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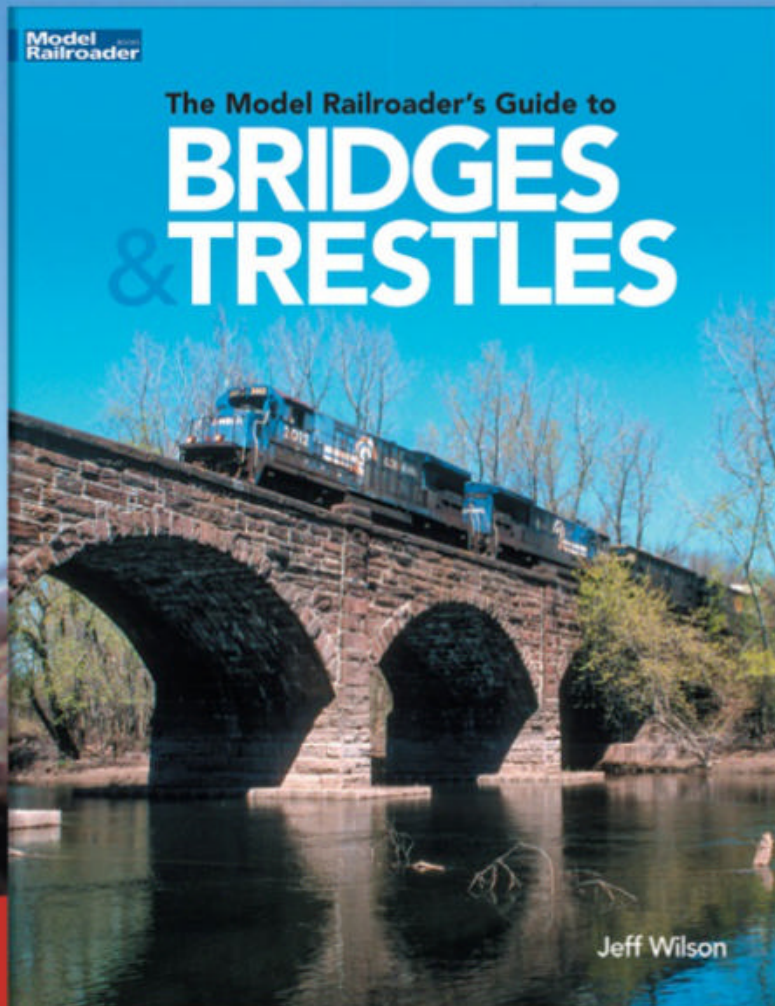


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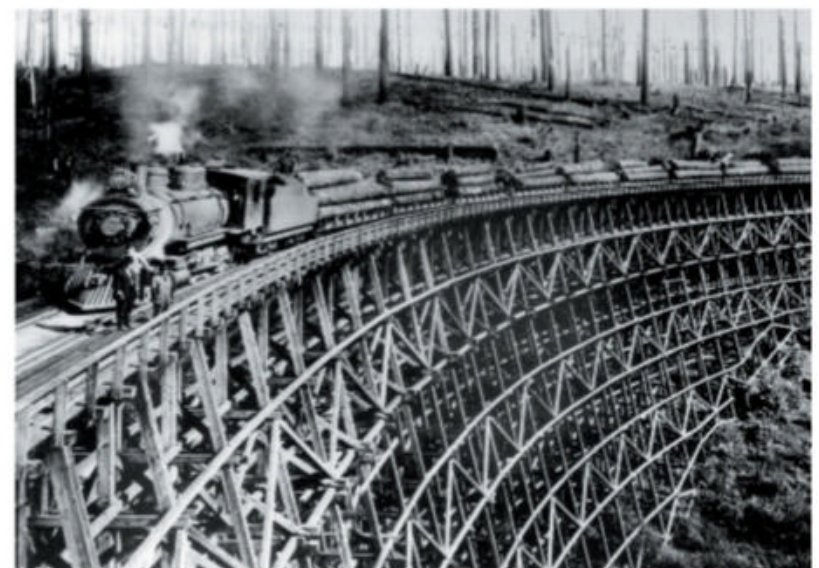


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The name of the game is Operation

REMEMBER THE OLD GAME “OPERATION?” The one advertised as “The goofy game for dopey doctors?” Players would take turns using electrified tweezers to remove plastic pieces representing the patient’s funny bone or breadbasket without setting off the buzzer. Though I knew several people who owned the game, I never met anyone who actually played it. The box was always beat up and pieces were missing.

As model railroaders, we still play a game called Operation, and though it still uses electricity and tweezers, if you’re doing it right there are no wrenched ankles involved.

We select the layouts we feature in *Great Model Railroads* based on the quality of modeling shown in the photos submitted. A great model railroad can qualify on that criterion alone; actually being an operating layout isn’t necessary. Take a look at our 2017 annual, which featured an industrial diorama built by Gabriel and Jorge Martinez. The 2 x 4-foot scene bore only a single track, but unquestionably qualified as great. This year, though, it so happens that several of our featured railroads put an emphasis on realistic operations, not just excellent modeling.

Take our cover story, for instance – Tony Koester’s HO scale Nickel Plate Road, St. Louis Division. Anyone who’s read the annual *Model Railroad Planning* that he edits, his monthly “Trains of Thought” column in MR, or any of the other articles he’s contributed to the magazine, knows he’s a stickler for realism, both in modeling and operations. Tony

looks at prototype research as a hobby in itself, and his model railroad, shown starting on page 8, is clearly designed to be run just like the real thing.

Club railroads, designed and built by committee, often reflect no particular prototype or location and are built primarily to let the trains go around and around. Not so the Blissfield Model Railroad Club, whose multiple-deck layout is seen on page 28. This HO scale pike manages to pack several working yards and tons of switchable industries in, while still allowing long runs between stations. Members route cars with car cards and waybills, and the layout is realistically controlled by a dispatcher in a nearby office.

Other model railroads in this issue, freelanced and prototypical alike, are also designed for operation. Ted Pamperin built his HO scale Chesapeake & Ohio New River Subdivision to allow him to replicate the operations of his prototype in 1943 as accurately as he can. “In my view, constructing the railroad is analogous to crafting a chess set,” Ted says in his article, which starts on page 46. “No matter how beautiful it is, the objective is to play the game!”

No matter how you like to play the game, I’m sure you’ll agree the layouts in this special issue are all winners.

Steven W. Otte

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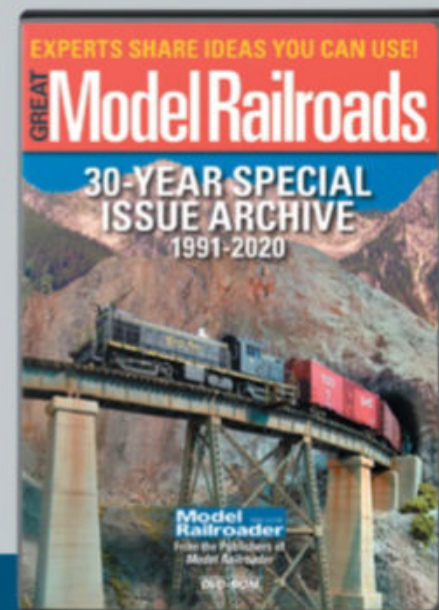


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UPDATE ON THE NICKEL PLATE

Tony Koester's
lifelong dream
has matured

By Tony Koester
Photos by the author

AROUND THE TURN OF THE CENTURY, when the mountain-climbing Allegheny Midland had occupied my basement for a quarter of that time, I decided it was time to model a different type of rail-roading. I had spent the early 1950s living along the New York, Chicago & St. Louis RR (Nickel Plate Road) St. Louis Division and got to witness the last four years of steam operation. I also saw one of its two nocturnal Cleveland-St. Louis passenger trains pulled by a single Alco PA-1. That looked like a good modeling candidate to me.

Glenn Pizer and I had founded the Nickel Plate Road Historical & Technical Society (nkphts.org) in 1966, so I had access to a wealth of information to accurately model this prototype. Many manufacturers had produced accurate models of NKP locomotives, freight and passenger cars, and cabooses. And pioneers like Bill Darnaby and track planner



Frank Hodina had shown how to design multi-deck model railroads that would accommodate single-track, high-speed freight traffic.

It was time to take the plunge.

A MULTI-DECK EXPERIMENT

I last talked about my HO scale tribute to the Nickel Plate Road's St. Louis Division in the December 2014 *Model Railroader*. Since that time, the railroad has been going through a process of refinement as projects are completed. I'll look at some of the more significant ones, but first I'd like to step back and offer an overview at the two-decades-and-counting juncture.

The most important thing I had to keep in mind is the main design and operational objective: timetable and train-order (TTTO) operation on a fast-moving, single-track railroad. Everything else had to be relegated to a back

seat. So the question I had to ask myself as the years and decades passed by was whether or not that goal was reasonable or it gave away too much in search of a single-minded objective.

I won't keep you in suspense. The railroad quickly proved successful and has grown moreso over time. It's not perfect – nothing is – but I've never glimpsed even a hint of a Plan B that seemed to me a better idea.

My previous HO scale layout, the freelanced Allegheny Midland (AM), was designed and built with the conviction that then-untried stub-ended ("muzzle-loading") staging yards at both ends of the railroad would work – and they did. In contrast, the inspiration for the NKP was the multi-deck approach that had proven so successful on Bill Darnaby's Maumee Route. But Bill's design had the two endpoint staging yards one above the other, so he could

1 Hot symbol freight MB-98, running as usual on No. 98's schedule, hustles eastbound through Cayuga, Ind., Tony Koester's 1950s home town. It will continue its run all the way to the east end of the Nickel Plate at Buffalo, N.Y. Note the green flags; it's actually First 98.

fiddle cars and locomotives on and off the railroad in real time to build new trains. Frank Hodina's design for my Nickel Plate relied on the AM's principle of passive stub-ended staging yards with sufficient capacity to originate and terminate all trains required for an operating session.

We operate the NKP's 1954 full schedule of a passenger train and five fast and through freights in each direction, plus a lot of sections and a few extras. This is easier than it sounds,



however, as each session is only half a day: 12 fast-clock hours (four actual hours at 3:1). So the approximately 16 to 20 trains per day boil down to about 10 per session.

Nonetheless, it takes at least 16 crew members to operate the railroad: a chief dispatcher, dispatcher, and two operators; a general yardmaster, two yardmasters, a roundhouse foreman/hostler, commercial engine crew, and soybean plant crew at Frankfort; a yardmaster and roundhouse foreman/hostler/local switch crewman at Charleston; a staging crewman; and road crews. I prefer two-person road crews of an engineer and a

conductor on freights, so we easily accommodate 18 or so operators.

The track plan has 17 staging tracks at the east end – 12 representing the busy Sandusky Division connection to the Nickel Plate's original Chicago-Buffalo main line at Bellevue, Ohio, and five for Toledo, Ohio. There are another six staging tracks at the west end representing the Peoria Division and 12 representing the Fourth Subdivision of the St. Louis Division. All but the Fourth Sub staging yard connect to busy Frankfort (Ind.) Yard; the Fourth Sub connects to the west end of the other division point at Charleston, Ill.

Road crews operate between Frankfort and Charleston. They never deal with a staging yard. The second deck (added at Bill Darnaby's suggestion) was required to achieve this, and it's one of the most important attributes of the railroad. The second deck also doubles the length of the main, making timetable-and-train-order operation practical.

The downside is that some parts of the railroad are a bit lofty for shorter crew members. Stepstools and raised platforms accommodate their needs, but there's no getting around the fact that the upper deck's elevation isn't ideal for shorter operators.



2 Both ends of the railroad terminate in semi-hidden, stub-ended staging yards. East-end staging is on the bottom deck at lower right; west-end staging begins behind the control panel at upper left. Between them, the railroad climbs westbound from 43" to 68½".

ELIMINATING STAND-INS

There are two distinct philosophies regarding using stand-in structures. One is that the time and money used to build and/or buy a stand-in could better be spent on the actual model. Moreover, as I discovered on the Allegheny Midland,



3 The view down the long aisle. Frankfort, Ind., is on the lower deck on the left. Seen here looking east, Frankfort was one of two major hubs on the Nickel Plate. As on the prototype, four divisions radiate out of the yard; three go into staging, while the fourth feeds the modeled Third Subdivision of the St. Louis Division.

some stand-ins are deemed good enough to become permanent additions to the railroad, thus almost always compromising the original objective.

The other approach is to leave the area where a structure will eventually reside as a vacant lot. This saves time and money, and the vacancy is often enough of an eyesore to prompt progress on filling it.

I subscribe to the philosophy of using stand-ins. I'd rather have something that at least sort of resembles the prototype sitting on the layout than nothing, much like giving the landform scenery a coat of ground foam rather than leaving it bare plaster or plywood. There is indeed a cost in materials and time to construct the stand-ins, but I think that's been amortized many times over as the railroad has crept slowly but surely toward today's relatively finished state.

When *Great Model Railroads* editor Steven Otte contacted me about writing this article, I made a list of things I wanted to finish before the submission deadline. Over the years, I've learned to use deadlines constructively. Yes, this is just a hobby. But if we treat it as an "as time permits" activity, we're selling its potential short. Way short.

I'm no spring chicken. I've invested a lot in this hobby and in this model railroad. I've received a great deal in return, in the form of seeing a favorite railroad that no longer exists come back to life, regularly gathering with old friends, and making new ones. Among those fellow modelers are people with knowledge and skill sets I don't have. I share what I know with them, and they reciprocate. What an utterly lacking railroad the NKP Third Sub would have been without their input!

On that list of projects to complete was the complex brick depot and the hotel at Cayuga; freight house at Linden, Ind.; V-shaped depot at Metcalf, Ill.; brick superintendent's and dispatchers' office; the Monon elevated crossing tower at Frankfort, Ind.; Kramer Bros. Lumber, also at Frankfort; the wood depot and Peoria & Eastern tower at Veedersburg, Ind.; and the Milwaukee Road's wood-and-brick tower at Humrick, Ill. Not all got done, but had Steve not contacted me, those projects would have remained in limbo as I coped with magazine and book deadlines.

And there's still a Big Four tower and stockyard to build at Charleston, Ill., not to mention the switch motors for the west-end yard ladder and a pair of crossing diamonds to spike down. The two passenger trains are still losing more money than they should for lack of revenue passengers – any passengers, to be honest. (How do those car roofs come off?) There are more crops to plant, myriad details to add, and a

THE LAYOUT AT A GLANCE

NAME: Nickel Plate Road, St. Louis Division

SCALE: HO (1:87)

SIZE: 24'-6" x 60'-6"

PROTOTYPE: New York, Chicago & St. Louis RR (Nickel Plate Road)

LOCALE: west-central Indiana, east-central Illinois

ERA: fall 1954

STYLE: multi-deck walk-in

MAINLINE RUN: 500 feet

MINIMUM RADIUS: 42"

MINIMUM TURNOUT: no. 6 (yard), no. 8 (main)

MAXIMUM GRADE: 1.5 percent

BENCHWORK: open grid; plywood shelf

HEIGHT: 43" to 68½"

ROADBED: Homasote and Homabed

TRACK: Micro Engineering codes 55 and 70

SCENERY: ¾" extruded-foam insulation board; plaster-cloth on screen

BACKDROP: 1/8" tempered hardboard with digital images

CONTROL: NCE radio Digital Command Control

The Nickel Plate's Third Sub

HO scale (1:87.1)

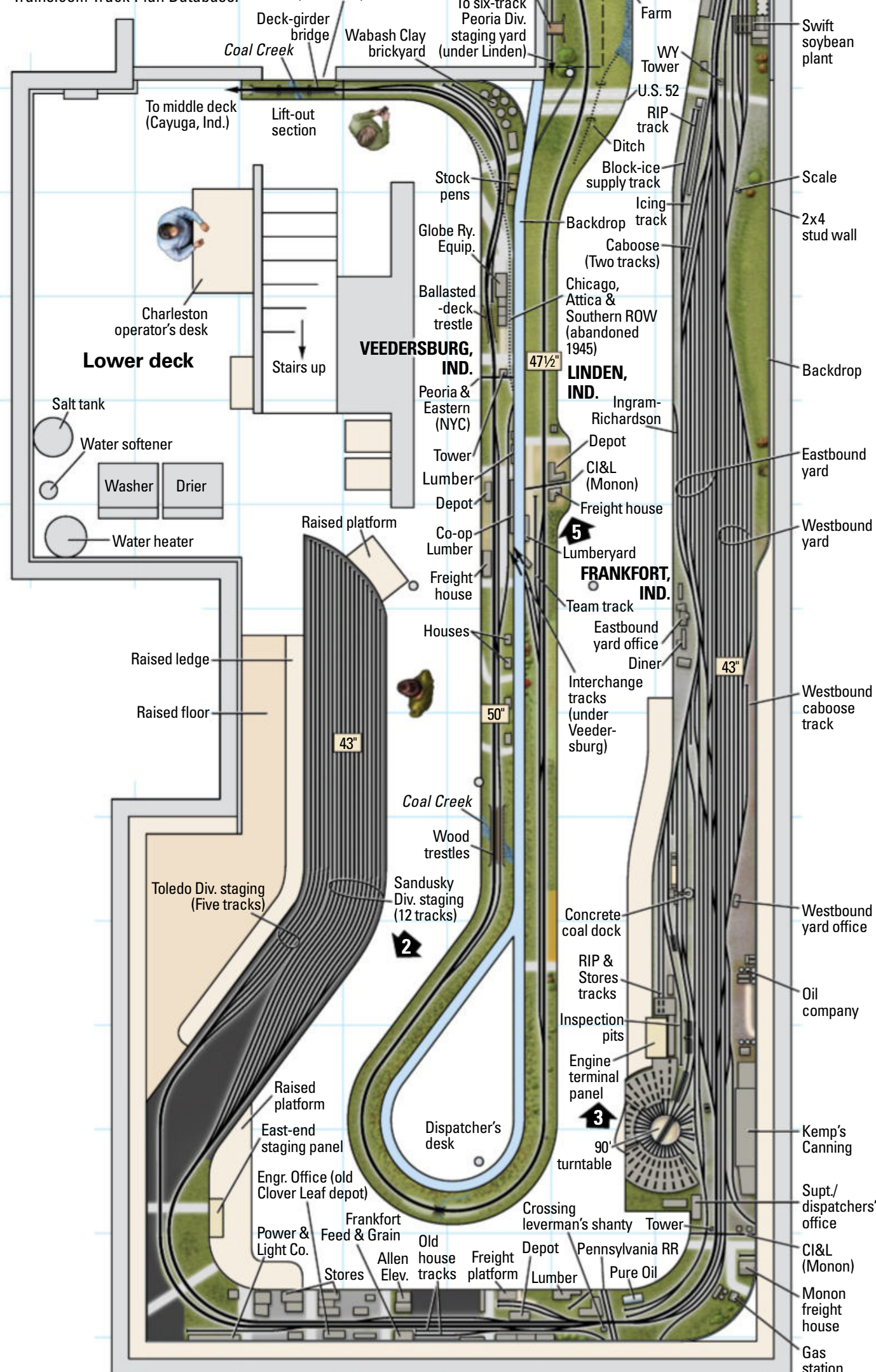
Room size: 24'-6" (main room) x 60'-6"

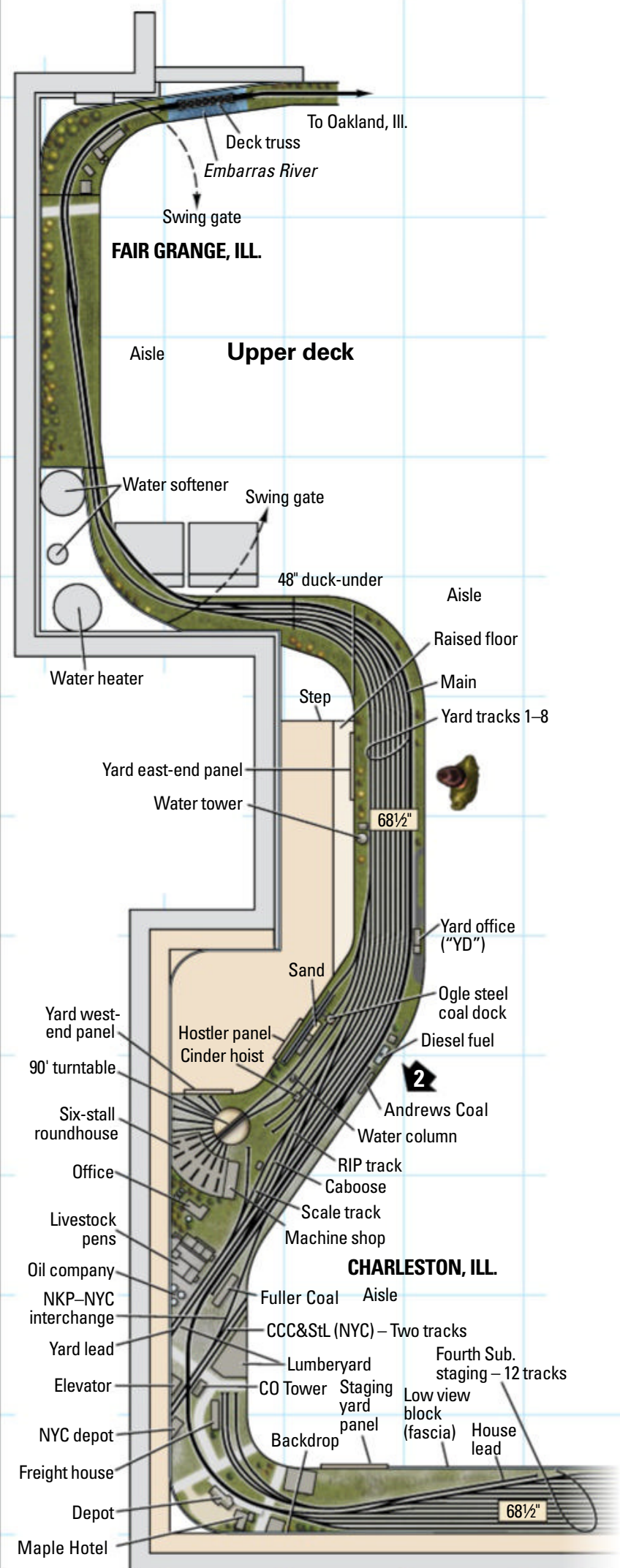
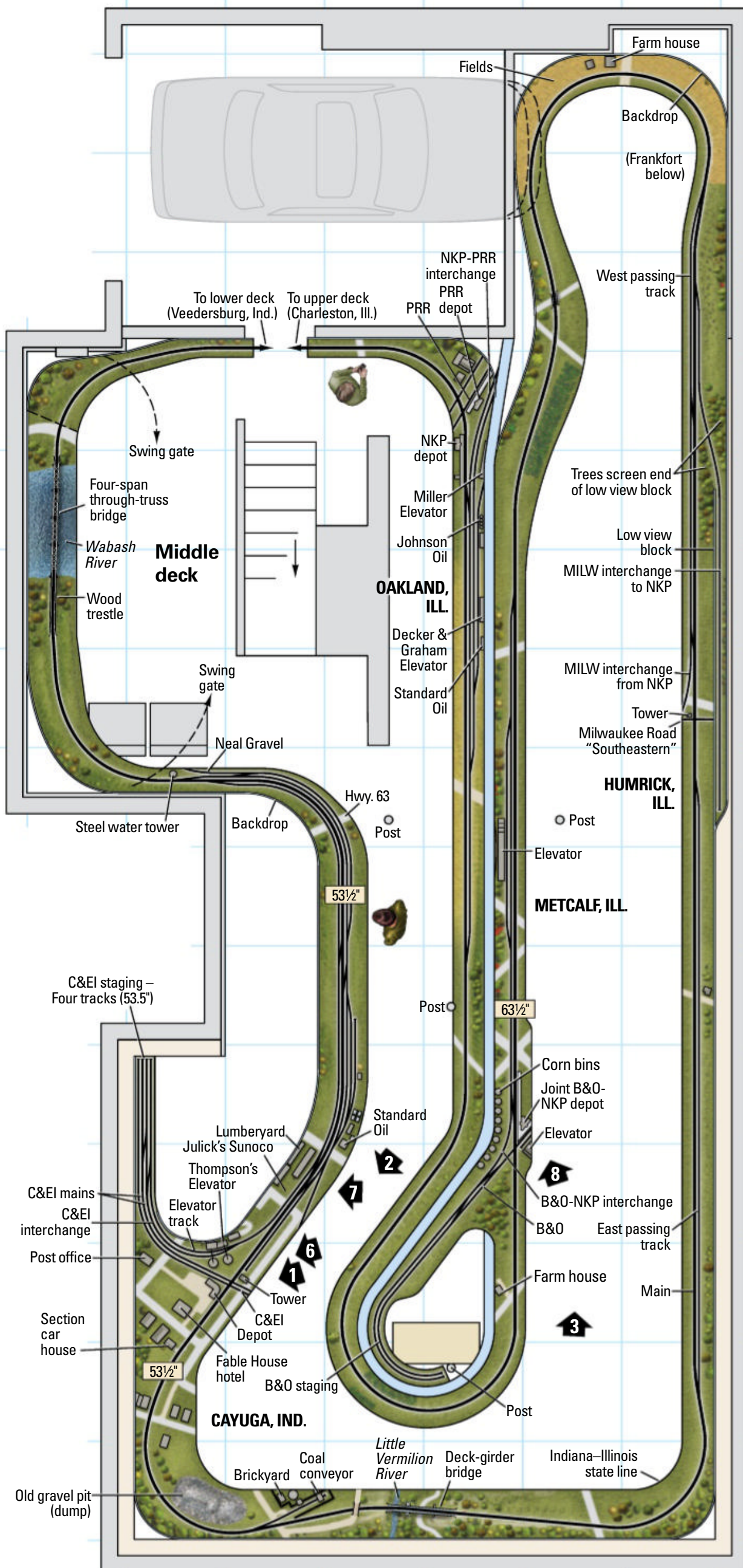
Scale of plan: 5/32" = 1'-0", 48" grid

Numbered arrows indicate photo locations

Illustration by Rick Johnson

Find more plans online in the Trains.com Track Plan Database.







4 Actual NKP scissors phones and Western Electric vacuum-tube speakers were assembled into a three-way telephone network between the dispatcher and two operators' stations by Seth Neumann of Model Railroad Control Systems.

Communications

ONE OF THE MOST IMPORTANT aspects of model railroading is good communication between the maestro controlling the pace of operations and those carrying out his or her instructions. I model a single-track railroad that was dispatched using timetable and train-order (TTTO) rules, so the chain of command is the superintendent (me), chief dispatcher, dispatcher, operators, and train crews. I'm usually busy answering questions, fixing something, or just keeping out of the way. That works because my chief dispatcher, Jim Schweitzer, keeps his finger on the pulse of operations and coordinates train movements between the yardmasters and dispatcher.

The yard at Frankfort, Ind., is divided into eastbound and westbound yards, so general yardmaster Jim Dalberg is the one with whom Jim Schweitzer communicates to be sure everything stays fluid – especially the critical westbound yard, which feeds the modeled Third Subdivision of the St. Louis Division. If it plugs up, the railroad ceases to function properly. Fortunately, veteran yardmaster Phil Monat keeps it flowing like water through a hose.

On many model railroads, train crews speak directly to the dispatcher as they report their progress along the railroad. But that's not how it worked on the full-size railroad in TTTO days. When trains went by an open depot or tower, the operator called the dispatcher to "OS" ("on sheet") a train. So that's how we do it too. One of my two operators will call the DS, as follows:

"OS Cayuga."

"Go ahead, Cayuga."

"Number 98 by Cayuga at (time)."

As a train passes an OS station, an infrared sensor lights a light-emitting diode for that station and rings a bell in an operator's panel built by Signals by Spreadsheet (signalsbyspreadsheet.com). If the operator is away from his desk, the light stays lit. He should know which train passed that station based on the timetable schedule or train orders he copied.

Until recently, we used wireless intercoms, which in addition to being anachronistic were also plagued with static. I had Seth Neumann of Model Railroad Control Systems (modelrailroadcontrolsystems.com) build a telephone system using authentic railroad and Western Electric components to connect the two operators and the dispatcher. It was a sizable investment, considering only three crew members use the equipment, but good communications are at the heart of realistic operations. – *Tony Koester*



freight car roster that needs culling as better detailed cars join the fleet. Obviously, I need another deadline.

REFINING OPERATIONS

I think I can say we're about there as far as operations are concerned. Employing timetable and train-order rules was definitely the right thing to do. Learning the basics isn't hard at all, especially if at least one person on the crew already has a pretty good handle on the system. Plus, it's a lot of fun. No signaling whatever is required, keeping costs low (although I'm still working toward installing Iowa Scaled Engineering's clever Interlocking in a Box hardware at every foreign-road grade crossing so NKP trains don't get a free pass over the entire subdivision). And about a third of the prototype had Automatic Block Signals, so that's another thing.

Speaking of Iowa Scaled Engineering, its Automated Interchange system is really slick. I use it at the Monon interchange in Linden, Ind., and the Milwaukee interchange at Humrick, Ill. Both interchanges employ 30-car-long hidden interchange tracks. When the NKP picks up a cut of about 8 cars, this uncovers an infrared sensor, which triggers a timer.



5 Thanks to a kit offered by the Monon Historical Society, Tony was able to add the L-shaped freight house to complement the scratchbuilt depot Frank Hodina constructed some years ago to complete the NKP-Monon crossing scene at Linden, Ind.

After about a fast-time hour (20 minutes at 3:1), the timer fires up the Monon or Milwaukee Road power, which shoves another cut of cars into view until they cover the IR sensor and stop. The NKP can make up to four pickups per session before the foreign-road power itself rolls into view, covers the sensor, and shuts itself off. (Nickel Plate deliveries to the Monon or MILW are made on a second 30-car-long track.)

If everything went per the timetable schedule, the dispatcher could take a three-hour nap. But that never happens, as the NKP ran sections of almost every fast freight and a few extras a day, all of which require train orders. And even scheduled trains need a Clearance Form A before they can leave the yards.

As noted in the timetable's Special Instructions, eastbound trains are superior to westbounds. So if you're the crew of first-class passenger train No. 10, you



6 The most important new scene on the railroad is the Nickel Plate-Chicago & Eastern Illinois crossing in Cayuga. Tony scratchbuilt the depot and the Fable House hotel behind it. He kitbashed the interlocking tower from a Walthers kit.



Scaled-down copies of actual waybills (left) can be intermingled with the familiar 2 x 4-inch four-cycle waybills (right) until the latter are replaced. They are printed on regular copy paper, and six or more can be stacked in a clear plastic sleeve. Tony finds them not only more realistic but easier to use than four-cycle bills.

More realistic waybills

I'M RAPIDLY CONVERTING my waybills to scaled-down versions of actual waybills that still fit in the same bill boxes used by the popular 2 x 4-inch car cards. They work about the same way as the four-cycle waybills, except that the bills are stacked like a deck of cards in clear plastic sleeves.

They can be intermingled with the four-cycle waybills until the old ones are gradually replaced. We've been using them for quite a while now, and I find them more realistic and easier to use than the four-cycle bills.

I use Micro-Mark wood bill boxes, with one slot for each track where a car can be spotted. Bills for cars to be picked up face outward; bills for cars just set out are dropped into the box behind them facing inward. (Crews don't cycle the waybills.)

Also in the box are Empty Car Slips for industries needing empty cars. A job aid tells the general freight agent (me) how many "MTYs" that industry needs per day, and between sessions I pick up that many slips and give them to the appropriate yardmaster, who's charged with finding suitable empty cars and seeing that they are forwarded to that industry. — Tony Koester



scaled-down versions of prototype bills (see "More realistic waybills" at left).

STILL AHEAD

I've been slowly gathering the motive power and rolling stock to host 1965 operating sessions. That's the year following the Nickel Plate and Wabash merger into the Norfolk & Western, which would allow me to model the newest power — Alco RS-36s and the NKP's sole Century 420; EMD GP18s, GP30s, and the lone GP35; as well as a few Wabash and N&W units.

This was a time when I was very active as a railfan with a car and a decent camera, so my memories are strong and largely positive. But it's not a trivial matter to purchase and equip with sound decoders a large diesel fleet, not to mention modern freight cars. And I'd lose the two passenger trains, the Alco PA-1s that powered them, and worst of all the Berkshires and Mikados that I so

own the railroad, barring any orders taking away your rights. Same for westbound No. 9 (except for keeping out of No. 10's way, although that usually happens east of the modeled part of the NKP). Second-class eastbound freights are superior to everything except No. 9; there were no third-class scheduled trains on the Third Sub. An extra is inferior to everything unless it holds a train order to the contrary.

The fun is watching a westbound crew work its way through the oncoming eastbounds. If the dispatcher sees a problem brewing, he may issue a helping order allowing the westbound or extra

to proceed by holding the superior eastbound for a given length of time or at a given location. The dispatcher communicates with the two operators using an authentic telephone system (see "Communications" on page 14).

Do we mess up? Sure! No big deal. Model trains stop on a dime unless the owner has added a ton of momentum to the DCC decoder, so actual cornfield meets are rare. Laughs are frequent.

As Ted Pamperin explained in the February 2012 MR, and as I covered in my book *Realistic Model Railroad Operation*, Second Edition (Kalmbach Books, 2013), we now use waybills that are



7 Tony uses Iowa Scaled Engineering's Interlocking in a Box to control interlocking signals at several locations on his railroad. The unit's software, which can control two crossing routes or one active and one dummy route, can be programmed with the schedule of the foreign road, ensuring NKP trains don't always have a clear run over the Third Sub.

admired as a youth. Is a pair of turbo-charged GP30s or a trio of chanting RS-36s a reasonable tradeoff?

The enforced hiatus of the global pandemic in 2020 and 2021 may have reset some of my priorities. We'll have to see how this plays out once things return to some semblance of normality. **GMR**

Tony Koester is a contributing editor to Model Railroader and the editor of MR's annual special issue Model Railroad Planning.



8 As Tony uncovers more prototype information, Metcalf, Ill., takes shape. Randy Laframboise scratchbuilt the depot from plans obtained by Jon Marx, the corn bins are castings from Resin Car Works, and the grain elevators are Walthers kits.

FROM DENMARK



TRAINS OF ALL SIZES have fascinated me since I was a little boy growing up in Denmark. My parents wouldn't buy me an HO train set because they thought my interest would fizzle out after a short time. (Boy, were they wrong!) I had to settle for a Lego train. Once grown and finally able to afford it, I started modeling HO scale in 1986.

My first house was very small with no separate train room, so I put it in my 10 x 11-foot bedroom, suspended from the ceiling and covering the whole room. It had a pulley system to lower it for construction and operation. It was very cumbersome to lower and raise. After the pulley anchors came loose from the wall twice – resulting in the layout

crashing down – I gave up that idea and started looking for a bigger house. My friends said I was looking for a train basement with living accommodations on top.

I found the perfect house on a small lot (I hate yard work) in which half the basement was one 11'-6" x 28'-0" room. I built a modern Danish-themed layout.

TO TEXAS

Per Laursen's modern-day UP layout draws inspiration from his countryman, Pelle Søeborg

By Per Laursen

Photos by the author



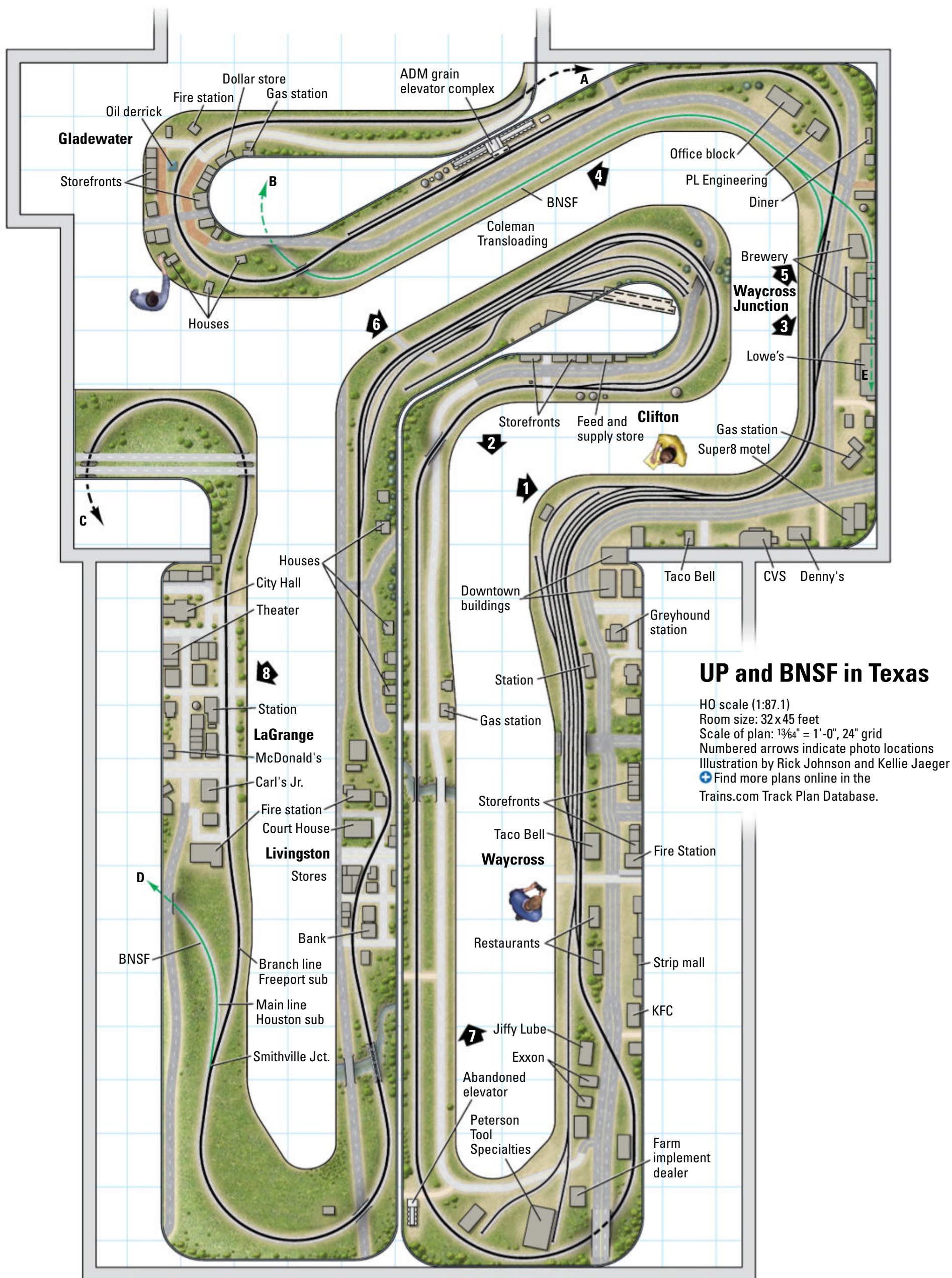
A few years earlier, I had met a new friend, Jan, who modeled Chessie System and later CSX. He introduced me to the magic of American railroads, and I subscribed to *Trains* and *Model Railroader* in 1991.

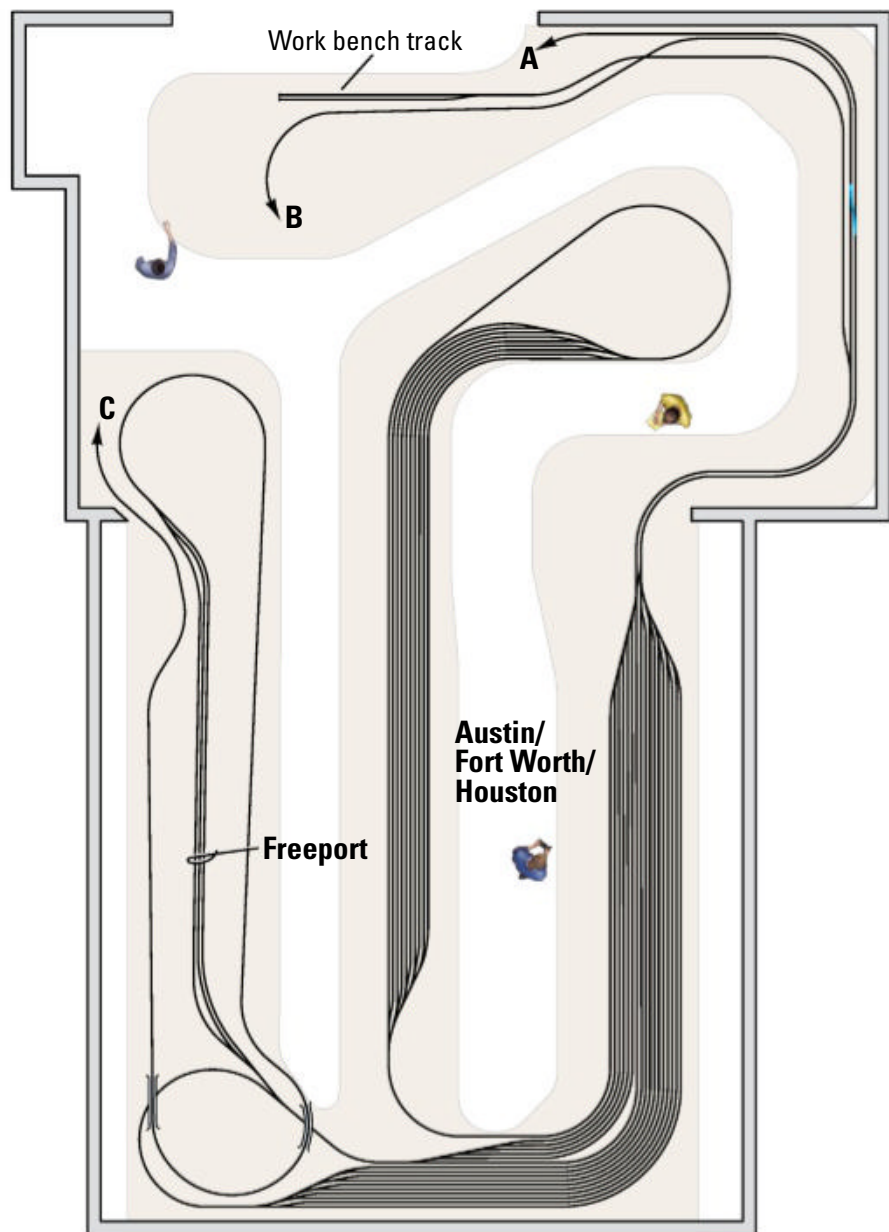
We planned our first train-watching trip to Cajon and Tehachapi in the fall of 1992. A couple of months before depar-

ture, we saw a picture in MR's Trackside Photos – the most realistic-looking I'd ever seen – by a fellow Dane, future MR contributing editor Pelle Søeborg, who lived only 20 miles away. Jan looked him up and gave him a call.

At that time, Pelle knew few people who shared his interest for trains, so he was thrilled to meet fellow modelers. He

1 A Union Pacific manifest freight rounds the curve along U.S. Highway 79 near Waycross, Texas, on Per Laursen's HO scale UP model railroad. The contemporary layout is a showcase for modern structure kits made and sold by Per's company, Summit Customcuts.





2 A view down the main aisle of Per's layout. Waycross is on the left and the main line to Clifton is on the right. The model railroad inhabits a purpose-built building in Per's back yard.

THE LAYOUT AT A GLANCE

NAME: UP/BNSF in south-central Texas

SCALE: HO (1:87.1)

SIZE: 32 x 45 feet

PROTOTYPE: Union Pacific and BNSF (via trackage rights)

LOCALE: south-central Texas

ERA: present day

STYLE: walk-in

MAINLINE RUN: 277 feet

MINIMUM RADIUS: 30"

MINIMUM TURNOUT: no. 6 (main), no. 5 (yards and industries)

MAXIMUM GRADE: 1.5 percent

BENCHWORK: open frame and L-girder

HEIGHT: 49" to 58"

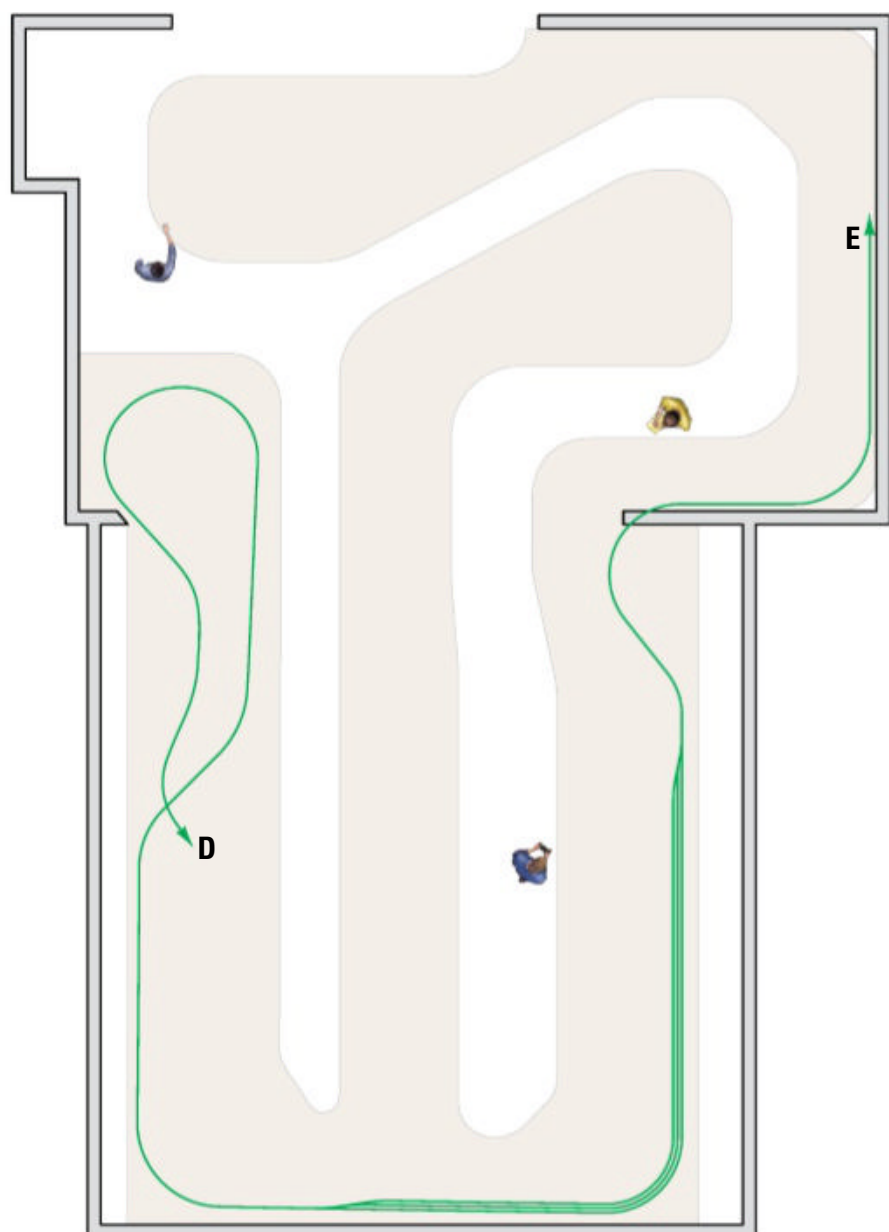
ROADBED: 1/4" Homasote on 3/4" plywood

TRACK: Peco code 83 (visible main), Shinohara code 70 (branch), Peco code 100 (staging)

SCENERY: extruded-foam insulation board covered with Sculptamold

BACKDROP: painted 1/8" tempered hardboard with some prototype photos

CONTROL: Lenz Digital Plus DCC with CVP Products wireless throttles





3 A BNSF manifest freight, exercising trackage rights over the Union Pacific main line, rolls past Waycross Junction. Modern details like highway signs, billboards, and working traffic signals add to the layout's realism.

4 A Trackmobile moves covered hoppers through the ADM grain complex for loading. The massive structure is one of the few rail-served industries on the layout. The yellow structure above the cars is for attachment of safety harnesses for workers on top of the cars.





had also planned his first railfan trip to Cajon and Tehachapi to be a couple of weeks after Jan and me. He invited us for dinner and railfan slides upon his return. A couple of other modelers also attended, and it became the start of the “train gang” who’s been meeting for dinner about once a month ever since.

When Pelle built his Caliente layout, seen on the cover of the March 1998 *Model Railroader*, I saw for the first time how realistic a layout could look. Most layouts I had seen until then (including my own) had a lot of track and a little bit of landscape squeezed in between. This new approach, to make a great landscape and then put a railroad through it, with a simple track plan and ample space for the surroundings, totally captivated me.

When I moved to Lake Charles, La., in 2004, it was clear that I was going to



model American railroads, so I sold all my European equipment except my Lenz Digital Command Control system. (My company was the import agent for Lenz in Denmark from the time the system came out in 1993 until I moved.)

When we bought our house, there was no room suited for trains, so my wife suggested building a train house in the large back yard. After three years of renovating the house and another 3½ years of building the train house, I was finally ready to build my new layout in the fall of 2010.

THE IDEA BEHIND THE LAYOUT

The layout sits in a 31 x 45-foot T-shaped room covering about 1,100 square feet. The layout design is along the walls with two peninsulas, so there are two aisles and no duckunders.

I always model the current era, because I like to be able to walk right out and take a photograph of what I’m modeling. I also enjoy modeling the environment around the railroads, such as highways, cities, and countryside, so I adopted Pelle’s philosophy of designing the environment and then putting a railroad through it, with a simple track plan.

I’m not much on switching rail cars; my main joy is watching long trains go by in a nice setting, so my track plan is mainly a train watcher’s layout, with many different scenes. There are three small rail-served industries: a grain elevator, a brewery, and a tool manufacturing company. To handle a variety of rail

5 A westbound BNSF oil train is waiting for a southbound UP freight to clear the diamond at Waycross Junction. The layout is signaled, and the UP main line operates under CTC.

cars, the largest rail customer is a trans-loading facility. The main city on the layout has a small yard. I also wanted to have an active diamond, so I have two lines crossing in the main city.

RAILROADS AND SETTING

I prefer Class 1 railroads, so in order to run the greatest variety of equipment, I picked a Union Pacific line with BNSF trackage rights. That allows me to run Union Pacific, BNSF, Norfolk Southern, CSX, and an occasional Kansas City Southern train.

I also prefer to model an area that is close to me so it’s easy to go out and look at prototype details. Therefore, I picked east-central Texas. The lines are fictional, and so is the main city of Waycross.

Union Pacific has many single-track main lines in Texas. They came through mergers over the years – Southern Pacific, Missouri Pacific, Missouri-Kansas-Texas, and Rock Island. The main line though the layout is Union Pacific (ex-Missouri Pacific), the Austin Sub is a former Southern Pacific line, and the Freeport Sub used to be a Katy line.

There is no Waycross, Texas, in the real world, but after visiting Waycross, Ga., I thought it was a good name for a



town with a rail crossing. Hearne, Texas, inspired the track arrangement.

I wanted to model a modern town where the railroad runs alongside a U.S. highway with many businesses on the opposite side. The businesses are mainly retail, motels, restaurants, and gas stations – what you see when rolling into a typical medium-sized American town. The other four towns on the layout are based on real Texas towns.

Gladewater is a small town on the UP's Dallas Sub about halfway from Dallas to Shreveport, La., and its downtown is somewhat accurate. On the model, it sits on a curve, but in the real world the track through town is straight.

Clifton is inspired by its namesake, located on BNSF between Temple and Fort Worth.

The scene around downtown Livingston, with its courthouse and surrounding buildings, is pretty accurate, as are the fire station and the First State Bank. I love the way the railroad crosses the highway in a street intersection and cuts a small corner off the courthouse lot.

Finally, there's the town of La Grange, which is on the UP's Smithville Sub halfway between Houston and Austin. It has

several blocks of street running and sees mostly coal trains to the nearby huge Fayette Power Project, a few rock trains, and an occasional manifest freight. I wanted to model the feel or atmosphere of this place, but it's limited by space. The remodeled 1897 M-K-T depot a block from the courthouse square is fairly accurate, though.

Both UP and BNSF trains serve the power plant, and so will the model. This branch line will see one loaded BNSF coal train, one empty, an empty UP coal train, a UP sand train, and UP and BNSF freight locals.

BENCHWORK AND TRACK

The layout is one level, with exception of the hidden staging yards. The track height on the visible parts is between 49" and 58", with most at 54". That brings it a bit under eye level for a short person like me (5'-7"). At this height, it looks more real and dramatic. I have several platforms to stand on when working on the layout. The staging yard level is about 16" lower. In order to run long trains – 25-32 feet – I kept the grade on the ramps from staging at 1.5 percent or less. Minimum curve radius is 30".

6 Since the layout was designed for railfanning, with only a handful of online industries, Per chose to make one of them a transloading facility, which can ship and receive almost any kind of freight car.

There are four staging yards, with a total of 27 tracks. All the staging and other hidden track is Peco code 100. The visible main line and sidings are Peco code 83 and the Freeport Sub branch line, yard, and industry spurs are Shinohara code 70.

Mainline turnouts are no. 6, except at Waycross Junction and at Smithville Junction, which have no. 8. Yard and industry turnouts are no. 5. All visible tracks sit on a 1/4" Homasote roadbed.

The benchwork is open-frame with L-girders and 1 x 3 joists every 10". The legs are 2 x 2. Where possible, I used wall brackets to minimize the amount of legs. The fewer legs, the easier it is vacuum the floor. In addition, I placed the legs as far back from the fascia as possible to avoid hitting them with my feet.

The track roadbed and city/town bases are 3/4" water-resistant plywood



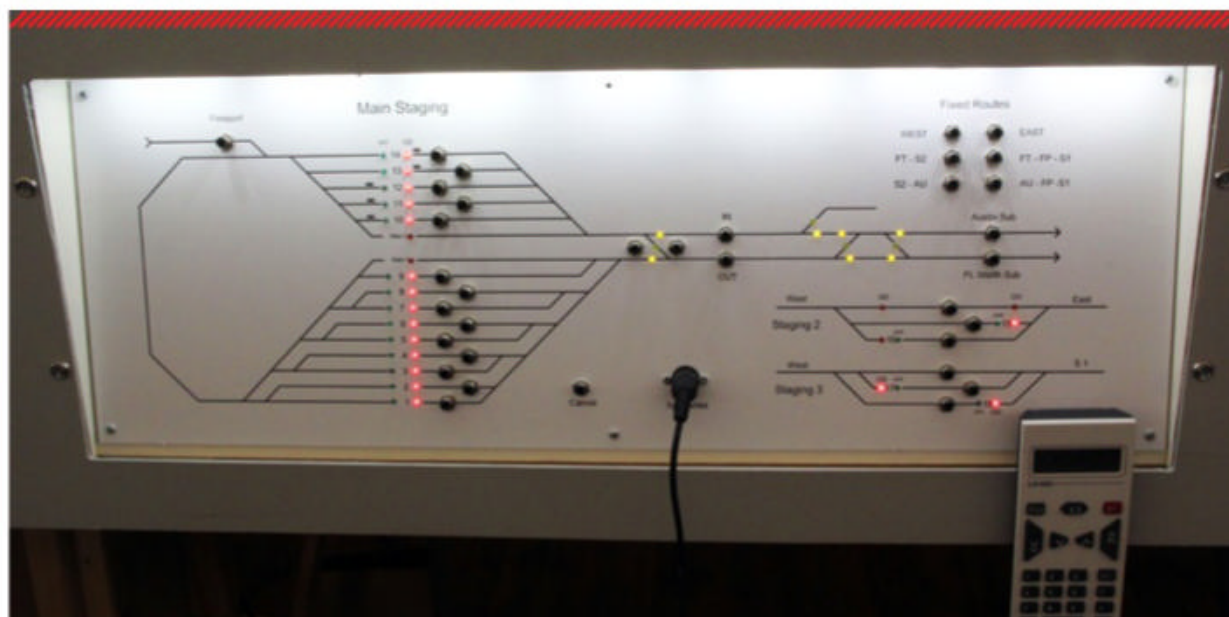
mounted on 1 x 3 risers. The backdrops are 1/8" tempered hardboard mounted on 1 x 2 risers. I have a 10-foot ceiling, so I built a hanging frame to hold the layout lights and the valances. The valance and fascia are also 1/8" tempered hardboard. The valances are painted white on the layout side to reflect the light.

The scenery base is mostly foam covered with Sculptamold, with cardboard web and plaster cloth in a few spots.

The roads are mostly made with Woodland Scenics Smooth-It road system; a few exceptions were made with styrene sheet. The roads are cast on top of 2mm cork sheets.

LIGHTING

Many layouts I've seen have insufficient lighting. The light is usually spotty, uneven, and not bright enough. To provide the light of a bright sunny day, I have back-to-back tube lighting right behind the valance. At first, it was 4-foot 3500K fluorescent tubes, but a couple as years ago I rebuilt all the fixtures to hold light-emitting diode (LED) tubes. This cut the power consumption in half and eliminated the heat. In deeper corners, I have additional LED floodlights to give



This control panel controls routes through the three staging yards. A Lenz LW100 Tower Cab lets Per select any of the routes through staging by pushing two buttons.

Staging automation

THE STAGING YARDS are automated with a system I designed and built. At the end of each track is an infrared occupancy detector that cuts off the power so the train stops and the sound goes off. When the train must leave the staging track, there's an override function which turns the power back to the track for two minutes, long enough for the entire train – including distributed power – to clear the detector.

Controlling the routes in and out of the staging yards can be done from the dispatcher screen or from a panel on the fascia.

I was lucky to have acquired a couple of Lenz LW100 Tower Cabs about 20 years ago. They were discontinued more than 15 years ago because the parts manufacturer discontinued the main processor on the board, and Lenz didn't sell enough of them to justify a redesign.

This device allows me to easily program switching chains for your routes. I can line up to 16 turnouts in a route by pressing only two buttons, and up to 64 routes can be stored. This is a superb controller that was never really recognized by most modelers. – *Per Laursen*

enough light to the background. There are 50 tube fixtures along the edges and five floodlights in the deep corners.

When I wired the building, I prepared for a "night light" circuit, just in case I would change my mind. I haven't yet, so it's still a daylight layout. I think night layouts are cool, but it would be too difficult and work intensive to light all the business signs and building interiors. When you have interior lights and streetlights, you also have to light most of the cars, and then you lose the flexibility of moving things around.

BACKDROP

The backdrops are painted. I looked at many photo backdrops available from commercial manufacturers, but I was

unable to find some that would fit with my layout theme all the way around. If they had existed, they would have cost close to \$4,000, which was another good reason to paint them myself. I bought the excellent book from Kalmbach *Painting Backdrops for Your Model Railroad* and followed it strictly. I highly recommend it.

On my trips around Texas to the places I wanted to model, I took many landscape photos. You can't paint realistic backdrops without photo references from the real world. I also took pictures of specific streets and places for use as photo backdrops. I mixed photos in with the painted backdrop where the need for detail called for it, such as where city streets continued towards the horizon.



7 Texas Highway 317 is a great place for railfans to pace a train. Here, a distributed power unit pushes on the rear of an eastbound UP freight. Per adopted fellow Danish modeler Pelle Søbørg's philosophy of designing an expansive landscape, then putting a railroad through it.

Because the layout is almost to my eye level, the horizon line is only 1" to 2" above the ground. If it were any higher, it would look wrong in ground-level photos and video.

The base backdrop color is a sky blue from Lowe's. Toward the horizon, the sky turns gradually whiter; this is accomplished with both white artist's acrylics and flat white spray paint, which gives a white haze. A few clouds are hand-painted, and several are spray-painted using cardstock cloud templates.

The landscape colors are artist's acrylics. I've noticed that on many layouts there's a mismatch between the shades of green on the backdrop and the scenery. To avoid that, I made a palette of Woodland Scenics foam colors and took them to a good friend of mine who's a university art professor, specializing in painting. She put names to all the colors so all my basic paint shades are the same as the scenery material.



DCC CONTROL

I have had my Lenz DCC system since it first came out in 1993, and it's been working flawlessly all this time. In 2008, I had a major software and firmware upgrade. In addition, I have two CVP Products Zonemaster 7A boosters for the track power, connected through CVP Products ZoneShare electronic breakers. A single Lenz LV100 3A booster drives all the accessory decoders – mainly the turnouts. Keeping accessory decoders on their own booster lets you still line a turnout if a locomotive shorts out on one.

8 In contrast to the modern structures in the big city of Waycross is the restored 1897 Missouri-Kansas-Texas depot that stands on the corner of Lafayette and Washington streets in La Grange. The model is made of laser-cut microplywood.

There are Lenz LH100 handheld throttles tethered at four switching locations: each end of the yard, the trans-loading facility, and by the workbench programming track. I also have a Proto-Throttle for running the switch engines



MEET PER LAURSEN

AFTER EARNING HIS DEGREE, Per became an electronic engineer. In 1991, he founded Summit Electronics, named after Cajon Summit. A few years later he took on a business partner and entered the American market. He moved to Lake Charles, La., in 2004, and two years later founded Summit Customcuts, manufacturing modern model building kits in HO and N scale. He enjoys country music, Western swing, bluegrass, and Cajun music from the 1960s to the early 1980s, so he always has music playing when working in the train room.



in the yard and the transloading facility. For running trains on the main line, I have four wireless throttles from CVP Products.

All the turnouts are Peco Electrofrog for best power pickup. The power to the frog and points is supplied through Frog Juicers from Tam Valley Depot – one of the best inventions since the wheel. Trains never stall in a turnout (providing the wheels are clean, of course).

Tortoise by Circuitron switch machines power all turnouts except a few in staging powered by Fulgurex switch machines I had left over from my old layout.

On the CTC-controlled main line, the Tortoises are controlled through the DCC system. In the yards and spurs, they're controlled by toggle switches on the control panel.

The three reverse loop controllers are Dual Frog Juicers.

SIGNAL SYSTEM

The layout is fully signaled. The main line is CTC controlled by modern BLMA signals and a few Atlas G-target signals on the ex-SP line across the diamond. The branch line Freeport Sub is “dark” territory. It has a repeater signal for Smithville Junction right outside La Grange to keep trains from blocking grade crossings.

The turnouts in the CTC territory are controlled by Lenz LS110 accessory decoders, which can be accessed from the throttles as well as the dispatcher screen.

The signals and the turnouts are controlled with the CMRI (Computer Model Railroad Interface) developed by Bruce Chubb. The hardware consists of input connectors from turnouts, sensing their position; block detectors that sense the presence of trains; and outputs to LED signal lamps.

The software is CATS, a display program that runs under JMRI. I was so lucky to have a good friend in town, Paul Bender, who was a computer science and math professor at our local university and a JMRI software engineer with expertise on Lenz integration. He offered to write my CTC software.

Track detection is a combination of current-sensing detectors and infrared (IR) detectors at each block junction. I started out with resistor wheel sets, but they don't always make reliable contact and are cumbersome to install. When a car is detected over the IR sensor, it gives an “occupied” signal to both blocks.

NEED EQUALS OPPORTUNITY

When I was planning this modern-day layout, I discovered there were few modern American building models

available. The most modern were the 1960s KFC from Life-Like and the 1980s Burger King from German company Vollmer. That meant that I had to scratch build every fast-food place, motel, gas station, and store I needed. So I went out in the real world and took a huge amount of pictures from all angles of all these types of buildings.

Luckily, I already owned a computer-controlled milling machine with which I had made several structures for my previous layout. I had also cut building parts for Pelle Søeborg, who was having the same problem finding modern buildings. When his article about his HO version of Mojave, Calif. – Daneville – was published in *Model Railroader* in 2005, he got many e-mails inquiring about the modern buildings. That gave me the idea that many fellow modelers also needed modern structures. So I decided to make all the buildings I had designed patterns for available for sale as kits. That was the beginning of Summit Customcuts. My business started with the Summit Motel and Taco Bell restaurant in early 2006 and has grown ever since.

In 2016 I became an American citizen. I still love watching trains, and over the past 30 years I've visited almost all places worth seeing in this country, most of them several times. **GMR**



ROLLING COAL ON A CLUB LAYOUT

The Blissfield Model Railroad Club designed its multi-deck HO layout with operations in mind

by Joe Watts ■ Photos by Jeff Watts

1 Clinchfield unit coal and reefer trains pass at the McClure, Va., paper mill on the upper deck of the Blissfield Model Railroad Club's HO scale layout in Blissfield, Mich. The club members designed the multi-deck model railroad for prototypical operations.



BUILDING A MODEL RAILROAD CAN

occupy the efforts of a train club for years. But once construction is completed, the layout needs to be able to maintain the members' interest. The Blissfield (Mich.) Model Railroad Club (BMRC) planned for this eventuality by packing as much operating potential as possible into its multi-level HO scale layout.

The BMRC's club layout models the Chesapeake & Ohio Ry. (C&O) and the Clinchfield RR (CRR) in the Ohio Valley and the Appalachian Mountains. The modeled portion of the C&O represents parts of Ohio, Kentucky, and West Virginia, while the Clinchfield is set in Kentucky, Virginia, and Tennessee. The two connect via a twisting mountain grade and interchange at Elkhorn City, Ky., on the railroad's upper deck.

LAYOUTS OLD AND NEW

The club's charter members modeled the C&O's Big Sandy Branch between Cincinnati, Ohio, and Charleston, W.Va. The C&O ran south and interchanged with the CRR at Elkhorn City. The section of the CRR extended from Elkhorn City to Dante, Va. This choice of prototype railroads led to extensive mountain scenery on multiple levels with a continuous connecting grade of 2 percent. The layout was set in the steam-to-diesel transition period, roughly 1955-1965.

In 2013, the club left its rented space and purchased a permanent clubhouse. The members dismantled the layout, salvaging and moving about 70 percent of it to the new building. A new layout configuration was designed, incorporating the salvaged sections and adding new railroad. The CRR was extended to Johnson City, Tenn., to make it closer to the size of the C&O. The C&O got new track, too, adding a line from Limeville Junction, Ky., to Toledo, Ohio.

The C&O lines reside on the lower levels of the layout. The bottom level contains the Toledo line as well as storage tracks for members' rolling stock. An ore dock, a coal dock, and an oil refinery are the industries served at the Port of Toledo. The main line between Cincinnati and Charleston runs on the middle level. For convenience, the end points of the C&O are both located at the same staging yard.

Major industries served on the C&O include Armco Steel at Ashland, Ky.; Cherokee Lumber at Hurricane, W.Va.; and Newport Meat Packing at Newport, Ky. Many smaller industries are found on the main line throughout the layout. Huntington, W.Va., became the hub of C&O freight operations, with a large classification yard and diesel and steam engine service facilities. Huntington was also a major stop for all passenger trains.

THE LAYOUT AT A GLANCE

NAME: Blissfield Model Railroad Club

SCALE: HO (1:87.1)

SIZE: 23'-3" x 85'-4"

PROTOTYPE: Chesapeake & Ohio and Clinchfield RR

LOCALE: Ohio Valley and Appalachian Mountains

ERA: 1955-1965

STYLE: walkaround

MAINLINE RUN: 3,275 feet

MINIMUM RADIUS: 36"

MINIMUM TURNOUT: no. 6

MAXIMUM GRADE: 2 percent

BENCHWORK: open grid/tabletop

HEIGHT: 30" to 63"

ROADBED: cork

TRACK: Atlas code 83 flextrack with Atlas and Peco turnouts

SCENERY: plaster cloth hardshell and extruded-foam insulation board

BACKDROP: painted tempered hardboard

CONTROL: Digitrax Digital Command Control

At Catlettsburg, Ky., the Big Sandy Branch of the C&O leaves the main line and heads to Elkhorn City on the upper level. The climb to Elkhorn City is the ruling 2 percent grade on the layout. During layout construction, it was decided to depart from the prototype and make the branch double track between Catlettsburg and Elkhorn City to avoid coal drags slowing traffic on the long, twisting mountain track.

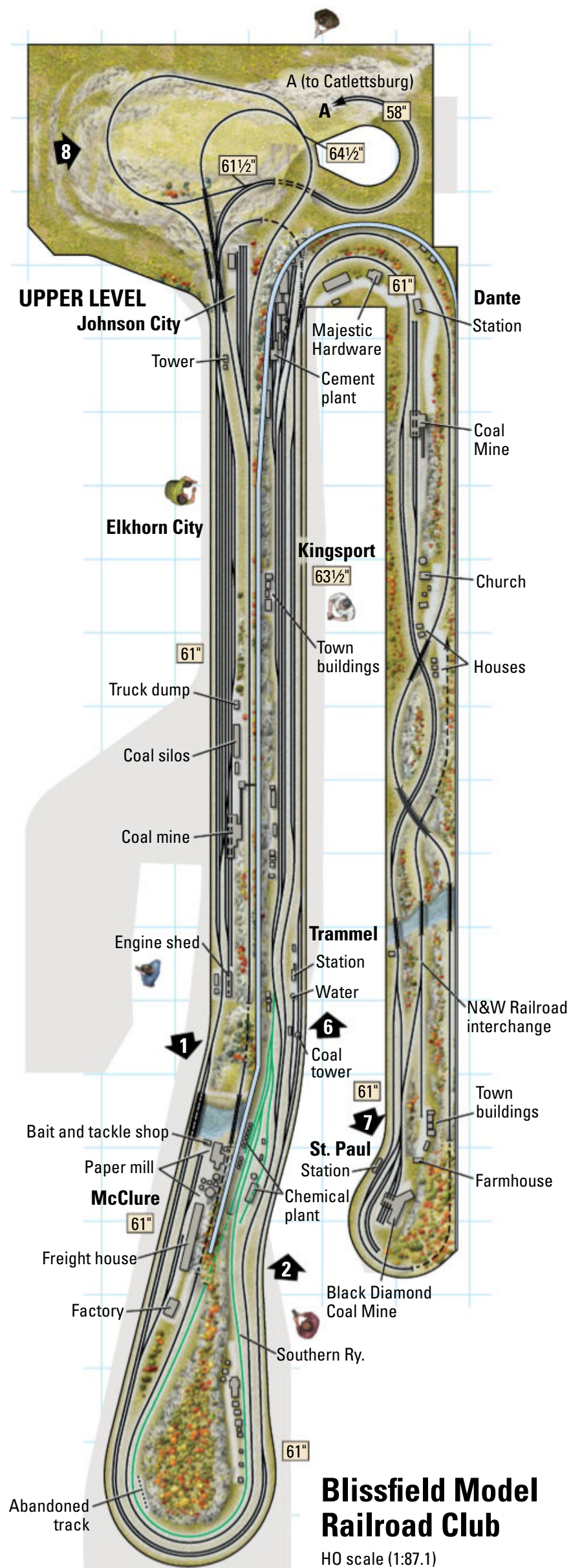
Trains of both railroads using Elkhorn Yard have facilities to change power, crews, and cabooses. The yard handles through unit trains and manifests and sends out three local turns on the Clinchfield. The local switcher also services the Elkhorn coal tipple at the south end of the yard.

The CRR heads south from Elkhorn Yard to coal country and ultimately reaches Kingsport, Tenn., and Johnson City. There are coal tipples at Elkhorn City, Dante, and St. Paul, Va. Kingsport is home to Clinchfield Cement, Eastman Chemical, and several other industries.

Johnson City, the south end of the modeled Clinchfield, has a reverse loop for turning trains and a visible stub-ended staging yard. A refrigerator

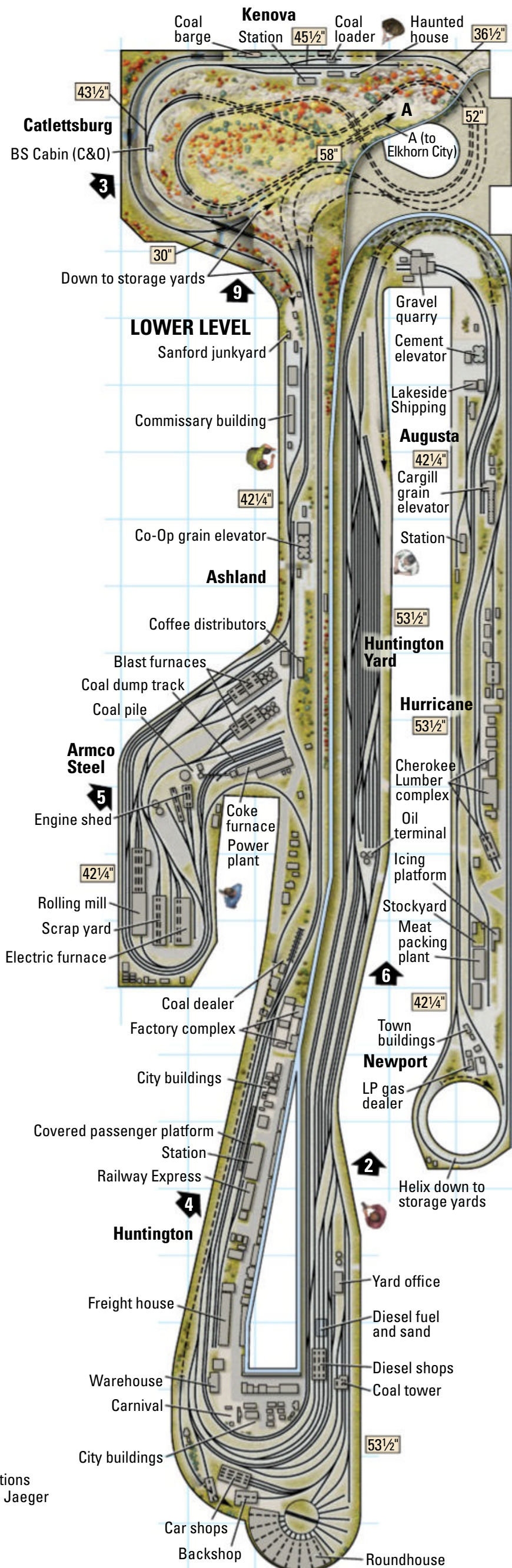


2 Train crews work in the south aisle during an operating session. An ideal operating session sees 20 operators running more than 40 trains over the course of a five-hour session.



Blissfield Model Railroad Club

HO scale (1:87.1)
 Layout size: 23'-3" x 85'-4"
 Scale of plan: 7/64" = 1'-0", 48" grid
 Numbered arrows indicate photo locations
 Illustration by Rick Johnson and Kellie Jaeger
 Find more plans online in the
 Trains.com Track Plan Database.





3 A Chesapeake & Ohio coal train passes Big Sandy (BS) Cabin at Cattlesburg, Ky., the junction between the C&O and the Clinchfield RR. Most of the structures on the layout are illuminated, and some, like this tower, have interior details.



4 The club runs two express passenger trains in an operating session, the *George Washington* and the *Sportsman*. Here, the *George Washington* pulls up to the station at Huntington, W.Va.

unit train from Florida and a local passenger train to Elkhorn City originate from this staging yard.

PLANNING FOR OPERATIONS

To make sessions more comfortable for operators to do their jobs without crowding, the construction team planned wide aisles. The cities and towns were designed with industries that require rail service. Classification, interchange, and staging yards were provided to support the planned traffic.

Two-way radio provides communication between train crews and the dispatcher, who operates out of a separate room.

The club also needs a large pool of locomotives and rolling stock to serve the 52 industries on the layout. Approximately 450 freight cars and 50 locomotives have been loaned or donated by members. Only C&O and CRR locomotives and cabooses are used. Locomotives of the C&O and CRR for this time period are getting hard to find, so some newer locomotives are included in the

roster to meet the need. Members' personal trains of many different railroads, which members can run between official operating sessions, are stored on assigned tracks in four storage yards on the bottom level.

The club operates two C&O express passenger trains, the *Sportsman* and the *George Washington*, between Cincinnati and Charleston. Local passenger trains also run between Cincinnati and Charleston and between Huntington and Elkhorn City. On the Clinchfield, one passenger local works between Johnson City and Elkhorn City. The passenger trains can have time schedules applied to challenge both novice and veteran operators' skills.

All trains get a train order to identify their number, origin, and destination. Passenger train orders include station stops. Local freight orders include the towns to be serviced. When complex switching is involved, orders may include switching advice to assist inexperienced conductors until they develop their own preferences. If a dark territory

line is involved, orders indicate where trains must stop to receive a verbal track warrant from the Dispatcher (DS) or to be cleared back to signaled territory. Upon arrival at the train's destination, train orders are left in the destination yard order box.

Car cards and waybills are prepared for all cars (except those in permanently linked unit trains), identifying the car, railroad, number, and type. A small photo of the car is also printed on the card to aid in identification.

Waybills, which fit into a pocket in the car card, identify a car's route, destination city, industry, and contents. Waybills are double-ended and turned at the destination for return to its origin. In this way, the destination in one session becomes the origin in the next.

Each manifest and local freight crew has a handful of car cards for their train. As cars are dropped off, the appropriate cards are placed in the local waybill box. For cars picked up, the crew also selects the corresponding car cards to accompany the cars back to the yard. As with prototypical operation, the delivery performance of the railroad depends on operator efficiency. There's normally a wide range of efficiency from one train to another as operators gain experience.

OPERATING ROLES

The Trainmaster (TM) is the planner and supervisor of the operating session. He has to know all the other jobs in a session, as he's the primary source of information for training new conductors and crews. If traffic gets snarled, the Trainmaster must be able to give direction and assistance to clear the congestion. If a signal or switch malfunctions, he may have to devise a detour or temporary fix to keep traffic flowing. Sometimes the Trainmaster feels like the "broom and shovel man" trying to keep things tidy through the session.

The Trainmaster plans initial crew assignments in advance, based on member attendance and experience. This aids the start of the session and gets everyone active quickly. Train departures are dependent on crew availability and smooth yard operation.

Occasionally, a crewman will want to learn a new job. The Trainmaster may assign him to work with a more experi-



Dispatcher Mark Deseck sets turnouts and signals for C&O No. 1, arriving at Cincinnati. The Dispatcher manages the flow of trains over the railroad from an office off the train room.

enced operator who's doing that job. The Trainmaster keeps a record of what members are qualified to do the various jobs and what trains remain to run to complete the session.

The Dispatcher's function is to keep traffic across two railroads moving smoothly. Train priorities and traffic control are his primary job. Passenger trains and express unit reefer trains always have priority, and the DS is challenged to keep clear signals ahead of them across the railroad. A DS's normal day may have derailments, inexperienced crews blocking the main line, and other trouble spots. As on prototype railroads, some days are better than others.

The Trainmaster and the Dispatcher work together to challenge all operators to keep the jobs from becoming routine. Surprise twists may include a time schedule for passenger trains, a derailment or track work on a main line, a locomotive with insufficient power to handle the mountain grade, or an unexpected change in a train order. Time invested to alter session routines tends to keep operators on their toes.

The Huntington Yardmaster (YM) operates the Huntington classification yard. Trains depart Huntington Yard for destinations up and down the C&O. The YM's primary job is to keep trains departing at the same rate as those



6 Huntington Yardmaster Darwin Lloyd watches C&O manifest freight No. 56 depart for Charleston, W.Va. The Huntington Yardmaster position is one of the busiest on the railroad, as most trains make up, break down, change power, or otherwise do business here.

5 Loaded and empty coal trains pass each other on the siding at the Armco steel mill in Ashland, Ky., one of the largest industries on the layout. The model railroad has 52 online industries.

arriving. As trains arrive in the yard, they must be classified (switched to specific destination tracks). The YM must know the origin and destination of all freight trains on the C&O. When an outbound is ready to depart, YM calls for a crew who contacts the Dispatcher for departure instructions.

There are two other Yardmaster positions handling traffic at other busy spots on the layout. The Elkhorn YM handles power and crew swaps between railroads, some classifying to make up outbound and receive returning CRR locals and sorting the inbound manifest from Huntington Yard. He also switches the Elkhorn coal tipple at the south end of the yard. The Armco Steel YM does the switching inside the mill, brings in coal



and ore from the C&O, and takes empty hoppers out.

Passenger trains, manifest freights, coal trains, and other unit trains are normally crewed by one engineer, since there is no major switching and no waybills. These trains also serve as learning tools for new operators, as an experienced crewman can supervise the new hand as he operates the train.

Local freights normally require an engineer and a conductor. The engineer runs the train, observes signals, and communicates with DS. The conductor handles switching moves and keeps track of car cards and waybills. The engineer has a throttle and a radio; the conductor has a handful of car cards.

OPERATIONS GUIDELINES

When model railroaders are operating on another's layout, the protocol is normally "follow the owner's orders." Many times a "round robin" group of operators move from one member's layout to another on a periodic basis, devel-

oping an appreciation for different owners' rules and the general etiquette for operating on another person's layout. Some layout owners take great pride in being as prototypical as possible, so their rules can include following signals, waybills and train orders, language used on the radio, rules of the prototype railroad, penalties for breaking rules, schedules, fast clocks, track warrants, and train speeds, in addition to various operator duties.

Operations in a club like BMRC are different. All club members have a voice in the development of plans, rules, and standard procedures. Blissfield Model Railroad Club has an Operations Committee of experienced hands, including some with experience on the full-sized railroads. The efforts of this committee, over the years, fostered a successful club environment for operating sessions. Experienced club and railroad veterans working together generate an enjoyable culture that includes hands-on mentoring of novice operators of all ages.

7 A Clinchfield coal train switches the Black Diamond Mine at St. Paul, Va. Coal is the main source of freight traffic on the model railroad.

The club's operations began with the simple intent to increase members' interest and enjoyment. Soon operators realized that operating more prototypically could be more fun to than simply running trains in circles, so plans were made to gradually add to the realism of operations. Phase I involved running several kinds of trains under train orders. Each train had an origin and destination, and locals switched without waybills. Industries received a car or two, and the local picked up the same number to take to a yard. Passenger trains stopped at all stations on a random schedule, and unit trains operated between yards or industries. Signals were sparse; some areas of the layout had none. "Watch for headlights" was the rule of the road.

Phase II saw more trains and the introduction of the car-card-and-waybill



8 A coal train circles the mountaintop, traveling from the upper level of the Clinchfield to the lower. The mountain houses a complex web of tracks, some visible and others hidden, that links all the levels of the railroad.

system. These procedures took quite a bit of time to work out before operators became comfortable with it. When new operators began feeling it was too complicated or frustrating, experienced operators spent more time helping them. These “old hands” needed to adjust and be willing to assist neophytes during operating sessions. Overall, operating sessions moved from chaos to smooth running in about two years. These first two phases took place before the club moved to its new clubhouse.

As a result of that five-year period of moving and rebuilding, Phase III of BMRC’s operations was a major one. The new configuration of the railroad had to be learned. A new Centralized Traffic Control system required operators to pay attention to the signals. Fortunately, the train equipment was brought back online in short order.

The car cards and waybills were updated for new industries and more cars. The number of trains operating was increased, and train orders were updated to reflect the changes. Operators learned the new signal system. A greatly improved dispatching protocol smoothed out operations considerably and resulted in increased enjoyment by all operators.

One long-term club goal is to simply start a new session where the last one left off. This club has grown closer to that goal, but each session requires some “clean up” to find waybills in the wrong place and to put train orders back at their origin locations. A yard may be left jammed or an industry overloaded, requiring some rebalancing of freight to allow a smooth start at the next session. Coal that’s been hauled from the mines to the steel mill or lake port is hauled back up the mountain and the empties hauled back down. If two or three trains in the classification yards are pre-set prior to the session, the start is less chaotic. And cleaning of track and locomotive wheels before each session always leads to a smoother operation.

AN IDEAL OP SESSION

The Blissfield club’s ideal operating session would look something like this:

- All track and locomotive wheels have been cleaned in advance.
- Twenty operators show up and are ready to go at the designated start time, with radios and throttles equipped with fresh batteries.

- Assignments are made for a Yardmaster and assistant at Huntington, a YM and assistant at Elkhorn, an Armco Steel YM, and a Dispatcher.

- The Trainmaster has three trains ready at Huntington Yard, five at Elkhorn Yard, two at Charleston, and two at Cincinnati.

- Six trains depart within the first 10 minutes of start time. All trains have two-man crews.

- The Trainmaster starts setting up two more trains to be ready for departure when the Dispatcher gives the word.

MEET THE BMRC

THE BLISSFIELD MODEL RAILROAD CLUB

is a group of 35 model railroaders from across southeast Michigan and northwest Ohio, ranging in age from 16 to 86. The COVID-19 pandemic caused the group to suspend open houses, but the members are planning to reopen to the public on a limited basis. Visit the club’s website at BMRR.org for updated information.



- All operators remain on duty for the full five-hour session, running more than 40 trains.

The club has operated 40 or more trains on one or two occasions in the past two years, but it would be terrific if the “ideal” could become the norm.

Operations are an important facet of model railroading, especially in a large club like Blissfield Model Railroad Club. Unlike painting a freight car or building a scale structure, it involves a large part of the membership working together. There’s much to learn, but once learned,

it adds a meaning to the hobby and friendship among the members. If prototypical operations are desired by a club, the layout must be designed and built with operations in mind. **GMR**

Joe Watts comes from an Atchison, Topeka & Santa Fe Ry. family and has been an officer for the BMRC since shortly after he joined in 2001. He was an aeronautical research engineer with NASA for 34 years, retiring in 1995. He has a son, Jeff, in Arlington, Va., and a daughter, Karen, in Ann Arbor, Mich.

9 This mountain bridge scene is a favorite of visitors to the club. The track under the high bridge leads to the staging and storage level.

A SPRING IN SKAGWAY



DAY



Riding the White Pass & Yukon Route in H0n3

By Mike May

Photos by the author

For a seemingly rare change of pace on a March day in Skagway, Alaska, the clouds break and the sun shines through. It's Saturday and the tourist season has yet to arrive, so a friend and I decide to take advantage of the beautiful day and enjoy some railfanning on the White Pass & Yukon Route. Living and working in a small town has its advantages, and the chances are that some of the train crews working today are friends of ours.

WHILE I'D KNOWN ABOUT the White Pass & Yukon for many years, my fascination with it began while working in the tourist railroad industry and learning more about the railway. After taking a trip to Skagway, I was overwhelmed by the rich history and story of the narrow gauge road that managed to survive until the modern era in a remote wilderness spanning an international boundary. I was determined that when I started building a model railroad, the WP&Y would be my prototype.

The White Pass & Yukon travels through some of the most spectacular scenery in the world. As the route climbs, the rails hang precariously on cliffs, dwarfed by towering mountains and broad valleys. The railway snakes along just feet from the shore of Bennett Lake, accentuating the small scale of the trains against the vast landscape. To capture some of the emotion of this railway, my modeling had to be convincing, but also tell a story.

1 There's not much of a better way to take in the stunning scenery of remote British Columbia than riding the back of a caboose with a cup of coffee in hand. Mike May's H0n3 White Pass & Yukon layout depicts a railroad that lasted a few years longer than its prototype.

White Pass & Yukon

HO scale (1:87.1)

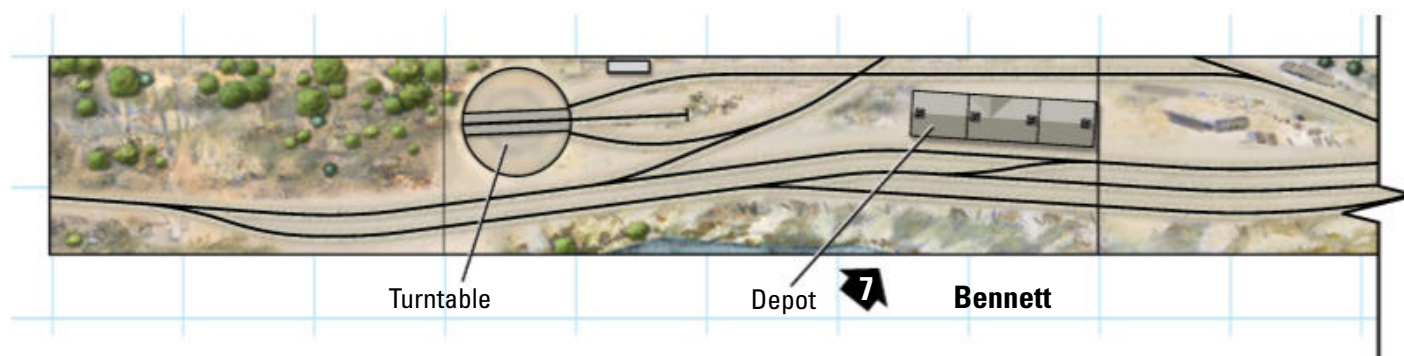
Room size: 8x25 feet

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

Numbered arrows indicate photo locations

Illustration by Rick Johnson and Kellie Jaeger

➦ Find more plans online in the Trains.com Track Plan Database.



ALTERING HISTORY

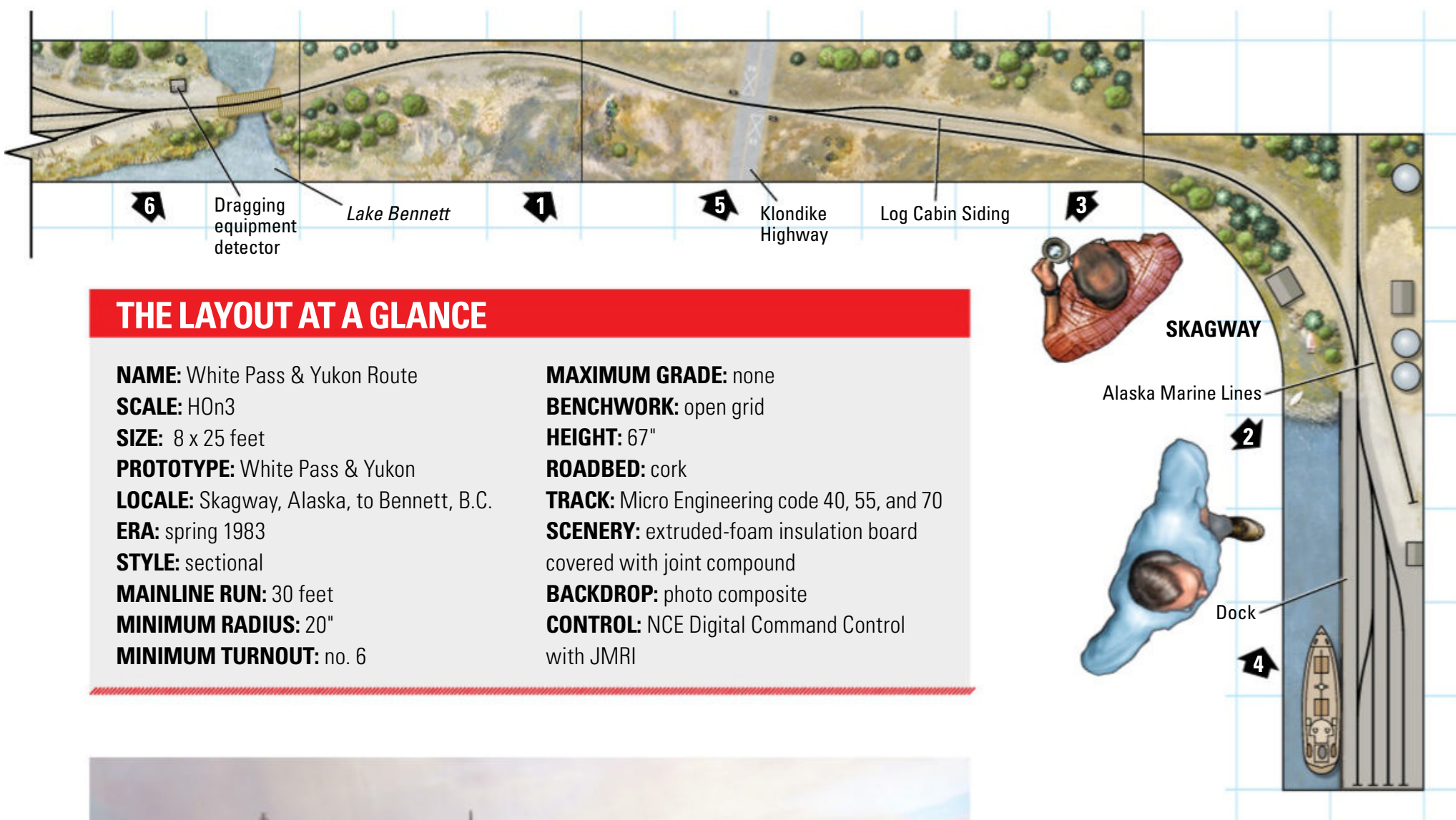
The best cinnamon roll in town and a rich cup of coffee can be found at a small shop on Broadway. It's the ideal way to begin a great day of railfanning. It's 6 a.m. and dawn is just breaking as we walk down to the small yard office at the Railroad Dock. In the harbor, the loaded container ship Frank H. Brown is being towed out to sea for a journey south. A string of now empty container cars sits on the dock track while a pair of General Electric class 90 locomotives idle softly nearby. The harbormaster welcomes us into the small dock office where he's sip-

ping a cup of coffee and chatting with the White Pass train's crew. After a little discussion of the day's work, conductor Steve realizes it's time for he and engineer John to climb aboard the locomotives to pull the empties back to the yard. There, the plan is to tie onto a work train they'll be taking north this morning. We watch their train depart, then drive up to Log Cabin, B.C., to catch them and some other trains there in a few hours.

In 1982 the prototype White Pass & Yukon was forced to indefinitely suspend railroad operations following the closure

2 Mike's imagined railfan trip begins in Skagway, Alaska, at the WP&Y's Railroad Dock. There, a pair of shovelnose General Electric class 90 locomotives are ready to start their day. Mike scratchbuilt the container flatcars on a framework he designed on a computer and 3-D printed.

of the Cyprus Anvil Mine in Faro, Yukon. With an international drop in ore prices, the mining company realized it could no longer operate the mine profitably. The resulting loss of ore shipments was a devastating blow for the railroad,



THE LAYOUT AT A GLANCE

NAME: White Pass & Yukon Route

SCALE: HO_n3

SIZE: 8 x 25 feet

PROTOTYPE: White Pass & Yukon

LOCALE: Skagway, Alaska, to Bennett, B.C.

ERA: spring 1983

STYLE: sectional

MAINLINE RUN: 30 feet

MINIMUM RADIUS: 20"

MINIMUM TURNOUT: no. 6

MAXIMUM GRADE: none

BENCHWORK: open grid

HEIGHT: 67"

ROADBED: cork

TRACK: Micro Engineering code 40, 55, and 70

SCENERY: extruded-foam insulation board covered with joint compound

BACKDROP: photo composite

CONTROL: NCE Digital Command Control with JMRI



which relied on the revenue as a significant portion of its business.

On my model railroad, I've rewritten history so that ore prices never fell and the mine increased in productivity rather than closing. The railway would continue its modernization program and invest in infrastructure. With this revised history, I chose to model 1983, one year after the prototype closed. This gave me license to deviate from the prototype's history yet stay true to the railway of the time.

Building the entire White Pass wasn't an option in my available space, so I chose to model two locations. Skagway

3 **Alco DL-535 no. 104 spots a flatcar of new ties on Log Cabin siding for the track crew while the caboose waits with another flatcar on the main. The locomotive is a Precision Scale brass import, as are the shovelnose GE's.**

is home to the railway's shops, yard, and port facilities. To represent it, I'd build the Railroad Dock, the oldest of the docks that handled general freight and passengers. I'd also build Bennett, where the tracks meet the shore of Bennett Lake. It's a midpoint for the railway,

where long trains would meet. In my revised history, the railway would install Centralized Traffic Control (CTC) to better facilitate traffic demands.

I knew that a change in residence was in my future, so I designed the layout to be sectional, allowing it to be taken apart and moved with relative ease. Construction is similar to a modular design, but in this case the sections only assemble in one specific way.

The benchwork is built from 1 x 4 and 1 x 6 clear pine, all glued and screwed together to be very sturdy. The subroadbed is made from 1/2" plywood attached to risers, with N scale cork roadbed.

All the track is Micro Engineering flextrack with Micro Engineering no. 6 turnouts. I used a mix of code 70, 55, and 40 rail to replicate the different weights of rail used on the prototype. Today, much of the White Pass' former route has been relaid with 115-pound rail, which code 70 nicely replicates. Though the rail wasn't that heavy in 1983, I imagined the story as if upgrades to the infrastructure happened a few decades before they really did.

THE GREEN AND YELLOW

Log Cabin is a little less than an hour's drive from Skagway, so we load up in our



4 Skagway is the location of most of the layout's industry, including the Alaska Marine Lines oil facility. The water on the layout is Enviro-Tex two-part resin, topped with artist's gloss medium waves.

red 1970 Volkswagen Beetle and head north. We clear Canadian customs at Fraser, then continue on a few miles up the road. Log Cabin is a remote corner of the world where the railway crosses the recently built Klondike Highway. It's easy to get lost in the natural beauty here, but before long the silence is broken by the distant growl of Alco 251 prime movers battling a heavy train.

From what we learned in the yard office, this should be a loaded oil train carrying gasoline and fuel oil to Whitehorse. The crossing signals spring to life,

and with horns blaring, shovel nose No. 94 leads a quartet of locomotives past, pulling a long string of tanks. Many of the cars in the train are ex-UTLX cars that once ran on the narrow gauge Denver & Rio Grande Western before being sold to the White Pass.

The White Pass & Yukon operated a fleet of unusual, iconic locomotives. On the layout, models of these are brass imports from Precision Scale built in the '80s and '90s. Both the Alco DL535 and the GE 90 Class models are rare pieces,



only a few hundred of which were ever produced. Each of the models of them on my layout has had drive-train tune-ups or motors replaced as necessary to ensure they all operate smoothly. Soundtraxx Tsunami 2 sound decoders and Soundtraxx Current Keepers are installed in all of the locomotives.

Some of the locomotives have factory paint, while others were custom-painted into the green-and-yellow scheme that White Pass locomotives wore for nearly the entire existence of the railway. During the era that I model, however, most



of the locomotives were painted in a blue scheme for the owner at the time. Not liking that scheme, I decided that the railway chose to go back to the classic green-and-yellow.

Rolling stock on the layout is a mix of repainted Blackstone Models offerings, kitbashed cars, and scratchbuilt ones. I scratchbuilt a fleet of container flats, starting with a 3-D printed frame from drawings I made.

Nearly all rolling stock rides on Blackstone Models trucks because of their excellent operation; the exception is a handful of Micro-Trains trucks, which are a close second. Couplers are primarily Micro-Trains N scale couplers to represent the White Pass's half-sized knuckles, plus some Kadee no. 714s.

SCENERY

Stillness returns to the Canadian wilderness as the northbound train rumbles off into the distance. From the lineup we discussed with Steve and John this morning, their work train should be the next move heading north to Bennett this morning. We decide to hike to the Log Cabin siding, a quarter mile or so, in hopes of seeing the train through there.

5 At Log Cabin, the railfans swap their red VW Bug for a ride in the local's caboose. The backdrops on the layout are composited from photos Mike shot on research trips to the prototype.

Before long, the sound of a distant locomotive breaks the silence. The train, led by a pair of Alco locomotives with No. 103 in the lead, comes to a stop to set out a flatcar loaded with new ties for the maintenance-of-way gang. With the set-out made and air test completed, Steve walks over from the caboose and invites us to ride the rest of the round trip up to Bennett today. It's an unexpected offer that can't be refused, as Bennett is a beautiful place, but remote, only accessible by rail or foot. Gratefully accepting the offer, we climb up into caboose no. 901. With a sputter, the Alco locomotives growl to life, easing us on our way.

To re-create the look and feel of the North Country scenery, I carved terrain from extruded-foam insulation board, then covered it in a hard shell of joint compound. Ballast from Arizona Rock & Mineral along with other collected



idling in the siding. Its Whitehorse-based crew is in the depot visiting the staff and seeing what's cooking for lunch today. Our train knocks down an approach signal at the South Bennett interlocking and rolls up to the depot. Steve and the crew have some work here today, so we climb off the caboose to explore around Bennett. The weather is about as perfect as a spring day can be and Bennett Lake is glistening in the afternoon sun. From on top of the hill where St Andrew's Church sits, we watch the freight train depart for its last 40 miles to Skagway. The work train sets out the rest of the cars for Bennett and picks up one of the White Pass's unique low boy flats, which the train will take back to the shops in Skagway.

When gold was discovered in the Klondike in 1896, people flooded to the Yukon to stake their claim and the railway quickly followed. Before the completion of the railway, prospectors hiked the narrow and steep White Pass trail from Skagway to the southern tip of Bennett Lake. There they boarded steamships to continue their journey, eventually landing another 400 miles up the Yukon River to reach the gold fields at Dawson.

The town of Bennett sprang up nearly overnight where the trail met the steamships. Hotels, merchants, restaurants, and taverns were built to meet the needs of prospectors traveling though. Today Bennett is nothing more than a remote section house and depot that always offers a hot meal in this remote part of the wilderness.

The depot is the focal point of Bennett. I scratchbuilt it to replicate the prototype in the early 1980s, employing some selective compression. Evergreen styrene and numerous Tichy detail parts make up the majority of the model.

Bennett is also home to a turntable which was built from an N scale Walther's 130-foot turntable. The deck was removed and replaced with a scratchbuilt deck to convert it to an approximately 71-foot table in HO scale. There was never a turntable in the real town of Bennett, but I wanted a way to turn power. With space considerations, the prototypical wye wasn't going to fit. Other structures in town are a combination of scratch- and kit-built models from various manufacturers.

natural rock material form much of the scenery base.

I used several colors of ground foam and turf products to replicate scenery in photographs I've taken while visiting the railway. Water is poured Enviro-Tex two-part resin with waves built up with artist's gel medium.

For deciduous trees and bushes I've used Scenic Express Super Trees, but to replicate the numerous Black Spruce trees I chose to scratchbuild those. The backdrop is a composite of photographs

6 Locomotives 103 and 104 pass the approach signal at the South Bennett Interlocking and enter Bennett, B.C. Behind no. 103's nose is a dragging equipment detector.

taken along prototype locations over several trips to the area.

STRUCTURES

When we arrive at Bennett, the oil train we saw at Log Cabin has just departed, and a southbound freight is



7 Once a bustling pioneer town on the route to the Yukon gold fields, Bennett is now home to little more than the WP&Y depot. Mike scratchbuilt the selectively compressed station from Evergreen styrene siding and Tichy Train Group windows and details.

THE FUTURE

After the crew runs the pair of Alcos around the train, completes the air test, and sights a clear signal ahead, we climb back aboard the caboose for the trip back south. The brakeman keeps a watchful eye on the train from the cupola while we enjoy the ride with Steve on the rear platform, sipping coffee and watching British Columbia roll by.

This model railroad is now about eight years in the making and hopefully has many more to come. Over that time, I've learned and refined so many modeling skills, always leading to new projects and things to experiment with. I've made many new friends through the hobby,

many of whom I owe a lot of thanks to for lending their skills and time helping with the layout.

My White Pass & Yukon has grown and changed with time, and since it's sectional, there is opportunity for new sections to be added. I have a dream of expansion to include other iconic elements of the White Pass & Yukon Route, but time and space will determine that. For now, the layout is my centerpiece to a great hobby.

Our train rumbles through the switches at Log Cabin Siding and John grabs a few pounds of air, easing us to stop at the Klondike Highway so we can disembark. The caboose is spotted perfectly in the road right by our trusty red Volkswagen. Climbing down, we thank Steve for the fantastic day and wave to John on the head end. The locomotive's horn blows, and we wave again as the short train departs for Skagway. What started as a morning walk for cinnamon rolls and a coffee turned into a Saturday for the books. GMR

MEET MIKE MAY

MIKE'S BACKGROUND IN technical theater helps him as he leads the production department of a special events company working with railroads. He also spent several years as a locomotive engineer for Amtrak and the Durango & Silverton RR, where he still runs locomotives occasionally. Mike loves living in Durango, Colo., where the outdoors, travel, and music take up much of his non-railroading time. For more on his layout, visit Facebook at facebook.com/groups/wpvr1983.





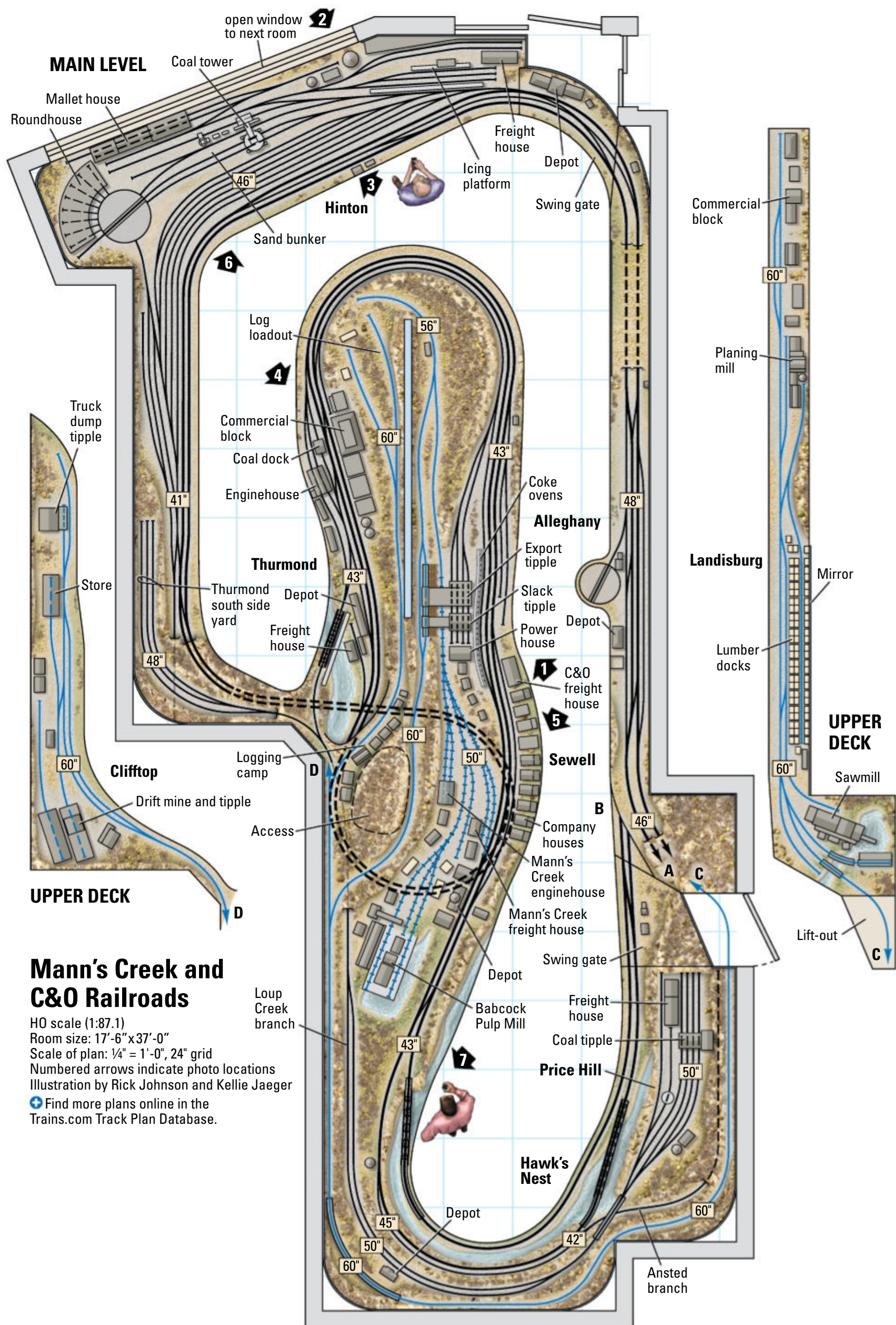
A WEST VIRGINIA JOURNEY

Modeling the Chesapeake & Ohio's
New River Subdivision in 1943

By Ted Pamperin • Photos by Paul Dolkos



1 Chesapeake & Ohio no. 1585, a class H-7 2-8-8-2, pulls a classified armor move past the coke ovens at Sewell, W.Va., on Ted Pamperin's New River Subdivision. The HO scale layout depicts Appalachia in early winter, 1943.



Mann's Creek and C&O Railroads

HO scale (1:87.1)

Room size: 17'-6" x 37'-0"

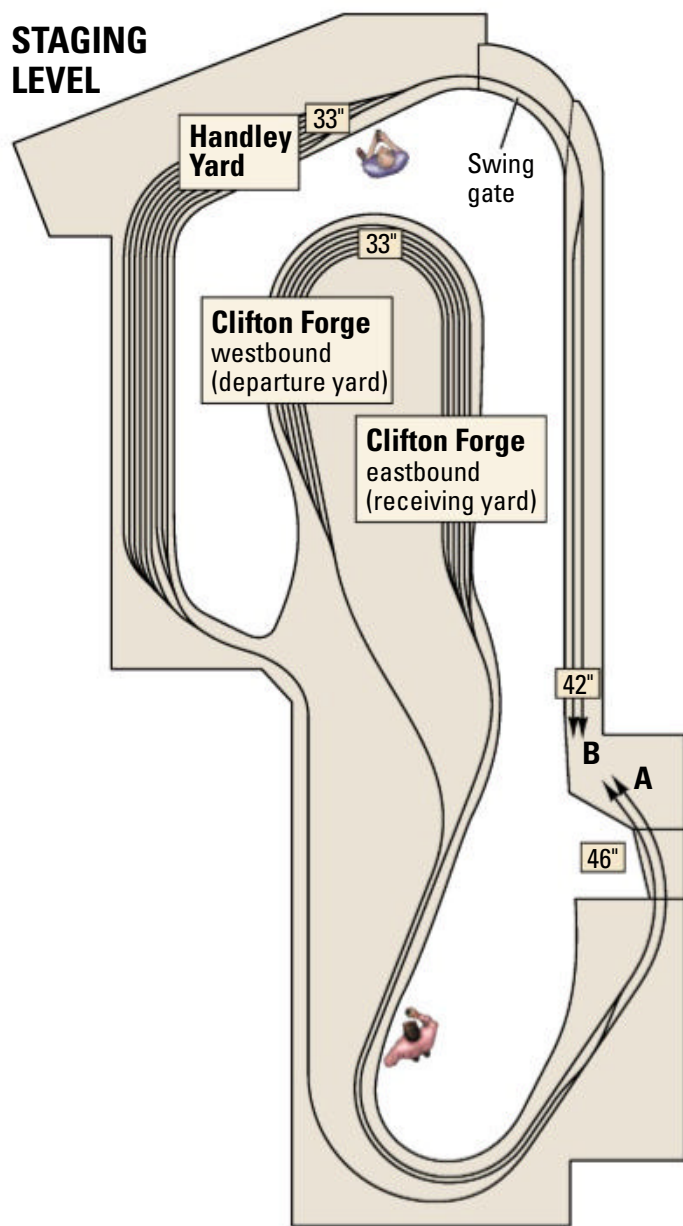
Scale of plan: 1/4" = 1'-0", 24" grid

Numbered arrows indicate photo locations

Illustration by Rick Johnson and Kellie Jaeger

Find more plans online in the
Trains.com Track Plan Database.

STAGING LEVEL



THE LAYOUT AT A GLANCE

NAME: C&O New River Subdivision

SCALE: HO (1:87.1)

SIZE: 15 x 35 feet

PROTOTYPE: Chesapeake & Ohio and Mann's Creek RR

LOCALE: West Virginia

ERA: late fall/early winter 1943

STYLE: walk-in

MAINLINE RUN: 150 feet

MINIMUM RADIUS: 36"

MINIMUM TURNOUT: no. 8 (main), no. 6 (yard)

MAXIMUM GRADE: 2.5 percent (from staging)

BENCHWORK: Gatorfoam, cantilevered from wall

HEIGHT: 46"-60"

ROADBED: Woodland Scenics Track-Bed

TRACK: Micro Engineering code 83 and 70 (C&O) and code 55 (Mann's Creek narrow gauge)

SCENERY: extruded-foam insulation board topped with leveling sand

BACKDROP: SuperTrees-covered foam panels, sky painted on walls

CONTROL: NCE Digital Command Control



AS I WAS APPROACHING RETIREMENT,

I believed I needed more than racquetball and golf to fill all the spare time I expected to have. More importantly, I understood I would need a community of friends to replace the business associates who would no longer be part of my daily life.

In the past, I had constructed a credible model of the destroyer on which I served during the Vietnam War. I also began a small model railroad layout in the 70s, but it never really got off the ground. However, I like miniatures, so I thought perhaps the model railroad hobby could serve both purposes.

I decided to attend the 2000 National Model Railroad Association (NMRA) national convention in St. Louis with my cousin Bob Guinter, a model railroader, to get an idea of the state of technology. I subscribed to *Model Railroader* and began to clean out the basement. Although I had no real plan, I tested my modeling skills by building a few dioramas.

WHAT TO MODEL?

As I researched the different types of equipment available, I was drawn to narrow gauge. The wonderfully executed, superdetailed models, combined with their smaller mass, were very appealing. Shays and Climax locomotives are interesting, and if I could find an eastern prototype to model, perhaps I could follow a road less traveled.

In the search for information, I discovered a book authored by Ron Lane

2 Ted operates in Hinton Yard. The window into the rest of the basement gives access to both sides of the yard, making operations more convenient.

and Ted Schnepf, *West Virginia Narrow Gauge, Mann's Creek Railroad*. The authors introduced me to Tom Maule, a master craftsman who provided creative inspiration for modeling the environment served by the Mann's Creek. I had found my prototype!

By this time I had introduced myself to Tony Koester, Perry Squier, and David Olesen. They introduced me to operations – the social side of model railroad-ing. For me, “social” meant entertaining a crew of 10 or more. The Mann's Creek alone wouldn't do that.

Coal and coke were the primary products of the Mann's Creek. These commodities were shipped to market on the C&O railroad, another very attractive prototype to model. It's a high traffic, double track railroad with cool steam located in the scenically breathtaking New River Valley of West Virginia. This location also provided a solution to a design preference of mine, the desire to avoid painted or photo backdrops.

I had my prototype railroads. Now, what era? I really like steam locomotives, a variety of consists and high traffic. The era that best seemed to fit these preferences are the World War II years. Unique to this era are troop, unit oil, military armor/equipment and hospital



3 With a division point yard, locomotive servicing facilities, and local industries to switch, Hinton is one of the busiest locations on the railroad. Ted uses a temporary backdrop made from a photo of a wooded hillside on his layout to hide walls and windows for model railroad photography.

movements. These combined with manifest freights, passenger and of course empty and loaded hopper turns should keep a crew of 14 busy.

PREPARATION AND PLANNING

I joined the C&O Historical Society and began the “paper chase.” The COHS opened up its historical archives in Clifton Forge, Va. Tom Maule and Ron Lane provided essential information on the history of the Mann’s Creek. The internet and multiple field trips to the New River Valley rounded out my understanding of the history and operations of the railroads I intended to model.

LAYOUT DRUTHERS

COINED BY the dean of model railroad design, John Armstrong, the term “druthers” refers to features the layout builder considers most important. Ted’s druthers include:

- Scenery should dominate the railroad
- Layout design elements that are recognizable
- Minimum 2½-foot aisles

- A model that supports prototype operations
- Recessed, indirect lights
- Clean fascia, with recessed waybill boxes and phones
- Finished ceiling and walls
- Dedicated dispatcher and operator locations
- Adequate staging

It took a while to free up space in the basement, but in the end, I had a 15 x 35 room with additional space for a crew lounge, dispatcher’s office, and an operator/CTC booth.

I started with a rough drawing of a possible layout, and once I had something I liked, I rendered it in the computer game Trainz (trainzportal.com). A consequence of choosing this program is that I got hooked on the game. I not only built the railroad in the program,

I included scenery and structures, including animated industries, vehicles, people, signals and of course trains. That cost me a year. Not only could I operate the virtual railroad, but in many ways my digital version was more prototypical than the model I was intending to build.

In 2005 I forced myself to put the computer to use designing a detailed track plan using a now discontinued program 3D Railroad and Design. The plan was to re-create elements of selected

prototype locations as closely as possible. These are the locations I ultimately chose and the operational reasons I did so:

- **HAWKS NEST:** Not only is this the location of the iconic Hawks Nest Bridge, it's also the location of the Ansted branch, a major source of coal traffic.

- **SEWELL:** Export location of coal, coke, and lumber products from the Mann's Creek RR. It's also the headquarters of the Mann's Creek and its engine facilities. This is also the location of the Babcock Coke Ovens, a huge traffic generator and representative of the primary industry in the New River Valley.

- **THURMOND:** One of the most iconic railroad towns in America, with storefronts on the tracks instead of a main street. Thurmond is the principal marshalling point for loaded and empty hoppers being routed to and from the mine tipples in the valley and in Loop Creek.

- **HINTON:** The division point between the New River and Alleghany subdivisions. It includes significant classification and local industry switching. Helper engines originate here for the shove to Alleghany. Crews and locomotives are changed here. Combined with engine servicing, Hinton keeps a crew of four operators very busy.

- **ALLEGHANY:** The highest point on the railroad. A helper engine dance takes place here. Under CTC control, helper engines cut off, run around the cabooses, and shove it back on the train. Helpers are then turned on the turntable and under orders return to Hinton. All moves on this subdivision are controlled by the CTC operator.

- **MANN'S CREEK:** Locations served by this railroad are Sewell, Clifftop (the location of the major coal mines), Landisburg (home of the sawmill and lumber docks), and a logging camp on another branch.

I invited Tony Koester, Perry Squier, and David Olesen to review my plans, and for the most part, they passed. After planning for several more staging tracks, I was good to go. A suggestion to expand the layout to the remainder of the basement was fortunately resisted.

With the plan in hand, I hired a contractor to finish the space. He installed a drop ceiling, finished the exposed walls, and added electrical circuits that provided for multiple outlets on the walls and

Urethane rock castings

I NEEDED HUNDREDS OF ROCKS to replicate the spectacular outcroppings of the New River Valley. Cripplebush Valley Models has a perfect selection of "rubber rocks" that met my needs. Unfortunately, the size and terrain of my model railroad required far more of them than I could afford.

The solution was to purchase one example of each, and with the manufacturer's permission, replicate them. I used two products from SmoothOn Corp.

The first step was to make a mold of each master using OOMOO 25, a two-part silicone molding material. I simply hot-glued the rubber rock master to the bottom of a disposable aluminum cake pan, mixed up the OOMOO, and poured it on. The molding material takes just over an hour to fully cure.

Once the mold had cured, I removed it from the original and filled it with another product from the same company, FlexFoam-IT 17, a self-skinning, expanding urethane foam that results in a flexible cast rock that can be painted, cut, and mounted wherever needed. Using this method, I cast and spray-painted an inventory of dozens of flexible rocks. — Ted Pamperin



Ted made his own flexible rocks by making urethane molds from Cripplebush Valley Models originals, then casting them with a self-skinning urethane foam material. Ted Pamperin photo

above the false ceiling. The ceiling outlets were particularly valuable because it allowed me to later install plug in lighting as required without a code violation.

A big problem was my inability to create a design that didn't require two access gates.

LAYOUT CONSTRUCTION

As much as possible, I cantilevered my layout off the wall using commercial metal shelf brackets. For deeper sections, I used brackets cut from plywood.

While the layout-building world seems to love 3/4" plywood, I decided to take a road less traveled, and one that was certainly much easier. I made my subroadbed from 3/4" Gatorboard. This material is feather-light, rigid, and dimensionally stable. I purchased the material in 4 x 8-foot sheets and cut it according to the plan using a saber saw or retractable knife blade.

I used Woodland Scenics Track-Bed for the roadbed, HO scale for the main line and N scale for the sidings. I chose this material to reduce noise transmission from the rails to the subroadbed. The track and switches are Micro Engi-

neering code 83 and 70 for the standard gauge and code 55 for the narrow gauge. I used Fast Tracks jigs to aid in the construction of many of the curved turnouts and the no. 8 and 10 turnouts on the main line. These are terrific products that make it easy to build turnouts that are flawless in performance.

The roadbed was affixed to the subroadbed and track to the roadbed using clear DAP Alex Latex Caulk Plus Silicone. If modifications were needed, I simply slid a putty knife under the track and roadbed to pry it loose.

All mainline turnouts are lined by Tortoise by Circuitron switch motors controlled by levers on the fascia. The remainder are hand-operated ground throws. To attach the switch machines to the subroadbed, I used white glue to affix a mounting pad of 1/8" lauan plywood under the bench work. I then screwed the machine into the lauan.

SCENERY

The New River Valley's rock outcroppings are spectacular and are most visible when the trees are without leaves, so I decided to model early winter. This



4 Extra 1610 West has completed its coaling stop at Thurmond, W.Va., enroute to a classified military destination. Since the layout is set during World War II, military bridge traffic is a frequent sight.

5 Coal drag Extra 1570 West passes the Sewell depot enroute to the C&O's Great Lakes port at Toledo. Coal is the main source of traffic for the railroad.





Ted inserts the stems of Scenic Express SuperTrees into brown-painted extruded-foam insulation board panels. After spray-painting the trees and affixing cast urethane rocks, he attaches the scenicked panels to the layout with hook-and-loop fasteners. Ted Pamperin photo

Thousands of SuperTrees

I KNEW I HAD TO INSTALL thousands of Scenic Express SuperTrees on my layout. My objective was to do as much of that job at my workbench.

SuperTrees are a natural plant product that includes leafy parts that don't look like a scale tree. Removing these with a hobby knife is a necessary first step. Since I model early winter, I don't add ground foam or other foliage; bare branches is the look I want.

On my workbench I used an awl to punch holes in 1 x 2-foot extruded-foam insulation board panels that I painted brown. I glued the SuperTree stems into the holes and used hot glue to stick my homemade urethane foam rocks onto the panels. I took the planted panels outside and sprayed them with a variety of Krylon and Rust-Oleum camouflage spray paints, including grays, browns, tans, and rusts. Once the paint was dry, I used hook-and-loop fasteners to attach the panels to the backdrop. – *Ted Pamperin*

means the layout requires thousands of trees and hundreds of rocks. I needed a modeling solution that was efficient and easy. That left out plaster cloth, plaster rocks, and other messy products.

For the rocks I found a variety of beautiful foam rubber rocks from Cripplebush Valley Models. They're expensive, so I used them as masters and cast multiple copies of each – but not in plaster. I used products from Smooth-On Corp. to create the molds, then cast them in an expandable, self-skinning urethane material that results in a flexible rock casting. (See "Urethane rock castings" on page 51.)

I cast hundreds of rocks. I took them outside and, using an appropriate mix of

several camouflage spray can colors from Krylon, created an inventory of painted rocks for future use.

Scenic Express SuperTrees were the solution for the majority of the trees. I ultimately devised a method to install the required thousands of trees on the layout without breaking my back. I forested 1 x 2-foot panels of extruded-foam insulation board, then installed these panels on the layout with hook-and-loop fasteners so they would be removable if necessary. (See "Thousands of SuperTrees" above.)

For the non-vertical portions of the layout, I stacked layers of extruded-foam insulation board. I didn't bother to carefully shape the foam because I covered it

with Step 2 Leveling Sand from Lowe's. This is a crushed granite product that, when damp, will hold up to an 80-degree slope without flowing. I used a thin-set additive, Laticrete 333 (used commercially to keep finished shower tile cement flexible), as the binder. The advantage it has over white or yellow glue is that the finished ground cover remains flexible and won't chip. While the adhesive was still wet, I got out my static grass applicator and applied the first layer.

The structures on the layout are a combination of scratchbuilt and kit-bashed to represent the prototype. Mike Tylick, Tom Maule, Jim Kerner, and Bernard Kempinski have contributed several models to this effort.



6 Trains are made up and broken down in Hinton's busy classification yard. Note the patriotic war propaganda displayed on the rolling stock in this era.

ENGINES AND ROLLING STOCK

With few exceptions, I've tried to remain era-specific with regard to the stable of locomotives and rolling stock as well as the division on which they are run. On occasion, one may spot a 2-6-6-6 H-8 Allegheny on the New River Sub or a 2-10-4 T-1 Texas on the Alleghany Sub, but the layout is set in wartime, and the extreme amount of traffic resulted in some power being pressed into service far from its familiar territory.

While I have a significant number of brass locomotives, over the last several years many of the locomotives I required have been produced in plastic by more well-known manufacturers including Bachmann, Walthers Proto 2000, and Rivarossi. With a little weathering, they're indistinguishable from their brass counterparts. My locomotives are all equipped with sound decoders, and recently I've been installing stay alive capacitors to increase their reliability.

Over the years I've been updating my roster of rolling stock with the finely detailed ready-to-run options that are now being offered. Now that the railroad has its scenery in place, I have the time to weather all my cars.

OPERATION

In my view, constructing the railroad is analogous to crafting a chess set. No matter how beautiful it is, the objective is to play the game!

In my case, the game is to re-enact the historical operations of the C&O in the New River Valley in the late fall of 1943. To the degree practical, we attempt to accurately replicate prototype train and car movements on the modeled portion of the railroad during each four-hour operating session.

Traffic is controlled using the 1943 C&O employee timetable No. 132 and train orders, overlaid by Automatic Block Signals on the New River Sub portion of the railroad. On the Alleghany Sub, authority is given and controlled by Centralized Traffic Control (CTC).

Mike Burgett, Seth Neumann, and Chuck Catania helped David Olesen and me with the design and programming of the signal systems. The development and installation of the system is truly a hobby in itself. We invested a year rewiring the railroad for block detection and installing the electronics for controlling the signals and turnouts. The electronic components are a combination of CMRI and Model Railroad Control System. The signals are from Tomar Industries. I mounted the signals to the layout using super magnets from The Home Depot. This prevents damage when they're inevitably elbowed during an operating ses-

sion. The end result is worth it, but it's not a project for the faint of heart.

In addition to the timetable, Form As and Form 19s confer authority. A variable speed fast clock helps manage the flow of traffic during our sessions. Telephones located throughout the layout provide communications to the Dispatcher and Operator. Cars are routed using waybills that emulate in miniature the prototype document. Work orders provide the crews with a job description of their train.

WORTH THE EFFORT

Whether it's broken switch points, humidity necessitating the realignment



7 Double-headed 2-8-4 Kanawhas pass over Sewell Bridge as they haul a heavy consist up the New River Gorge. Rows of Scenic Express SuperTrees mounted to foam board make up the wooded hillsides.

of the gates, dirty wheels, signals requiring reprogramming, or brass steam locomotives needing attention, maintenance is a constant need. I'm happy the railroad isn't larger. No matter how carefully one constructs a model railroad, it seems that every operating session brings out the gremlins. It's a constant battle to keep the railroad from becoming an

operating nightmare. Restaging after an operating session takes about eight hours, and that's only because the task is shared with my friend David Olesen.

On the other hand, watching the railroad come alive is worth all the time and effort it took to create and maintain. The re-creation of history via this living and breathing thing is rewarding both emotionally and intellectually.

Most important, however, is that through the hobby I have achieved my primary objective: meeting and making friends of hundreds of new acquaintances scattered across the country.

Yes, it's worth it! **GMR**

MEET TED PAMPERIN

TED GREW UP in Green Bay, Wis., and remains an avid Packers fan despite living in northern New Jersey for more than 40 years. He and his wife, Karen, have three grown daughters who also live in the area. A retired marketing consultant, he also enjoys golf and racquetball.



The HO scale Muni F Line trolley reaches its final destination – Fisherman's Wharf

By Harvey Simon ■ Photos by the author

BEGINNING IN 2013, I built a working HO scale model of San Francisco's F Line trolley system. It's been a wonderful journey. *Model Railroader* readers saw its progress in the July 2018 issue with my story on building the Castro District, where the F Line originates.

The layout is less than 35 square feet – my train “room” is a corner of a guest bedroom – but its walk-in style allows viewers to watch the trolleys move along the layout in a linear fashion. The cars only turn at their destinations, the Chevron station in the Castro District and the Fisherman's Wharf parking lot, just like on the prototype.

Traction modeling is perfect for a small layout, as it allows a lot to be packed in without looking cluttered. A 6" radius curve is possible, making a small layout seem much larger. In addition, the web of overhead wire powering the trolleys adds to realism. Visitors think this gives the layout a “cool” factor.

PLANNING FOR REALISM

The actual F Line is only 6 miles long, so a trolley layout with a main line round trip of about 30 feet can still look and feel like a replica of the prototype. With 6" radius curves, you can turn a car in far less space, thereby allowing a true point-to-point orientation. When I planned the layout, my intention was to fully model both destinations and connect them with the downtown area. The walk-in footprint enabled me to do this.

Each terminus has enough space to allow for a reasonable representation of its full size counterpart. As on the prototype, the F Line encircles the Chevron Station in the Castro District and the Fisherman's Wharf parking lot. This meant the most selectively compressed part of the layout would be downtown San Francisco, where Market Street turns toward Fisherman's Wharf. If I had more space, I would have lengthened this section of the layout.

Of course, the benefit of a smallish downtown area was not having to build

so many skyscrapers! Structures always take a lot of time, especially the tall ones with all those windows to paint, install, and glaze.

Additionally, the equipment itself adds greatly to realism. The prototype operates as a heritage streetcar line with restored streetcars from cities around the world providing the service. Bowser's HO scale F-line streetcars, launched in 2009, are well designed models that run smoothly and reliably. The variety of cars is interesting and colorful.

Even on a small layout, it's possible to have several cars running simultaneously as a “train” is only one car. This is part of the appeal of traction modeling. You don't get that feeling of a train chasing its caboose as you might on a similarly sized conventional layout.

With three main sections, I decided to use different elements in each one to create the illusion of a larger layout. For example, I used three different styles of streetlights from the Woodland Scenics Just Plug line. I also used brick sheet to represent pavers in the downtown area, like the prototype, in contrast to the conventional sidewalks of the Castro District and Fisherman's Wharf.

Each of the 29 structures represents an actual building on the F Line. Some structures are kitbashed, others are scratchbuilt, and a few are 3-D printed. My son and daughter-in-law live in the Bay Area, but with COVID-related travel difficulties, we weren't able to visit them in more than a year. Google satellite and street-level photos were a big help in filling in this data gap. I should also mention that during the seven years building the layout, some of the businesses I chose to model have closed. But on the bright side, gas is now about a dollar cheaper than it was in 2013.

SCRATCHBUILDING STRUCTURES

Given the amount of scratchbuilding I wanted to do, I invested in a scroll saw and miniature table saw. The table saw was especially useful for building



structures, as square cuts are a necessity. And when I needed to cut out a window, such as those for the second floor of the Twin Peaks bar, the scroll saw came in very handy. I would outline a window on the wall, drill a ¼" hole in the middle, slip in the saw blade, and make the cut.

FRANCISCO TREAT



1 Streetcars circle past the iconic Fisherman's Wharf sign on Harvey Simon's HO scale San Francisco F Line traction layout. The trolley line, first seen in the July 2018 issue of *Model Railroader*, has now reached its destination, passing many recognizable San Francisco landmarks along the way.

The F Line begins in the Castro District, which was the subject of my article in the July 2018 MR. Since then I made one small change, which was to light the interior of Twin Peaks. This structure occupies an important corner location – across from the Grooves record store,

another key structure – and has large picture windows. Originally I'd frosted the windows with Dullcote, but I was never happy with it and felt something was missing. Lighting the interior solved the problem, as it now looks like it should: a bar scene with activity. With

the glazing replaced by clear styrene, I added a Preiser table and chairs set, a few figures, "hardwood" flooring (paper flooring ads scaled to size on the computer), and a couple Castro Theatre movie posters I found on the internet. These give the bar a personality.



Two suggestions for interior detailing as you develop your layout: First, don't glue down your structures; second, make the roofs removable. There are many new products on the market that make it easier to detail and light your interiors. I only have three lighted structures, but each adds punch to their respective scenes. A lighted, detailed interior is really cool looking, and worth the effort.

DOWNTOWN SAN FRANCISCO

As the trolley leaves the Castro District, it makes a turn into the downtown area. This section serves as a bridge to Fisherman's Wharf and was the most challenging part of planning the layout. Devoting enough space for the two destinations meant greatly compressing the downtown area in between. This kind of tradeoff is necessary in any layout, but carefully choosing identifiable structures and scenery helped create the illusion of a larger area.

Another consideration was how the track bisects the scene, so I needed elements in the front that wouldn't block the taller structures against the backdrop. The prototypes in the front were deliberately chosen because they were smaller than those behind the track. In addition, the front structures are free-standing, which – along with the food truck and park – helped create a less

cramped look. You'll notice pedestrians walking around, seated, or on their bikes. The 3-D printed E-Trade building and Ru Ru food truck are adjacent in real life, as is the park. The park adds greenery and is an important feature, especially considering the Fisherman's Wharf park next to it that creates a scene block between the two areas.

I purposely designed an intersection to break the transition between the Castro District and the downtown area. Across this intersection are the first two buildings in the downtown area – the Bank of America building, which was scratchbuilt from styrene, and the Van Ness Walgreens, across the street. The models are in the same orientation to each other as in the prototype.

Walgreens is scratchbuilt from styrene, and here I used a couple of tricks to help tell the story. I created the look of the polished stone walls on the first floor from a flooring ad I found on the internet. After I cut out the windows, I cemented the ad to the styrene. After the cement dried, I took the back of a no. 11 hobby blade and scored in the mortar lines. I used a light touch here, as it's easy to tear the paper, ruining the effect.

I also added lighting to this structure, using the City Classics Picture Windows drug store kit. This is an interesting way to add an interior without the effort to

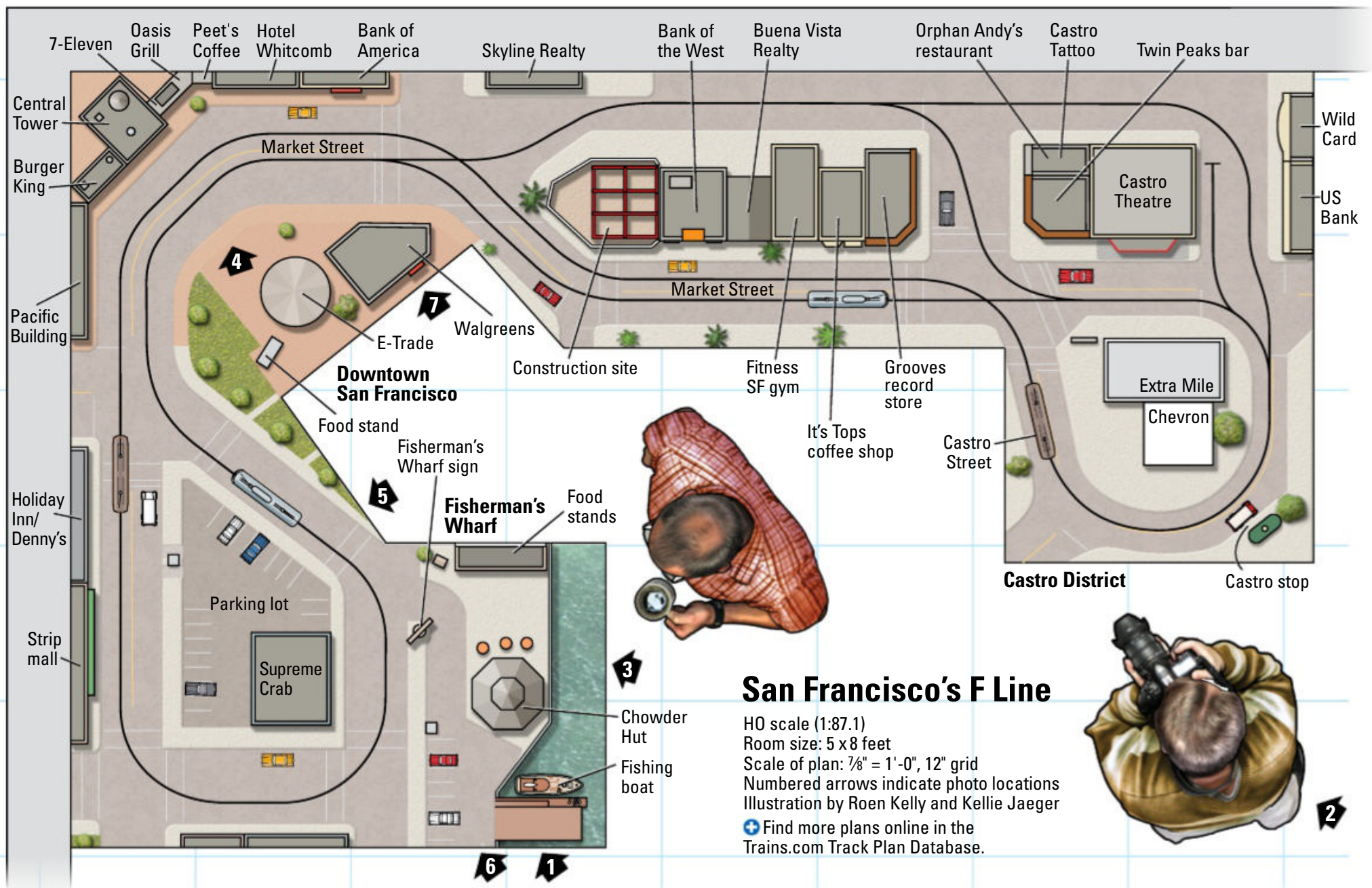
2 | The entire layout occupies just 5 x 8 feet. The tight radii possible with traction lines allow a dogbone track configuration that maximizes operation in this small area.

create one. You simply trim the photo in the kit to fit the window and add an LED to light the windows from behind. It's very easy, and the effect is pleasing. The easy-to-build awning and the Walgreens script logo sign, which I had custom made, complete the model.

BACKDROP AND STRUCTURES

Continuing down Market Street are a series of buildings – Hotel Whitcomb (Walthers Ashmore Hotel kit), Peet's Coffee & Tea (scratchbuilt from Ashmore Hotel wall remainders), Oasis Grill and 7-Eleven (scratchbuilt from styrene), Central Tower (Bachmann Metropolitan Building kit), Burger King (scratchbuilt from styrene) and the Pacific Building (kitbashed from two Magnuson Wise Supply Co. kits I found on eBay).

The downtown section features a backdrop of the San Francisco skyline. Early in the project I purchased a photo mural of the skyline, but it needed enlarging. I had two goals, getting to the approximate size necessary and making sure the most identifiable building – the Transamerica Pyramid –



THE LAYOUT AT A GLANCE

NAME: San Francisco F Line

SCALE: HO (1:87.1)

SIZE: 5 x 8 feet

PROTOTYPE: San Francisco Municipal Transportation Agency's F Line

LOCALE: San Francisco

ERA: present day

STYLE: walk-in

MAINLINE RUN: 30 feet

MINIMUM RADIUS: 6 1/4"

MINIMUM TURNOUT: single point, equivalent to no. 2

MAXIMUM GRADE: none

BENCHWORK: open grid

HEIGHT: 37"

ROADBED: 1/2" plywood topped with 1/2" Homasote

TRACK: handlaid Orr girder rail, crossings, and turnouts

SCENERY: patching plaster roads and styrene sidewalks

BACKDROP: commercial and self-shot photos

CONTROL: Model Rectifier Corp. Prodigy Express DCC, live overhead

would be prominently featured. To get the size correct, I first took the wall sections of the Bachmann kit and fashioned a stand-in building by taping the walls together. I placed this in the corner of the layout, as it would be the tallest building in the scene. Through trial and error I made an educated guess on how tall the Transamerica Pyramid should be based on the dimensions of the building against it. I took the photo mural to Kinko's and they did the rest by reprinting it in the adjusted size.

Making sure the Transamerica Pyramid would be easily recognizable, I placed it next to the Bachmann building. The idea was for the Transamerica Pyramid to help tell the story, and by prominently locating it relative to the models, I think I accomplished this.

Adjacent to Bank of America is Hotel Whitcomb. The Walthers Ashmore Hotel is an interesting kit, as it includes parts for three different storefronts depending on the era you're modeling. Those extra parts came in very handy for other structures on the layout. Two fea-

tures helped convey realism – the vertical blade sign and hotel entrance, and the flags hanging from the facade on the front wall. The prototype has flags from several countries, and I was able to find international flags on the internet, resize them, and install them on the model.

If you're wondering why the yellow utility SUV is doubling as a taxi, it's because I couldn't find a modern taxi at the time I built the hotel. The lettering on the side of the SUV is so tiny, I can imagine it says "Bay Area Taxi Co." or something to that effect. Woodland Scenics has since introduced a modern vehicle line that includes a taxi, but I like this little bit of improvisation. I added a small piece of white styrene in the shape of a taxi herald on top of the SUV.

Adjacent to Hotel Whitcomb is Peet's Coffee & Tea, an easy kitbash using remaining parts from the hotel. I set Peet's back to allow for outdoor seating in front of the shop. The Preiser table and chairs kit and several figures populate the scene. Turning the corner is the 7-Eleven and Oasis Grill. This was more



4 Harvey built the trolley cars on his layout to match those on the prototype, which came second-hand from the trolley systems of cities across the United States. His models, like the prototypes, run off overhead current.

involved, but I thought the prototype was interesting, so I added it. I used window parts from other kits and strip styrene to create the rib design so distinctive on the prototype. For this building I added a large air conditioner from a Walthers roof detail kit. The layout is on the short side, so the roofs are very visible.

The 7-Eleven sign came from the

internet, and the Oasis Grill letters I cut from styrene. I first applied dry transfer lettering to the styrene to create a cutting guide, then cut out the letters using my hobby knife. It's then easy to remove the dry transfers using clear tape, after which I painted the letters blue to match the actual Oasis Grill letters.

The center structure is Central Tower.

3 Harvey renamed Nick's Lighthouse, a well-known seafood vendor on Fisherman's Wharf, to Gram's Lighthouse after his wife Lisa's nickname to pay tribute to her support of his hobby.

This was a conventional build, and the only real change I made from the Bachmann kit was eliminating the tower on top. I thought it would look awkward and out of place. I did add a flag and a water tank on the roof, which gave the structure added height without looking overpowering.

The scratchbuilt Burger King is next. Here I printed off a couple Burger King ads, scaled them down, and cemented them to the windows. I cut the Burger King letters using the same technique as I did for Oasis Grill.

The last structure in the downtown area is the Pacific Building. This is one of my favorites. I'm a big fan of Magnuson resin kits, and although they're hard to find, they make beautifully finished models. For this structure, I made significant changes by cutting off the street level floor and replacing it with one that better matched the prototype using the brick shed walls that came in the kit.

This is where the miniature table saw was so useful. I was able to make identical cuts necessary for consistency and a tight fit.

I needed two kits to give the building the wider footprint of the prototype and allow enough room for the two main retail stores – Old Navy and Levi’s – on the first floor. The big store front windows came from the unused parts of the Ashmore Hotel kit. To provide a seamless transition between the retail shops and the upper floors, I added a slim horizontal strip of styrene detailed with small vertical ribs.

As you also see in the photos, Hotel Zelos occupies some of the upper floors of this building, and I added the Hotel Zelos (printed from the computer) vertical blade sign found on the prototype.

I used MicroMark HO scale brick sheet to represent brick pavers on many of the sidewalks in downtown. It’s a little tricky getting the placement right, as there are seams to contend with, but once the figures and details are in place, the seams aren’t too distracting.

FISHERMAN’S WHARF

The F-Line ends at Fisherman’s Wharf, where the cars turn around for their return to the Castro District. Like the rest of layout, I used Google satellite and street level views as a guide for composing the scene. The satellite photo was especially helpful and the finished scene compares very favorably with the real-world images.

Note how the trolleys circle the parking lot to make the return trip. The only change from the prototype is the direction the trolleys circle the parking lot. On the prototype they enter the area by first passing the waterfront, the iconic Fisherman’s Wharf sign, and Supreme Crab. The cars exit passing the Holiday Inn and strip center. Due to the layout’s configuration, this is reversed.

The Holiday Inn and Denny’s is a straightforward kitbash using Design Preservation Models modular walls. The key modification is the window. Here I took the kit window, shortened it, snipped some of the mullions, and added a piece of Evergreen clapboard siding to represent a room air-conditioner vent. I also cut a pilaster to separate the kit window opening into two smaller ones.



5 As on the prototype, F Line trolleys on Harvey’s layout circle the Fisherman’s Wharf parking area to reverse direction for the return trip to the Castro District. Unlike the prototype, they circle it clockwise.

Next is the strip mall, a Summit Customcuts kitbash. On the prototype there is another building between the Holiday Inn and strip mall, but the strip mall is a readily available kit, so I chose this one for the layout. It required facade modifications, but the awning, a leftover part from the Ashmore Hotel kit, is the important feature.

My favorite shop in this row of stores is the Segway rental shop, and I represented it by cementing the logo I found on the internet to a door from the DPM wall kit for first floor of the Holiday Inn model. The only thing missing are 1:87 Segway riders; maybe Preiser will add a set someday.

PARKING AND SUPREME CRAB

The center of the scene is the parking lot. With the sidewalks already in place, and using them as a dam, it was pretty easy to fill the open space with plaster. It takes some sanding and filling in of the low spots, as I wanted a smooth surface with only some minor imperfections. The tricky part was the color, but through trial and error it came together, using a mix of gray, concrete, and white, and then rubbing powdered chalk in the same shades onto the surface.

I then marked off the parking spaces and included a handicapped space by cementing a printed handicap parking symbol onto the surface. Sanding the back until the paper was almost see-through makes it look like it was painted onto the concrete. Three other features – the entrance gate, chain link fence (a Luke Towan YouTube tutorial video was very helpful in building this) and the Fisherman’s Wharf Parking sign – completed the scene.

Supreme Crab, scratchbuilt from styrene, is one of the layout’s “hero structures.” On the prototype it’s located in the corner of the parking lot, and as it worked out, fit nicely into the same spot on the layout. The prototype’s large second-story windows offered an opportunity for a detailed interior. I used a second Preiser table and chairs set, which along with the figures, a bar at the rear, the hardwood floor, and a few fish restaurant wall signs from the internet, helped tell the story. Note the red gingham checkered tablecloths, the kind you might find in a casual fish restaurant. I made these from paper, sanded very thin and cemented to the tabletops. I lit the scene with a single LED from the Woodland Scenics Just Plug line. When



doing an interior scene, it's important to have the light directly overhead.

ON THE WATERFRONT

The waterfront scene is at the edge of the layout and completes the layout. There are three important prototypical elements. The first is the famous Fisherman's Wharf steering wheel sign, which is 3-D printed. I worked with a local CAD designer, Scott Tarcy. His process is interesting. I gave him a photo of the sign and made an assumption about the height of the man standing next to it, and he did the rest. 3-D printing is great for unusual details like this, as it would be extremely difficult to build such a complex shape from scratch.

Chowder Hut is also 3-D printed, and here the roof is the most prominent feature. The octagonal shape is distinctive, and the verdigris color stands out, too. Vellajo has such a paint color – 70382 – which I then weathered with washes and powdered chalks.

The last structure, which helps frame

the scene, houses two casual walk-up restaurants, Crab Station and Gram's Lighthouse. This structure was scratch-built using leftovers from Magnuson kits. And if you're curious why Nick's Lighthouse sold the business to Gram, it turns out that Gram – a.k.a. my wife, Lisa – has been so supportive of my trains hobby that I gave her a prominent spot on the layout. After she took over the business, she thought the place needed a remodel, and the JL Innovative Design diner set fit the bill nicely.

One interesting feature I noticed on the Google satellite photo added a pop of color: the orange umbrellas. I had three from the Preiser sets, and they worked well in the open space between Chowder Hut and the walk-up restaurants. Tourists milling around, having fun, and enjoying a bowl of clam chowder add vitality to the scene.

I finished the waterfront with the Campbell wharf kit, a Sea Port Model Works freighter, and the harbor itself. I built several Campbell models about 30

6 Supreme Crab, in the middle of the Fisherman's Wharf area, is one of the layout's "hero structures." Since the restaurant was in such a visible location, Harvey lighted it and gave it a full interior.

years ago, and these kits are still great. The parts are precisely cut and the instructions are clear. With limited space, I was only able to use about half the parts for the wharf, but the extra pilings and deck sections were put to good use with the seawall and other elements.

You'll note how the seawall is divided into three sections. Parallel to the edge of the layout is a stone wall made from Woodland Scenics cut stone retaining wall sections (no. C1259). I made a small adjustment by cutting the ends to create a linear wall, and then used pilings to hide the seams. The last bit of detail was adding the moss and seaweed from green Woodland Scenics Fine Turf. The diagonal wall is split between a pilings only section and a wood retaining wall

section that is held in place by a few more pilings.

Sea Port Model Works (seaportmodelworks.com) offers a large selection of HO scale boats, and I chose one that fit the space and overall look of the harbor. For the harbor, I followed the method Dave Frary described in a video available on the Sea Port Model Works website. He uses Mod Podge gloss medium, sold in craft stores, to create the effect. Mod Podge is much less expensive and easier to control than commercial water products, and after a couple “first time for everything” jitters, I found it to be an excellent way to model water.

I got the idea for the low-rise piling fence with the link chain threaded through the pilings from the prototype near Chowder Hut. After staining the cut pilings, I drilled a hole into the top of each and then threaded A-line link chain to create the fence. Hopefully the figures don't get too close to the water's edge.

A WONDERFUL HOBBY

Building the layout to its completion was a wonderful journey that reinforced to me how great our hobby is. Although there were a few slow and challenging moments, modeling a specific prototype helped keep me motivated.

There are always moments in building a layout when you run out of gas and need to step away. That happened to me, too. After all, should it really take seven years to build the footprint equivalent of a traditional 4 x 8? But the good thing about having a specific vision is it enabled me to power through the difficult moments. And, being retired,

MEET HARVEY SIMON

HARVEY SIMON RETIRED from his full-time career in 2015 and is a part-time instructor at Appalachian State University in Boone, N.C. Harvey and his wife, Lisa, have two children, three grandchildren, and Lucy, their fifth miniature poodle.



7 Though they may not be tourist landmarks, Harvey scratchbuilt structures like the Walgreens drugstore and Bank of America building to match the prototypes, giving the layout a sense of indisputable authenticity.

I could take a more leisurely approach so I wouldn't get burned out.

Modeling the F Line provided me with an unusual and unexpected bonus. One of the people I connected with is a streetcar operator for the F Line. My son, Dave, had posted a short video of my layout on Instagram. Through very fortuitous circumstances, Mike Delia, the F Line operator, saw the video and contacted Dave, which then led to our connection. Turns out Mike is from Boston, where he was a transit operator there, and he remembered my layout story on the Boston MTA that ran in MR more than 20 years ago [October 1999-March 2000 – *Ed.*]. Mike even has his own trading card, which gives his nickname as “Mr. Boston.” He's promised our family a ride once the pandemic is over and the F Line resumes service.

Visitors often ask three questions. They're curious about how long it took to build, a few ask about cost, and finally, they want to know what's next. When I started the project I couldn't imagine taking seven years to finish it, but research and scratchbuilding, especially when you're trying to remain faithful to the prototype, takes a lot of time. But that's why I like building small layouts. They're much easier to digest.

Regarding cost, for me it's like the old

MasterCard commercials; the joy of building a layout is “priceless.” Yes, I know it's crazy to spend \$50 on a custom-made sign – like the one on Chowder Hut – but with a small layout, you can afford to put resources toward these kinds of details. After all, I only have five cars, whereas a basement empire's motive power and rolling stock alone would likely cost almost as much as I spent on my whole layout.

As for what's next, I'd like to build another trolley car. After the Castro article, I built a second Milan-style car, this one in the orange scheme. And I was able to fit a speaker inside to add sound. There's another Milan car in the F-Line fleet, in a different color scheme, and I'm hoping to find the necessary parts.

One of the great things about our hobby is learning new things. Taking the plunge on building a streetcar with lights and sound was a bit scary, but watching the car move around the layout is tremendously gratifying. And some of the smaller projects were fun to build, too.

I hope you'll get some ideas for your layout by seeing how I approached mine. Our hobby is wonderful, and I can't imagine what I'd be doing without it. Now that my F Line is complete, I'll take a breather, turn on the power, and enjoy the action. **GMR**

SEEING THE FOR THE TREES

1 A northbound manifest train makes its way across Percival Creek behind a diverse array of motive power on Tyler Whitcomb's N scale Tenino Western RR. Tyler's freelanced layout, his second by that name, depicts a regional road serving lumber and quarrying industries in the Pacific Northwest.



FOREST

The freelanced N scale Tenino Western RR captures the feel of a modern short line in the Pacific Northwest

By Tyler Whitcomb ■ Photos by the author

THE N SCALE TENINO WESTERN RR is a freelanced Class 3 railroad set in the beautiful Pacific Northwest between the mid 1980s and early 1990s. It was inspired by Weyerhaeuser's Longview Woods Line; the Chehalis Western; Texas, Oklahoma & Eastern; Oregon, California & Eastern; and other logging and industrial railroads.

The layout occupies a 15 x 24-foot room plus two staging yards in an adjoining crew lounge. It was built from the ground up to operate in little under a year and pressed into service for Sound-rails 2016, an Operations Special Interest Group (OpSIG) event.

The layout you see here is my second Tenino Western RR. The first one was built in sections and expanded with new sections each time I moved over a span of eight years, eventually growing to a similar size. When I remodeled my current home in 2015, the old one was dismantled and very little was salvaged. Though both layouts were similar in appearance and in operations, they had personalities of their own.

CONSTRUCTION

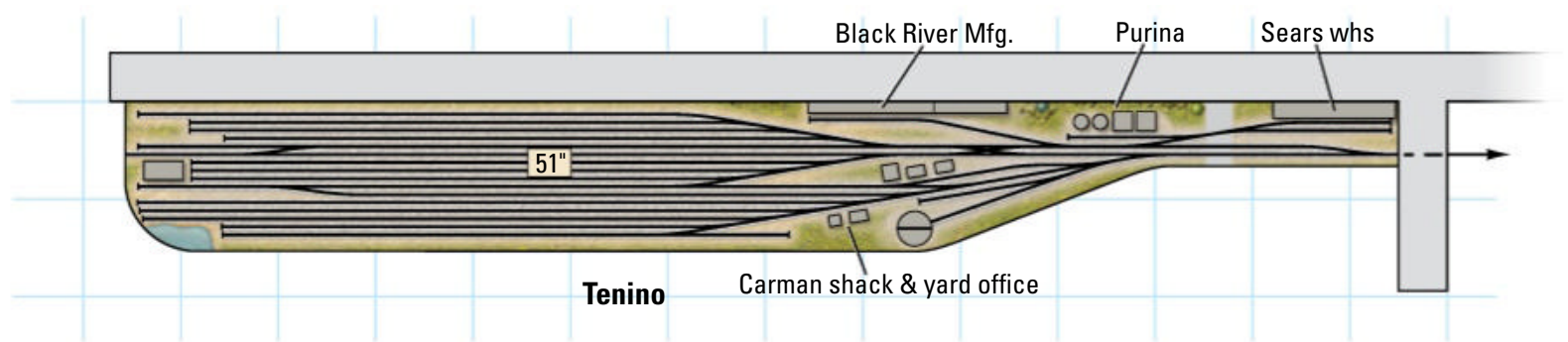
The open-grid benchwork was built from $\frac{3}{4}$ " plywood cut into 4" wide strips. This makes the benchwork more stable and less prone to warping than even cabinet-grade lumber. It's also easier to work with, since all the basic dimensions are the same.

The cookie-cutter top supports a layer of $\frac{3}{8}$ " Homasote topped with Homasote roadbed and scenic elements. All the track is Peco code 55. Even though the TWRR only runs four-axle locomotives and fairly short equipment, 17" minimum radius curves were selected for a better appearance and reliability. The turnouts are manually operated.

Scenery on the layout was created with extruded-foam insulation board, which has been carved to shape, painted

2 There's no better place to get acquainted with a railroad than sitting trackside at a classification yard. This bird's-eye view of the throat of Lake Yard shows the diverse motive power on the Tenino Western, with an early Alco working the local while a pair of Electro-Motive Division GP38s and a venerable F7B booster unit lead a manifest freight on the main. In the background is the TWRR freight house and corporate offices.





THE LAYOUT AT A GLANCE

NAME: Tenino Western Railroad

SCALE: N (1:160)

SIZE: 15 x 24 feet, plus staging

PROTOTYPE: freelanced, inspired by Weyerhaeuser subsidiaries

LOCALE: Pacific Northwest

STYLE: point-to-point walk-in

MAINLINE RUN: 93 feet

MINIMUM RADIUS: 17"

MINIMUM TURNOUT: no. 8 (main), no. 6 (yards and industries)

MAXIMUM GRADE: 2 percent

BENCHWORK: plywood open grid

HEIGHT: 48"-51"

ROADBED: Homasote

TRACK: Peco code 55

SCENERY: extruded-foam insulation board

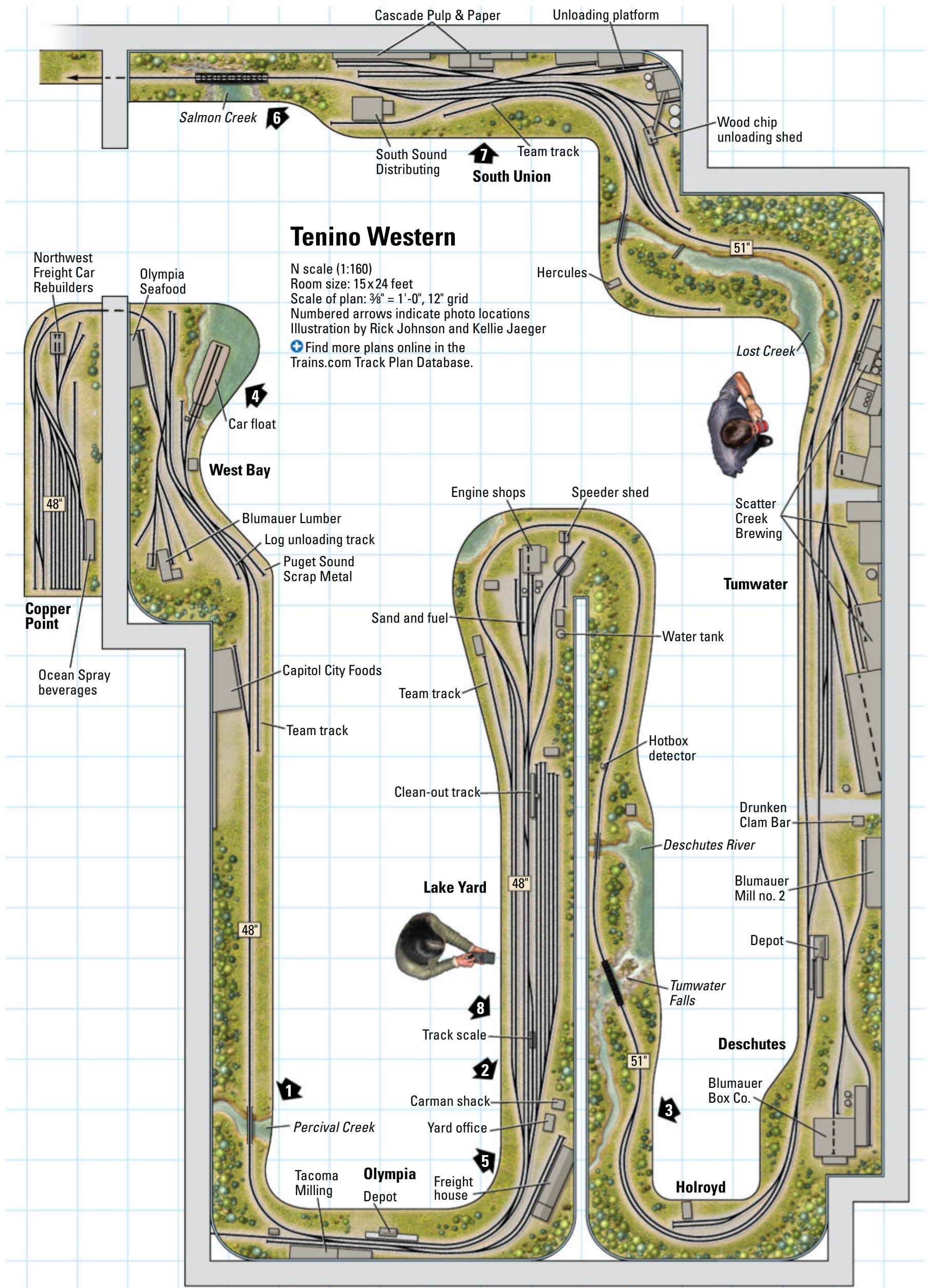
BACKDROP: photos by Trackage Scenery

CONTROL: Digitrax Digital Command Control

3 The line's venerable Baldwin VO-1000 is generally assigned to work train service, as it is today, heading to clean up a derailment at one of the logging operations. An extra train like this adds complexity to operating sessions, which usually see 15 to 20 trains run in 4 to 6 hours.

4 The captain of the barge tug *Joanna P* keeps a watchful eye out for the train crew as a kayaker drifts by checking out the action at West Port. If the barge isn't unloaded soon, that task may have to wait until the next slack tide. The TWRR operates a barge service between Olympia, Shelton, Port Townsend, and Bellingham, Wash.







5 One of the Tenino Western's Alco RS-2m rebuilds goes about its duties switching cars at Lake Yard as a track inspection speeder passes by on the main line. Photo backdrops from Trackside Scenery add a lot of visual depth to the layout shelves.

brown, and covered with dirt, static grass, and ground foam. The rocks were created with Bragdon Enterprises items and the water is Magic Water by Unreal Details. Water scenes are a predominant feature here in the Pacific Northwest and one of my favorite things to model.

I used a variety of products for the trees and vegetation, primarily from Scenic Express, Noch, Heki, and Arizona Rock & Mineral. The photo backdrops were created by Trackside Scenery.

Most of the structures on the layout were kitbashed or scratchbuilt. Many of them are works in progress. We all know a layout is never really finished! As a case in point, I'm currently rebuilding and scenicking the Tenino and Cooper Point staging yards.

I also incorporated environmental sounds around the layout to help immerse my operators into the scenes.

OPERATIONS

The layout is controlled with a Digi-trax Digital Command Control system. Operations are fairly straightforward. The Tenino Western is operated as a point-to-point line. Cars are routed by four-cycle waybills and train movements are governed by track warrants. The only signaling on the layout protects and designates yard limits.

During a typical operating session, we generally run about 15 to 20 trains, taking approximately 4-6 hours. I try to limit my sessions to seven operators plus a trainmaster/dispatcher.



There's a lot of variety as far as operations go, including transfers, locals, yards, industrial, passenger, logging, and extras. Four different classes of simulated Hazmat add to the complexity and fun.

The two staging yards are "active staging," meaning I have yard crews break down inbound trains even further by simulating interchanges with the Burlington Northern and Union Pacific before the waybills are flipped and the cars are restaged. This not only adds more operation but also mixes up the order in which the cars will re-enter the railroad later on.



6 As larger railroads started retiring steam locomotives in the 1950s, some found new homes on logging lines in the Pacific Northwest.

One of those survivors, Tenino Western 2-8-2 Mikado no. 49, lugs a mile-long log train over Salmon Creek trestle.

A brief (fictional) history of the TWRR

THE TENINO WESTERN RR began as a 17-mile narrow gauge logging railroad during the great timber boom of the late 1800s. Originally constructed between Olympia and Tenino, Wash., the railroad expanded east and west after being taken over by its largest customer, the Blumauer Lumber Co. Within a few years the line was standard-gauged and extended to West Port on the Pacific. The railroad also expanded east to reach several quarries that supplied materials for the construction of the state's capitol and jetties along the Columbia River, leading to the slogan "Rock Solid Transportation."

But management's dreams of a transcontinental empire were no match for competition from the Northern Pacific, Milwaukee Road, and Union Pacific. The TWRR had to settle for hauling logs and stone, as well as seafood, wood products, produce, and passengers.

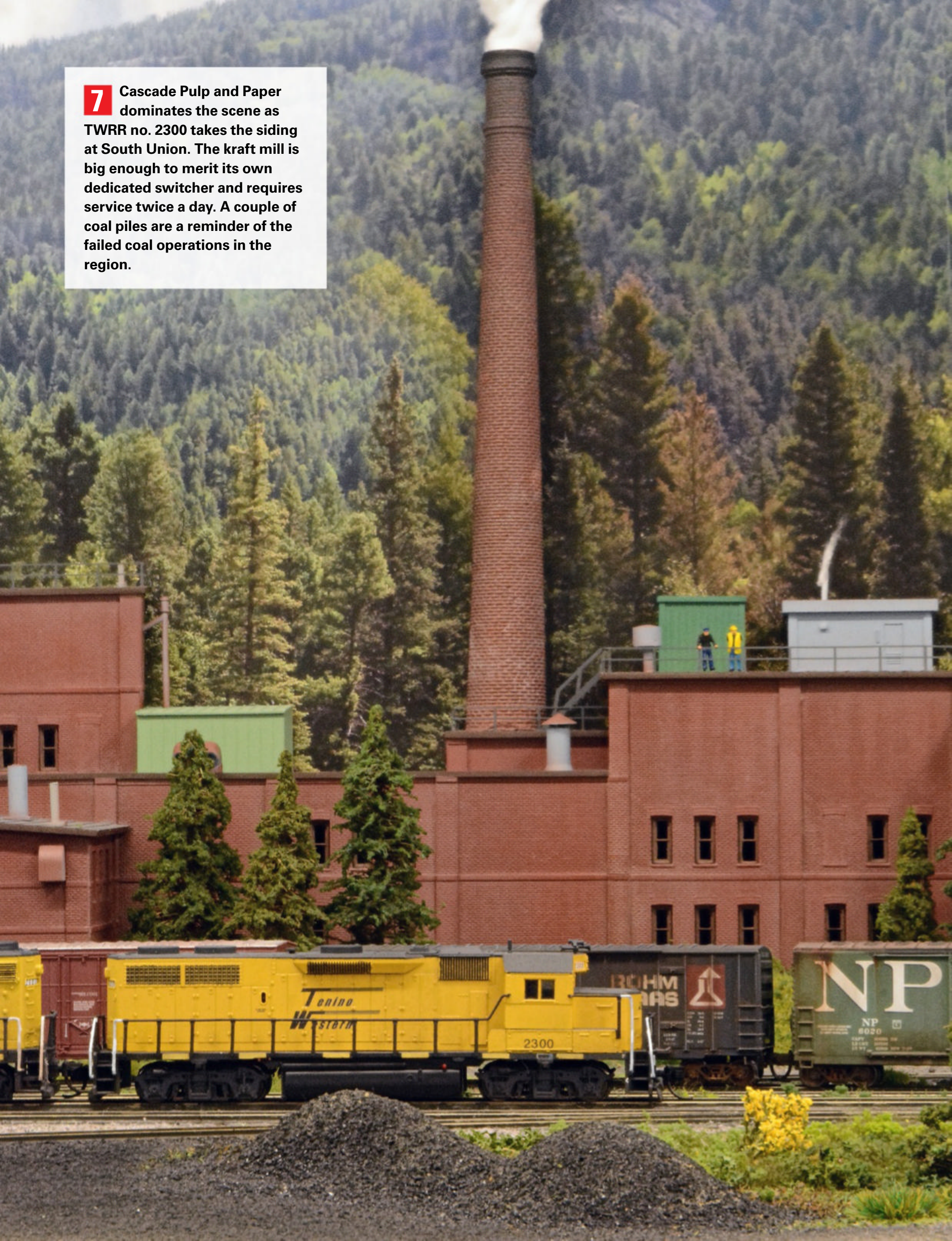
When coal was found in the foothills west of Tenino, the railroad built a line west to serve the mines. But when the mines were played out, the TWRR adapted its fleet of coal hoppers to haul wood chips. Similarly, when passenger traffic started to decline, the railroad sold off its passenger fleet.

As the forests began to be logged out, the railroad hit hard times. Luckily, the Weyerhaeuser Timber Co. needed a cheap and attractive way to move its logs to the mills and assumed joint operations of the line, ensuring its survival.

The golden years of the TWRR are over, but from a railfan's perspective, operations are as interesting as ever. A handful of ex-passenger covered wagons still prowl the rails, along with a wide variety of Electro-Motive Division Geeps, rebuilt Alcos, and even a few venerable Baldwin diesels. The railroad's largest customers are Weyerhaeuser, Blumauer Lumber, Cascade Pulp & Paper Co., and Scatter Creek Brewing Co.

The TWRR is living on borrowed time and struggling to stay independent. One thing on the horizon that may transform the railroad is containerized freight from West Port to the interchange at Tenino. It's a good thing you're visiting the railroad before it's sold off or taken over by a regional operator. Who knows; maybe the next time you visit, the Genesee & Wyoming, Watco, or Rail America may be operating it. Or it may have been absorbed by the BN or UP. The only thing guaranteed in railroading is change. – *Tyler Whitcomb*

7 Cascade Pulp and Paper dominates the scene as TWRR no. 2300 takes the siding at South Union. The kraft mill is big enough to merit its own dedicated switcher and requires service twice a day. A couple of coal piles are a reminder of the failed coal operations in the region.





For added play value, there is a simulated hotbox/dragging equipment detector and an operating scale track produced by Boulder Creek Engineering. These two items add a lot of variety to the operations.

POWER AND ROLLING STOCK

Most of the motive power on the Tenino Western is four-axle EMD, with a few oddball Baldwins, rebuilt Alcos, and General Electrics thrown in for good measure. Most are Atlas and Kato models. One of my current projects is adding beacons to all my locomotives – it's an '80s thing! Ditch lights didn't come into play until the 1990s.

All TWRR trains require a caboose, but I may be adding a few FREDs for experimentation at some point.

The rolling stock was chosen primarily to support the online industries – log bunks, bulkhead lumber flats, wood-chip hoppers, rock gondolas, and plug-door boxcars for the paper mills. But there is also some bridge traffic between the two staging yards.

Most of the rolling stock is from Atlas, Fox Valley, BLMA, Exactrail, Trainworx, Micro-Trains, and Bluford

8 A switch crew slowly pushes a scale test car onto the track scale at Olympia. Once the scale is recalibrated, weighing operations will resume. The scale, by Boulder Creek Engineering, detects when a car is placed over it and reads out an appropriate weight. Trains hauling bulk commodities like sand, rock, and wood chips must weigh in, adding to operating interest.

Shops. All the equipment is fitted with Micro-Trains trucks with metal wheels and Magne-Matic couplers.

IF I HAD A DO-OVER

If I were to do it all over again, I'd probably design the layout to focus on more of a backwoods, short-line feel, similar to my previous version. I'd also design it for more complex operations with fewer operators. Also desirable would be an option for continuous running, since sometimes it's fun to just watch a train go in circles.

With the advancement of scale sound, better running, and more prototypical equipment, I would also be inclined to build the TWRR in a larger scale. But for

MEET TYLER WHITCOMB

TYLER WHITCOMB HAS BEEN

interested in trains for as long as he can remember. He completed a tour in the U.S. Navy before attending Central Washington University. After graduating he rebuilt passenger equipment for the American Orient Express, then became an engineer for a Class 1 railroad. In 2020, he earned his Master Model Railroader from the National Model Railroad Association. In addition to railroading, Tyler enjoys industrial archaeology and anything to do with nature.



now, I'll keep plugging away and revising the current version.

Now that you know all about the Tenino Western, let's go trackside and check out the action! **GMR**

CAPTURING THE COMMONWEALTH



Re-creating the unique geography of the Pennsy's Middle Division in O scale

By Neal Schorr
Photos by the author

MY RAILROADING STORY BEGINS more than 45 years ago, when I set out on a journey to the mountains of central Pennsylvania. I'd always been interested in highways and their construction and had obtained an official 1974 map of the Commonwealth (not state!) of Pennsylvania. The map showed a long stretch of expressway – some completed, some under construction – along the Juniata River. I made plans to drive out to the “wilderness” of Pennsylvania after my freshman year of college in 1975 to see the project firsthand. I was unprepared

for what I would see that day, and it would touch my life forever.

When I finally reached the Juniata Valley, I saw a remarkable new highway. But what got my attention wasn't the road, but the scenery. This was the most beautiful place I'd ever seen. So taken was I by what I saw that day that I've returned to the area every year since.

What I didn't know yet was that this valley was the route of the greatest railroad ever built, the Pennsylvania RR. Over the years, my repeated visits ranged away from the highway and into the



nearby railroad, which by then was Conrail. Though the Pennsy had faded into history a decade earlier, its presence remained everywhere along the tracks. The towers, signal bridges, interlockings, and massive stone arch bridges were still all there and screamed “Pennsy” at me.

THE CALL OF THE JUNIATA VALLEY

I began to research the railroad, and would learn of its history, including its K4 Pacifics and M1 Mountains, its crack passenger trains, and its corporate might. But more than anything, it was

that massive four-track “Broadway” passing through the gorgeous mountain scenery that called me back.

Given my interest in engineering, it was no surprise that over the years I built two HO layouts portraying the South Pennsylvania RR, a never-finished line upon whose right of way the Pennsylvania Turnpike was built. But I never stopped thinking about the Pennsy’s Middle Division and the breathtaking scenery of the Juniata River Valley.

With plans being drawn up for a new home in the mid-1990s, I decided to

1 A freight headed toward Altoona approaches a coal drag led by a classic Pennsylvania RR Centipede just east of Port Royal, Pa., on Neal Schorr’s O scale PRR Middle Division. Neal kitbashed the signal bridge from two Plasticville kits and fitted them with signal heads made by Precision Scale Castings and assembled by Terry Christopher of Custom Signals.



THE LAYOUT AT A GLANCE

NAME: PRR Middle Division
SCALE: O (1:48)
SIZE: 38 x 45 feet
PROTOTYPES: Pennsylvania RR, Penn Central, Conrail, and Norfolk Southern
LOCALE: central Pennsylvania
ERA: varies by location
STYLE: single deck
MAINLINE RUN: 260 feet
MINIMUM RADIUS: 60" (main), 52" (elsewhere)
MINIMUM TURNOUT: no. 7½ (main), no. 5 (sidings)
MAXIMUM GRADE: none
TRAIN LENGTH: 28 feet
BENCHWORK: open grid
HEIGHT: 54"
ROADBED: ½" Homasote on ¾" plywood
TRACK: Atlas code 215 three-rail flextrack
SCENERY: extruded-foam insulation board and hardshell
BACKDROP: painted drywall and hardboard
CONTROL: Lionel TrainMaster Command Control

2 A PRR M1 Mountain, the classic locomotive of the Middle Division, is under steam in the East Altoona engine servicing area and ready to lead a train through the mountains. Many of the structures in this part of the layout were built and superdetailed by Neal's friend Mark Vinski. And your eyes aren't deceiving you – Neal's O scale Middle Division is three-rail.

change direction and finally model the Middle Division, a story told in the pages of *Model Railroad Planning 2017*. My perspective from my many years of model railroading is that three factors draw people to the hobby: motive power and rolling stock; operations; and scenery. When it comes to what rolls down the tracks, I'm pretty forgiving. I want things to be reasonably accurate, but they need not be perfect. And although my layout was designed for operation, truth be told, I'm more than happy to let the trains roll by and railfan the layout.

But if there is one thing I'm picky about, it's scenery. For me, it's not enough to have a layout merely covered with pretty landscapes and prototypically correct models scattered about. In my case, the layout better look just like what I saw during those trips to the Juniata Valley and the former Middle Division. Hence, my scenic goal was to visually capture the commonwealth.

Two things were necessary to achieve this goal. The first was to understand the unique geology of central Pennsylvania. The mountains in this area are formed of folded rock and consist of miles long barrier-like ridges broken only by gaps formed by water courses, in this case, the Juniata River.

The ridges run from southwest to northeast. They are very old, so unlike the rugged Rocky Mountains, they are well worn with fairly level tops, not rocky peaks. Their elevation is lower as well, so they're covered with trees. Because one ridge follows another, they presented a formidable barrier to transportation in our nation's early years and were often referred to as "the endless mountains." Between these ridges laid broad, pastoral valleys of great beauty.

It was this topography that defined the route of the Middle Division as it coursed its way west from Harrisburg to Altoona. Typically, the tracks would be carved into the base of the mountain on a shelf above the Juniata, or they would traverse the broad valleys between the mountain ridges. Where the right of way ran directly into the ridges, its only way west was to travel through one of the gaps that the river had cut through the ridges over millions of years.

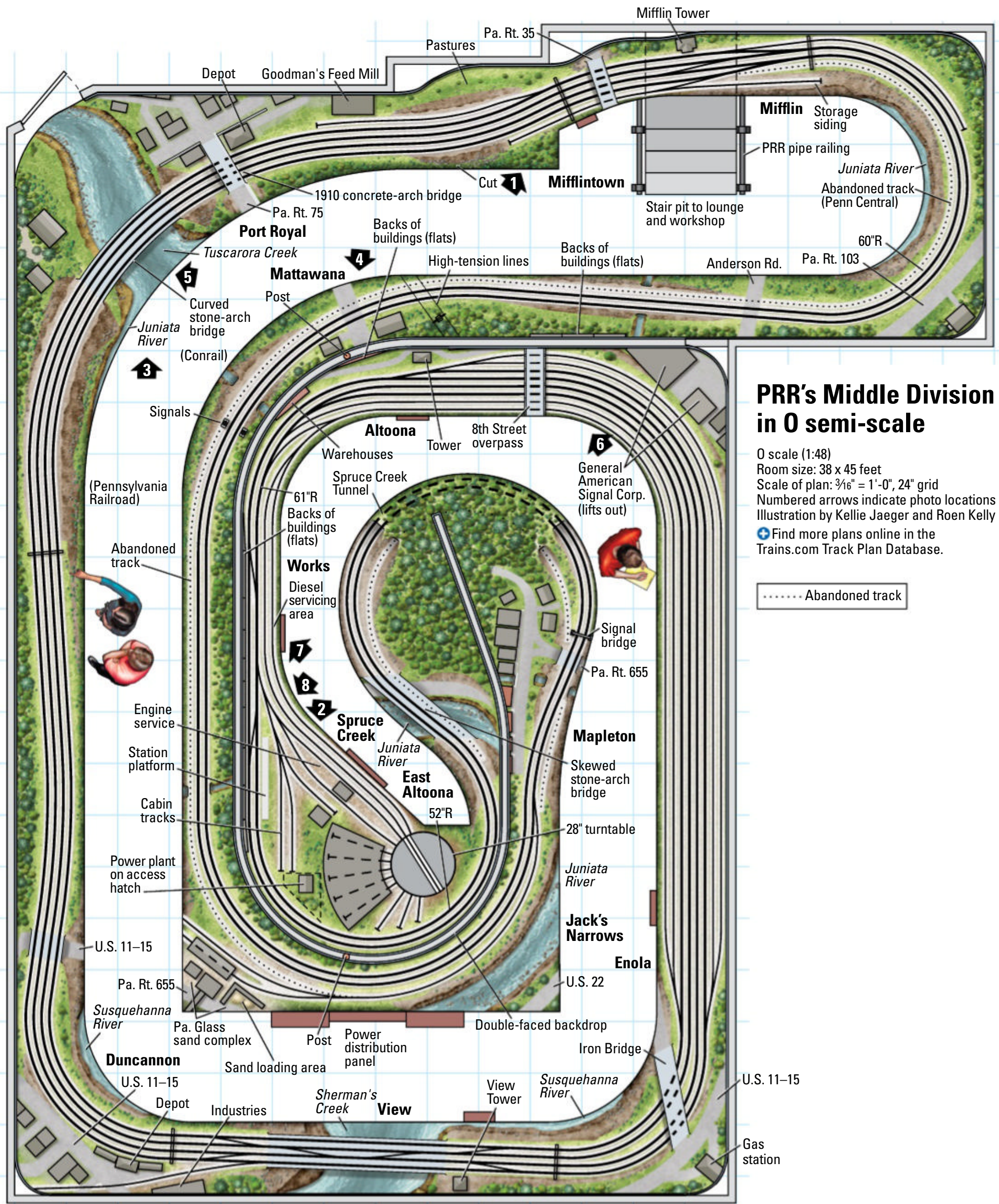
FROM STRUCTURE TO SCENERY

The second factor is to gain an understanding of the physical plant of the railroad. First, I recognized that most rights of way consist of an alternating series of cuts and fills, and I planned for that when I designed the layout.

I also knew that it wasn't enough to slap down two tracks, install a few PRR position light signals, run a K4 Pacific down the rails, and call it the Middle Division. Almost all the Middle Division consisted of four tracks with features distinctive to the PRR. As such, I designed my railroad to have four tracks and to incorporate those features.

Furthermore, the Middle Division was punctuated every few miles with complex interlockings operated from trackside towers that were landmarks in and of themselves. Between the interlockings, the four-track right of way was spanned by numerous signal bridges fitted with PRR's signature position light signals. Each interlocking had a pair of signal bridges at either end.

The three-dimensional scenery mimics the geology in two ways. Where the railroad is sandwiched on a shelf between the base of a ridge and the Juniata River, the now tree-covered cut face of the mountain is simulated with puff ball trees stuffed into tightly stretched chicken wire stapled onto profile boards. The rolling hills of the farm





3 A short-tender PRR Decapod hauls a mixed freight east toward Enola over a classic Pennsy stone arch bridge spanning Tuscarora Creek near Port Royal. The bridge was built out of 153 pounds of Hydrocal plaster over the course of a year in 2000. The surrounding scenery would not be completed until March 2020.

valleys between the ridges are carved from layers of 2" extruded-foam insulation board laminated together.

Next, I took my understanding of the railroad's physical plant and applied it to the construction of the subroadbed. I used old-fashioned open-grid benchwork, but avoided screwing the plywood directly on top or framing sections of lowered benchwork to leave room for waterways. Instead, I elevated my subroadbed on risers about 8" above the top of the benchwork. This gave me the opportunity to create fills and bridge approaches of prototypical height.

The next step was to build up the foam terrain between the top of the benchwork and the edge of the subroadbed. I carved realistic slopes (about 30



4 A customer of the Mattawana post office observes the action as the quiet of the countryside is shattered by a consist of Conrail GP38-2s blasting across the grade crossing. Neal's son, Steven, superdetailed the Weaver units with painted handrails and black pilots, scale couplers, m.u. hoses, windshield wipers, and more.

degrees) from the subroadbed down to the native ground or watercourse. In real life, most of the Middle Division doesn't sit far above the Juniata River, so this technique allows me to accurately reproduce the prototype.

DESIGNING THE TRACKWORK

Beyond the earthwork, it was important to lay out the railroad as did the Pennsy. Because of space limitations, I reduced my number of interlockings to just three. Each is signaled at both ends. By limiting the number of interlockings, I could have long stretches of track where the trains operate under the direction of intermediate signals, just as on the Pennsy. As a result, I was able to include three intermediate signal installations. Those position light signals were a signature item of the Pennsy, and their use in a prototypical fashion is one more element which helps to capture the look of the Middle Division.

Another element of the physical plant is the use of stone arch bridges. While it's tempting and probably easier to include massive steel trestles kitbashed out of commercially available models, those simply weren't part of the Middle Division. With very few exceptions, all major waterway crossings were stone arches. There are three on my layout, two of which have been completed. They're time-consuming to build, but their use is essential in capturing the prototype.

The final part of the physical plant is the inclusion of all of the classic PRR trackside details. These include things such as pneumatic piping and air tanks to operate the interlocking switches; cast iron signs, whistle posts, and mile markers; and classic Pennsy pipe railing. Some of these are commercially available, but much has to be scratchbuilt.

TRAVELING THROUGH TIME

While understanding of the geology of central Pennsylvania and the physical plant of the Middle Division were key to achieving prototype realism, there are many other factors in play. For example, with but a single exception, all of the towns and landmarks on my railroad are laid out in the correct order. And with just two exceptions, the railroad curves in the correct direction through each town as it proceeds from east to west.



5 Neal hand-painted the backdrops on drywall and tempered hardboard before building the railroad. The key, he says, is accurately depicting the topography of central Pennsylvania's "endless mountains."

Painting backdrops

BEFORE ANY OF THE ROADBED was installed, the first step was to paint the backdrop, which admittedly is probably my favorite part of the hobby. It takes discipline to take the time to paint a backdrop before any trains are running, but it's well worth the sacrifice. The most critical factor in reproducing this part of Pennsylvania is applying the knowledge of its geology to the painting of the mountains.

The key is painting the distant ridges with a relatively flat top rather than with the many peaks so often seen on model railroads. The next step is to paint the farm valleys and forests found between the ridges. My backdrop was painted before the use of large, printed backdrops became popular. However, I find that the drybrushing technique that I learned to use for the tree-tops allows some of the blue sky to show through the tree line. This avoids the unrealistic razor-sharp tree line left behind when the sky is cut off a paper backdrop. — Neal Schorr

I've resisted the temptation to fill the layout with every appealing structure that comes to market. I've instead limited their number and spread my towns along the mainline, with structures concentrated in the towns along the Middle Division. The space in between is filled with farm fields, pastures, and woods. At the expense of having a longer mainline, I avoided looping the mainline around the layout a second or third time. That's a great approach for the hardcore operator who wants lots of sidings and industries. However, that method can result in many miles of retaining walls, sheer cliffs, and the use of a larger number of structures, which may contribute to the

sense of a continuous urban area, all of which I preferred to avoid.

Despite my quest for scenic realism, I made two departures from that goal. The first was to age the layout as it proceeds from east to west. I wanted the opportunity to model everything that ran on the Middle Division, from prewar PRR steam up through the end of Conrail, and everything in between. For this reason the town of Enola represents 1930, Duncannon portrays the World War II years, Port Royal is based on 1957, and so on. Only Altoona doesn't fit this sequence. In order to have both a steam roundhouse and a diesel servicing facility, I placed this city in the 1950s.



6 A Pennsy “Erie-Built” rolls under the 8th Street Bridge in Altoona. Given his interest in civil engineering, Neal scratchbuilds his bridges. This is a concrete T-beam bridge, which were common in the 1930s-50s. Aside from the parapet trim, it was built out of 1 x 12 lumber and 3/16" tempered hardboard.



7 Two engineers converse at the Altoona diesel servicing area prior to boarding their trains and heading out on the road. The engines are Atlas GP7s, the engineers are from Arttista, and the water hydrant and hose were built out of Evergreen styrene and a piece of coiled 22 gauge hookup wire.

And as a nod to my son, we extended the time frame to include a scene which depicts the early years of Norfolk Southern on the Middle Division, as well.

Not only do the towns age, but so does the right of way. East of Mifflin interlocking, the right of way is classic four-track Pennsy, with signal towers, a cinder subroadbed with razor-sharp ballast edges, and signal installations typical of the pre-Conrail era. West of there, it resembles Conrail in the mid-1980s. Here, there are just two tracks on a broad right of way, with an adjacent

maintenance road and signal practices reflective of the Conrail era. The messy ballast edge is typical of post-1960 mechanized ballasting practices.

Line poles that I had designed by Jim Sacco of City Classics and manufactured and marketed by Weaver Models line most of the right of way, but have fewer crossarms in the Conrail-themed section, and a very short time to remain in place. Conrail removed them in the 1980s following the installation of CTC.

While this approach may be rare in the hobby, it gives me the challenge of



8 Altoona remained a busy passenger stop for the Pennsy well into the 1950s. The prototype station didn't lend itself well to the being modeled as a building flat, so instead the side of an MTH bank was used to kitbash a classic-looking urban train station.

modeling different eras and the opportunity to run all sorts of trains. I certainly have received much positive feedback about it from my visitors over the years!

SIGNALING ON THREE RAILS

Now if you've looked at any of the photographs, you've probably noticed my second departure from the quest for accuracy – the use of three-rail trains. Like many people, that's what I started off with as a child, but I eventually switched to HO, seeking more realism. But the gradual improvement of upper end three-rail trains to near scale fidelity is part of what drew me back. I also liked their operational reliability and Lionel's command control system, which I find to be utterly reliable and easy to use.



But there is one other factor which most model railroaders would find surprising. I love railroad signals and have included them on every layout since I was 16 years old. The signal system on my current layout is relatively complex. My old HO layouts required a detection system, which could be made to work pretty reliably, but only at the expense of added work and complication.

MEET NEAL SCHORR

NEAL SCHORR IS A RETIRED family physician in Pittsburgh and has been active in model railroading for 50 years. He also enjoys gardening, biking, photography, and – with daughter, Caroline – tropical fish. Son Steven is now an active participant in all aspects of the hobby.



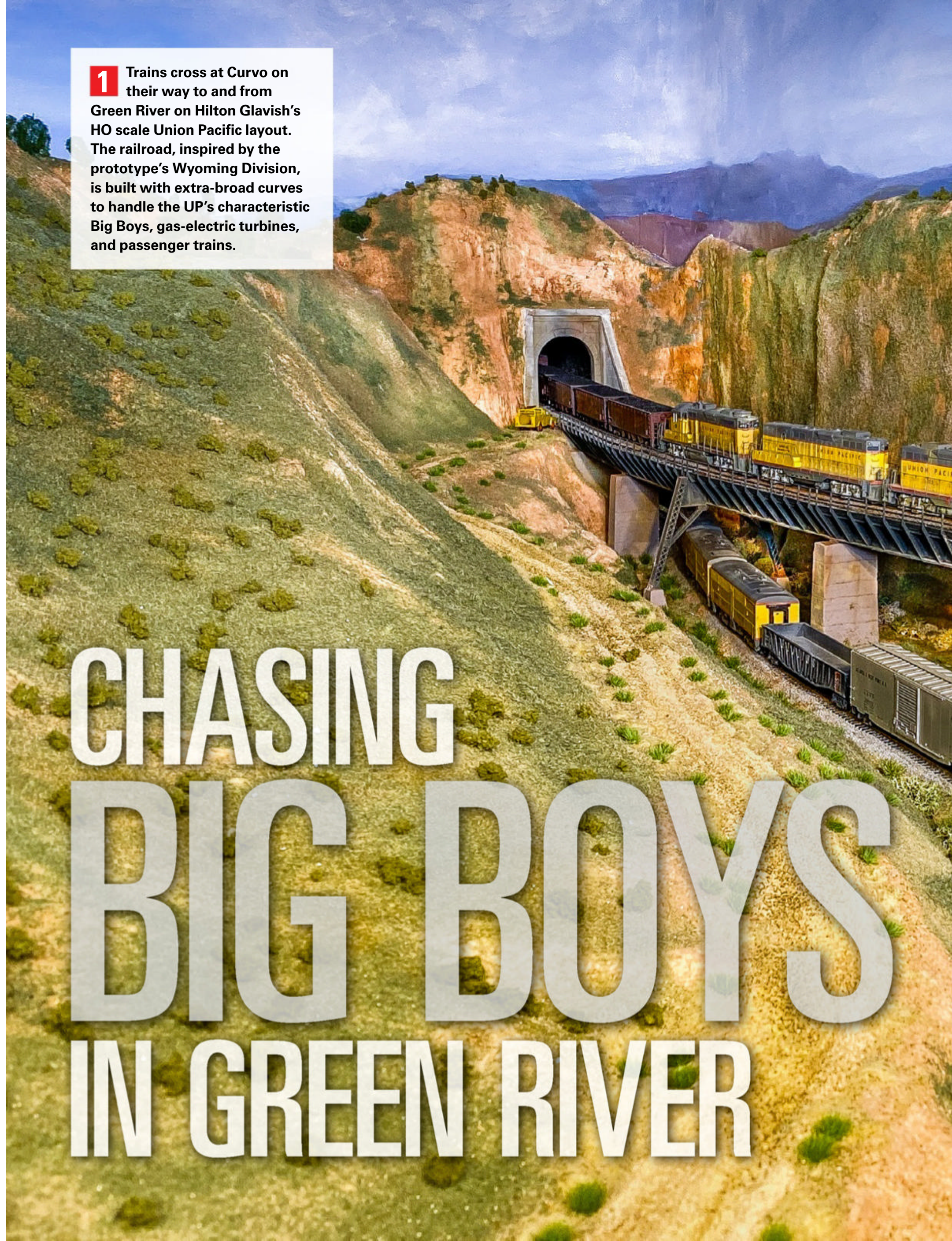
On my three-rail layouts, I've always used track where all three rails are insulated, unlike toy train track where the two outer rails are connected. I only ground the rail nearest the centerline of the right of way and reserve the outer rail for signal detection. Thus, as a train enters a block, current flows up the wheel on the ground rail, through the axle, down the other wheel, and into the detection rail. The current ultimately flows to the relays that operate the system and drops the signal, just like the prototype. And while the use of relays is old-fashioned as well, the system has operated flawlessly since it was installed. And since it's non-proprietary, there are no concerns about obtaining parts in the unlikely event of component failure.

Over the years, I've had many visitors to the layout. The comment that I often hear from those who aren't model railroaders is how much the layout looks like central Pennsylvania. But being active in the National Model Railroad Association, I frequently host open houses as part of regional and local NMRA events. Other frequent visitors

are friends of my son, Steven, who, like him, are avid railfans and quite familiar with the former Middle Division, now Norfolk Southern's main line across Pennsylvania. Many immediately recognize the scenes and comment on how much it resembles the prototype. I find such comments to be extremely gratifying. More than that, I know that I have accomplished my goal of scenically "capturing the commonwealth."

I hope what I've written here will be of value to model railroaders of any scale and with two or three rails. But I can say with certainty that nothing gives me more happiness than walking into my basement, looking at what I have created over more than 20 years, and being taken back to that day in 1975 when I first laid eyes on the most beautiful place on earth.

Finally, I wish to acknowledge my son, Steven, who helped in the construction of scenery and the detailing and weathering of motive power and rolling stock, and my friend Mark Vinski, who created the engine servicing facility and downtown Altoona. **GMR**



1 Trains cross at Curvo on their way to and from Green River on Hilton Glavish's HO scale Union Pacific layout. The railroad, inspired by the prototype's Wyoming Division, is built with extra-broad curves to handle the UP's characteristic Big Boys, gas-electric turbines, and passenger trains.

CHASING BIG BOYS IN GREEN RIVER



This HO scale Union Pacific layout closely follows the Wyoming prototype

**By Hilton Glavish
and Steven Otte**

Photos by Hilton Glavish

AS A YOUNG BOY IN THE 1940S, I lived in a small New Zealand town called Helensville, a relic of the days when railroads were important to the development of farms, forests, and fisheries. The parents of some of my childhood friends worked for NZ Government Railways, and I became familiar with the railroad operations in the Helensville yard. My parents fed this interest in trains by giving me an O scale Hornby three-rail train set for Christmas.

The first model railroad I built for myself was a freelanced HO scale layout on a 6 x 10-foot tabletop. But it had to be abandoned in 1970 when I immigrated to Menlo Park, Calif., with my wife, Barbara, and our son and daughter. At the insistence of my then 8-year-old son, we built a Santa Fe/Union Pacific-themed layout in our California garage. It lasted until we moved again in 1979. I stayed an armchair modeler until 2005, when I got back into the hobby by chance.

While working in the north Boston area, I drove past a model railroad hobby shop. I visited the shop the next day and was immediately taken by the HO layout behind the counter. The proprietor pulled out an HO scale Athearn Genesis UP 4-8-8-4 "Big Boy" and demonstrated it on the shop layout. I was impressed, and walked out of the shop with the engine, some track, and a Digitrax Digital Command Control (DCC) system.

The Big Boy's history I read in the model locomotive's manual intrigued me. The prototype was built to operate over the Wasatch Mountains between Ogden, Utah, and Green River, Wyo. In 2008, I drove the route, and after seeing firsthand the dramatic scenic features of the area, decided it was a great part of the UP to model.



In 2011 I joined the Union Pacific Historical Society (uphs.org), primarily to obtain *The Streamliner* magazine. Volume 14 No. 4, issued in the fall of 2001, had a detailed article on Green River in the 1950s. Although my initial intention was to build a moderate-sized layout showcasing freight trains negotiating the Wasatch, after reading the issue from cover to cover several times, I decided to cut back the modeled portion to Green River, its switching yard, and Echo Canyon. I would set the layout in the 1950s, replicating the freight and passenger train activity as well as the switching operations.

PLANNING FOR OPERATIONS

The centerpiece of the layout is what captured my attention the first time I visited the prototype, the footbridge where I stood watching long trains wind their way through Green River Yard tracks, as well as the spectacular scenery of Castle Rock, Green River Township, the river itself, and the somewhat barren surrounding landscape.

The purpose of my railroad is to realistically represent the prototype operations of UP's Wyoming Division, including the Big Boys, UP's newly introduced diesel and turbine locomotives, the *City*

series passenger and mail trains, and the local soda ash mining activity.

During the '50s, many passenger and several mail trains passed through Green River. I decided on a minimum radius of 48" and no. 10 switches to minimize the coupler displacement associated with long passenger cars, thus making these operations as realistic as possible. John Armstrong's book *Track Planning for Realistic Operation* (Kalmbach Books, KalmbachHobbyStore.com) was very helpful on this aspect of the layout. I also frequently referred to the book *Union Pacific Trackage* by Lou Schmitz (Morning Sun Books).

Because of the size of my room and my rather large minimum mainline curve radius, there was no space to include a visible staging yard. Instead, I use Green River Yard for this. I enjoy it, thanks to the remote switching and hands-off uncoupling designed into the layout (see "Uncoupling on command" on page 85). Once a train is made up, it can be sent to any of several hidden storage loops, representing Cheyenne, Ogden, Portland, and Park City. As each loop can hold three moderate or two very long trains, a total of eight to 12 trains can be stored and subsequently brought into an operating session.

2 This view from near the entrance of the layout room shows Green River, Wyo., with its trademark train station at left and the bluffs of Echo Canyon at right.

THE LAYOUT AT A GLANCE

NAME: Green River
SCALE: HO (1:87.1)
SIZE: 33 x 44 feet
PROTOTYPE: Union Pacific, Wyoming Division
LOCALE: Echo Canyon to Green River, Wyo.
ERA: 1950s
STYLE: around-the-walls walk-in
MAINLINE RUN: 375 feet
MINIMUM RADIUS: 48" (main and yard), 30" (industries)
MINIMUM TURNOUT: no. 8 (main), no. 5 (yard and industries)
MAXIMUM GRADE: 2 percent
BENCHWORK: open-grid tabletop, shelving, and L-girder
HEIGHT: 47"
ROADBED: Woodlands Scenics
TRACK: Peco code 83 flextrack
SCENERY: hardshell
BACKDROP: oils painted on 1/4" MDF
CONTROL: Digitrax Digital Command Control

Green River RR

H0 scale (1:87.1)

Room size: 33x44 feet

Scale of plan: $\frac{3}{16}$ " = 1'-0", 24" grid

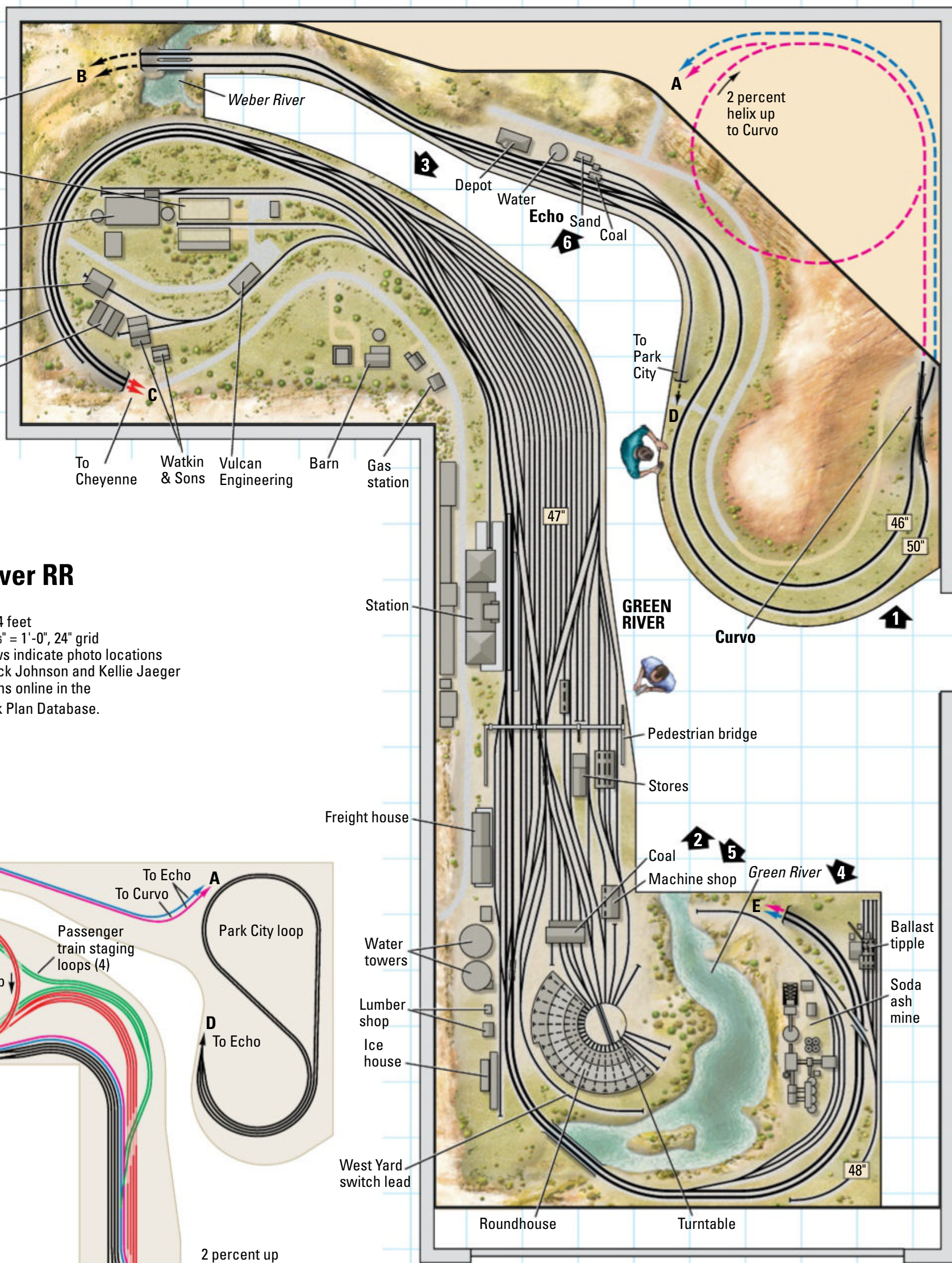
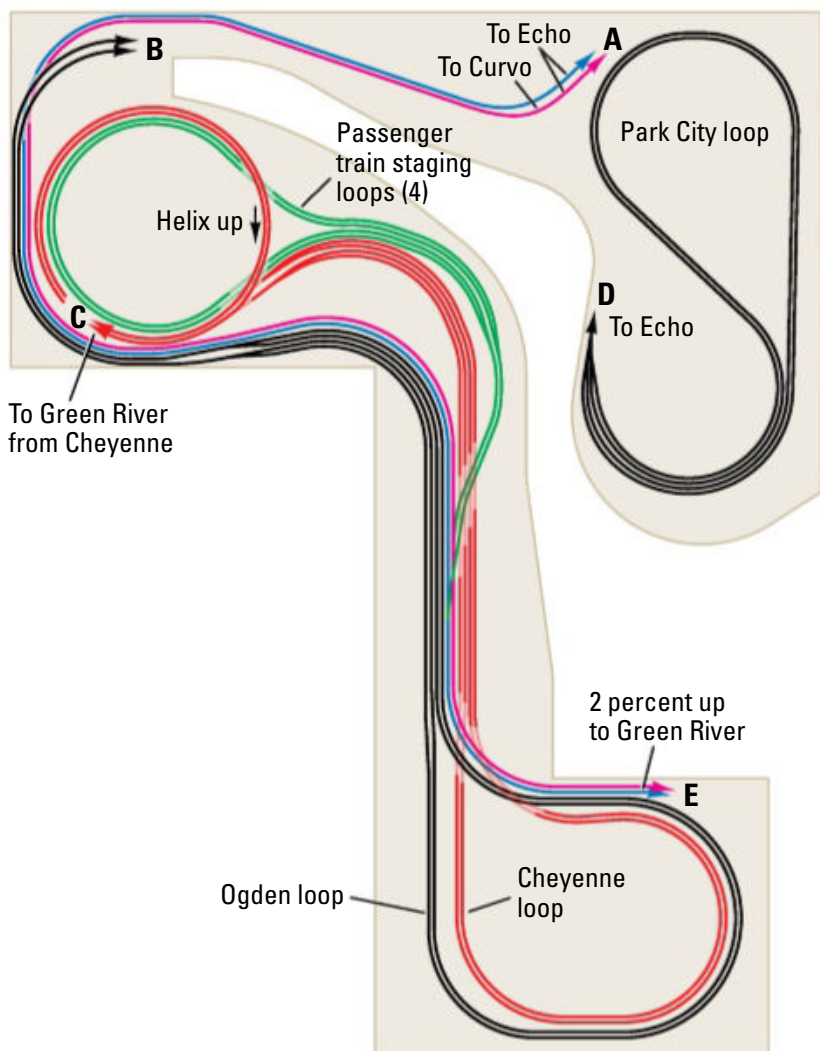
Numbered arrows indicate photo locations

Illustration by Rick Johnson and Kellie Jaeger

Find more plans online in the
Trains.com Track Plan Database.

Staging level

Not to scale





3 Most of the operations on the Green River center around the namesake city's yard. This panoramic view of the east end of Green River Yard includes a manifest freight headed by a Union Pacific 4-8-8-4 Big Boy, the locomotive that rekindled Hilton's passion for model railroading.

CONSTRUCTION BEGINS

I started building the Green River in 2011. I began by preparing the garage. I installed a drop ceiling of 2"-thick extruded-foam insulation board, painted midnight blue. Next I mounted backdrop panels of medium-density fiberboard (MDF) to the walls.

In painting the backdrops, I had the good fortune to obtain assistance from my neighbor, Don Britton, a recognized landscape artist who focuses on the western United States. He took it upon himself to travel to Green River and take many photos to capture the ambience and standout features of the scenery. He says the Green River backdrop scenery is the longest painting he has ever done. He cleverly blended the backdrop painting and plaster work with noticeably good perspective and color matching.

Each backdrop panel was primed with acrylic gesso and then sanded smooth, this process being repeated two or three times. Don painted the scenes with extra fine artist's oil colors manufactured by Holbein.

The backdrops included subtle hints of weather effects. At the back of the



cliffs and hills near the Green River depot, Don depicted a summer afternoon sky with only a few clouds. In other areas, such as beyond the tunnel at Curvo, the sky was darkened with the addition of small amounts of burnt sienna or cobalt orange to create a darker blue-gray color suggesting an impending storm. Likewise, some of the distant hills were painted to show signs of snow.

Next came the benchwork. I built the Green River yard on an open grid, divided into four sections that can be easily disassembled in case I need ever need to move again. I used shelving where hidden tracks ran close to a wall.

4 The Westvaco Chemical soda ash mine, west of Green River, is one of the layout's busiest industries. It was scratchbuilt by noted custom model builder John Busa.

For the rest of the layout, I used long-span L-girders to minimize the number of support legs needed. Much of the scenery is mounted on lift-out foam board panels, making them, like the backdrop, readily removable.

The track is Peco code 83 flextrack and Insulfrog turnouts, with the exception of four Walthers/Shinohara no. 10 double-slips in the yard.



WIRING AND CONTROLS

The trains on the layout are operated using a Digitrax DCS100 Digital Command Control (DCC) system. This is connected to a computer on my control desk running Java Model Railroad Interface (JMRI) software. The walkaround throttles are Digitrax DT402 and DT402D (wireless). In addition, I can run trains on the layout using the JMRI software throttle on the control desk.

The track is divided into 10 separate Digitrax DB200 power districts, protected by DCC Specialties PSX circuit breakers. Reversing for the eight hidden loops is handled by DCC Specialties PSX-AR auto reversing circuits.

Five video cameras monitor the hidden loops under the visible layout. Two more remote-controlled video cameras overhead can display the entire yard and associated industrial areas. These cameras have been a great aid in implementing yard switching and roundhouse operations from the control desk.

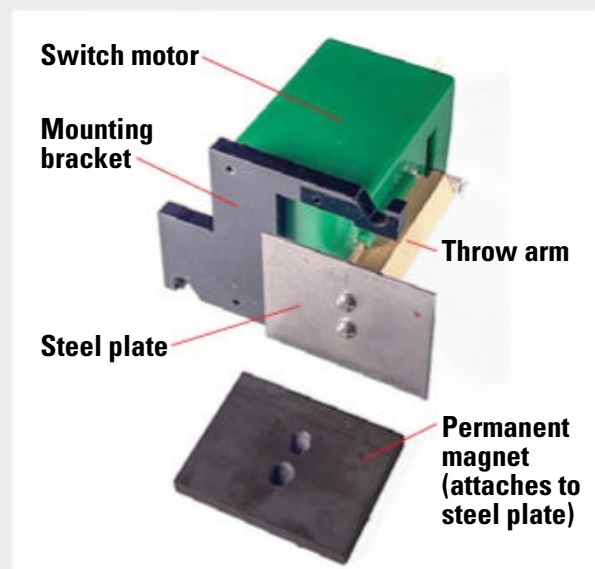
Turnouts are lined by Tortoise by Circuitron switch motors controlled via DCC Specialties Hare stationary DCC decoders. I use the same combination to control the remote magnetic uncouplers beneath my yard tracks.

All of these controls are linked through the JMRI software, allowing simple, single-command switch routing. The yard and mainline track switch route numbers are all three digits beginning with 7. The yard tracks are sequentially numbered and accessed from

Uncoupling on command

AN IMPORTANT OBJECTIVE I had for the layout from the beginning was “hands-off” uncoupling during switching operations. I think that in a model, manual uncoupling detracts from operating realism and is undesirable. I could have installed under-the-track magnetic uncouplers, but that could have caused unwanted uncoupling, especially on main lines and on yard tracks. So I implemented remote, hands-off uncoupling by adding a magnetic uncoupler to a Digital Command Control-operated mechanism.

In order to avoid unwanted uncoupling, especially on mainlines and bowl yard tracks, a Kadee no. 308 permanent magnet uncoupler is mounted on the end of a slide arm fitted to a Tortoise by Circuitron switch machine. The Tortoise is addressed and controlled using a Hare stationary decoder from DCC Specialties. The magnet is raised (thrown) or lowered (closed) to make the uncoupler active or inactive. – *Hilton Glavish*



Hilton mounted a Kadee permanent uncoupling magnet to the throw arm of a Tortoise by Circuitron switch motor to raise and lower the magnet under his yard tracks on command.

either the west switch lead (WSL) or east switch lead (ESL). These options are defined by the second digit – 4 for WSL, X for ESL. The third digit is the track number. For example, if a train needs to enter track 5 from the west switch lead, entering the routing number 745 will line the appropriate turnouts for that route. What could be simpler?

This system greatly simplifies operating the layout. In fact, I can single-handedly operate four to six mainline trains from the control desk, while at the same time demonstrating hands-off, remote set-out and pickup of cars.

SCENERY

In 2008, I was helping my two young grandsons build and operate a 7 x 12-foot tabletop layout. Together we worked on how to improve reliability, operate the roundhouse, and do manual switching operations. They were keen to get their hands into plaster scenery, and so during a long weekend, we all created Castle Rock. This became the first piece of scenery ever built for the Green River layout, which wouldn't start construction for another 3 years.

The landforms are hardshell, made using Hydrocal-soaked cloth or napkin paper supported by a masking tape web or carved foam board. Woodland Scenics carving plaster or regular commercial filling plaster was generously applied over the hardshell. Water-based dye staining and Woodland Scenics liquid pigment was then applied. This was followed by Zip Texturing – sifting pigment powders mixed with dry plaster onto the surface and setting it by applying a fine water spray. Finally, ground cover, trees, and shrubs were added.

The water was painted using artist's oil colors on MDF panels prepared the same way as the backdrop. I modeled it based on photos and on-site sketches of the actual river. The color was created with sap green, lightened in shallow areas with yellow ochre and titanium white. Deeper areas were darkened with burnt sienna or phthalo blue. Titanium white was used to create white water.

The Green River area is my personal favorite part of the layout, encompassing Castle Rock, the roundhouse, coaling tower, maintenance buildings, the river, and the vista of the Palisades Formation



extending visually off to the horizon. The vertical viewing angle is almost exactly to scale with the numerous prototype reference photos I took in preparation for the work. One can cross the river via a footbridge at the local park and climb the hillside to get precisely the same view as on the layout (or as precise as possible, given rational constraints of the model size).

Not that the Green River area was without its scenic challenges. One was the rapids on the river. On the prototype, the river is flowing toward the viewer. But due to the elevation of the hidden track beneath the surface, on the layout, the water has to be higher on the downstream side of the rapids.

The second challenge was working with the fact that the vertical backdrop panels form a right angle at the point where the distant vista begins to take over the view. This required the bluffs of the Palisades to be painted at an exaggerated perspective so they would appear to recede believably into the distance.

Dimmable light-emitting-diode (LED) strip lights are mounted at a 45-degree angle on the outside edges of the overhead sky panels. Some dimmable LED spotlights are also mounted overhead to better illuminate more distant scenic features and remove shadows.

BUILDINGS AND BRIDGES

My strength is in track work, layout design, and electronics. I also did most of the plaster work, something I enjoy, and the track ballasting. However, from the beginning of the project, I realized I could use help in other areas, particularly the structures, the backdrop, and river scenic effects.

Prior to the North Platte UPHS meeting held in 2012, I noticed an advertisement by John Busa offering to supply kit-bashed and scratchbuilt structures for model railroaders. I called him and explained that I was intending to model Green River and was interested in some of the signature structures there, including the depot, footbridge, and coaling

5 A Union Pacific turbine takes a spin on the turntable at the Green River roundhouse while, beyond the Green River in the distance, another pulls a reefer train bound for Ogden, Utah. The backdrop and the water are both painted with oil paints on medium density fiberboard.

station. He said he was already halfway through making the depot in HO scale. We quickly agreed that he would complete it for me.

John also built four bridges for the layout. The bridge over the Green River and the footbridge are completely scratchbuilt, using photos as a guide. The Weber River twin bridges are mostly kit-bashed from Walthers single-track truss bridges, with modified front faces to resemble the prototype more closely.

The Curvo Bridge was scratchbuilt based on photos and to suit the layout requirements of following a 21-degree curve. In addition to many styrene parts,



there are 66 hand-cut angled vertical bridge plate supports using .020" styrene and Central Valley bridge girders.

John is a long-time model railroader. He's been a great help in the Green River project, as evidenced by the many detailed structures seen in the photos with this article. Over the years he has also provided guidance on many operational issues, from selecting cars to faithfully represent the 1950s to generating a schematic drawing of the layout design.

A Walther's 130-foot turntable is at the center of my roundhouse. Although the turntable worked well, the electronics for the most part didn't. After dozens of hours of effort, it finally was made to work by sacrificing two of the track addresses within the roundhouse. I could only make it address half of the tracks specified in the manual.

ROLLING STOCK AND OPERATION

Thanks to John's input, all my equipment characterizes the era and the locale. In the 1950s, the prototype

featured a great variety of locomotive types in operation – steam, diesel, and turbine – all of which are used on my layout. John kitbashed my GP9Bs from GP9s before the B units became commercially available. All equipment is weathered using an airbrush and also by applying dry pigment powders with a small brush. Kadee whisker couplers are installed on the cars wherever possible to ensure the most reliable operation.

A serious operating session takes about three hours, with up to 15 trains appearing. Most passenger and freight trains stop at Green River Yard for some type of switching. There are also unit trains (coal, grain and livestock), local trains to the ballast plant and soda ash mine, and other local switching.

For simplicity, rather than using a car routing system, we use a switch list specifying generic car types. We have also eschewed a schedule in favor of sequencing because it's easier and less formal to implement, as well as being more relaxed for general onlookers.

Up to five operators can work at once without overcrowding the train room. This usually means one dispatcher, two mainline operators, one local train operator, and one Green River yardmaster. The operators communicate with the dispatcher using walkie-talkies.

I believe my model railroad has been successful in achieving the goals of realistically representing the Green River area's geography, appearance, and railroad operations. The layout was several years in the making, and changes were made as it progressed. If I had it to do all



6 Passengers wait on the platform at Echo. The canyon terrain is Hydrocal hardshell covered with zip-texturing, in which dry pigments mixed with plaster powder are sifted onto the landscape and fixed with a spray of wet water.

over again, I don't think I would do anything differently.

In closing, I would like to thank my wife, Barbara, who has been unbelievably supportive, sacrificing her garage space and tolerating the never-ending mess that found its way into the house during the construction phase. **GMR**

MEET HILTON GLAVISH

HILTON GLAVISH BEGAN modeling North American trains in mid-1970 after a vacation watching trains in Donner Pass through the Sierra Nevadas. He subsequently got busy with his career and didn't resume modeling until starting work on the present Green River layout. He lives with his wife, Barbara, near Lake Tahoe, Nev., where he runs his own business making components used to produce semiconductor chips and flat-panel displays. They have two grown children.





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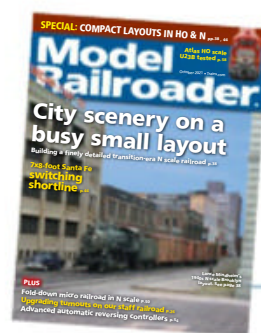
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The motivating magic of deadlines

By Steven Otte ■ Photo by Tony Koester



AS A MAGAZINE EDITOR, my life is a series of deadlines. It's been that way since I went into journalism some 35 years ago. Though other professions might not have so many deadlines in such rapid succession as publishing, almost everyone is familiar with the sense of urgency and focus a looming due date can bring.

But have you considered bringing that kind of motivation to your hobby?

Look around your layout and you'll probably find a project that's been neglected for so long it's almost embarrassing. It might be a water feature without any water, a locomotive in need of weathering, or a stand-in structure that's stood too long. Nothing that you couldn't fix if you really wanted to, but you just haven't really wanted to.

Tony Koester knows what that feeling is like. As he writes in the article that leads off this issue, sometimes we need the motivation of a deadline to get things done, even things that we profess to enjoy doing.

"Over the years, I've learned to use deadlines constructively," Tony writes. "Yes, this is just a hobby. But if we treat it as an 'as time permits' activity, we're selling its potential short. Way short."

You might not have the goal of a magazine article coming due to motivate your modeling. But even a self-imposed deadline can spur you to action. Maybe hosting an operating session or signing up for a layout tour can provide the sense of urgency you need. I know that back when the *Model Railroader* staff would hold its annual Layout Progress tours, I got a lot more done on my home layout than I do now.

Looking around my train room, my thoughts echo Tony's: "Obviously, I need another deadline." Do you? **GMR**

Building and installing the Monon freight house at Linden, Ind., was a project that sat on Tony Koester's back burner until the deadline of writing this issue's lead article came along to motivate him.



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