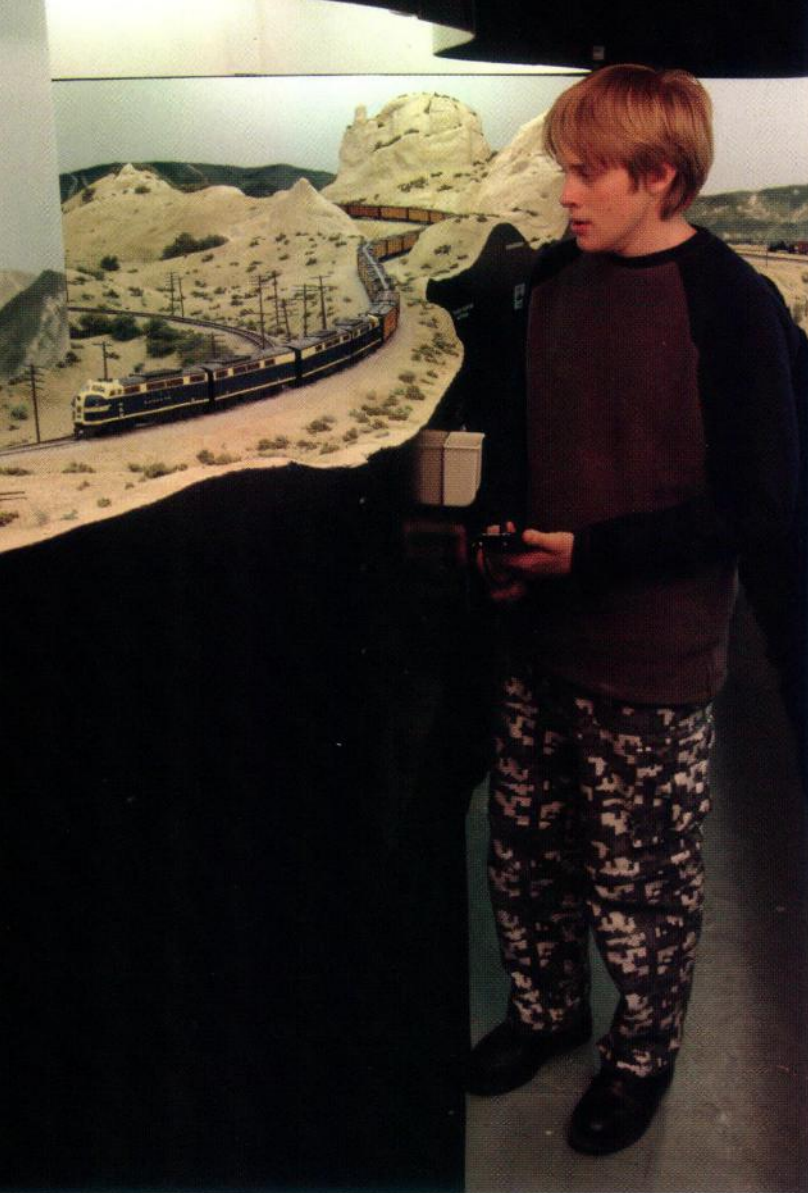
3. The height advantage gained by raising the aisleway floor is apparent as the author's sons Elliott (left) and Shawn handle a train through the tunnels just above Alray.

ceiling drops to about 11" above parts of the Summit yard because of a header that spans two load-bearing walls and an air-conditioning duct that parallels the header. In spite of the access and lighting concerns this caused, I thought preserving the climb to Summit was more important than having a more generous amount of headroom above that relatively short four-foot section of the yard.

The 66" height at Summit did generate a problem I ignored until I started gearing up for operating sessions. Although I had a nice eye-level view of the railroad here, trains close to the aisle blocked the view of trains on tracks farther back. It was also hard to see the position of switch points. This might not be much of a problem on an isolated stretch of main line, but Summit has two mains with crossovers, two passing sidings, a couple of spurs, and a turning wye.

Summit isn't large, but it's busy. Eastbound trains that have just topped the hill must cut out their pushers, and that requires backing the caboose into the engine track, moving the helper out of the way, then recoupling the caboose to the train. After the train leaves, the helper must zig-zag through several crossovers to get to the stock track on the far side, then turn on the wye to return to San Bernardino.





4. The black hardboard fascia and valance frame the railroad's arid California scenery as Shawn runs an eastward train at Pine Lodge.

A lot of mainline traffic passes through Summit, and the trains often need to use the crossovers. East- and westbound Santa Fe way freights also switch the spurs there. Clearly, shorter operators would have a tough time seeing what they need to see.

### Steps or raised floor?

My first thought was to buy or build portable steps. But even more than in San Bernardino, crews would need to walk some distance along the aisle, so moving on, off, and around the steps would be awkward, perhaps dangerous. Running a narrow permanent platform along the length of the yard didn't seem a good idea, either, because of the already narrow aisleway.

A better solution was to raise the entire floor around Summit, but as

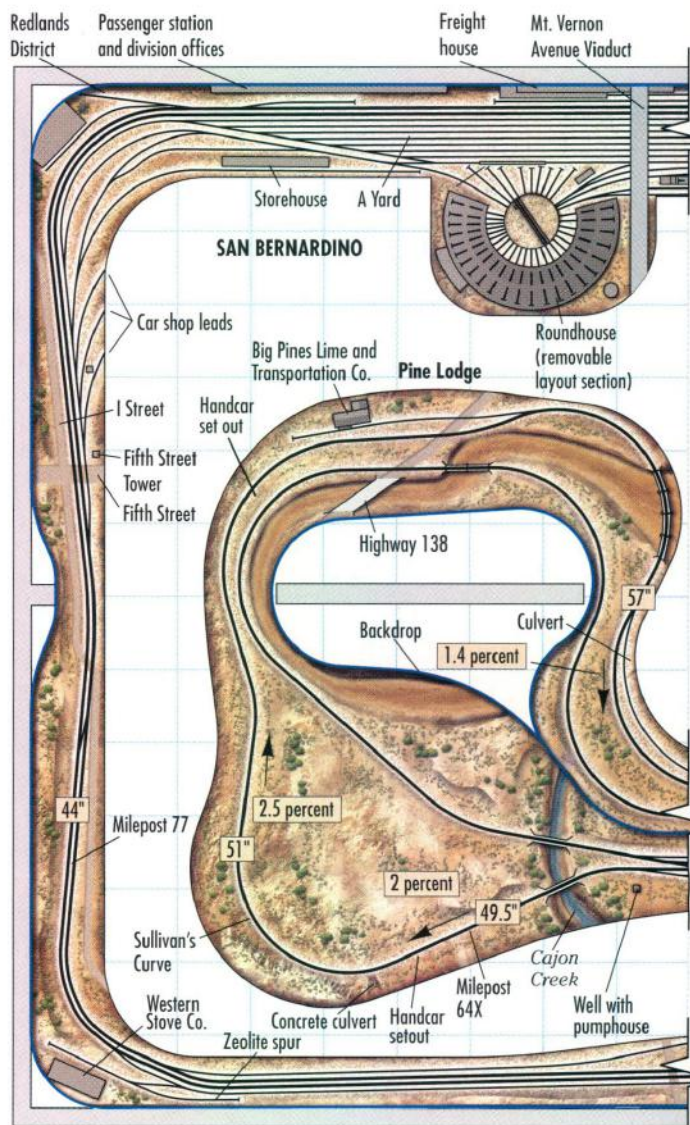
always there were other considerations. I had already built workbenches under this part of the benchwork, and raising the floor would make it impossible to put a chair in front of a bench. I finally gave up on the idea of workbenches under Summit.

As things turned out, raising the floor was a great decision. Not only is it easier for shorter crew members to run the railroad but, much to my delight, being on the raised floor actually enhances the feeling of being up in the mountains with the trains.

I used 2 x 8s for floor joists and  $\frac{3}{4}$ " chipboard decking. That produced an  $8\frac{3}{4}$ " rise above the basement floor. I laid out a perimeter of 2 x 8s, then put joists 12" apart inside the frame. I used screws and construction adhesive to assemble the floor structure.

### Laying out the grade

With the two end points set, you might think that all I had left to do was lay in a steady grade and call it a day.

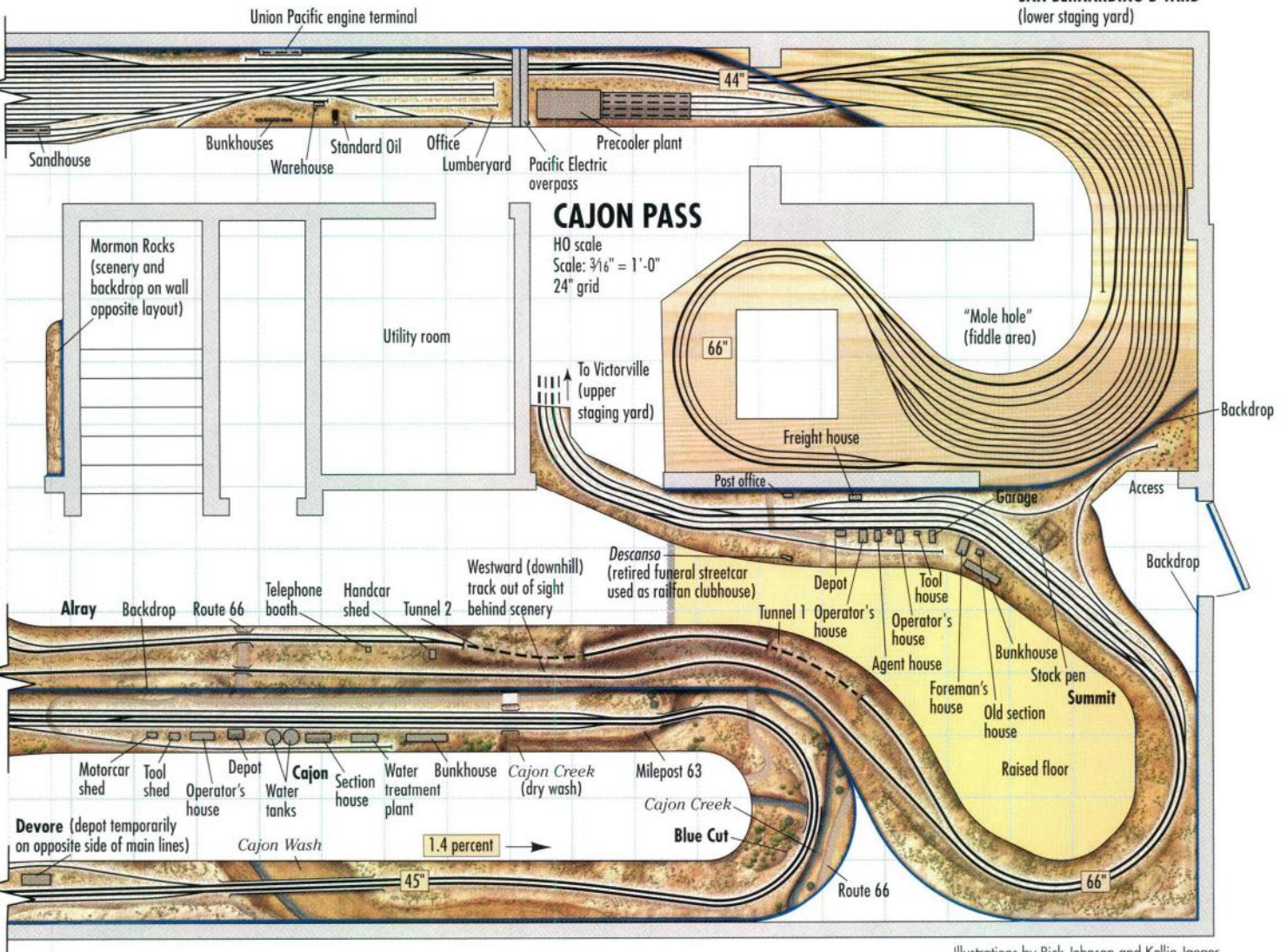


Unfortunately, thanks to the required compression of vertical distance, a steady grade between the ends of the model railroad would not have come close to matching the grades that are still a signature of Cajon Pass. What I decided on was a short stretch of my maximum 2.5 percent grade with the remainder a combination of less-severe grades or level track.

The long sidings, which accommodate 16-foot trains of about 24 40-foot cars plus an A-B-B-A diesel, a 2-10-2 pusher, and a caboose, were part of the solution. I had room for three passing tracks along the line to Summit, two of them with spurs and depots.

I kept the grade level through the two sidings with spurs to prevent run-aways while switching cars. Most of the third siding, at Alray, is on a grade for esthetic reasons, but enough of the uphill end is level to aid in switching the lime plant at Pine Lodge. In all, this amounted to 45 feet of level track between San Bernardino and Summit,

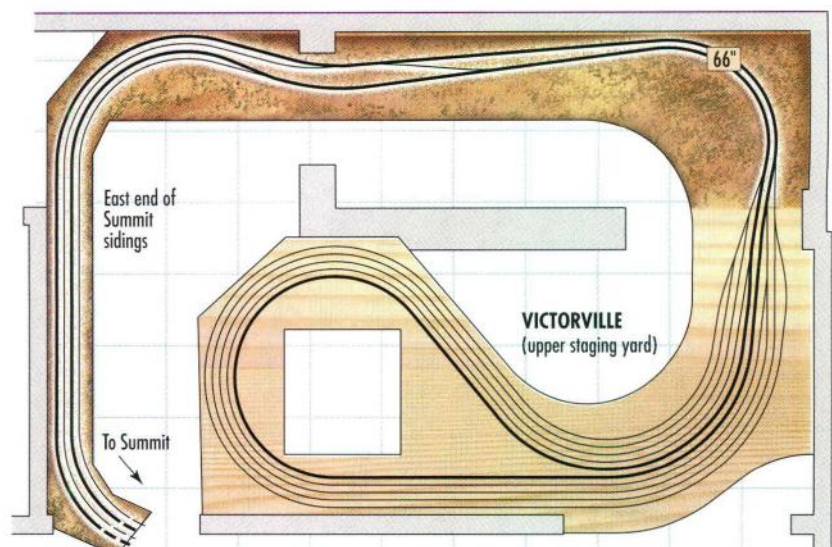




Illustrations by Rick Johnson and Kellie Jaeger

## The layout at a glance

**Name:** Cajon Pass  
**Scale:** HO (1:87.1)  
**Size:** 28 x 56 feet  
**Prototype:** Atchison, Topeka & Santa Fe,  
First District of the Los Angeles Division  
**Locale:** Southern California  
**Period:** late 1940s to early 1950s  
**Layout style:** linear walkaround  
**Layout heights:** 44" to 66"  
**Benchwork:** L girder and conventional grid  
**Roadbed:** pine lath on hardboard spline or  
1/2" plywood  
**Track:** handlaid code 83, 70, and 55  
**Length of mainline run:** 280 feet  
**Turnout minimums:** no. 8 on main, 6 elsewhere  
**Minimum curve radius:** 36"  
**Maximum grade:** 2.5 percent  
**Scenery construction:** plaster on cheese-cloth over  
cardboard webbing  
**Backdrop construction:** Masonite hardboard  
**Control:** Digitrax Digital Command Control (DCC)  
with radio wireless throttles







5. The dynamic brake fans are howling as this red-nosed 16-class F3 eases no.123, the *Grand Canyon*, downgrade at Cajon.

### Learning points

- Modeling a mountain railroad's grades realistically within the confines of the railroad room is as challenging as compressing the length of its main line.
- Raising the floor may be a more practical, and safer, alternative than raised platforms or stools.
- Lighting requirements change as the layout's track level gets closer to the ceiling.
- A wireless command control system complements the railroad's design by allowing crew members to stay with their locomotives and operate them realistically.

which let me increase the steepness of the grade elsewhere.

I actually put a slight drop in the main starting out of San Bernardino to increase the total length of the climb. Then there's a grade of 1 percent to the first passing siding at Devore, which is level. Leaving Devore, the grade increases to 1.5 percent until it reaches Cajon, where it levels again.

Out of Cajon, trains encounter the steepest portion of the line with grades up to 2.5 percent. This is a bit steeper than the prototype but a good compromise to ensure that helpers are really needed. At Alray the grade drops back to 1.4 percent, and it continues at that slope until reaching an elevation of 66' just before it gets to Summit.

These grade variations turned out to enhance operating interest. Road engines and helpers are run by separate crews, so the two hoggers must work together to maintain speed and keep slack in the middle of the train.

Any tension in the train between road and helper engines can result in stringlining the train on a curve.

### Benchwork

The steady climb to Summit presented some construction challenges. I wanted the benchwork to climb along with the railroad rather than being built all on one level with ever-taller risers. In the middle of the climb is a large peninsula divided by a backdrop; there is a foot or more of elevation difference between the two sides.

I started benchwork construction at the east end of San Bernardino yard using L girders left over from a previous layout. As I built past Devore, I left the girders level and used longer risers. As the track turns toward Cajon and enters the peninsula, I raised the L girders to coincide with the new elevation and maintained that level throughout the peninsula. This required high risers along the Alray side.





I did raise the L girders one more time where the tracks make a sweeping S-turn into Summit. From Summit the benchwork changes to conventional grid, as it allowed thinner framing to minimize three "lean-unders" where people have to pass below the tracks. Finally, the upper staging yard was stacked directly over the lower staging yard, so a thinner benchwork profile was helpful for that reason as well.

### Layout lighting

I found that I had to adjust the lighting as the layout got closer to the ceiling. I started out with double-tube fluorescent fixtures spaced 2'-6" apart in the lower areas. I changed to single-tube fixtures spaced a foot apart between Sullivan's Curve and Pine Lodge. The ceiling and the backs of the valances are painted white to help reflect light.

Fluorescents provide a lot of even light but little heat at low cost. I used

cool-white tubes. Since I installed valances, I did not add track lighting to highlight scenes as originally intended.

### Take two

There are a couple of things I'd do differently if I were starting over. For example, I considered using engineered plywood I-beams called TGLs but didn't. After seeing how Lee Nicholas used them to span long distances on his Utah Colorado Western, however, I'd definitely use them instead of L girders to reduce the number of legs. The TGLs are also more stable than dimensional lumber. One tip: Be sure you have room to get the longest beams into your train room, especially if it's in the basement!

I also would build a 2 x 4 stud wall down the center of the peninsula, then hang the benchwork off either side at the appropriate elevations. This would have precluded the use of long risers at Alray while making it easier to work under the benchwork as well as providing better access to hidden track in that area.

I am converting to DCC wireless (radio) throttles. They offer as big an improvement in enjoyable and realistic train control as switching from DC to DCC. Engineers never have to worry that they might need to make a speed change while their cabs are unplugged, which can lead to a hurried search for the next cab-cable socket.

### What goes up . . .

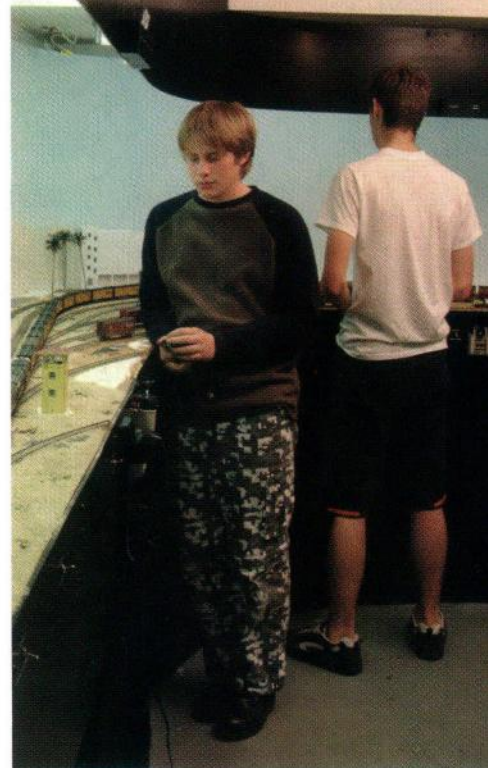
One parting thought about mountain railroading: Everyone worries about getting trains up the mountain, but it turns out that the bigger problem is that some locomotives have trouble handling long trains on downgrades. Several of my engines bucked coming down the pass, which was very frustrating and unrealistic.

This problem is usually caused by too much end-play along the worm shaft; even as little as .005" can cause problems. On the advice of some more mechanically inclined friends, I purchased several packages of .005" and .010" thrust washers from NorthWest Short Line.

If a locomotive bucks, I pop off the gearbox cover and slide washers with appropriate-size holes onto the worm shaft, in between the worm and the bearings. With the extra play taken out, engines and trains can descend the grade smoothly.

### Time machine

That all the mental machinations and construction pains were worth it



6. The lowest level of the railroad is San Bernardino at 44", an excellent height for working in the yard while standing and a reasonable height for viewing the railroad.

became evident when a group of experienced model railroad operators came to town. I was able to sit back and watch these veterans bring the railroad to life. It was like being in a time machine as steam pushers shoved freights headed by carbody diesel units up the hill.

I watched freights move into sidings to allow scheduled passenger trains to slide by. Freights pounding up the mountain passed their westbound counterparts creeping downhill with dynamic brake fans howling.

At Summit, I saw helpers cut off, turn on the wye, and then drift back down to San Bernardino before helping yet another manifest over Cajon Pass. Half a century had passed since railroaders and railfans could see such action in the mountains of Southern California, but here in my basement it was happening once again.

Yep, it was definitely worth the time and effort! MRP

*Ted York's dad gave him a Lionel set for his first Christmas – one day after he was born! Following a hiatus for college and the birth of a son of his own, Ted returned to the hobby, starting his current layout eight years ago. He's an airline captain and lives with wife Tracy and seven of their eight children in the Salt Lake City area.*



# X-factor staging

*It adds flexibility to stub-ended staging*

**By Byron Henderson**

Stub-end staging yards are compact and easy to build, but they lack some of the operational flexibility of through yards or those that loop back on themselves. The latter two approaches make it easier to reuse complete consists during an operating session, although ensuring that open-top loads continue in the proper direction over the main line can be a problem with loop staging.

So let's give stub-end staging yards a closer look, as they can provide more operational flexibility depending on where you locate them relative to the rest of the track plan. The idea is to have a pair of stub-end yards face each other across a short stretch of (typically) hidden track. At the small cost of backing moves through the yard throats, you can reuse consists during an operating session, more easily handle open-top loads, and/or restage the railroad more quickly between operating sessions.

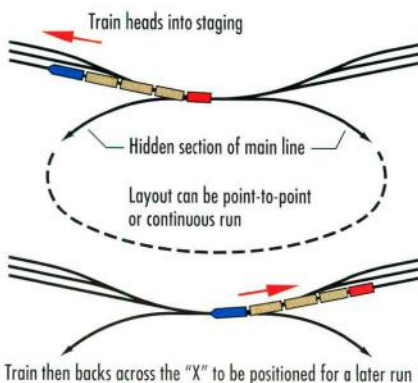
## X marks the spot

The term "X-factor" comes from the shape of the track plan schematic when both staging yards and the main line are viewed from above (fig. 1). You can see how this arrangement works by visualizing the movement of a train entering one staging yard from the main line.

With a conventional stub-end staging yard, that train in the illustration would be done for the day. Thanks to the X-shaped arrangement of the two staging yards, however, that train can be backed into the second staging

yard. It's then ready for reuse with the engine on the outbound end of the train. This avoids having to back loaded trains to their distant points of origin or move a lot of equipment around by hand.

By placing the X in the corner of a room, it's easy to make the staging yard turnouts accessible, yet hidden from view behind removable backdrops or structures. A tall fascia could also be used to conceal the X and associated staging-yard throats. With the X in the corner and the staging yards extending along the adjacent walls, the truly hidden trackage can simply be straight tracks along the wall, minimizing derailment potential and maintenance. A slight downgrade through the yard throats and to the end of the staging tracks may make these backing movements more trouble-free.



**Fig. 1 X-FACTOR STAGING**

## During or between sessions

Trains that head into a staging yard after completing their visible runs could be held there for the rest of the operating "day" and restaged between sessions by backing them a short distance into the other staging yard through the crux of the X. However, you'll get more use out of your equipment if you back trains out of one staging yard into the adjoining one during a session. This ensures that open-top loads are moving in the proper direction – say, coal east toward tidewater or sugar beets to a sugar refinery – and allows you to reuse passenger trains with their relatively high-cost consists in the same day.

The far (stub) ends of the staging tracks can also be made accessible, if desired, to make restaging easier. The addition of a sector plate or small turntable at the end of the staging tracks will also make it easier to vary staged consists between or during sessions.

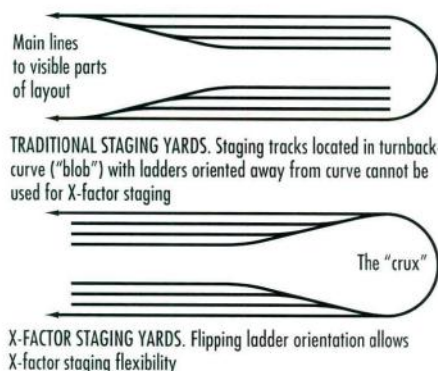
## X meets the blob

It may sound like a 1950s science-fiction thriller, but the idea of combining the X with a turnback loop, or blob (at least half a circle), is a way to get more out of your staging yards.

Note that when two stub-end staging yards are oriented with the ladders facing away from the turnback curve (fig. 2, top), there's no way to back a train from one yard to the other. But when the ladders are located next to the ends of the curve (fig. 2, bottom), the X-factor comes into play, and trains that enter one yard can be backed into the other and thus readied for reuse.

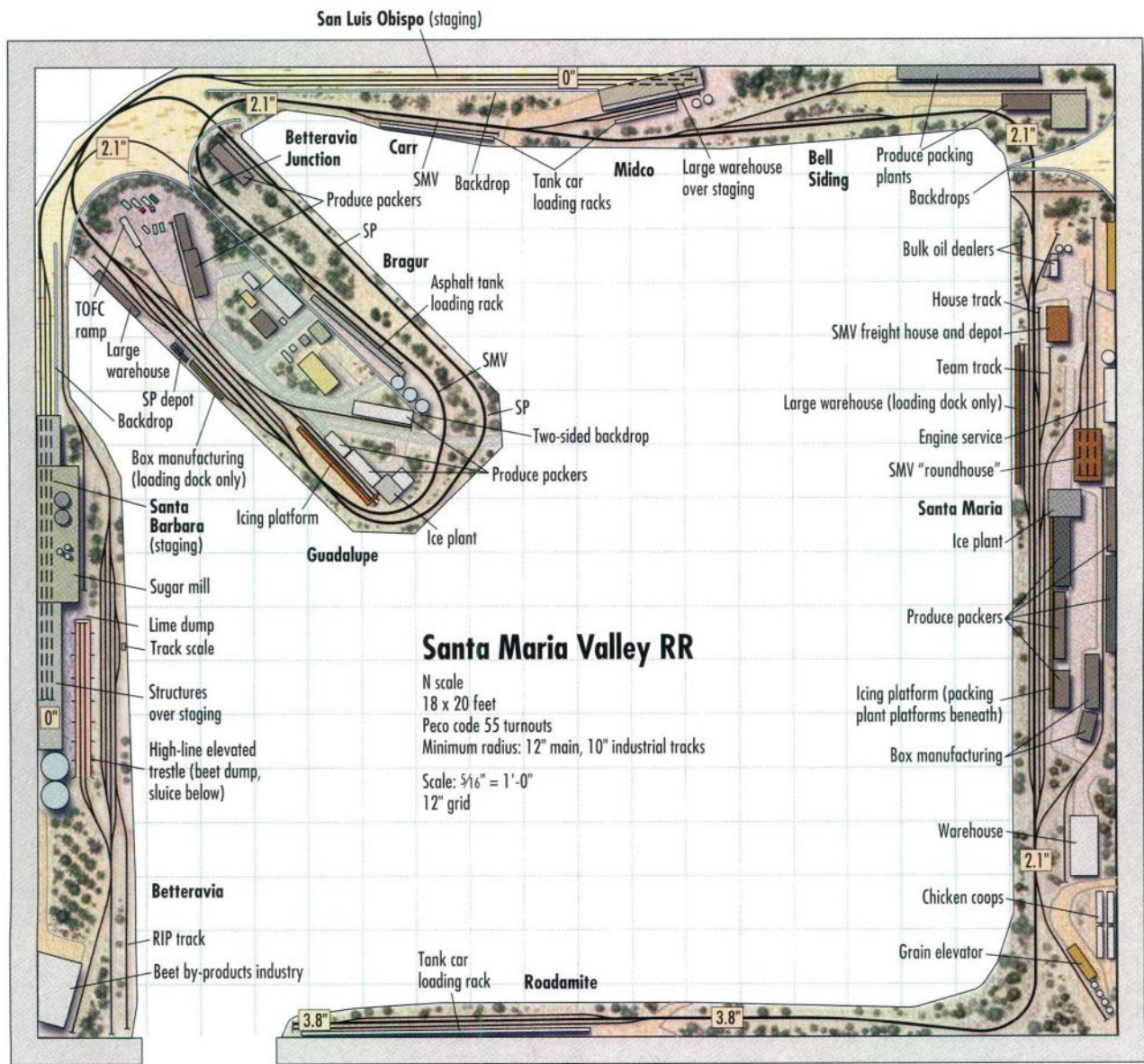
## Guadalupe on the SP

I first became aware of the potential of X-factor staging while helping a friend expand his N scale railroad into a larger area. The layout had to share



**Fig. 2 COMPARING TRADITIONAL AND X-FACTOR STAGING YARDS**





an 18 x 20-foot room with family activities, so most of it was confined to a narrow shelf around the room's perimeter. Space for the existing 4 x 10-foot layout was negotiated in a corner of the room.

One side of the existing layout already had a compact representation of the Southern Pacific's tracks in Guadalupe, Calif., which Patrick Flynn described in the September 1994 *Model Railroader*. But we needed something to put on the shelves around the room.

The obvious candidate was the Santa Maria Valley RR, which interchanged with the SP (now Union Pacific) in Guadalupe. The SMV offered a lot of character and was of a configuration, size, and scope that was ideal for the new space. Live interchange with the rest of the world would be provided by the SP, but my friend wanted more operations than simple

interchange moves. That meant we had to find a place to stage SP trains.

Since a large part of the layout was restricted to a narrow area around the room, we didn't see where we could put loop-type staging yards. A helix to staging on a lower level would have required more space and added to the construction complexity.

Then, one afternoon while I was drawing track plans, I sketched stub-end tracks along the left-hand and back walls of the room. My first thought was to cross the lead to an elevated staging yard over the lead to the other. Then — eureka! — it dawned on me that I could link the two yards at the same elevation and gain much more flexibility. This arrangement is shown in the track plan above.

Trains from Santa Barbara or San Luis Obispo, Calif., could pass through

Guadalupe on their way along the Coast Line. Many trains actually met their counterparts in the opposing direction in "SLO," so it would be natural to have passenger trains and other consists back across the crux of the X to reappear as their opposite number.

Peco's code 55 curved turnouts proved to be space-savers for the X connection. A small opening in the corner of the room, along with removable view blocks in the front, provided access for maintenance.

### Benefits for small layouts

Even small shelf switching layouts can benefit from X-factor staging. For example, the two legs of the layout connected by the X-shaped staging yard approaches can represent different parts of one switching district. In that case, trains coming into the scene



## Expanding an existing layout

The Santa Maria Valley RR offers an interesting counterpoint to the mainline Southern Pacific (now Union Pacific) with which it interchanged in Guadalupe, Calif. The short line handled tens of thousands of cars per year to and from the SP, delivering loads to customers along approximately 30 miles of main and branch lines. The SMV operated some steam power in regular service until 1962. Thanks to the largesse of its wealthy owner, Captain Alan Hancock, the railroad's steam locomotives were better maintained and equipped than many of their Class 1 counterparts.

The N scale track plan on page 73 represents the Santa Maria Valley RR during the 1950s. The layout was designed to make use of a previously constructed 4 x 10-foot layout loosely based on Guadalupe, Calif. It included a number of produce packing houses and a long icing platform.

The SP main line entered at the left of the scene from San Luis Obispo. Like the prototype, the N scale SMV interchanged with the SP in the Guadalupe yard. From there, the SMV and SP split, and the SMV began to climb – more steeply than on the prototype – to clear the SP tracks that head back to the “X” and on to Santa Barbara staging along the left wall.

The prototype Santa Maria Valley RR split at Betteravia Junction. However, to fit the layout in the space available, the 1:160-proportion tracks went in opposite directions compared to the real ones. A large, free-lanced packing shed on the SP helped disguise the SMV's exit behind the view block.

The line branching to the left turned back in the corner, passing over the SP, and ran to the large sugar factory at Betteravia. The yard was jammed during beet season with the SP's beet racks – gondolas with wooden extensions. Outbound bagged sugar moved in boxcars, and a few loads of lime were also delivered for use in the sugar-refining process. Both the beets and the lime were delivered via an elevated trestle.

The Sinton-Brown plant that processed beet by-products was represented as well, although its actual location should have

been in the aisle. The RIP (repair-in-place) track was quite busy in later years, an interesting scene that was a bit of an anachronism on this 1950s layout. In the other direction, the SMV served oil-related businesses at Carr and Midco and branched out to reach the produce packers on Bell Siding.

Passing through a pair of curved view blocks, the SMV entered Santa Maria. A number of industries were served here, with emphasis on agricultural customers. The large SP Milling warehouse was represented by the loading dock and assumed to be in the aisle. The icing platform in Santa Maria was a bit unusual, but efficient, in that the loading docks of several produce packers were situated below the icing deck.

The operating scheme for this layout was a little different from the norm. Segments of the layout were operated mostly independently and at different times. One operating session might have involved working the sugar mill, and the next session switching the yard in Santa Maria or assuming the role of the SP's Guadalupe switch crew. With a small group of operators, this worked well.

On the rare occasions when more people were available, the compact yard at Guadalupe became a bit congested. The tracks weren't long enough to remain fluid during busy operating sessions. This compromise avoided impinging on political boundaries in the room and allowed part of the previous layout to be reused. Extending the peninsula to allow a larger yard in Guadalupe would have been ideal had the space been available.

A household move meant the layout had to be dismantled, but it lasted long enough to test the X-factor concept. The staging tracks were built with a slight downgrade and worked reliably, even when backing long trains of N scale cars with truck-mounted couplers.

More information on the prototype SMV can be found at the Santa Maria Valley Railway Historical Museum at [www.smvhrm.org/history.html](http://www.smvhrm.org/history.html). – B.H.

may be from interchanging foreign railroads or the main line of the same road depicted on the layout. In fact, the scenes on the separate shelves need not be linked on the visible layout. Their connection can be simulated through the movement of trains from the staging yard.

### Always a catch . . .

While X-factor staging is useful, it doesn't work everywhere. Large point-to-point layouts often require staging at locations distant from one another. On some smaller railroads the layout's schematic and available room may dictate staging-yard locations not suitable for X-factor staging.

Moreover, the backing move across the crux of the X requires a conscious “model railroad thought,” so care should be exercised in assigning this role if trains are to be reused during an operating session.

If each operator is expected to manage his or her own train's path into and out of staging, switch-motor controls must be carefully thought out,

accessible, and intuitive in use. For busy layouts, care must be taken when dispatching trains through the crux of the X to avoid congestion – or collisions! Trains and trackwork must also be reliable so backing moves through the X can be made with confidence.

### An X for your design alphabet

It's likely that many layouts have been built with stub-end staging yards that face one another across a short section of track, so the basic arrangement of trackwork described here is not new. Employing that arrangement so as to allow the reuse of trains during an operating session while keeping open-top loads heading in the proper direction may, however, offer a new tool for your bag of track-planning tricks.

So why not take another look at the schematic of your existing or planned railroad to see if X really does mark the spot for your layout. MRP

*Byron Henderson lives in San Jose, Calif., where he works in high-tech marketing. His wife, Marian, and daughter,*

### Learning points

- X-factor staging allows relatively easy reuse of trains headed into stub-end staging tracks.
- X-factor staging maintains the proper directional orientation of open-top cars such as loaded hoppers headed to a port or power plant.
- This approach to staging requires that the two main staging yards be close to each other and that they be connected with a short length of unseen main line.
- Many layouts may already have, or can easily be modified to have, paired staging-yard orientations that can be adapted to use the X-factor concept.

*Claire, graciously ceded part of the garage for Byron's N scale layout. He's an active member of the National Model Railroad Association's Layout Design and Operations special interest groups.*



## Using 3rd PlanIt software

Although my original plan for the N scale Santa Maria Valley was drawn with pencil and paper, the version shown on page 73 was redone in *3rd PlanIt*, a model railroad-specific CAD (computer-aided drafting) program produced by El Dorado Software, PMB 196, 2222 Francisco Dr. #510, El Dorado Hills, CA 95762 ([www.TrackPlanning.com](http://www.TrackPlanning.com)).

I'm certainly not a "power user" of the program's 3-D rendering capabilities and other high-end features, but I find the program a good choice when precision is needed in laying out a track plan. What follows are some tools and techniques that I have found helpful when using *3rd PlanIt*.

### Before all else fails, read the instructions

*3rd PlanIt* isn't the first model railroad CAD program I've used, but it's the first for which I've actually read at least part of the manual. Reading the manual with a highlighter and a Post-it Notes pad in hand will save time later on. Also, take time to work through the on-line tutorial. While the tutorial may seem simple, it's a good, structured introduction to the program's capabilities.

### Scroll on

I used a PC and laptop with a standard mouse for my first few *3rd PlanIt* designs. For more recent work, I've used a trackball with a scroll wheel, which has increased my efficiency. Zooming in or out and navigating the screen is easier with the scroll wheel and the shift and control keys.

### Layer on those layers

Most of the CAD programs offer different "layers." Think of these as stacked overhead-projector transparencies. Overlapping layers creates a complete track plan.

I use separate layers for different elements: benchwork, track, callouts (labels), view blocks, structures, landforms, and roads. That makes it easier to keep things straight and, more important, to easily print different views highlighting specific aspects of the design that aren't cluttered with unwanted detail. It's not unusual for me to have nine or ten layers for a single-deck plan's final design.

The danger in using layers and switching freely between them is that it's easy to draw things on the wrong layers. If I get a better idea for a yard lead while I'm labeling structures, before I know it, I stick ten turnouts on the wrong layer. *3rd PlanIt* offers a way to avoid this using the "enable layers" pop-up box, which provides a check-box labeled "Allow only the active layer to be edited." While this requires me to switch between layers if I get a landscaping idea while arranging trackwork, it avoids confusion.

### Fix it, then flip it

*3rd PlanIt* makes it easy to draw parallel lines so you can work on complex track plans in any orientation (angle). But my brain works best when viewing yards and similar arrangements horizontally, and the program offers helpful methods to constrain lines to the vertical and horizontal planes if so desired. I therefore typically draw the tracks horizontally, group the elements, and rotate them to the final orientation.

### Size matters

Sometimes it's easier to get a feel for how something should be designed based on real-world dimensional references. I often switch back and forth between layout dimensions of inches and scale dimensions of feet using the units parameter in the *3rd PlanIt* settings window (found under the file menu). You may also flip between scale and actual dimensions by pressing Control-M.

After I've drawn a fairly substantial-looking building footprint, I'm sometimes surprised to find it scales out to, say, a mere 40 x 60 feet in the object data window. It's easy to lose scale perspective, especially when scrolling back and forth between different screen magnifications.

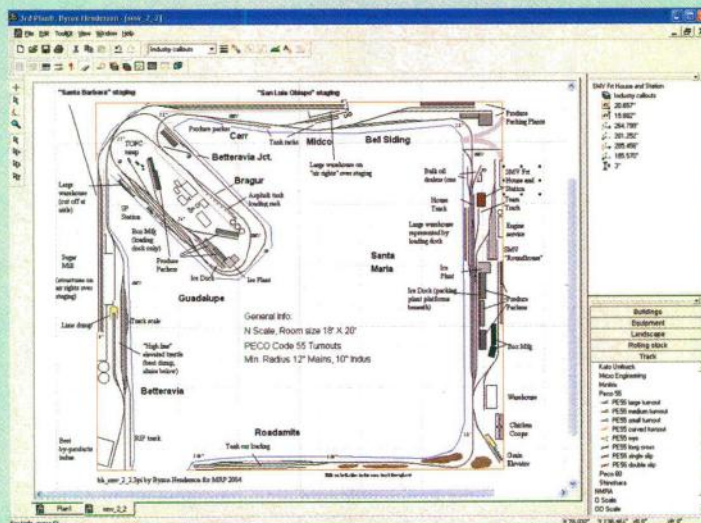
### Imitation isn't flattery, it's a necessity

One of my favorite capabilities in *3rd PlanIt* is the ease with which images from other sources can be placed into a drawing—from the ToolKit, select draw, then "place image." Drop an electronic graphic in the .jpg file format and use it as a template to draw trackwork or anything else.

I used a pencil sketch of the original design as well as scans of Sanborn fire-insurance maps, Santa Maria Valley RR Zone-Track-

Spot maps, and an aerial photo while I was working on the *3rd PlanIt* version of the SMV. I placed each of these in a different layer so I could work with each one in turn, then turn off that layer to reduce screen clutter when I no longer needed it.

Photoshop or other graphics programs can help you get imported files and images cleaned up for use as templates, but you can also shrink or expand the graphic from within *3rd PlanIt*. I like this feature because nothing is wasted, and a brainstorm captured in pencil on an envelope can be scanned and used as a template for a CAD design.



### Know when to say CAD

Like other CAD programs, *3rd PlanIt* provides fantastic tools to make a precise rendering of a layout design. If things fit together well in CAD, they'll fit together equally well in the layout room. But there are times when such precision comes too soon in the design process, stifling creativity and out-of-the-box thinking. I blundered onto a richer understanding of the flexibility of X-factor staging during the unstructured process of pencil-on-paper doodling. I often see people new to layout design struggling with the tools and spending many hours trying to fit something together because they think serious layout design can be done only in CAD. In the end, they have a precise drawing of a poor layout concept.

For me, it's much better to do the first steps of the design process with simpler sketching tools. Alternative designs flow more easily when I don't feel the pressure to rush to final precision. I also have the confidence of knowing that any of those sketches can be brought into *3rd PlanIt* later for use as inspiration or as a template to draw over.

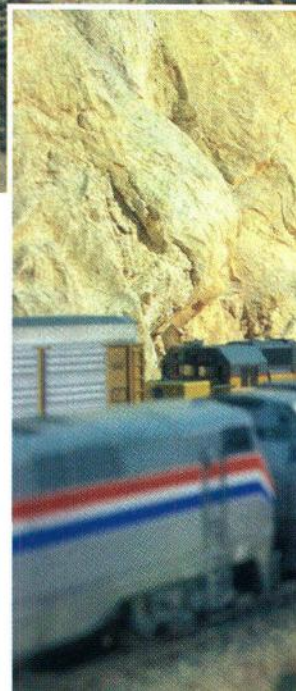
There's absolutely no substitute for CAD when precision and detailed communication are needed. But for those early design phases, you may find as I do that it's more productive to sketch with a soft-lead pencil instead of electrons. — B.H.





# Signaling his intentions

*A pro combines his vocation  
with his avocation*





## By Rich Weyand

Model photos by the author

**F**irst and foremost, model railroading involves compromises. Compromising something you're intimately familiar with can be very jarring. Bill Pistello, a signal foreman on a prototype railroad, knew how things should be done when he planned his N scale layout and he knew that any compromises in the signaling system would always bother him.

### Accommodating family needs

Bill works for the Canadian Pacific in the busy Chicago area. He wanted to model a similar high-traffic-density area on his layout, one with Centralized Traffic Control (CTC) and diverse industries. Since he's a fan of both modern western railroading and the arid scenery of the Southwest, he chose the Los Angeles to San Bernardino area.

Modeling Barstow or Long Beach, Calif., was overkill for the space he had, as the railroad had to share a basement room with other family activities. It functions as a large dining room for family gatherings, and it's even a guest bedroom at times.

That pushed the railroad up against two outside walls. The resulting shelf layout allows storage cabinets underneath the railroad and keeps the central floor area clear. But the narrow shelf wouldn't accommodate Barstow's huge hump yard or the sprawling port at Long Beach.

### UP's Los Angeles Subdivision

Bill found an ideal prototype in the August 1986 *Model Railroader* article

"Modeling Union Pacific's Los Angeles Subdivision" by Gordon Odegard. The smaller yards at Riverside and East Los Angeles would fit at the two ends of a linear layout.

Traffic would include through freight and passenger trains between Barstow and Los Angeles, plus local freights from Barstow to Riverside, Long Beach to East L.A., and between Riverside and East L.A.

An interchange with the Southern Pacific (now part of the UP) at Whittier would add operational interest and variety, and there were ample opportunities for mountain scenery on the layout. This would add apparent length to mainline runs. Inspired by editor Tony Koester's article "Where belt and trunk lines meet" in *MODEL RAILROAD PLANNING* 2001, Bill added a large switching area in Whittier as part of the SP operations there.

### A perfect signal system

Compromises in two key areas were not in the cards. As a signal foreman, Bill wanted the signal system to be perfect. The slightest lapse would loom large to his trained eye.

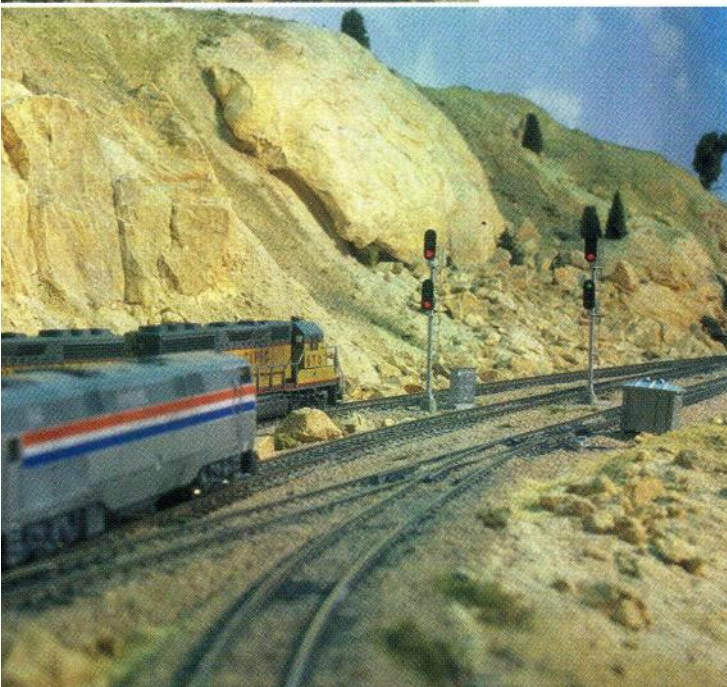
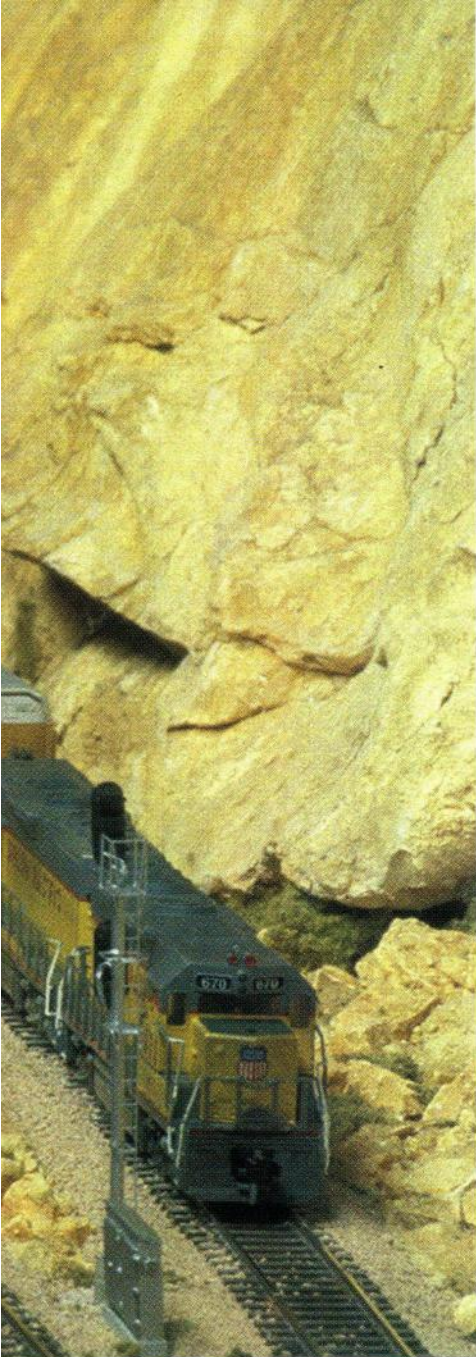
His second major concern was in the fidelity of his rolling stock. Bill sees prototype equipment every day at work, so he wanted his models to faithfully reflect the region, prototypes, and era – including appropriate weathering to show typical usage. Fortunately, accurate models of modern motive power, well-hole flats, double-stacks, lengthy auto racks, and the other familiar fixtures of modern railroading are readily available in N scale.

Locomotives regularly operating in consists were equipped with Unimate couplers to prevent "pistoning" (a concern with spring-loaded couplers) and accidental uncoupling.

### Staging and infrastructure

Bill needed large off-layout staging yards to generate the required traffic density. The long shelf design and once-through-a-scene walkaround design left the two ends where staging was needed 60 feet apart.

Bill also ended up with some typical infrastructure concerns. A sanitary pipe and other plumbing came down in the center of the long wall, precisely where the layout shelf needed to be. The plumbing problem was turned into an asset, however, when Bill built a closet around it. This added to family



A Union Pacific freight (upper left) at West Riverside Junction waits on track 1 at a red-over-red (stop) signal, as Amtrak train 6 proceeds through on the red-over-green (medium-clear) signal governing movement on track 2. The other view of this junction (left) shows the delicate signal detailing as well as the associated relay cabinets and sheds.



## The layout at a glance

Name: Union Pacific Los Angeles Subdivision  
 Scale: N (1:160)  
 Size: 26 x 34 feet  
 Prototype: Union Pacific  
 Locale: Southern California  
 Period: 2004  
 Layout style: linear walkaround  
 Layout heights: UP 46", Southern Pacific 36"  
 Benchwork: open-grid  
 Roadbed: Upson Board  
 Track: Walthers Shinohara code 60  
 Length of mainline run: 62 feet  
 Turnout minimum: no. 6  
 Minimum curve radius: 16"  
 Maximum grade: level main line, 2 percent between levels  
 Scenery construction: plaster on screen wire  
 Backdrop construction: Masonite hardboard  
 Control system: Computer cab control

Staging yards for both ends of the railroad were assembled using Kato Unitrak to allow revisions to be made easily as the operating scheme evolves. Train packets are conveniently stored on an overhead panel.

storage space, concealed the pipes, and separated one long scene into two more manageable ones. A pair of tunnels through towering rock escarpments thus replaced what had been little more than a long tangent. The closet now serves as a four-foot-wide, scene-separating backdrop.

### Designing for realistic operations

Bill wanted the layout to have prototypical operating patterns. With a relatively limited amount of space, Bill used short industrial spurs of three to six cars in length. Car movements, train and siding lengths, and yard capacities were developed together to ensure that the railroad could be operated prototypically. Bill also chose to model a larger number of small industries, instead of a few large industries, to ensure operational variety.

Car cards with waybills control all car movements. Train cards give instructions to crews regarding the work they are expected to perform.

Bill used Walthers Shinohara code-60 flextrack and turnouts, and operation has been flawless. He also put Micro-Trains couplers and trucks on all freight cars, although he cut back the uncoupling pins to make the cars look more realistic.

Bill prefers TracTronics DC throttles for their slow-speed control. He designed the railroad for CTC operations with blocks assigned by the CTC system's software, which switches successive mainline blocks to the appropriate cab as signals are cleared.

Industrial spurs along the main line have electric locks, like the prototype, so a turnout cannot be operated unless it is unlocked using a mini-plug "switch key." Unlocking a turnout lets local crews operate it, but also set the associated block signals to "stop."

Trains going through the closet tunnels are required to wait 30 fast-clock minutes (7.5 actual minutes at 4:1) to simulate the UP line through Pomona. The delay effectively lengthens the main line and slows down operations.

Bill ran a staging lead under the scenery and next to the backdrop from the Riverside end of the layout to the East Los Angeles end. The lead is partially double-track with multiple cross-overs to provide more serial staging.

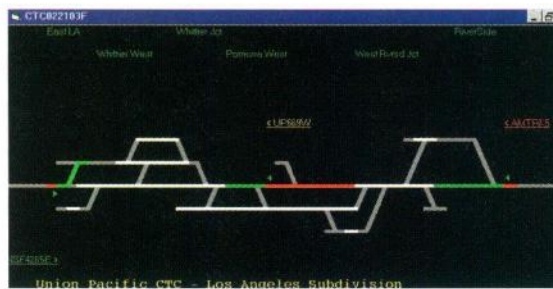
The two main staging yards were located at one end of the layout by bending the East Los Angeles yard around a corner, changing the footprint from an "L" to a "J." This made a box to contain the staging yards. Staging is connected at both ends of the main line to make restaging easier and allow continuous running during open houses.

### A signal concern

Getting the signal system to look as good and work as well as the rolling stock proved to be challenging. Bill couldn't find dimensionally accurate models of the multi-head color-light signals typical of western railroads. Nor could he locate CTC software that was exactly right for the modern dispatching display screens he saw every day at work.

Bill fixed the problem by contracting with Scale Electronic Systems (no longer in business). They consulted prototype engineering drawings to make the required signals of the correct shape complete with long lamp hoods, etched-through catwalks, and scale ladders.

Bill made the dwarf and drill-track signals himself using micro-miniature

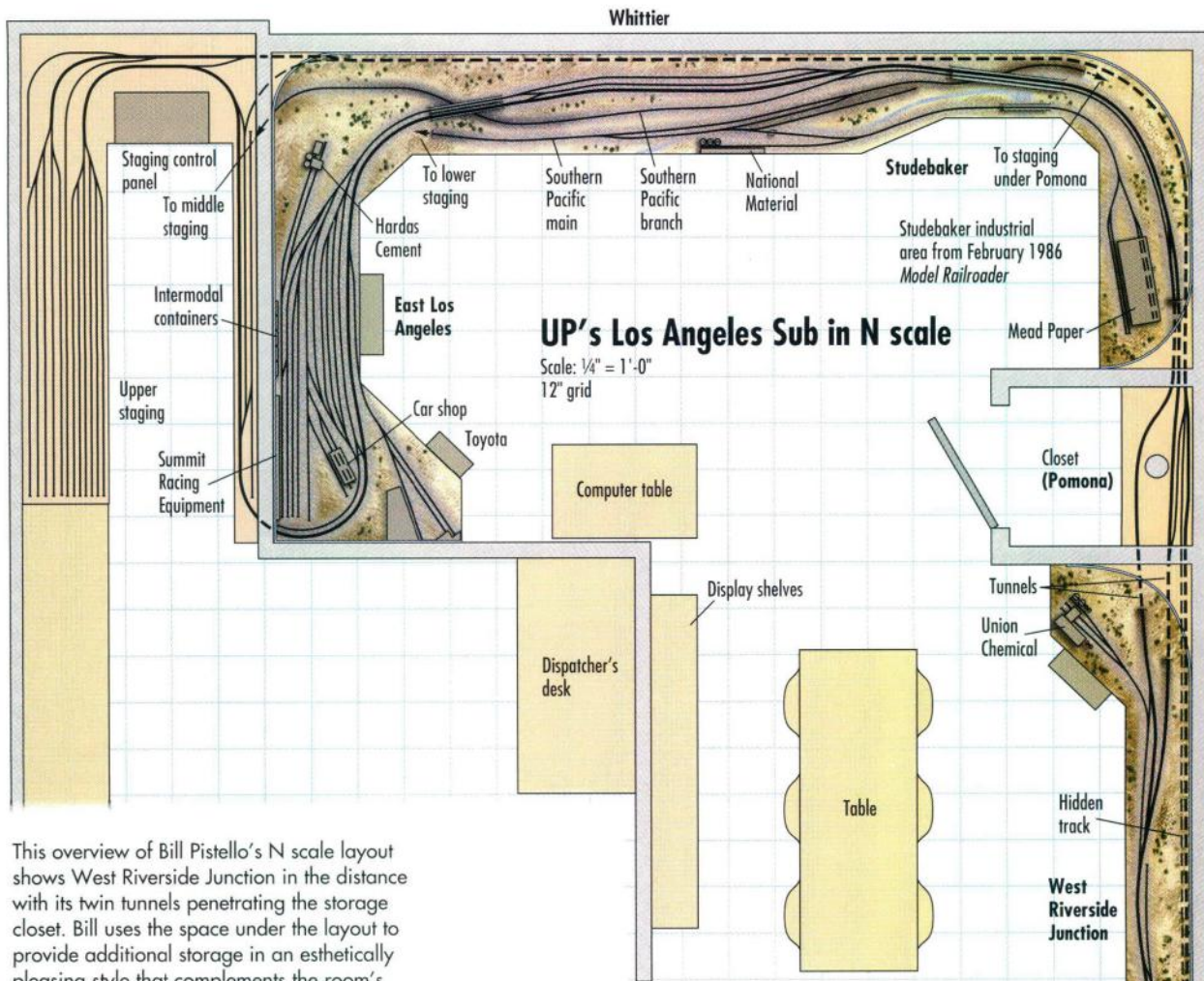


The dispatcher's CTC screen shows four active trains (red segments) with their train numbers and direction. Small green arrows show that all are seeing proceed signals. The color code assigned to each DC cab is also shown on the screen.

### Operations

Everything east of the closet is part of the Riverside area and is handled by the Riverside locals. All operation west of the closet on the UP is part of East Los Angeles, which is switched by the East L.A. locals. Trains west of the closet on the Southern Pacific are in a part of Whittier, which is served by the SP locals.





This overview of Bill Pistello's N scale layout shows West Riverside Junction in the distance with its twin tunnels penetrating the storage closet. Bill uses the space under the layout to provide additional storage in an esthetically pleasing style that complements the room's other family functions.

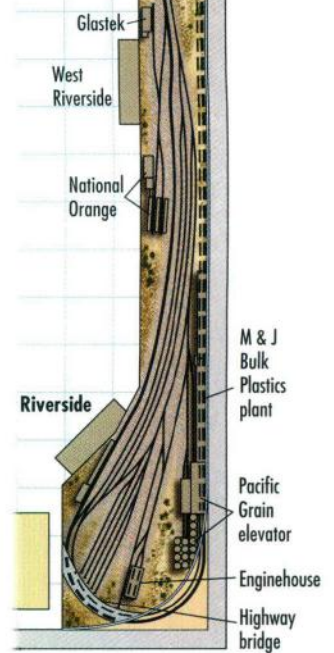
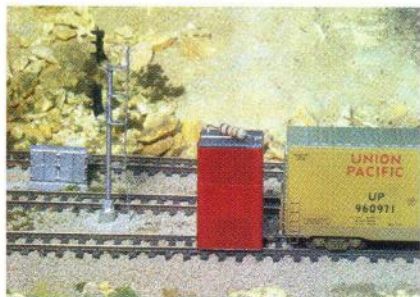
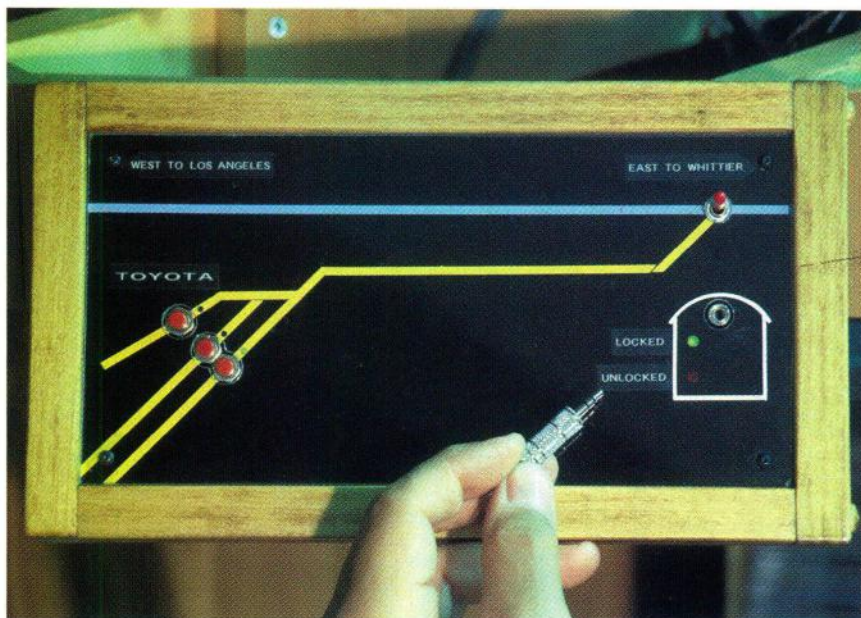


Illustration by Rick Johnson and Terri Field





**Above:** A stereo mini-plug "switch key" has to be inserted into a local panel to unlock a switch. It sets associated block signals to red to protect mainline movement. Switch points must be returned to normal and locked before the signals can be cleared.

**Left:** Crews use "brake blocks" (two pieces of metal bridged by a 10K resistor) to show the dispatcher the location of any cars left standing on the main and to "set the brakes."

LEDs. He trimmed each LED's plastic housing down to the size of a prototype signal head, then coated it with epoxy. Bill's toolmaker son, Mike, molded signal bases from epoxy.

No signal installation would be complete without relay boxes, signal sheds, and battery tubs. Bill made extensive use of castings from Railway Express Miniatures.

Bill uses the Optimized Detectors described by Bruce Chubb in the Sep-

tember 1982 *Model Railroader* for both signal blocks and OS sections. For computerized block, signal, and switch control, Bill uses the Trac-Tronics Serial Extended Control System Interface.

### The CTC system

None of the commercial offerings for software to run the centralized traffic control system performed exactly as Bill desired. He had copies of actual signal operator instruction manuals that precisely described what he wanted to implement on his railroad.

Bill Jahnke, a software engineer with a 30-year background in video games and robotics software, wrote a Visual Basic software application that exactly emulates a prototype signaling system for the layout. It also handles the DC block assignments.

Among the several surprises in store for Bill was the number of signal aspects that come under the general heading "clear." Green, yellow, flashing red, and lunar on the top or bottom of a two-headed signal can all translate to a variation of "clear." These distinctions are important because they show which blocks are

occupied and how the turnouts and other signals are set. This information is vital so that each train's operator knows exactly what is happening in front of him. When writing the software to change a signal, it was important for Bill to know what could be happening on the rest of the railroad to determine which signal was appropriate for each situation.

Most important, which aspect a signal would display depended on the status of other blocks and signals. If the next signal is yellow or better, this one can be green; otherwise, it must be yellow. But if the other one changes from red to yellow, then this one must change from yellow to green – unless the switch is reversed, in which case it must stay yellow. Did you get all that?

Bill's solution was to "walk the railroad" in software in response to any change. When any occupancy or signal indication on the dispatcher's panel changed, Bill recalculated all of the signal aspects on the railroad from one end to the other, then specified the correct outputs to the signal hardware.

Professional dispatchers are instantly familiar with this user interface, as Bill discovered in early 2003 when one of a group of visiting operators turned out to be Stephen Dolezal, an instructor for UP dispatchers. Stephen dispatched the railroad without needing any training or familiarization with the software.

Signal operation along the main line is as prototypical as the dispatcher's display. No simple red-yellow-green signals would do on Bill's layout! All of the prototype's aspects are here: red-over-yellow, green-over-red, flashing red-over-red, and red-over-flashing red.

### Setting priorities

Bill's layout is fully operational. Now he is focusing on completing the scenery and fine-tuning the operations plan and timetable. It's not too early, however, for Bill to know his objectives have been achieved.

That Bill was able to meet his difficult goals is the direct result of clearly understanding and defining the objectives up front, then working diligently toward them with the most important objectives foremost in his mind. MRP

*Rich Weyand is president of The Trade Secret Office and markets Trac-Tronics model railroad control electronics. Rich and Wendy live with their son Peter in Naperville, Ill.*

*Bill Pistello is a Canadian Pacific Ry. signal maintenance foreman. He and Donna, his wife, have two sons. Bill also enjoys building hot rods and drag racing.*

### Learning points

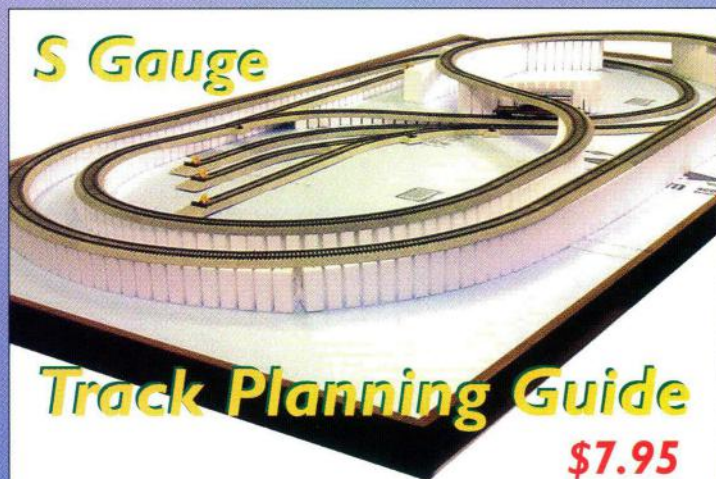
- Before you start planning a layout be sure you know what you want to accomplish.
- Compromises in areas where you have the most expertise can be the most irritating, even if others aren't bothered.
- One person can't know or do everything, so priorities must be established.
- A railroad and other family functions can peacefully co-exist in a room with thoughtful planning and an eye toward aesthetics.



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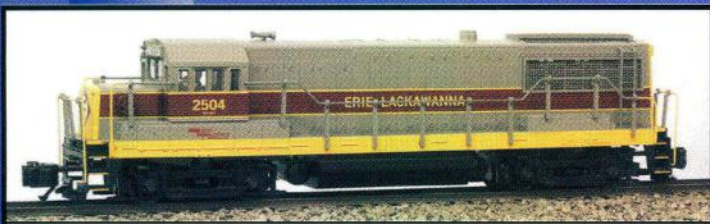
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## The 2004 NASG National Convention

This year's NASG National Convention is titled **'S' Curves Through Chicago 2004**, and is being held at the Chicago Sheraton Northwest in Arlington Heights, IL from July 28th to the 31st. Activities include tours to the Illinois Railway Museum & the Museum of Science & Industry, two days of selling and clinics, model contests, layout tours and all the other usual events that make a model railroading show fun.

With over 130 tables and several operating layouts, the show promises to be the one of the largest S Scale events ever. Spend two days searching for that favorite item to add to your railroad empire from the wide variety of engines, cars, track and structures available in S today. Maybe chat with the manufacturers to find out what's new and coming. Or take in a clinic or two to hear about and discuss your favorite model-railroading topic. Find out why S is growing.

For more information, call Sam McCoy at 708-457-0898, send a fax to 708-457-1341, visit the show web site at [www.2004nasgconvention.com](http://www.2004nasgconvention.com) or visit the NASG web site.

Happy Model Railroading!

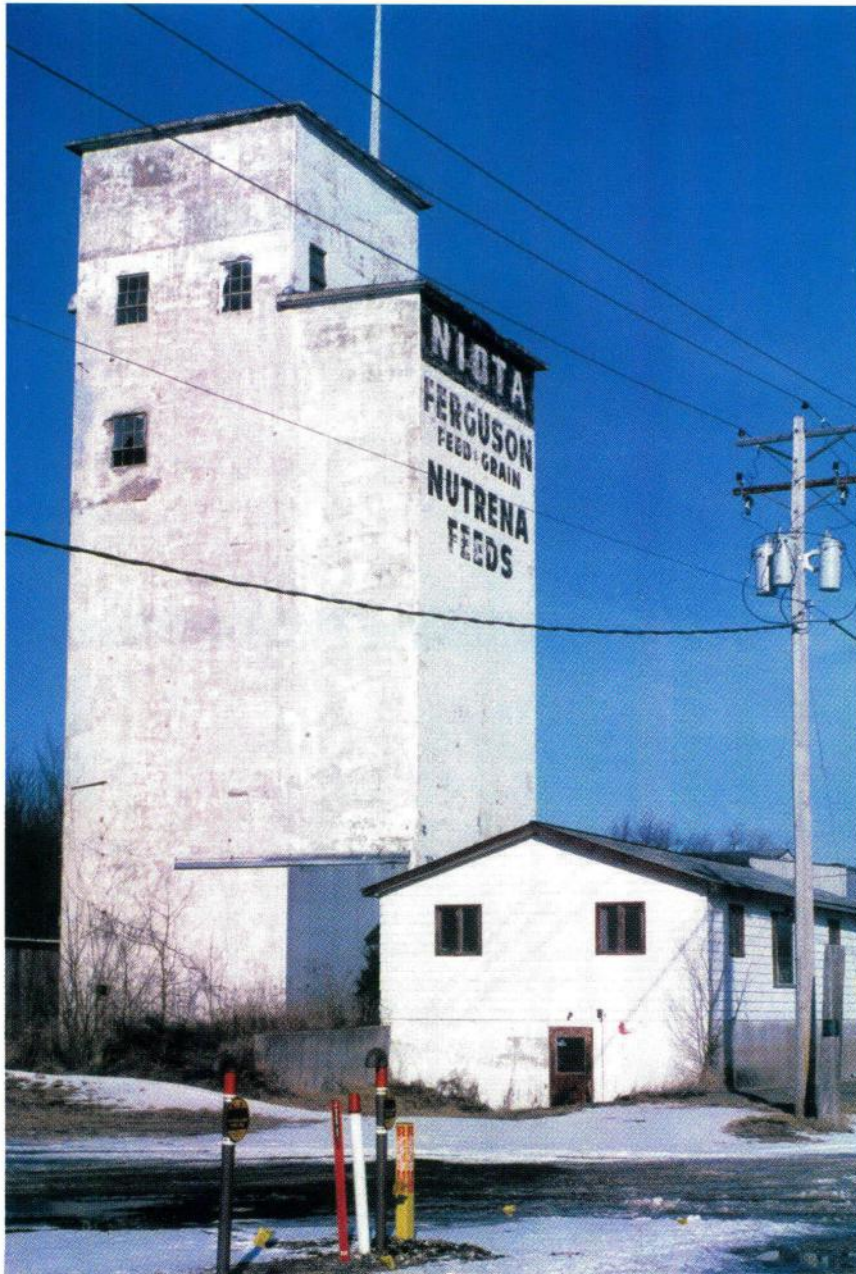




# Illinois Midland in S scale

*A simple 4 x 8 sectional-track plan provides a foundation for growth*

**By Bob Nicholson**



Bob Nicholson

Bob Nicholson's 4 x 8 track plan for an S scale version of a very short line, the real-life Illinois Midland, could serve a concrete grain elevator like this one at Niota, Ill. Such small-town industries would help add more traffic and operating interest to the model IM.

**S**cale ready-to-run locomotives and rolling stock as well as good-looking sectional track are among the new products that have helped to make modeling in S scale a good choice for new and veteran modelers alike. Moreover, its size –  $\frac{1}{16}$ " per foot, or 1:64 proportion, about halfway between HO and O – may make S more practical than a smaller scale for younger hands or older eyes.

This 4 x 8-foot track plan offers some interesting possibilities for parents with young children or baby boomers getting back into the hobby. It can start out as a family project and, as MRP editor Tony Koester demonstrates beginning on page 84, later be developed into a railroad supported by a staging yard or even "opened up" to fit onto an L-shaped shelf in one corner of a room.

## **An Illinois short line**

The actual Illinois Midland was a tiny railroad, just two miles long, in north-central Illinois. Its sole purpose was to provide rail service to the grain elevator at Newark. Its only employee intermittently ran two- or three-car trains to connect with a Chicago, Burlington & Quincy line at Millington (now operated by Illinois RailNet).

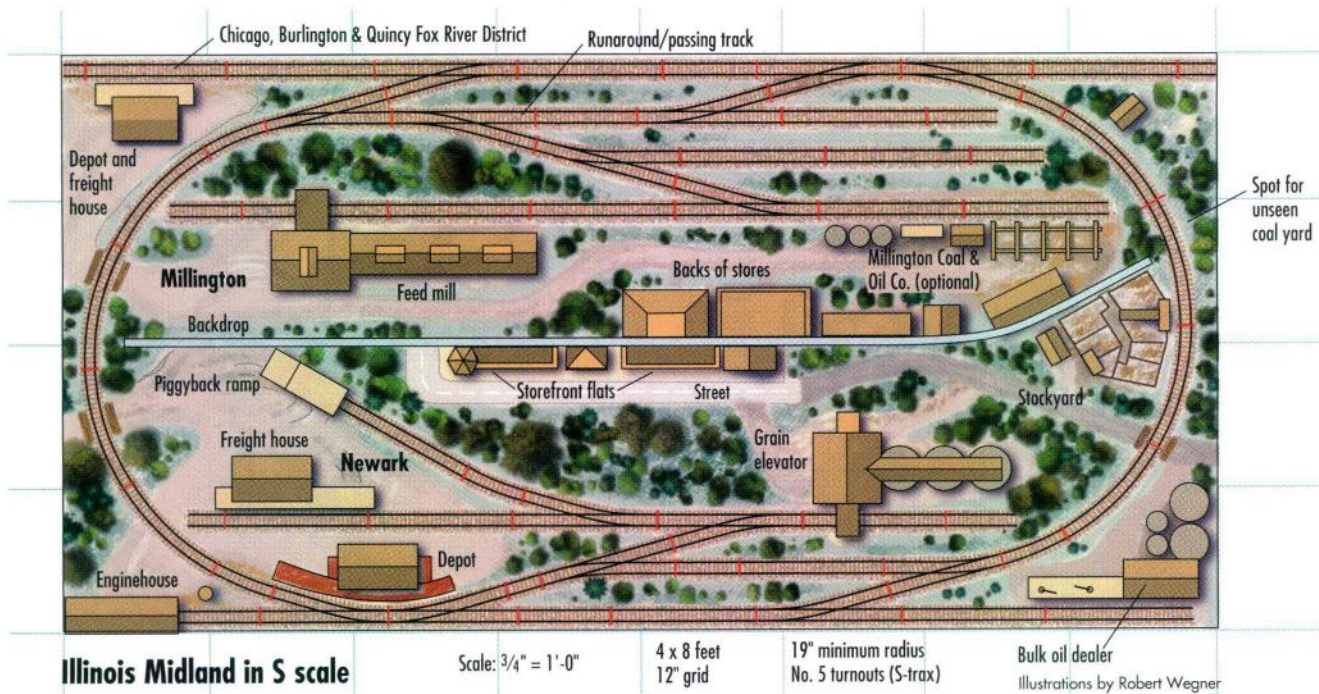
The IM initially employed an 0-4-0T saddle-tank steam locomotive, one similar to the Baltimore & Ohio's famous Dockside engines. In 1959, an ex-Burlington 60-ton Whitcomb center-cab diesel took over. It, too, was replaced, this time by a small Plymouth industrial switcher, which had the questionable honor of being the Illinois Midland's last locomotive.

In 1970, highway construction and trucking caught up with the IM. That, along with already shaky finances and a bridge fire, gave the little railroad an irrevocable push into oblivion.

## **Beefing up the resumé**

Newark was like other small communities in the region with an impor-





tant difference: Most of Newark's contemporaries had a more robust industrial base and more rail service.

The good news? Tweaking history a bit by having the IM serve more industries isn't out of character for the region. So, while the actual IM is hardly an inspiring subject for a model railroad, a little modeling license can reasonably create more traffic potential.

This expansion could also justify a larger locomotive such as an EMD SW1 or SW9, available in S scale in train sets that include a few freight cars and a caboose to help you get started.

### Point-to-point on an oval

The 4 x 8-foot IM plan shown here could easily fit in an 8 x 10-foot room, even over a bed if necessary. The taller structures and dividing backdrop could be removed to let it fold against a wall. Just remember that operators must have access to both 8-foot sides to switch Newark and Millington.

Obviously, the distance and running time between Newark and Millington is short, even at the very slow speeds typical of a poorly maintained short line. (The IM crew did have to stop the train to open and close a pasture gate, something you could model to slow down the pace a bit.)

You could run a set number of laps around the layout to reach the next town, but watching trains run in circles can get boring fast. There are, however, other ways to run the railroad.

As one of the shortest of short lines, the Illinois Midland's "mainline" runs were also limited, as was the on-line

switching. The key to generating operating interest on the model version is to increase the amount of switching and add multiple point-to-point moves over the main line. I have done this by including industries that cannot readily be served with one round trip per "day" (operating session) with trains no longer than four to six cars.

The Millington feed mill and the Newark grain elevator, for example, ship cars of feed and grain back and forth, as the short line can provide personalized service as needed. Carloads of grain unloaded at the feed mill have to be respotted for reloading with processed feed. At Newark, cars of feed unloaded at the feed store have to be respotted for grain loading. "Home-road" (IM) cars, likely old box-

cars that never leave the property, can shuttle back and forth several times a day. Add in "foreign" cars (any other than IM) via the CB&Q interchange for off-line shipments, and these industries alone could keep the little railroad relatively busy.

Also, the right end of the mainline oval can be used to represent an unmodeled coal yard at Newark, out of sight just beyond the stock pens. It addresses the old problem of having open-top cars appear loaded or empty in appropriate places. A remotely operated uncoupler where the track curves around the backdrop permits loads of coal spotted at the coal yard to be seen as loads from the CB&Q at Millington. Empties returned to the "Q" show up as empties from the unseen coal yard at Newark.

Other potential industries include a piggyback ramp at Newark (S-Helper Service makes mid-'50s trailers and flatcars), a bulk oil dealer, and a stockyard. A house track behind the Newark depot and the team track portion of the elevator track round out Newark's industrial development.

Millington also has a house track alongside the depot, although it looks like a part of the CB&Q's main line. Another fuel dealer could take up residence on the optional stub track off the runaround track.

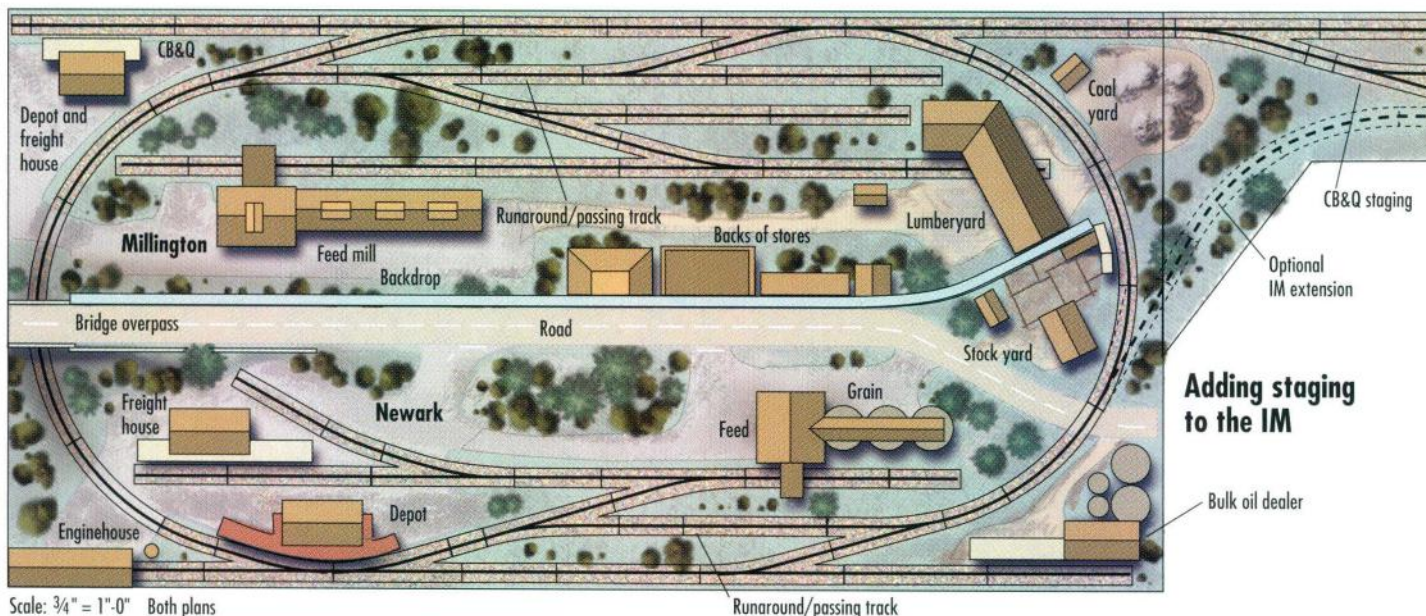
### Track and structures

The IM plan is designed around S-Helper Service's S-Trax sectional track. S-Trax sections include molded plastic roadbed and ballast, making it easy to

### Learning points

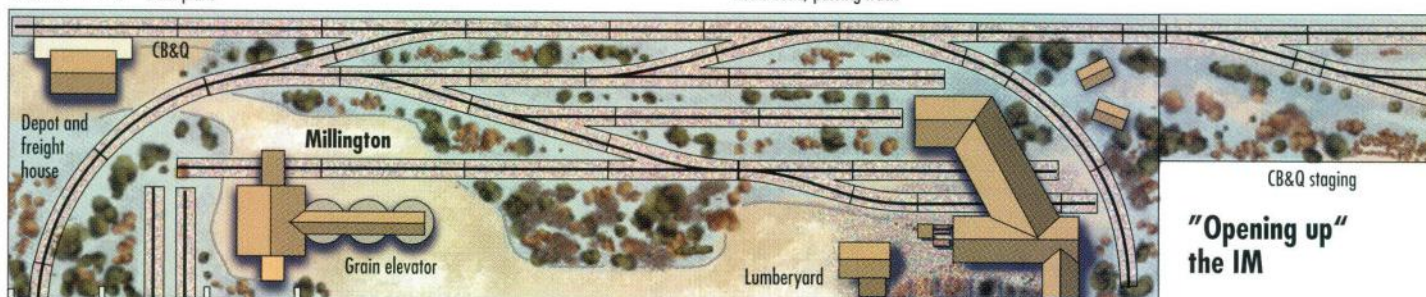
- S scale is a nice compromise between space requirements and the physical size of the models, especially for younger modelers or for those whose eyesight isn't quite what it used to be.
- Ready-to-run scale models now make it easier for a novice to build a "starter layout" in S scale.
- A 4 x 8-foot sheet of plywood still offers an easy way to get started on a layout, be it a scale or "hi-rail" project.
- Simple geometry makes concrete grain elevators good first-time scratchbuilding projects.





Scale: 3/4" = 1"-0" Both plans

**Adding staging to the IM**



**"Opening up" the IM**

Same structures as on the 4 x 8 Millington

Road overpass provides separation between town scenes

Corner curve can have a larger radius than on 4 x 8 plan

Newark

Bulk oil dealer

## Enhancements for the Illinois Midland: Adding staging and unfolding the plan to fit on an L-shaped shelf

When the very first 4 x 8-foot sheet of plywood was delivered to an unknown lumberyard, I strongly suspect it was purchased later that same day by someone who was building his first model railroad. The appeal is obvious: Prop it up on a pair of sawhorses, snap some sectional track together, and run a train.

Beginning on page 82, Bob Nicholson presents a typical track plan for the good ol' 4 x 8, this one depicting a Midwestern short line in S scale. It will provide hours and hours of fun in the configuration Bob suggests, and it offers room for growth as your interest in and knowledge of the hobby expands.

**The rest of the world:** A basic tenet of layout design is to provide at least one connection to the outside world. Bob's plan hints at this with a spur representing the Chicago, Burlington & Quincy's main line in the upper-right corner. In the revised plan shown here, I added con-

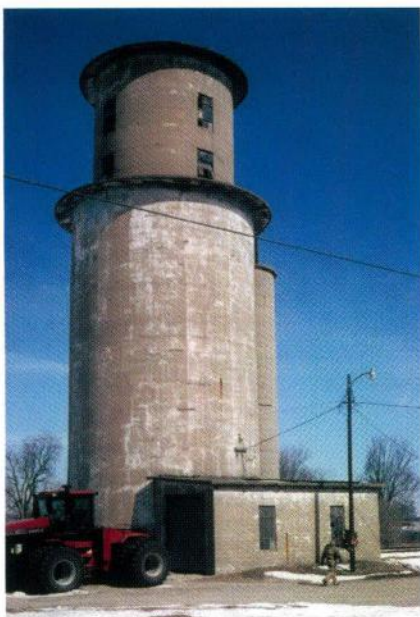
nections to an adjacent staging yard – to the rest of the railroad network – where two or more CB&Q trains can be held until they're needed.

This ensures that a variety of freight cars enter and leave the railroad, which avoids having the IM crew deal with the same cast of characters on every trip between towns.

If you have even more room, you could project the Burlington's main line off the upper-left corner of the railroad as well, either to a return loop or to another staging yard. This would allow you to model through train movements over the "Q," maybe even a secondary passenger train.

The broken-line connection to the staging yard applies only if you decide to expand the scope of the Illinois Midland even more than Bob already has by extending the line beyond Newark. In that case, staging tracks could provide space for one or more IM trains coming toward Millington. A gas-electric provid-





Both Bob Nicholson

The unusual tower, left, of a small elevator at Sheffield, Ill., would make an eye-catching model with a relatively small footprint. The Illini Feeds mill at Oneida, Ill., above, could be compressed to serve as the largest industry at Millington on the S scale IM.

quickly finish up tracklaying and move on to structures and scenery. Some track sections and turnouts will have to be trimmed to fit, however. The geometry of this track is compatible with American Flyer "tinplate" track, so you could just as easily use this plan to build a "hi-rail" layout.

You will be pleasantly surprised at the number and variety of S scale structures now on the market, mainly

in kit form. Most of the buildings shown on this plan can be built from the easy-to-assemble Plasticville kits from Bachmann, which are labeled "S/O" but are really better proportioned for S scale than for O.

The depot at Newark, for example, could be the Plasticville "rural station." Ideal for Millington is Bachmann's "suburban station," with the bay window and platform facing the house track. Plasticville's Cape Cod house could serve as the office for either the fuel dealer or grain elevator. Imagination is a major part of the fun when modeling in 1:64 proportion!

I haven't seen an S scale kit for a grain elevator lately, but there's a wide variety of prototypes to choose from, making kitbashing or even scratch-building relatively easy. The concrete elevator at Niota, Ill., for example, is little more than a box that could be quickly assembled from styrene, posterboard, or even an empty cardboard box. You might use Walther's HO concrete elevator kit as a pattern. The round elevator at Sheffield, Ill., is another structure that could be built using cardboard or plastic tubes.

For the feed mill at Millington, I'd use the Illini Feeds structure at Oneida, Ill., as the prototype for a selectively compressed model that fits the available space.

### Time to run a train!

The day begins with the crew backing the locomotive out of the engine-house and tying onto the caboose, which spent the night on the main next to the depot. They then switch the industries in Newark, which may

include spotting cars left over from yesterday's last run, and make up a train for Millington.

At Millington, which can be reached only by going out of town clockwise to the left (the continuous-running capability of this plan is reserved for entertaining visitors), they interchange cars with the Burlington and switch the industries there. (The "Q" has designated this part of its main line as being within yard limits, so IM crews can use it to switch and run around cars.)

Phantom CB&Q trains deliver cars wherever they find room, but loaded coal hoppers are always spotted on the track that curves behind the stub-end yard tracks.

Its work at Millington complete, the train returns to Newark. Here the crew again delivers cars to their proper spots. Cars that won't fit at the destinations are left "off-spot," in any available track, for later delivery. After a suitable period to allow for loading, the cars are pulled for another run to Millington. This continues until it's time to tie up for the day.

Want even more operating potential at the cost of more track plus space for an attached staging yard? See the box on the opposite page. MRP

*Bob Nicholson retired from a career in railroading in 2001 and moved back to Ft. Madison, Iowa. Renovating the Nicholsons' house and photographing classic cars for automobile publications has slowed planning for a new layout. "Otherwise," Bob reports, "I can usually be found making selections from the senior-discount section of the menus at local beaneries."*

ing basic passenger, mail, and express service might be a nice touch.

**Unfolding the oval:** Like a Ping-Pong table, a 4 x 8 sheet of plywood takes up a lot of floor space. Veteran modelers therefore often build their layouts on narrow shelves along the walls of the room. This leaves the central area open for other uses or for a peninsula that adds to the length of the railroad.

As you can see, it's easy to "cut" Bob's plan for the IM along the central backdrop and open it up into an L shape that will fit into one corner of a room. Very few track changes are required to do this.

It might seem that no longer having a view block between the two towns would be a negative, but instead you are now facing away from one town as you work in the other. I've shown a highway overpass to help visually separate the scenes, but a thick grove of trees would also work.

You'll still need a staging yard off one end to allow a variety of CB&Q trains to handle cars to and from Millington, of course. —Tony Koester



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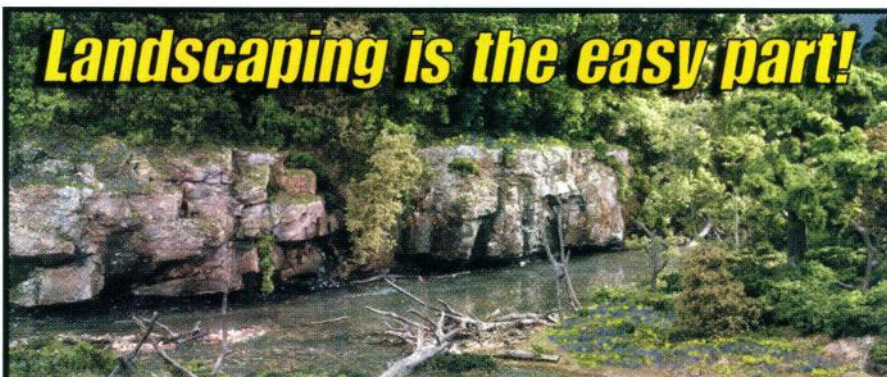
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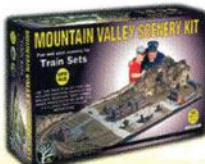
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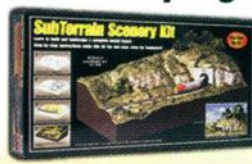


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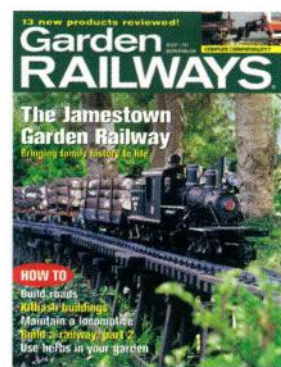
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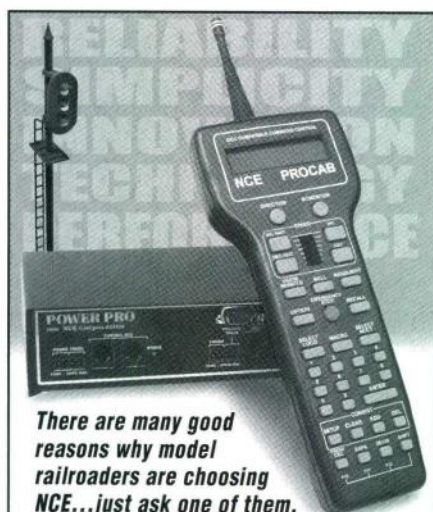
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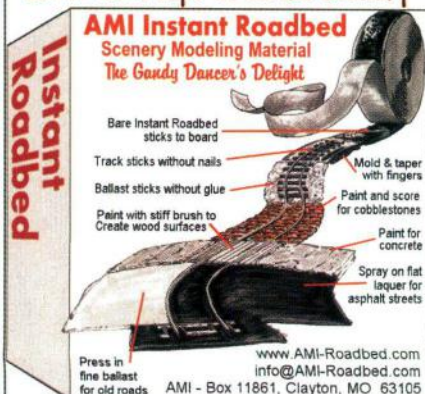
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## Reader Forum

# More on our Bush Terminal story

## Rail-marine information

As a rail-marine enthusiast, I enjoyed Bernard Kempinski's article about the New York Cross Harbor RR's Bush Terminal in MODEL RAILROAD PLANNING 2003. The lack of any mention of the Rail-Marine Information Group, however, seemed odd.

*Jim Moore, Valencia, Calif.*

[Merely an oversight, Jim. Readers who share Bernie and Jim's interests can contact John Teichmoeller, coordinator of the Rail-Marine Information Group, at the address in the following letter, or check the group's Web page at [www.trainweb.org/rmig/](http://www.trainweb.org/rmig/). As of December 2003, annual dues were \$30 (\$36.50 outside the U.S.). – Tony Koester, editor]

## Further reading

Readers who enjoyed the MRP article on the New York Cross Harbor RR may also want to read Tom Flagg's 15-page article on Bush Terminal in the January-April 2003 issue of the *Transfer* (no. 37), which is available for \$11.50 from the Rail-Marine Information Group, 12107 Mt. Albert Road, Ellicott City, MD 21042. This is the first part of a series Tom is doing on the waterfront railroads and terminals of Brooklyn.

*John G. Teichmoeller  
Ellicott City, Md.*

## Mystery switcher

I just read Bernard Kempinski's "On the Waterfront" article in MRP 2003. Excellent! I love that layout. Are photos of it other than the one on the front cover available?

The cover shows an engine that looks like a GE 44-tonner. Where can I purchase one?

*Steve Ward, Grafton, Ohio*

[You can find photos of the layout in progress at <http://www.geocities.com/bkempins/projectGallery/BushTerm.html>.

[The switcher is a small Japanese-prototype model sold by Tomix. I ran

mine so much I wore it out. Arnold Rivarossi has an Alco S-2 switcher much like those used by the NYCHRR, but I don't recall anyone offering a GE 44-tonner in N. – Bernie Kempinski]

## Name those rivers

There's an error in the map on page 10 of MRP 2003. What's labeled the Hudson River is really Newark Bay, and what's labeled the Harlem River is actually the Hudson. The Harlem River runs from the Hudson to the East River between Manhattan and the Bronx, ending at the Harlem River Yard.

*Bob Plett Jr.  
North Brookfield, N.Y.*

[Our thanks to the many readers who wrote to correct this labeling error. – T.K.]

## It's the Hackensack

You've hit a home run for me with the New York Cross Harbor, the Lehigh & New England, and the New York, Ontario & Western, all in one issue!

The map on page 10 shows the Hudson River running to the west of Bergen Point, behind Greenville, N.J. That's actually the Hackensack River. Minor details aside, I plan to use a slightly expanded version of Bernie's plan for my next switching layout.

*Dave Ferrari  
Atlas Model Railroad Co.*

## Cassette staging

I enjoyed reading about several of the layouts in MRP 2003, especially "Short Lines in HO and N" by Iain Rice and "Timesaver+" by John Flann. I plan on merging the two ideas in HO. Could you provide more detail about the "cassette" concept shown on page 19?

*Ed Batesla, Syracuse, Ind.*

[See "No space is no excuse" by Paul Dolgos in MRP 1996, page 58, and "Staging solutions" by the same author in the April 2003 *Model Railroader*. – Andy Sperandio, editorial director]



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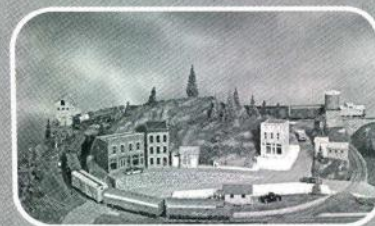
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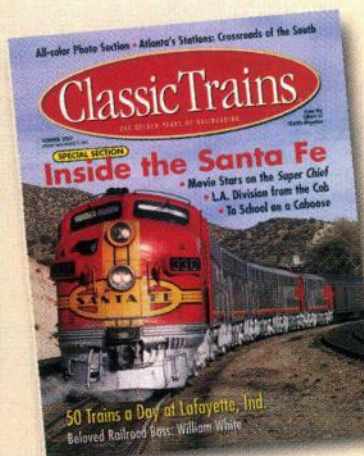


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## Planning Tip

### Do steam engines have to be turned?

**N**ice as it is to watch a steam engine spin slowly around on a turntable and then nose into a roundhouse, these facilities are space hogs. So's a turning wye, unless you can cleverly tuck the tail track into an unused area or through the backdrop. (Or see the tip on page 92.)

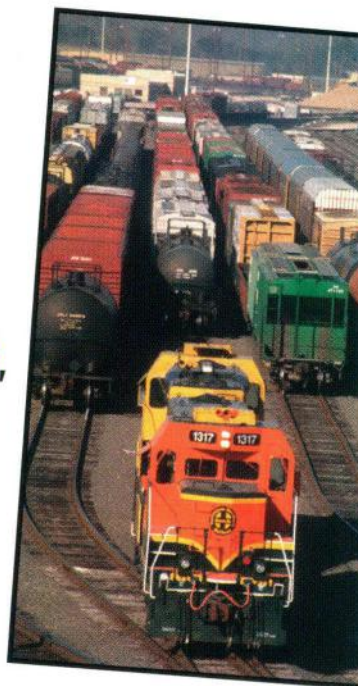
When I designed Sunrise Yard on my old HO scale Allegheny Midland, I planned for a 1950s-era turntable and roundhouse. But by the time I got around to building Sunrise, the AM had become a post-steam era layout. Yard tracks took over the space reserved for the turntable and roundhouse, which weren't missed with diesel hood units that could run in either direction.

Then I moved the AM back into the 1950s, and it dawned on me that my steam engines might now need that turntable. But a little reflection on our train schedules showed they didn't.

Only two or three southbound manifest and local freights each operating "day" actually terminated in Sunrise. Coal trains bypassed it and tied up in the Mountain Grove coal marshalling yard, represented by staging. Two of the terminating trains had "flip sides" that later headed back north. But one of those went up the Big Sandy Subdivision to Connellsville, Pa., and trains on that line were dieselized by the mid-1950s – no problem.

The other trains were "Alpha Jets" to and from the Nickel Plate Road at Dillonvale, Ohio, and normally had NKP or AM 2-8-4s. But by keeping an "extra" northbound Berkshire on the ready track, we didn't need to turn the arriving engine. Having that "Berk" in residence also added to the atmosphere at the Sunrise coal dock.

If your yard space is tight and your schedules allow, you can do what I did at Sunrise and build only part of an engine terminal – maybe just the coal dock. Run the servicing tracks off the edge of the benchwork as though they lead to the roundhouse a few hundred feet away. – *Tony Koester, editor*





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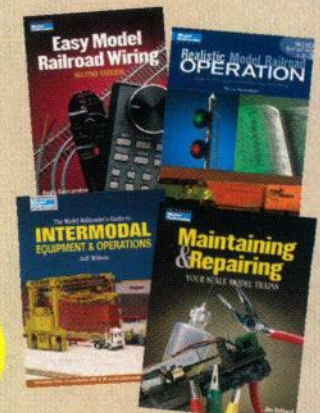
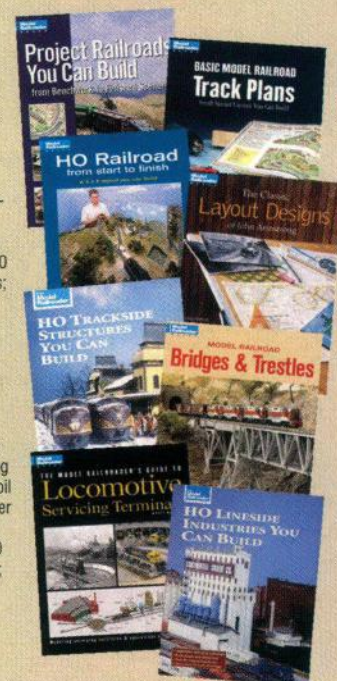
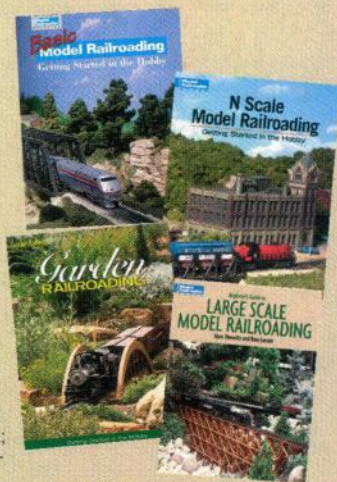
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## Planning Tip

# Wye through an outside wall

*A boring job, to be sure*



Both photos by Dick Tomlinson

A Michigan Short Line O-8-0 heads into the tail track to turn a passenger consist. The PVC-pipe "tunnel" through the basement wall allows a longer tail for the wye on the O scale railroad of Dick Tomlinson.

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The slope of Dick's lot allows access to the far end of the tail track by removing a pipe cap.

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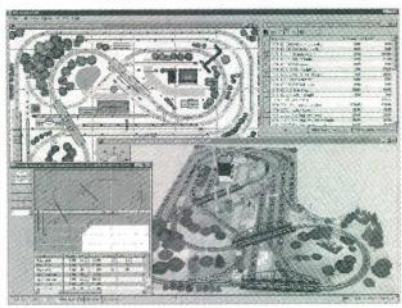
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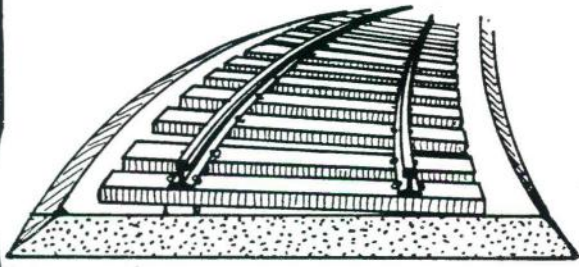
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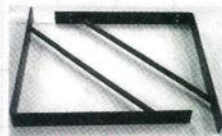
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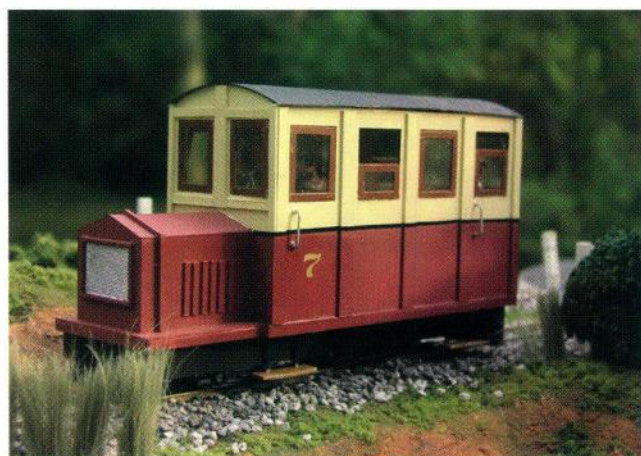
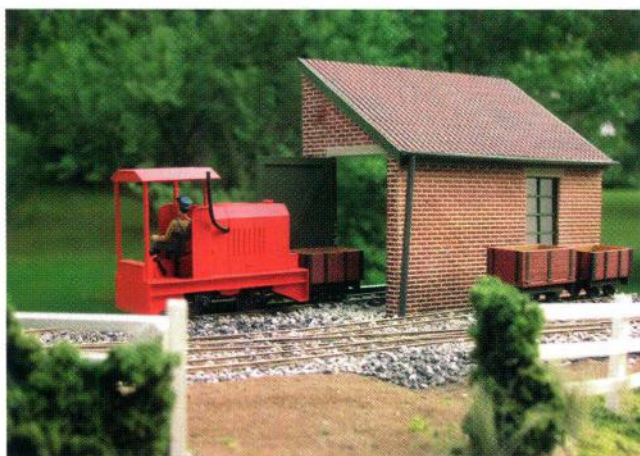


# Rear Platform Gn1¼ in 1x3

*Ever heard of a "traintable"?*

**By Ian Holmes**

Photos by the author



Last year, MODEL RAILROAD PLANNING published a number of bookshelf-size plans in various scales and gauges. I thought you might enjoy seeing that a functional part of a layout in a scale as large as G (1:22.5 proportion) can also fit into such a confined space.

Yes, it is a narrow gauge railroad. It's very narrow of gauge, in fact: only 15" between the rails and called "Gn1¼" or "Gn15." That comes from using HO gauge mechanisms and wheelsets in G scale, but it's typical of many industrial narrow gauge railroads on either side of the Atlantic.

The key to this plan is the "traintable" in the center, which will hold a small locomotive coupled to several "skip wagons" (dump cars). Each fully rotatable and removable cassette creates a sort of passing track as well as a place where trains move on and off the railroad. Its turntable-like function takes the place of a lot of complex trackwork, as it can be aligned with any spur.

The idea of using removable cassettes that amount to hidden sidings in the middle of such a small layout may seem radical, but it supports operational possibilities way beyond the layout's actual size. A typical sequence of operations might start with locomotive no. 1 making up a train of cars at the

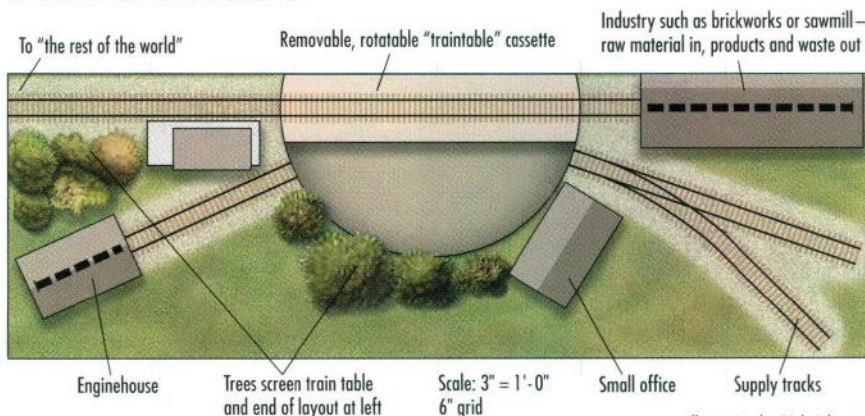
brickyard and disappearing from the railroad via a removable cassette that you lift off of the traintable.

A second set of cars enters the railroad on another cassette. Locomotive no. 2 moves from the engine shed and "runs around" them by using the traintable, then spots them at the brick works. Number 1 comes back on stage and goes to the shed. A railbus shows up and stops at the depot, then exits via a cassette. And so on. Note that a train can seemingly leave and re-enter town (like going around a reversing loop) simply by spinning the traintable.

And now for something completely different: a railbus and an industrial "critter" in Gn1¼ (G scale, HO gauge), with a turntable made from a foot-long Lazy Susan bought at Kmart! These scenes are on author Ian Holmes' layout, which is similar to the track plan below.

Since there's not much layout to build, you may choose to work to very high modeling standards. For more information on industrial narrow gauge railways, you can visit the Web sites at [www.ingr.co.uk](http://www.ingr.co.uk) and [www.ngrs.demon.co.uk](http://www.ngrs.demon.co.uk) as well as "Ian's Gn15 pages" at [www.ian-holmes.com](http://www.ian-holmes.com). MRP

## G scale on a bookcase





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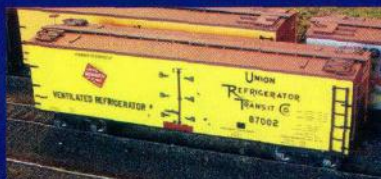
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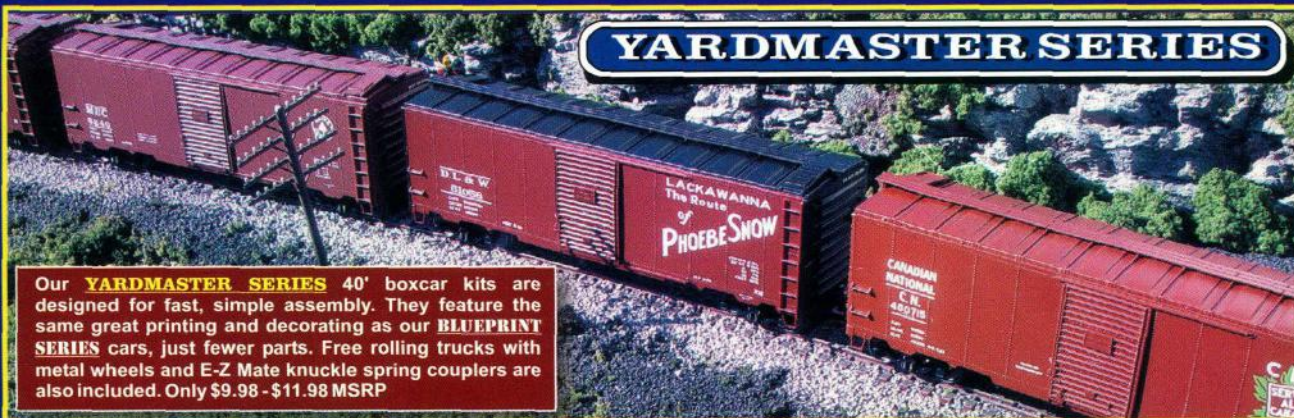
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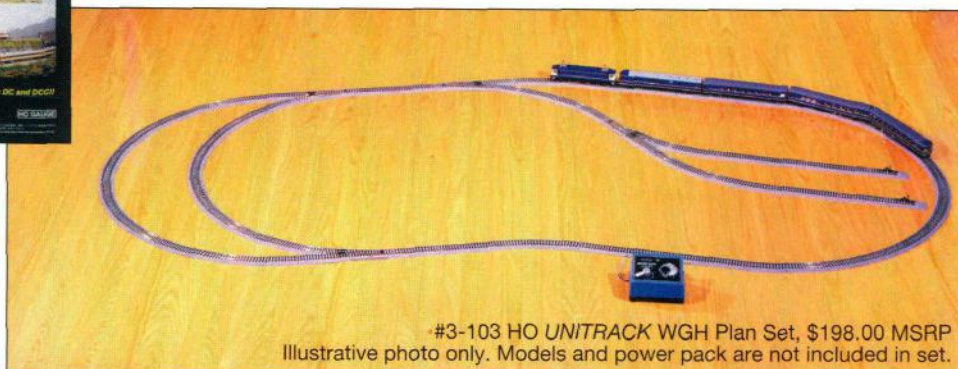


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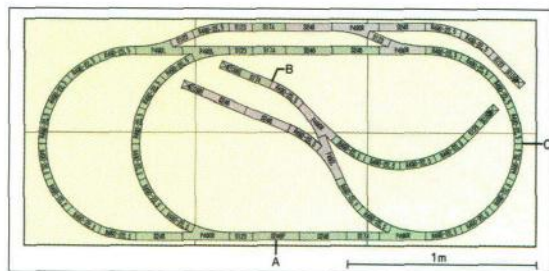
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