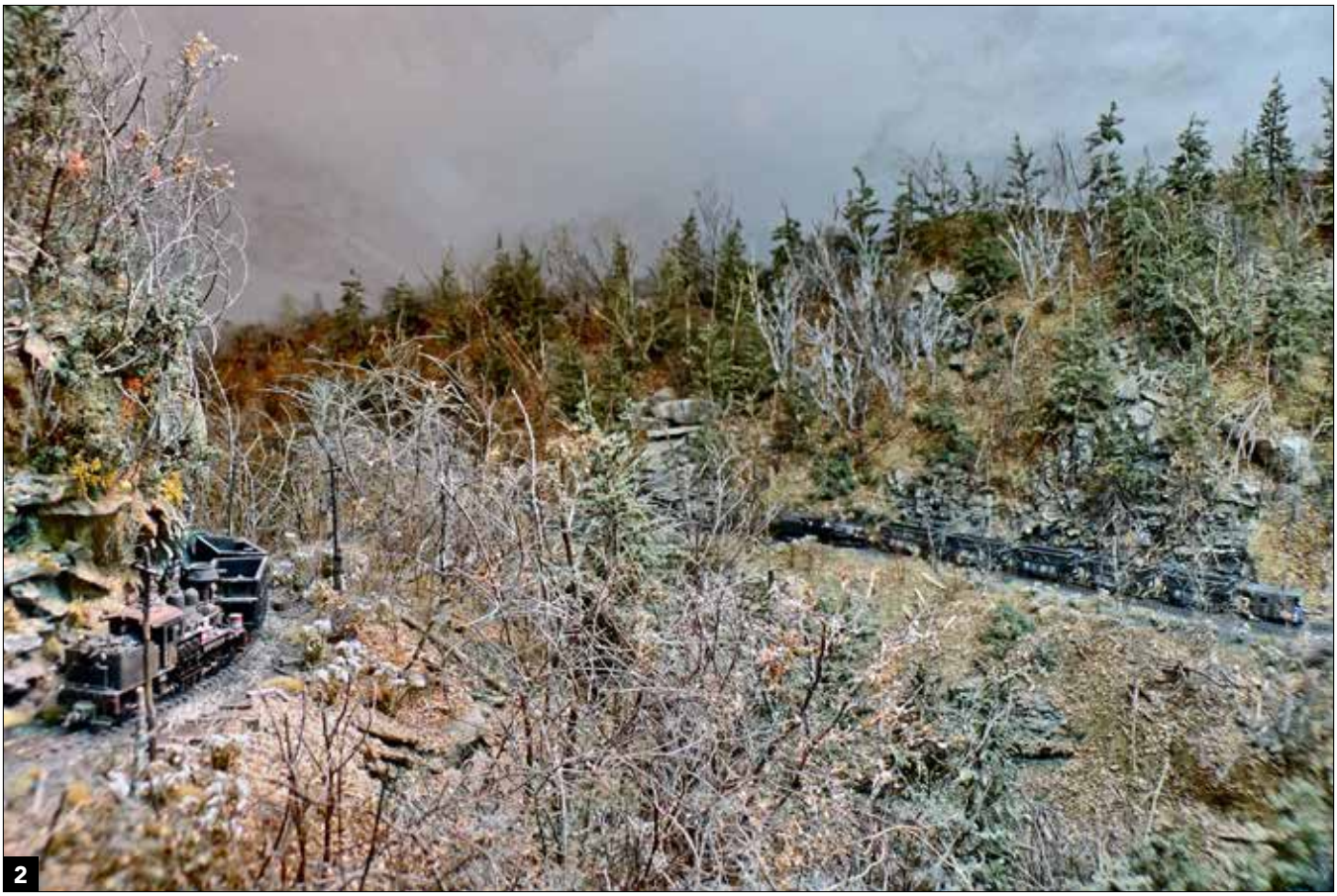
Contents



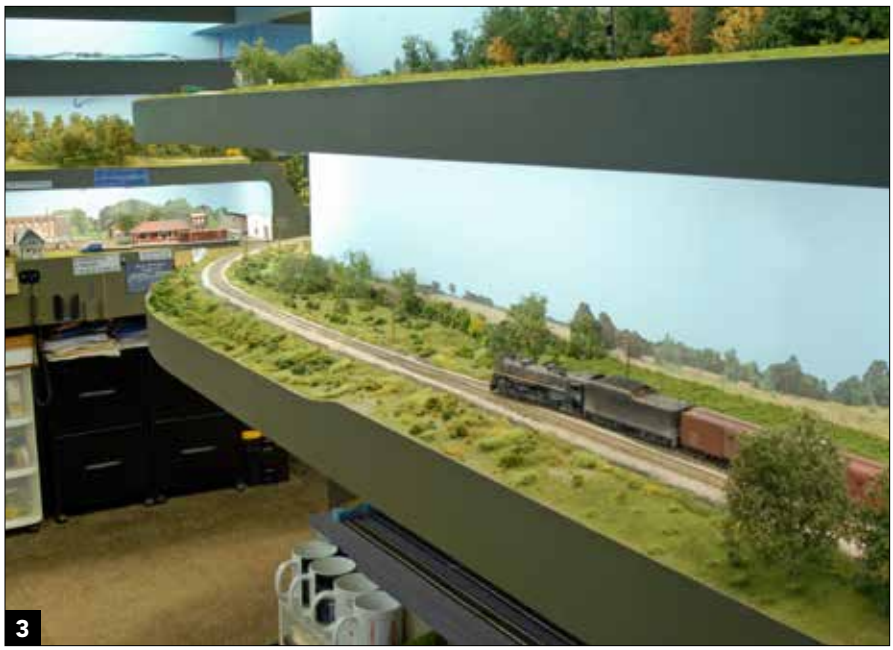
Tom Maule used U.S. Geological Survey topographic maps to accurately model the narrow-gauge Mann's Creek both horizontally and vertically. His railroad is located upstairs in a full-size "model" of the MC's car shop. *Tom Maule*

Degrees of freelancing

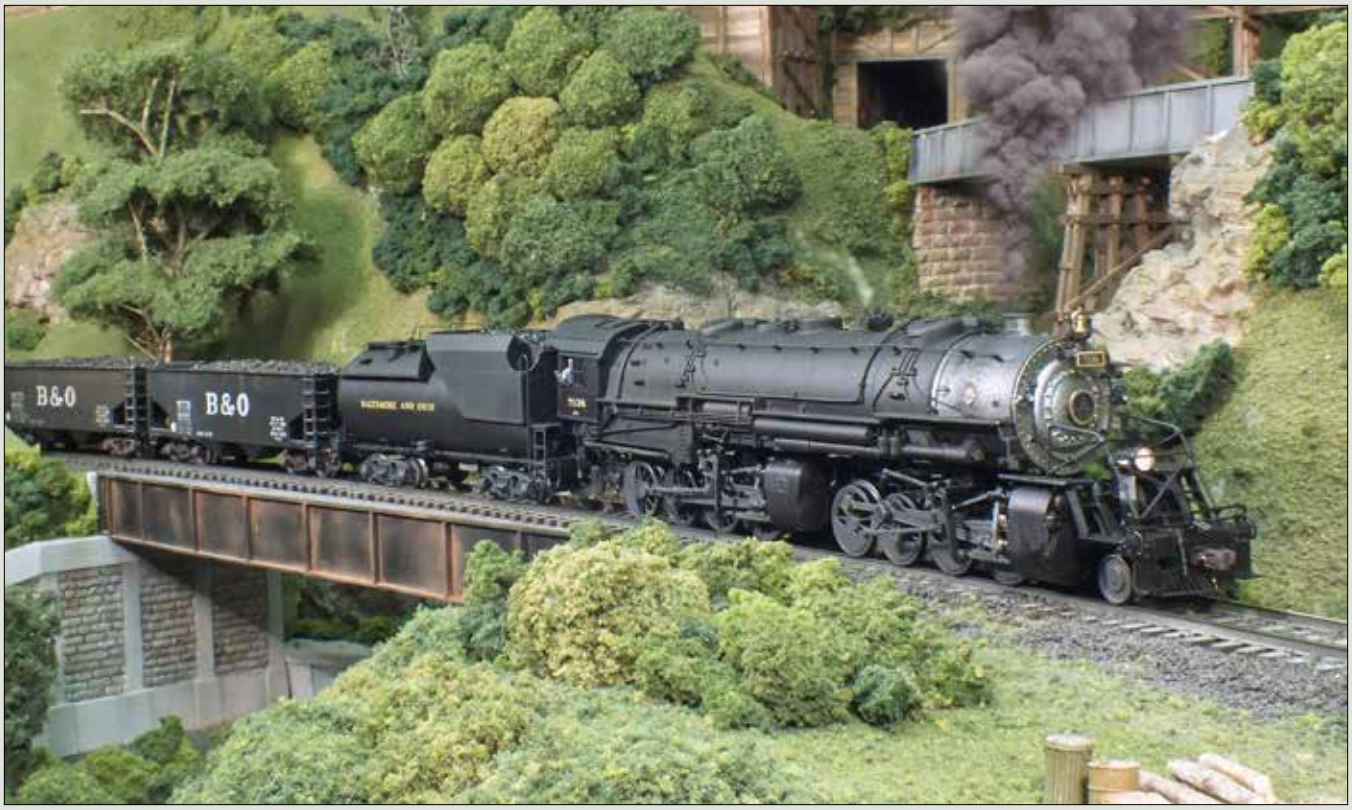
To some extent, we're all freelancers. I can think of only one modeler who has modeled an entire railroad inch for inch; even his elevations are accurately depicted, **2**. Almost all of the rest of us have bitten off more than we can possibly chew.

I'm modeling a 111-mile-long subdivision. That's roughly 586,000 feet. Divide by 87.1 for HO scale miles, and it would require a mainline run of a mere 6,700 feet—this in my roughly 30 x 60-foot basement. That's not gonna happen, even with a wedding-cake cascade of decks starting on the floor and extending up to the ceiling.

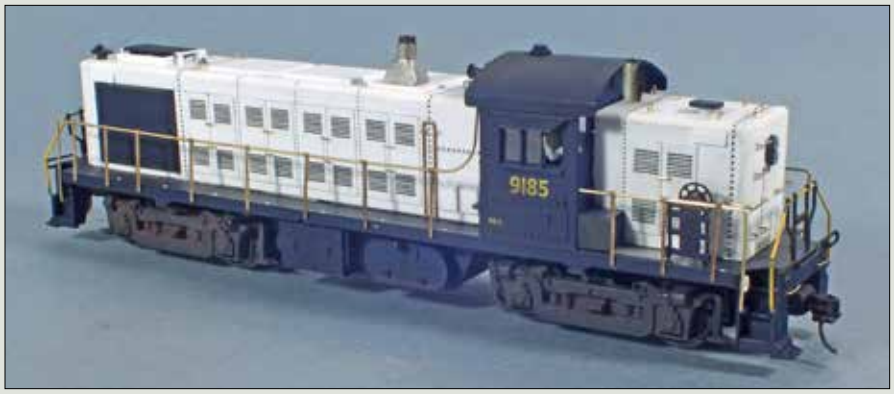
With the design talents of Frank Hodina and three decks, we did manage to achieve an 8-scale-mile run between the two division points of Frankfort, Ind. and Charleston, Ill. I am therefore modeling about 7 percent of the Third Sub, but pretending I'm modeling the entire subdivision.

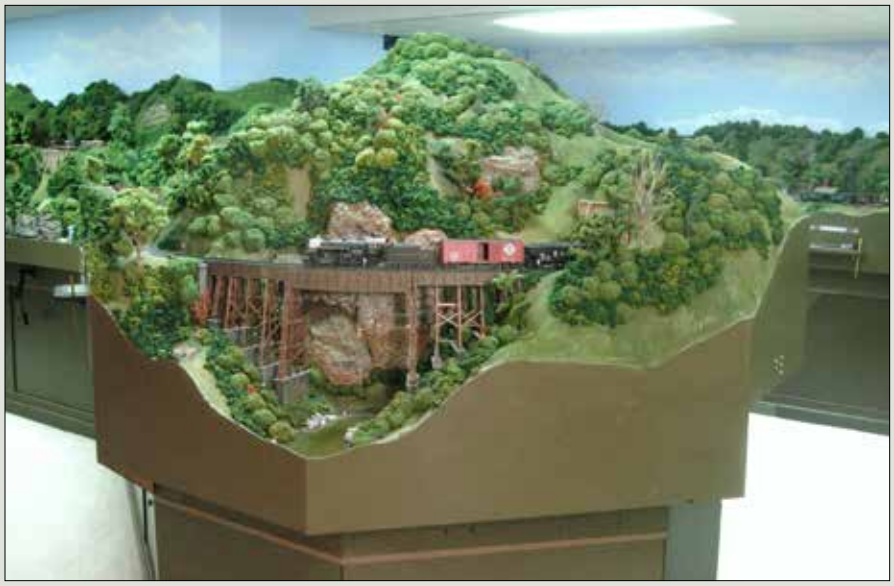


As the crew of westbound second-class freight No. 45, the KC Local, prepares to leave the passing track at Linden, Ind., to continue their run over the Third Subdivision on the author's railroad, they cannot see around the corner. They must therefore consult the schedule published in the employee timetable to see whether they can safely progress to at least the next passing track against superior (by direction) eastbound trains.

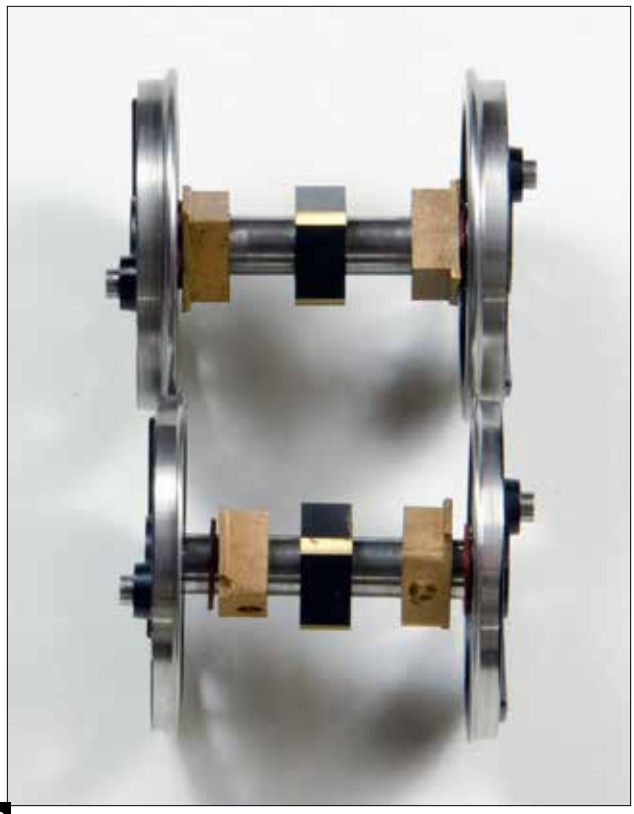


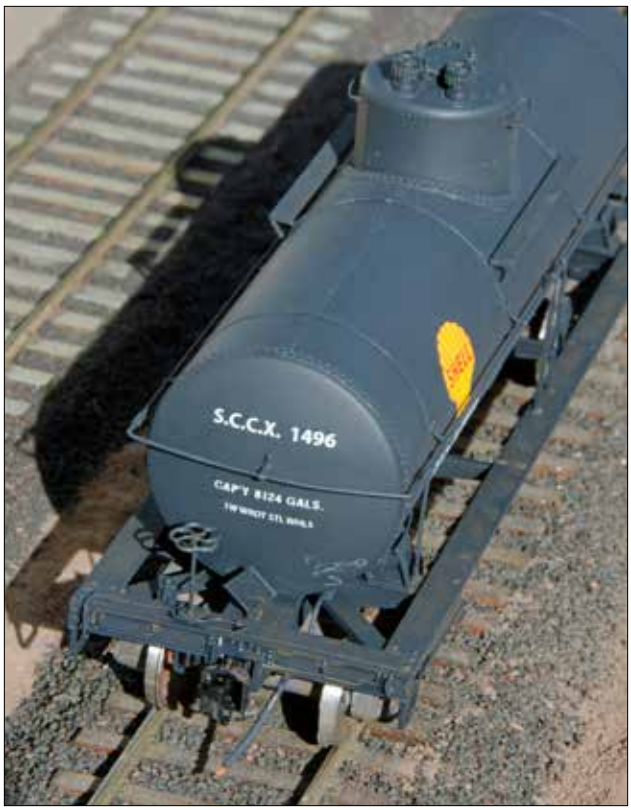
Matching goals to layout size





Brooks Stover models the shortline Buffalo Creek & Gauley and its connection with the Baltimore & Ohio in West Virginia in S scale (1:64). Of necessity, he kitbashes or scratchbuilds a lot of his motive power, including massive Baltimore & Ohio 2-8-8-0 EL-3 no. 7136 (top), which he kitbashed from a Lionel 2-8-8-2 with a scratchbuilt tender. He also scratchbuilt the body for B&O Alco RS-1 no. 9185 (above right) from styrene. His track plan and the overview photo (right; also see *Great Model Railroads* 2011 and the December 2009 *Model Railroader*) reveal that he limited the size and scope of his railroad to ensure that he had the time to tackle demanding locomotive, car, structure, and scenery building and detailing projects, which Brooks thoroughly enjoys.





12

O gauge track is gauged at 5 feet rather than the correct 4'-8½". Those who model in O fine-scale, known as Proto:48, correct the gauge error and use wheels that match prototype contours. Compare the locomotive drivers' gauge, width, and flange depth (left). This is especially noticeable on open-frame cars such as hopper cars and tank cars (right), where even the axles are visible. Close attention to track standards is required with P:48. *Gene Deimling*

later, it occurs to most of us that the railroad should be delivering cars to and picking up cars from local industries: a grain elevator, lumberyard, farm-implement unloading platform, retail coal or petroleum dealer, plastics manufacturing plant, brewery, paper mill, warehouse, coal mine, ethanol producer, and so on.

That favors a point-to-point design so that cars are obviously coming from over there and going to somewhere over here. But there's no reason the two staging yards off either end of the main line can't be looped around and connected in one big staging, fiddle, or even classification yard, as Jim Six did, **7**. That will allow continuous run to entertain guests and to test-run motive power, and it makes better use of limited space.

Basic switching needs

At locations where railroads had to do a lot of switching, they often provided a runaround track. It's easy to back into a trailing-point turnout, **8**, to pick up or set out a car. But picking up or setting out a car in a facing-point siding is more difficult. Diagram **9** shows how the car is runaround by the locomotive to position it properly for the required move.

Switching industries in a town or "spots" in a large industry is much easier if the cars are properly blocked (positioned) in the train. At major classification yards, there are usually enough tracks to sort cars in the desired order for the normal destinations: "shorts" for towns in station order for the local freight, and "throughs" for cars going to or beyond the next division point. But only two tracks are needed to do any degree of sorting.

For more information, please refer to my book, *Realistic Model Railroad Operation, Second Edition* (Kalmbach, 2013).

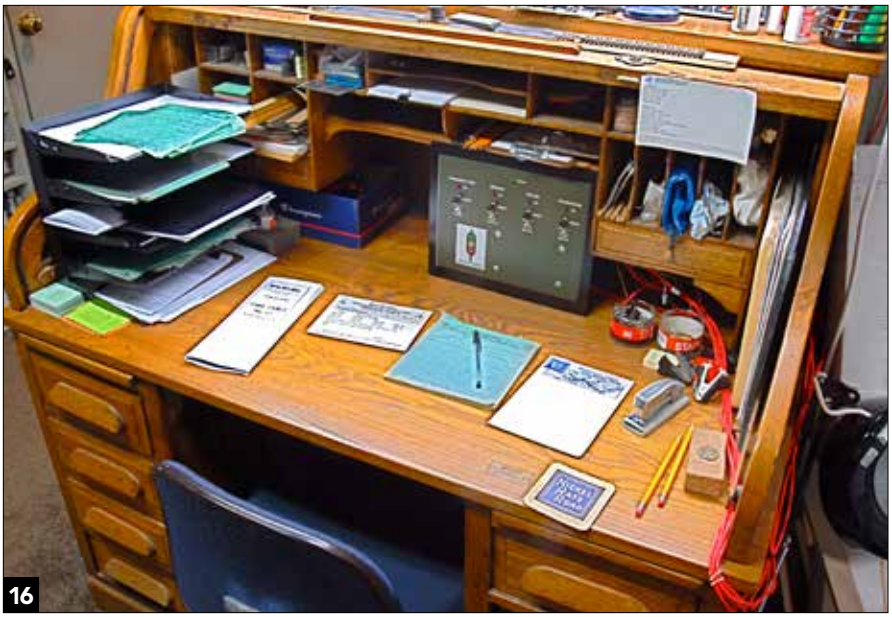
Buying track

What track you choose to purchase may have a direct bearing on the design of your railroad, especially if you do not intend to handlay (build from scratch) turnouts and crossings.

For example, if you choose to use Micro Engineering code 70 track, which has rail that measures .070" high, you're restricted to no. 6 turnouts. If you decide to use code 83 track (.083"-high rail), your options are greatly increased thanks to a wide range of turnouts (straight and curved) and crossings from Atlas, Micro Engineering, Peco, Walthers, and others. Code 100 track is also available in a variety of turnout numbers and crossing angles.

Photo **10** shows the appearance of the most popular rail codes for HO track. Note that the code doesn't change with scale: Code 55 rail is .055" high no matter what the scale or gauge.

Unless you are interested in



16

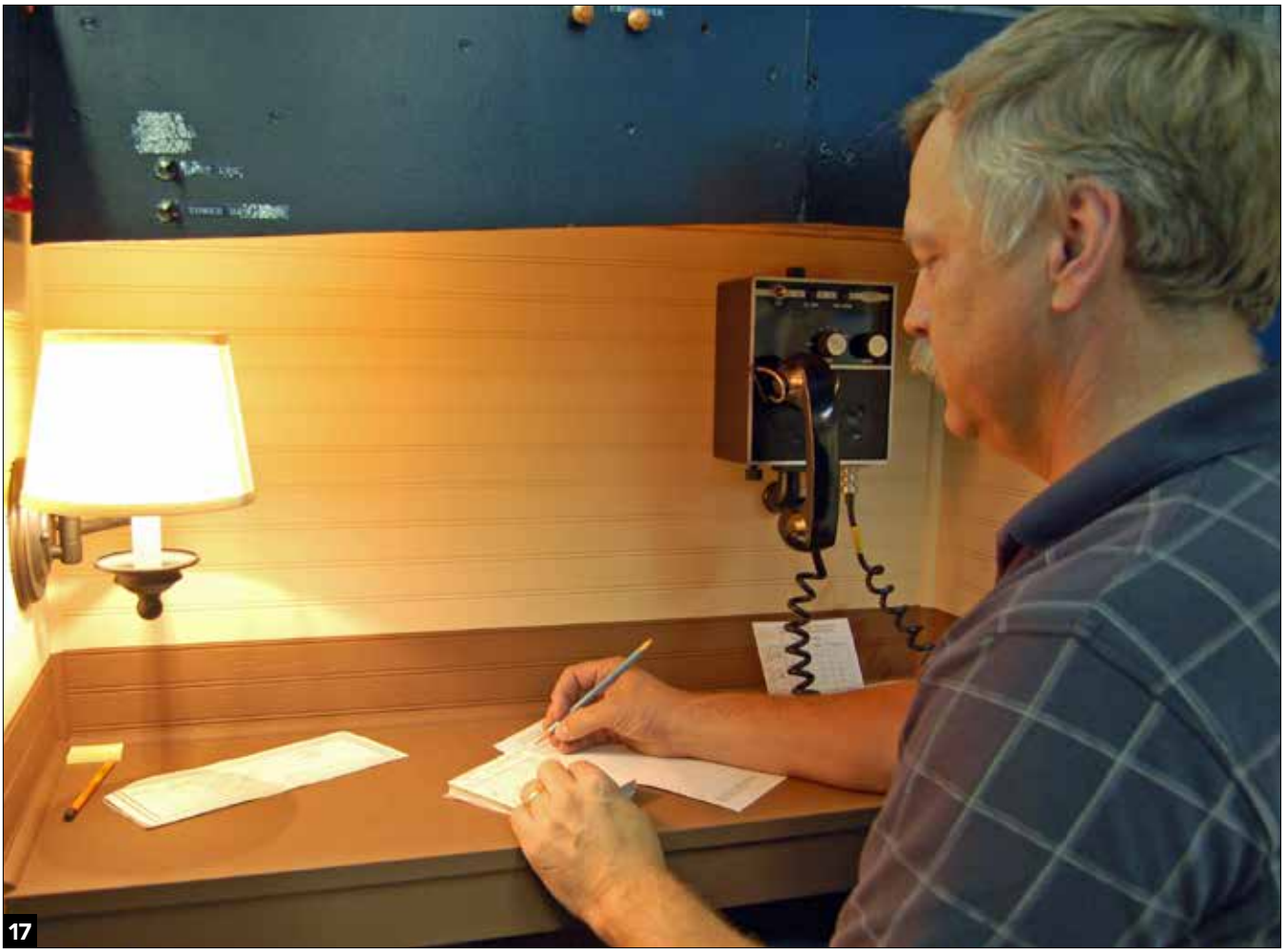
Layout planners need to allow for "desk jobs" such as a dispatcher, operator(s), and yard clerk when allocating space for the railroad as a whole. My workbench serves as the Charleston, Ill., operator's desk during operating sessions, forcing me to clean it up each month.

The reach-in dilemma

I've already discussed the perennial problem with 4 x 8 layouts: They're too wide to enable you to reach the back from the front. But that same concern raises its ugly head on any model railroad where the benchwork is more than about 30" deep.

At Frankfort, Ind., on my Nickel Plate layout, for example, there were both eastbound and westbound classification yards. Not surprisingly, they were located roughly north and south of each other on either side of the main line. Since I'm doing my best to faithfully model both the look and operation of Frankfort as a Layout Design Element, my westbound yard is against the backdrop while the eastbound yard is along the aisle, **14**. Guess which one is easier to operate.

I provided a raised ledge along the fascia to make it easier to reach



17

To give conductors a place to create switch lists from a stack of waybills, Dan Holbrook built desks under the benchwork that resemble those in Burlington Northern cabooses. Note the lamp and phone. *Dan Holbrook*

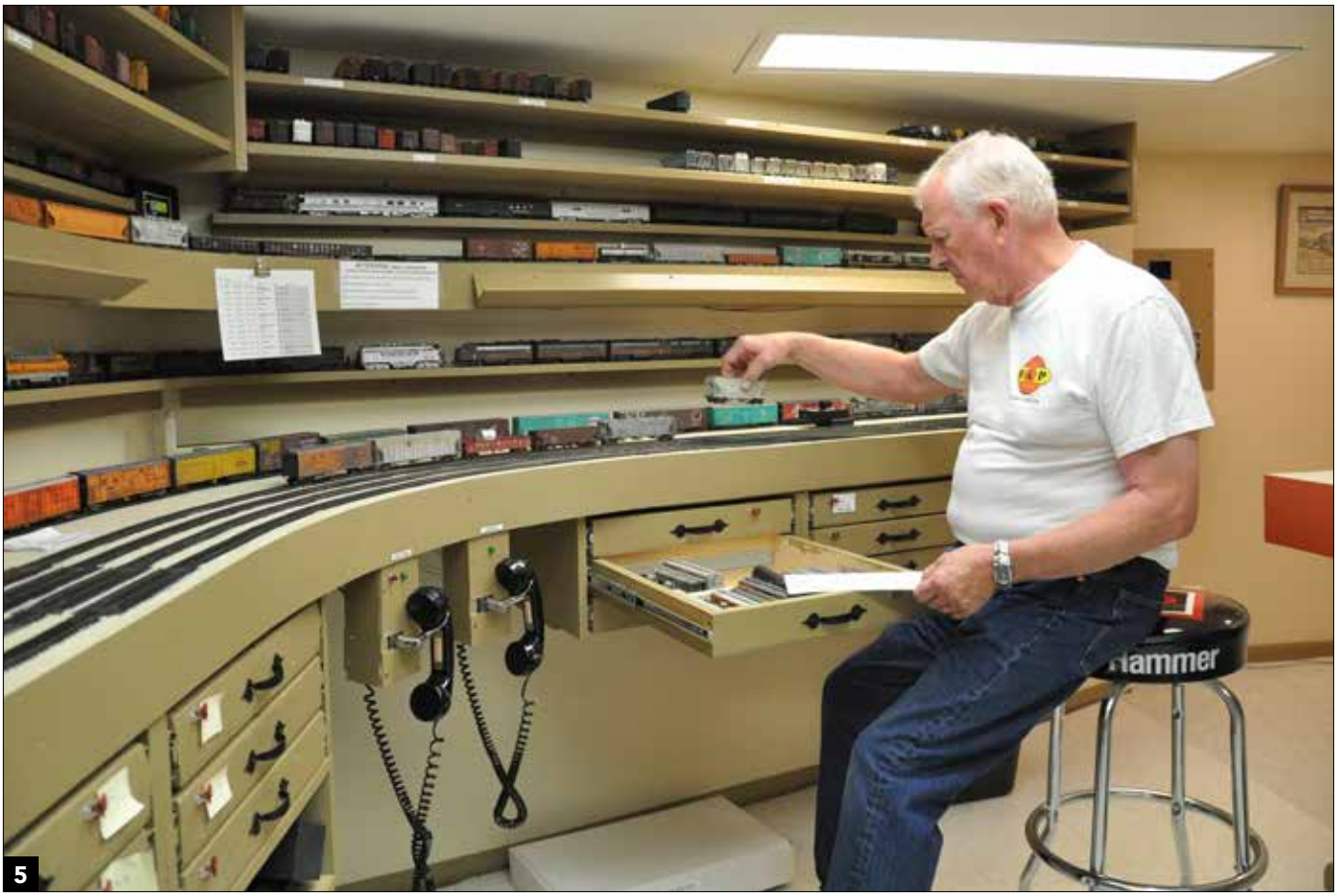
console today—and controls train movements remotely via signals and power switches, **7**. The work performed by a model railroad's dispatcher is exactly the same as that done by his or her professional counterpart, albeit without any property or lives being at risk.

The train crews also operate in an extremely realistic environment. As on the prototype, CTC accommodates a high traffic density over a single-track main line.

The potential downside is that the dispatcher, not the train crews, makes the go-no go decisions. If Simon says stop with a red signal, they wait for it to clear. This is dramatically different from a timetable and train-order environment in which the decisions about whether to move on down the line are made by the train crew based on their superiority or lack thereof,

4

The west-end staging yard on my HO railroad is 68.5" off the floor and hence hidden from ready view by a low fascia, yet easily accessed if needed. This 12-track yard accommodates all Nickel Plate trains coming from or headed toward southern Illinois and the St. Louis area.



5

Lee Nicholas's Utah Colorado Western employs a "mole"—here John Dulaney—who works an active fiddle yard located in a room away from the main railroad room. He moves cars and locos on and off the railroad during an operating session, thus allowing the railroad to operate indefinitely without restaging. Each drawer can hold the consist of a train, allowing it to be blocked ahead of time. *Lee Nicholas*

6: Selecting a period in the steam-diesel transition era for the Allegheny Midland

Event	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
NKP S/S-1 2-8-4s on Wheeling							>>>>	>>>>		
NKP I-3 2-6-6-2s in service	>>>>	>>>>	>>>>	>>>>	>>>>	>				
NKP J-1 4-8-2s in service	>>>>	>>>>	>>>>	>>>>						
NKP SD9s in service								>>>	>>>>	>>>>
NKP RSD-12s in service								>>>	>>>>	>>>>
WM steam on Elkins line	>>>>	>>>>	>>>>	>>>>	>>					
WM speed lettering						>>>	>>>>	>>>>	>>>>	>>>>
"Alphajet" fast freights						>>	>>>>	>>>>	>>>>	>>>>
Wheeling District dieselized								>	>>>>	>>>>

When backdating the Allegheny Midland, I made a table using Microsoft Word to identify ranges of key events. Railroad histories and locomotive guides identified dates when key events started or ended. My desire to use SD9s and RSD-12s alongside steam power quickly pointed to 1957 as being a good year to model.

Much more detailed maps were made by the federal government when they took over control of U.S. railroads during World War I. These valuation maps, **4** and **8-6**, served as the basis for railroad right-of-way maps for decades thereafter. Many railroad historical groups have copies on file.

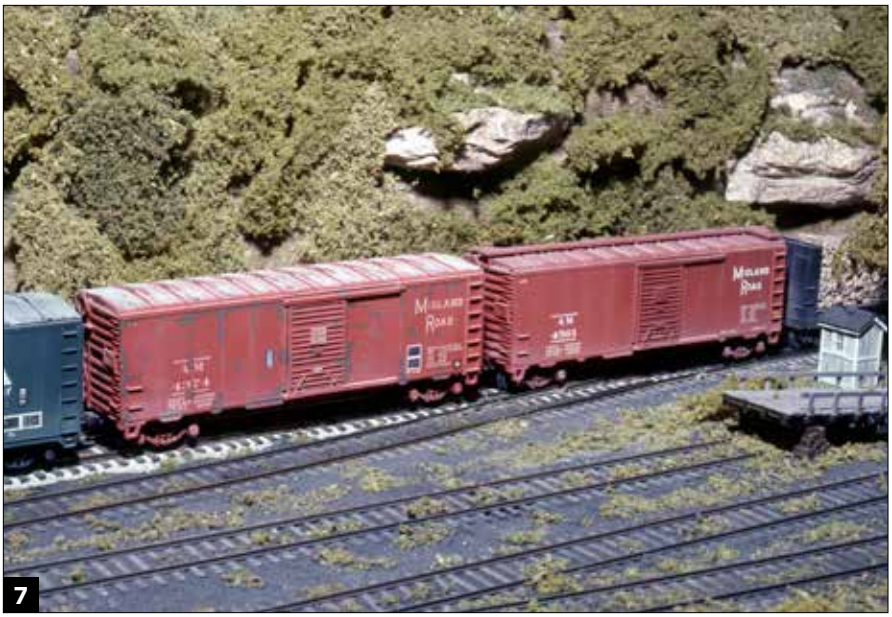
Another series of helpful maps was produced by the Sanborn Fire Insurance Co., **5**. These show structures insured against loss by fire, with intricate keys describing the construction of the buildings and often overall footprint dimensions. They cannot be relied upon as the final word on railroad track arrangements, but they're usually pretty close. Many state, college, and even local libraries have copies.

Railroad cars have the date they were built (BLT) and the date they were reweighed (shop initials and date, which is always later than the BLT or NEW date) stenciled on them. So a car that says "BLT 3-47" with a reweigh date of 5-55 would not be appropriate for my autumn 1954 railroad. One stenciled "BLT 3-18" would also be suspect as not sufficiently up to date for a 1954 railroad.

Timeline matrix

Whether you're modeling a specific prototype or freelancing based on prototype railroads, making a timeline matrix, **6**, is helpful. My simple table has columns for years and rows for various features: locomotive types, major structures, and specific trains. When it is finished, you can usually find at a glance a year or even a portion of a year when the features you want to model were in service.

If you view digging out such facts as pure drudgery, I recommend either giving it a try in the hopes of discovering that it is a lot more interesting than you may now imagine, or that you not give a second thought to locating your railroad on a narrowly defined timeline.



7

Steam-era boxcars got a new look when running boards were removed and ACI scanning labels (to left of door), consolidated stencils (black rectangles), and U-1 wheel stencils (black square with yellow or white dot) began to be applied in the 1970s. By this time, the era of the 40-foot boxcar was nearly over.

More subtle time hacks

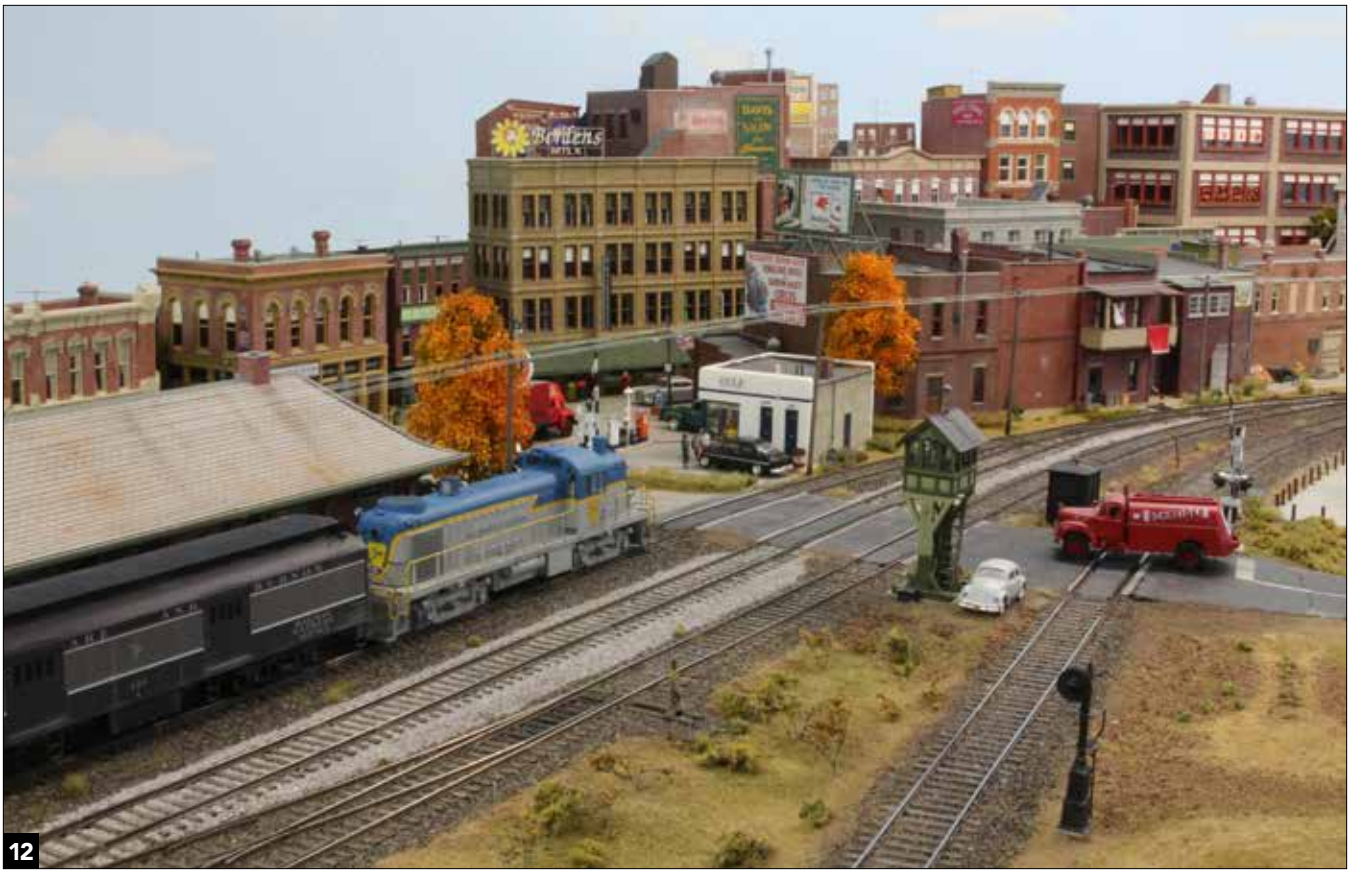
As you dig into railroad and North American history, you'll find a number of "markers" that help define eras. Among them are freight cars equipped with consolidated and U-1 wheel stencils and the removal of running boards (don't call them "roofwalks"), **7**; the mandate to put "ditch lights" on the pilots of locomotives; and the demise of cabooses and their replacement by end-of-train (EOT) devices.

In the 1970s, *Railroad Model Craftsman* published foldout charts prepared by Charles Buccola called RailDates. These handy references pinpointed when important events occurred as an aid to modelers who want to ensure chronological accuracy of details. Chief among them are major railroad mergers and abandonments.

You've heard of "analysis paralysis." This occurs when you fail to keep moving forward because you lack "all available" information. The quest for more data never ceases, and there

11

The Nickel Plate's eastbound yard office in Frankfort, Ind., looks a lot like a depot (inset). This was the yard's operating hub and therefore deserved to be accurately modeled, an easy scratchbuilding project using Evergreen styrene siding, Pikestuff shingle panels, and Tichy and Grandt Line windows and doors.

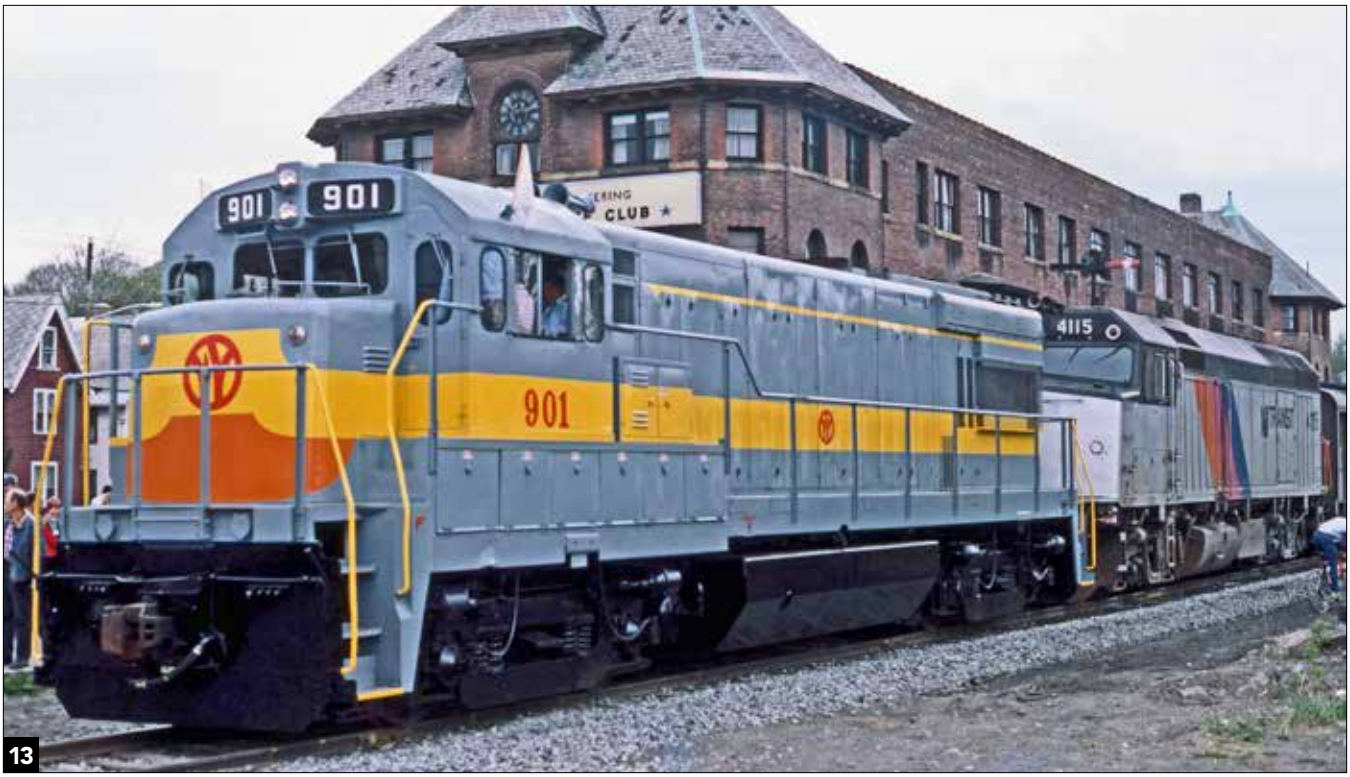


12

Kip Grant's HO scale Delaware & Hudson, set in the fall of 1962, is a modest-size railroad (see *Great Model Railroads 2011*). This allowed Kip to devote considerable time to detailing scenes such as the downtown area of Sonnyvale, N.Y. It's well detailed but not overdone to the point of being a caricature. *Kip Grant*

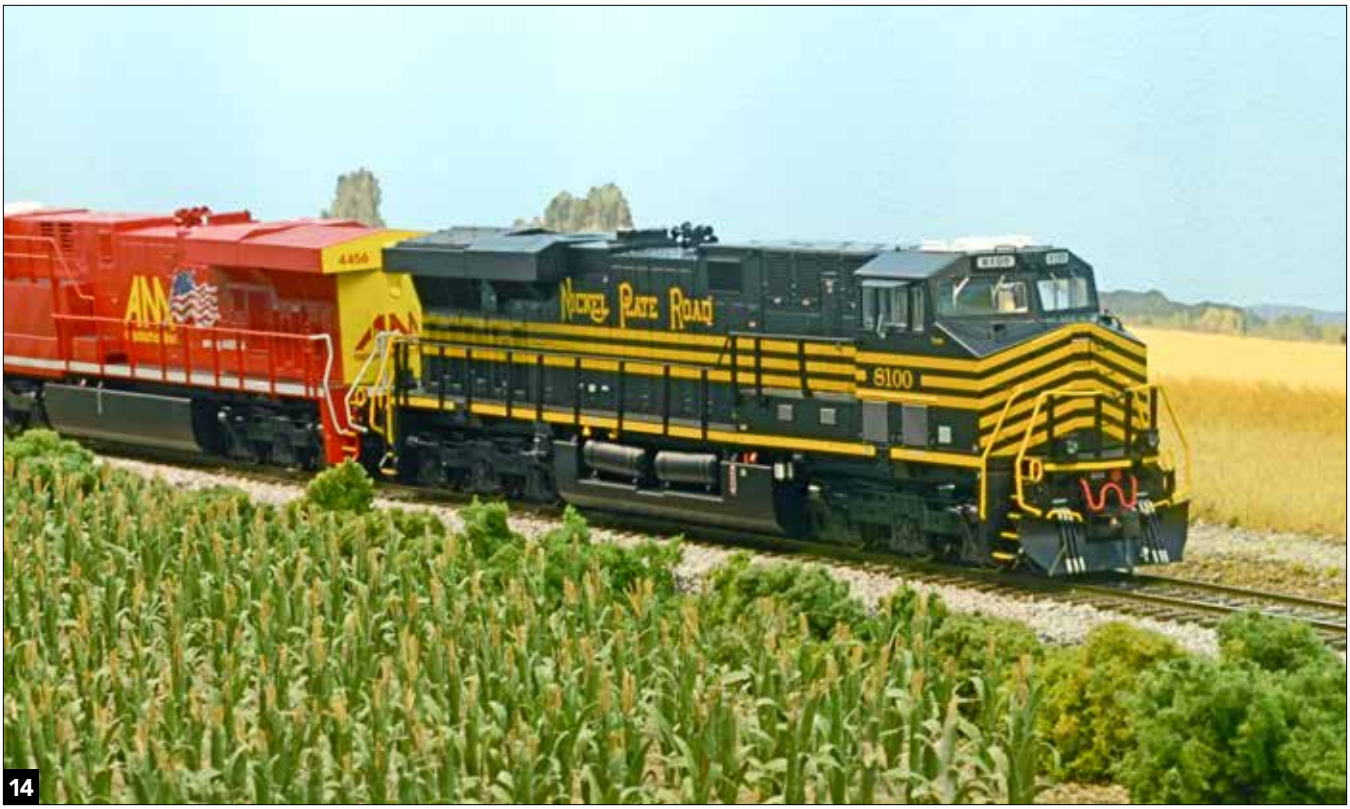
railroad or region, you have an even bigger communications job ahead of you. You cannot rely on the viewer's knowledge of the prototype to complement what you're doing. Your work has to stand on its own merits. Every step you take away from the base prototype(s) in pursuit of individualism is on increasingly soft terrain. You can sing "I did it my way!" without missing a note while utterly failing to convince anyone that you have stayed comfortably within the bounds of Plausibility.

Is that important to you? Be sure you fully understand your answer, and how your answer is likely to change in the future, before proceeding.



13

Here's what a New York, Ontario & Western GE U-boat would have looked like had the O&W survived past its 1957 abandonment. Lackawanna Valley U30B 901, which began life as New York Central 2888, pauses alongside the former NYO&W headquarters and station in Middletown, N.Y., on a fan trip out of Hoboken, N.J. *Jim Odell*



14

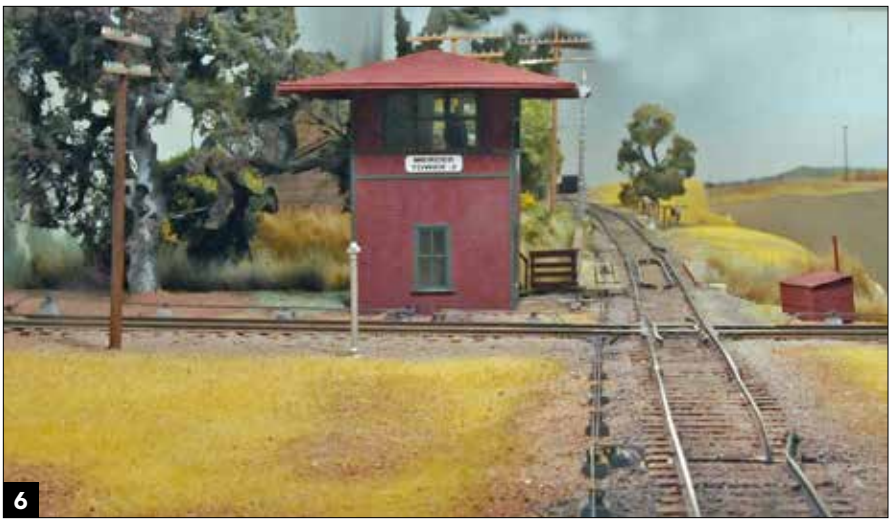
Assuming that (1) the Nickel Plate Road didn't merge into the Norfolk & Western in 1964 and (2) that the NKP's St. Louis Division was therefore not abandoned, here's what it might look like today as an NKP General Electric ES44AC (an Athearn model of one of the Norfolk Southern's Heritage Fleet) and an Allegheny Midland GEVO (from Fox Valley) team up to power a freight east of Metcalf, Ill., on my HO scale NKP layout.

4

Paul Dolkos photographed this manually operated gate or smash board guarding the CSX-NS diamond at Dock Junction in Brunswick, Ga., in February 2010 (left). A model gate could be rotated manually or by a motor. A rotating smash board with lighted signal atop protects the crossing of the Boston Track with the enginehouse lead on Perry Squier's 1923 HO edition of the Pittsburg, Shawmut & Northern. Here it's lined for the lead.

5

Bill Darnaby controls most of the interlocking systems on his Maumee Route using Hump Yard Purveyance levers. Moving a lever actuates a switch that triggers a Digitrax SE8c signal driver. *Bill Darnaby*



6

Jack Burgess rigged the rods from the tower to the semaphore home signals and split-point derails to move when an approaching train covers a sensor, automatically clearing the route for a YV train. This favors the (theoretically) much busier Santa Fe route through the interlocking plant. *Jack Burgess*

behind a steam or diesel locomotive passing over the crossing during the period that the modeled railroad's home signal is set at stop (and stay stopped).

Interlocking crossings were once commonly protected by "smash boards," which swung out to block one of the routes through a crossing. Similarly, the Pittsburg, Shawmut & Northern protected the crossing of a busy yard track with the engine leads by a rotating smash board, which Perry Squier has modeled and motorized on his HO railroad, **4**.

Bill Darnaby used logic software and Hump Yard Purveyance plastic interlocking "armstrong" levers to build interlocking plants for each of the many crossings on his HO railroad, **5**. He described the process in "Signaling with software" in *Model Railroad Planning 2010*.

Jack Burgess added working split-rail derails and operating semaphore home signals to his HO Yosemite Valley Railroad, **6**. Visit his website, yosemitevalleyrr.com, for more information on this remarkable railroad.

Automated interchanges

Iowa Scaled Engineering also makes an Automated Interchange (AI). I have two of them installed on the NKP, **7**. Power to a 30-car-long to-NKP interchange track is controlled by