

Otis McGee and several friends are building an HO scale Southern Pacific Shasta Route layout based on a John Armstrong track plan. Here we see SP Cab-Forward no. 4285 leading a North Coast Perishable train over a Harriman-era through-truss bridge at Sims. Model photos by Jim Providenza and Bill Kaufman



Main line through **the mountains**

An HO scale track plan for Southern Pacific's Shasta Route makes the most of a 22 x 45-foot room



Steep grades and mountainous terrain made for rugged railroading on the Shasta Route. John Armstrong designed an HO scale track plan of the Shasta Route that features grades similar to those on the prototype. The line's namesake mountain, Mount Shasta, can be seen in the background of this photo. Southern Pacific photo

By John Armstrong

The key to developing a track plan that can become a model railroad with realistic appearance and operations is making and implementing a series of good choices. When I'm developing a plan for a client, it's important that the person has a clear concept of what they want their model railroad to be. Is the client more interested in scenery or operations? Do they want a generic or prototypically accurate representation of a real railroad? These are just some of the questions I posed to Otis McGee, Jr., when I developed this HO scale track for him.

Asking questions also helps clients see the benefits and drawbacks to each layout approach. On a generic South-

ern Pacific layout, the trackage would represent a line somewhere in the western United States. The station designs and signaling would follow SP practices, but the towns and yards modeled would be fictitious.

However, when Otis approached me to design this layout, he wanted to take a more ambitious approach by modeling a portion of SP's Shasta Route. The prototype offered abundant scenic and operational features that, with appropriate compression, could be converted into model form. With ample space to work in, it's easy to understand why a generic layout just wouldn't do.

In this article I'll walk you through the thought process that went into designing this track plan. You'll see that by asking the right questions and carefully working through the layout-design process, track planning can be fun and enjoyable.

Meeting criteria

The layout Otis is building is located in a large room, reached from a four-car garage below by a U-shaped staircase. The staircase is wide enough that 4 x 8-foot sheets of plywood can be brought into the layout room even after the doorway is spanned by benchwork.

The track plan had to meet several criteria: a minimum track radius of 40" to accommodate 2-10-2, 4-10-2, and Cab-Forward steam locomotives; no scenes on the main line can be passed through more than once; a minimum

aisleway clearance of 30" is required; and the layout should be a mushroom multilevel design without duckunders.

Within these constraints, an around-the-walls model railroad feeding into lines on both sides of a single serpentine peninsula extending to a helix seemed to be the best option because it was possible to include almost five scale miles of main line while still maintaining 30" or better aisleways along most of the route. With a layout style selected, it was now time to turn my attention to the scenic elements of Espee's Shasta Route.

Along the line

Capturing the essence of the Shasta Route in the steam-to-diesel transition era was a matter of condensing as many of its most defining segments as possible, in order, on a visible main line.

A keystone of the Shasta Route was Dunsmuir, Calif. Located at the foot of a helper grade, trains from both the Siskiyou and Cascade Lines ran through this railroad town. Dunsmuir was home to a large engine terminal and modest-sized yard that are compressed in the track plan. The roundhouse has 16 stalls instead of 24 as on the prototype, and the upper yard has six tracks between Sacramento Street and the backshops instead of nine. An opening in the lower-level backdrop helps to bring critical parts of the trackwork within arm's reach for operators and provides a better view of the roundhouse.

The lower yard at Dunsmuir also had to be compressed from the prototype's 17 tracks to four. The yard sits on a 1 percent grade. For the sidings to provide 20- to 25-car capacity the tracks had to bend around a horseshoe, but the coupling and uncoupling areas are reasonably straight. Many of today's models have very free-rolling trucks, though, so even the modest 1 percent grade may prove to be a nuisance. As a precaution, I designed the benchwork so the grade could be eliminated if desired.

Climbing the grade

Coming out of Dunsmuir, trains begin climbing the 2.75 percent grade up to Black Butte. This part of the line passes through Small on its way to the scenic Cantara Loop, where the tracks parallel the river. The radius from Cantara to Azalea was reduced to 38". Even with the reduced radius, this stretch of the layout still consumes about 120 square feet. This includes the horseshoe itself, as well as the second curve needed to return to normal shelf width.

Between Cantara and Azalea there's an optional logging operation. The logging scene utilizes some empty space but highlights another problem with horseshoe curves – access.

Fortunately, the track is approaching eye level by this point, and the terrain is such that a good-sized access opening reached by a comfortable (more than 60" clearance) duckunder can be left without a top. The foreground can be contoured so the hole is out of sight.

Approaching Azalea, two steps up bring operators back to eye level with the layout for the rest of the climb to Black Butte and its wye junction with the Siskiyou Line. But how should this line be represented?

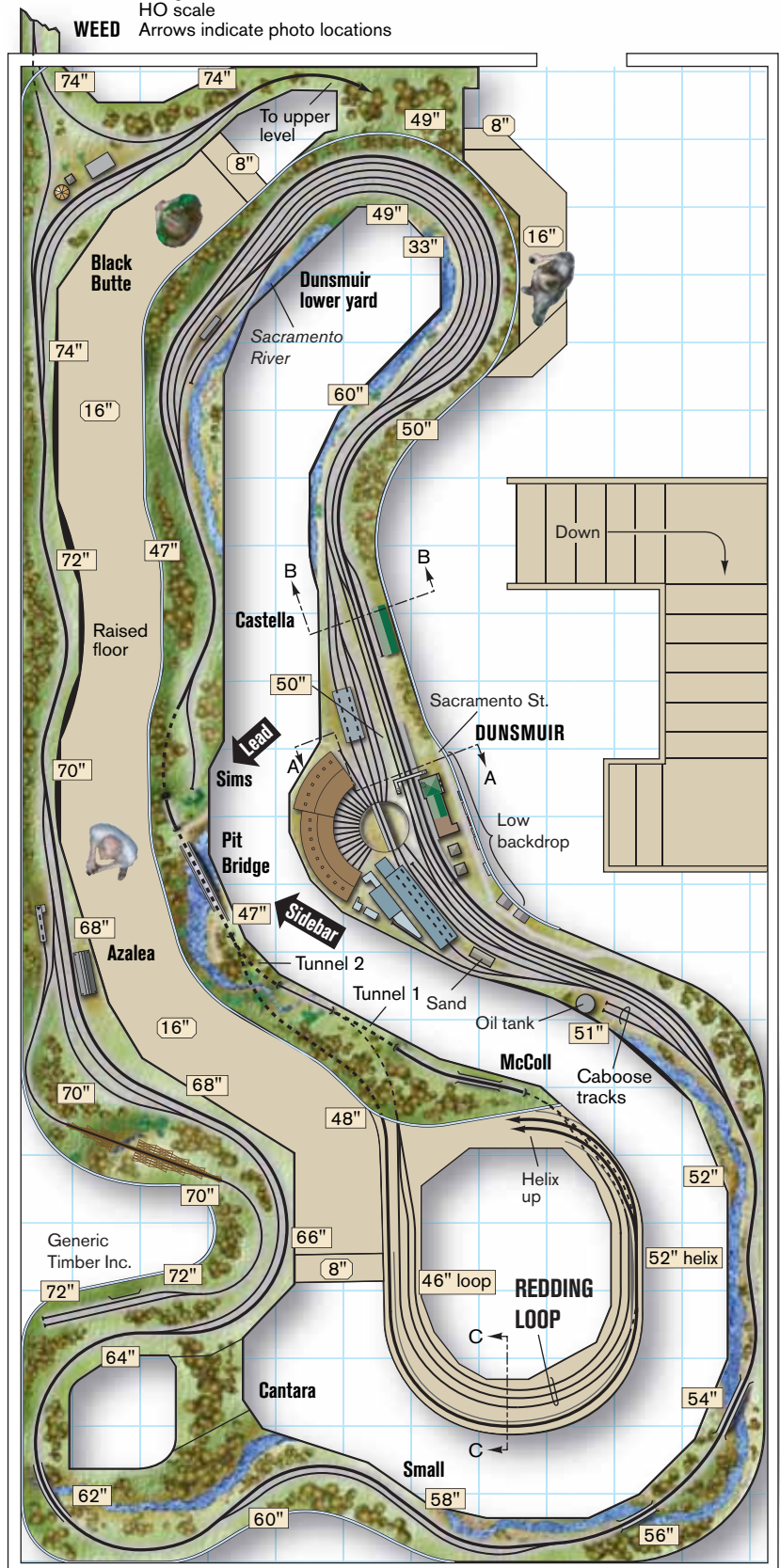
The layout is high enough above floor level to accommodate an unscenicked, along-the-walls return loop with lavish staging sidings in the crew lounge, workshop, and dispatcher's office without interfering with the functionality of this portion of the layout. However, we'll leave that loop as a future possibility. Instead, a modest wye-tail alignment proves a workable alternative, as shown in the track plans to the right.

Facing the big peak

Key scenic features (primarily the line's namesake, Mount Shasta) and the north-south alignment of the Shasta Route lead to a serious complication. It's normally possible to create a going-somewhere, directionally consistent feeling while still following the layout's convolutions where viewing angles are

Southern Pacific Lines Shasta Division

Room size 22' x 45'
Scale: 3/16" = 1'-0"
24" grid
HO scale
Arrows indicate photo locations

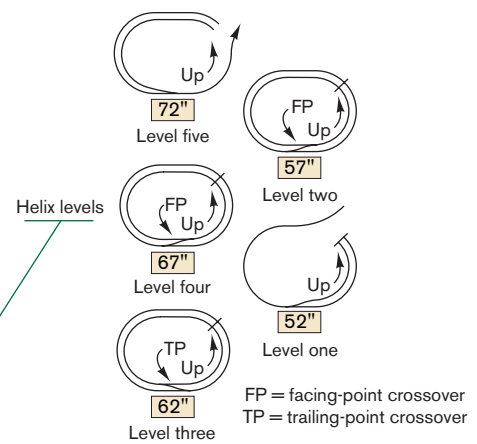
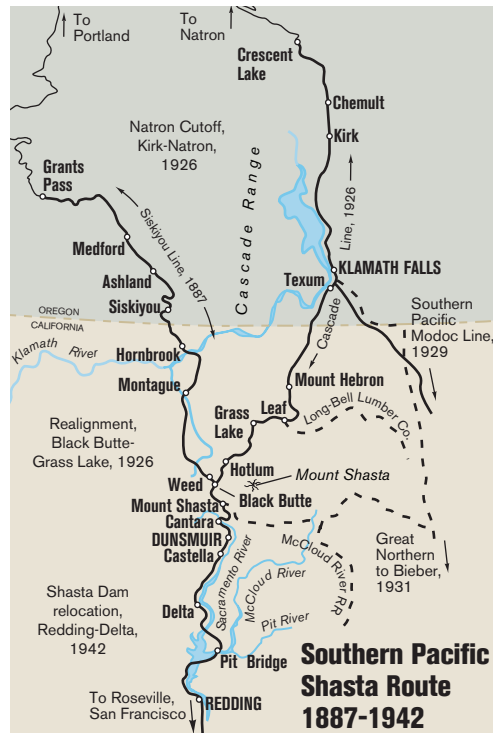


Illustrations by Jay Smith

Lower level



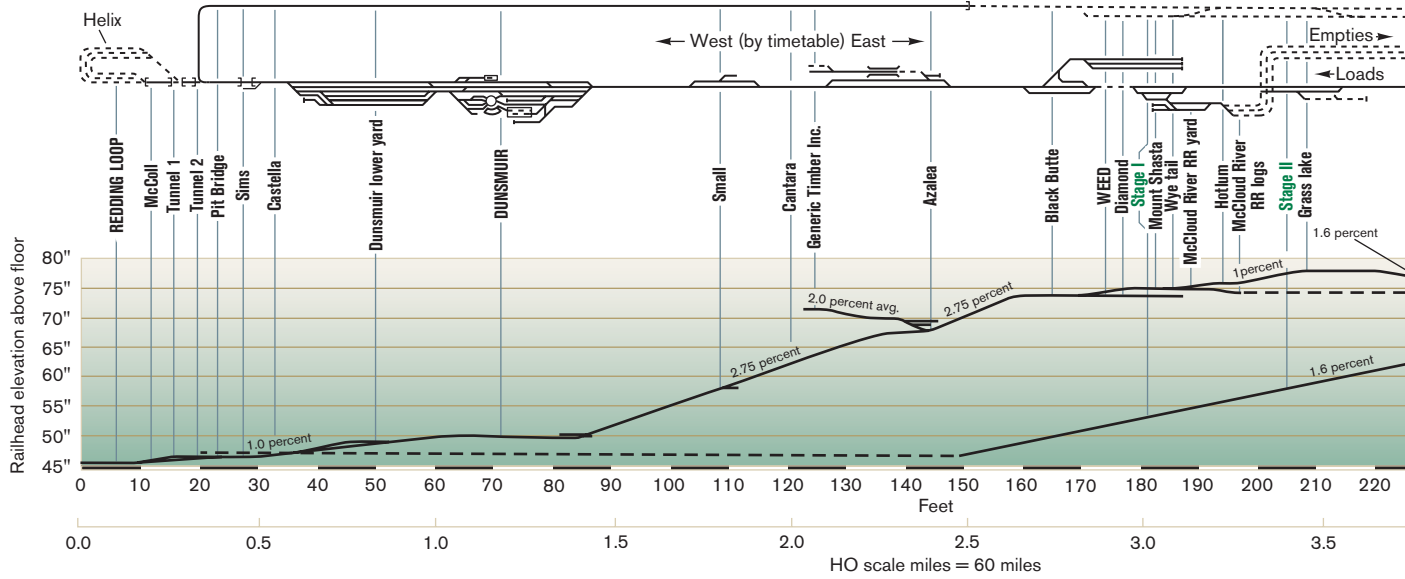
Upper level



Layout at a glance

Name: Southern Pacific Shasta Route
Scale: HO (1:87.1)
Size: 22 x 45 feet
Prototype: Southern Pacific
Locale: northern California
Era: 1952
Layout style: double-deck around-the-walls with peninsula
Length of mainline run: 300 feet
Layout height: 33" to 78"
Turnout minimum: no. 6
Minimum radius: 38" main line, 36" passing tracks, 20" branch lines
Maximum grade: 2.75 percent

Southern Pacific Lines-Shasta Division



arranged so that west is to the left and east is to the right, for example.

On the Shasta Route track plan, however, the scenic canyon line from the south (timetable west) through Dunsmuir must be viewed from the east, meaning north is to the right. For many miles north of Cantara, the essential feature is Mount Shasta itself, and it can be seen only in proper relationship to the track from the west, which means north must now be on the left. The only solution is for the line to cross the aisle.

Fortunately, the track is headed for the Upper Klamath Valley. The layout beyond Black Butte is high enough that, with the aisle taking two steps back down to floor level, the tracks can cross the aisle and operators can comfortably walk under the scene.

McCloud River RR connection

After passing under the crossing, operators enter Mount Shasta, where another section of raised floor brings them back to eye level with the trains. Mount Shasta is where the SP connects with the McCloud River RR. The town's namesake mountain looms properly to the northeast over the short line's yard.

But wait. Mount Shasta is actually South of Black Butte! What gives? Well, placing the mountain in its correct location would have caused complications such that quietly accepting this compromise with reality seemed the best choice.

Restoring geographic order

Geographic order is restored when trains enter Hotlum and pass over the Dry Creek trestle. The bridge is some 700 scale feet shorter than its prototype but

could be modeled almost as high. The low backdrop in this scene allows access from both sides, and viewing along the wider sections of the benchwork precludes raising the floor level in this area.

Trains then proceed to the highest point on the line: Grass Lake. Viewed and operated again from eye level, Grass Lake is the end of some helper turns from both directions. The town has a long passing track, a full-radius wye, and Mount Shasta in the background, just as it should be.

Is having two separate versions of Mount Shasta on the backdrop dishonest? Maybe, but not too obvious a deception since the intervening terrain is such that you never see more than one Mount Shasta at a time.

At this point trains disappear onto an unscenicked shelf far above the staircase opening, emerging into the town of Leaf, where logs are picked up from Long-Bell's mill. The Long-Bell line does a 180 through the lounge area to enter Leaf realistically from the east. Because of its elevation, this portion of the layout may need to be reached by ladder. The track arrangement is simple enough that operation should be trouble free. No space was devoted to turning locomotives on this nearly scale-mile-long branch since the geared and double-ended rod locomotives used on this line didn't need to be turned.

Crossing the line

Continuing down on a bit more-moderate grade (1.6 percent) typical of this plateau region of California, the track must unprototypically, but invisibly, cross itself at grade on its way

toward Mount Hebron. The 90-degree crossing can be reached from the walkunder below.

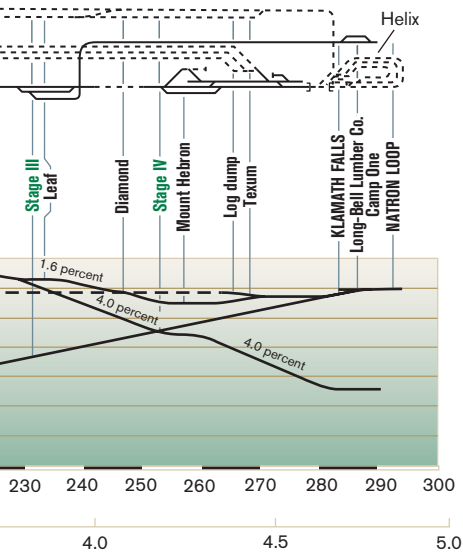
With an elevated aisle again to the east of the line, the 13- and 19-car lapped sidings at Mount Hebron and Texum allow the longest consists to pass without needing to saw by. The lumber mill at Texum completes a loads-in, empties-out connection with the McCloud River RR yard at Mount Shasta. In this case there's a third track so the railroad can make a runaround move to put the caboose on the right end of the train when both the empty and load tracks are occupied. As a large mill with its own switcher, Texum produces mostly finished lumber going out in boxcars, which look the same loaded or empty.

The end of the visible line is located in the industrial outskirts of Klamath Falls. In a manner similar to that at the other end of the layout below, the turnouts connecting the end loop with its staging sidings and the helix are hidden in a short tunnel.

Helix details

The key to the overall space efficiency of this layout is the helix, which has 40"-radius curves and 4" of separation between levels. The helix is reached via a duckunder and is secluded with a hard-board shroud. Experience has shown, however, that even with reliable locomotives and electrical control systems, visual confirmation of train movement is desirable. I recommend cutting openings in the shroud at each level.

The helix has facing- and trailing-point crossovers so that each of the four levels can also function as bidirectional



From track plan to reality

staging tracks capable of holding 35 cars. As is the case with all other staging tracks in this plan, track center spacing is 3". The extra inch provides finger room for moving cars by hand.

Concealed staging

The west end of the layout (milepost 0) is at the center of a 40"-radius loop surrounding tracks of slightly sharper-radius curves for staging an additional 70 cars worth of trains.

To get some extra visible main line, trains exiting staging pop into the open a few feet short of the loop turnout, which is hidden in a short tunnel. A connection from the helix that provides continuous-running capability sneaks in via Tunnel 2, crosses a highly condensed version of the double-deck Pit Bridge, and then enters the Sacramento River Canyon.

Decision time

With the track plan complete, it's now time to select an era for the layout. One factor in this decision is the challenge of re-creating a reasonably authentic locomotive fleet for a specific period. In the case of the Shasta Route, 1950 to 1956 were the transition years between the arrival of the first diesel freight units and the last revenue steam operations. The *Shasta Daylight* debuted in 1949, so colorful Alco PAs could be seen meeting AC-12 Cab Forwards.

Signaling systems can also dictate a layout's era. Although Centralized Traffic Control had been in service as far east as Black Butte, the line from there to Klamath Falls remained Automatic Block System territory. Espee's lower-

The late John Armstrong designed this track plan for Otis McGee, Jr., of Oakland, Calif. Otis said he'd been thinking about modeling the Black Butte Subdivision of Southern Pacific's Shasta Division, circa 1952, for several months. The idea for the model railroad, he said, came during the course of several visits to Scott Kew's tri-level HO scale SP layout of the same general area.

Otis settled on the location for his layout after visiting Dunsmuir, Calif., and making a side trip to Cantara Loop, Mount Shasta, Black Butte, Grass Lake, and Mount Hebron. He received further encouragement to model this portion of the SP from several of his friends in the hobby.

These friends have also helped Otis convert the Armstrong track plan into an operating model railroad. While there's still a lot of work to be done, Otis and his crew have made great progress in just a couple of years.

"Layout construction began on September 14, 2002, the day after we moved into our new house," Otis said. "A big challenge was converting John's plan into mushroom construction methods. By May 2004 we'd made enough progress to conduct our first operating session. Three months later we held our second session."

"More than 200 feet of main line is in place, including nearly 100 handlaid turnouts. The visible track is handlaid, using Micro Engineering rail and Central Valley tie strips. True to John's word, his plan fit in the allotted space. Some tweaking of the plan was done to better facilitate operations. Changes included adding staging tracks and extending the length of the passing sidings."

Otis notes that some parts of the layout are proceeding faster than others.

"Although scenery is lagging behind, Dave Biondi has painted sensational backdrops for the layout to accompany hundreds of Canyon Creek Scenics trees. We've also built and installed several laser-cut wood structures, including the roundhouse, machine shop, maintenance-of-way building, and Mallet shed at Dunsmuir, a feature location on the model railroad."

You can learn more about Otis' HO scale SP layout and see additional photos online by visiting www.spshastaroute.com. — *Cody Grivno, assistant editor*

quadrant semaphores lasted in ABS service until 1963.

Ultimately, Otis settled on modeling SP's Black Butte Subdivision circa 1952. His locomotive fleet has a variety of steam engines, from diminutive 0-6-0 switchers to large 4-8-8-2 Cab-Forwards.

For signaling, Otis plans to have Centralized Traffic Control (CTC) between Redding and Black Butte, and timetable-and-train-order operations from Black Butte and Klamath Falls. Rod Loder and John Signor, with assistance from Mike Burgett, are designing a prototypical CTC panel for the layout. Donald Woods

is working on interfacing the panel to the layout via Bruce Chubb's Computer/Model Railroad Interface.

Even though the layout is set in 1952, with some modeler's license the era could be shifted in either direction. The interesting changes that occurred during the transition era, combined with a large scenic layout, will make for hours of model railroading enjoyment. **MR**

John Armstrong, a well-known layout designer and model railroad author, died on July 28, 2004. He wrote more than 75 articles for Model Railroader.

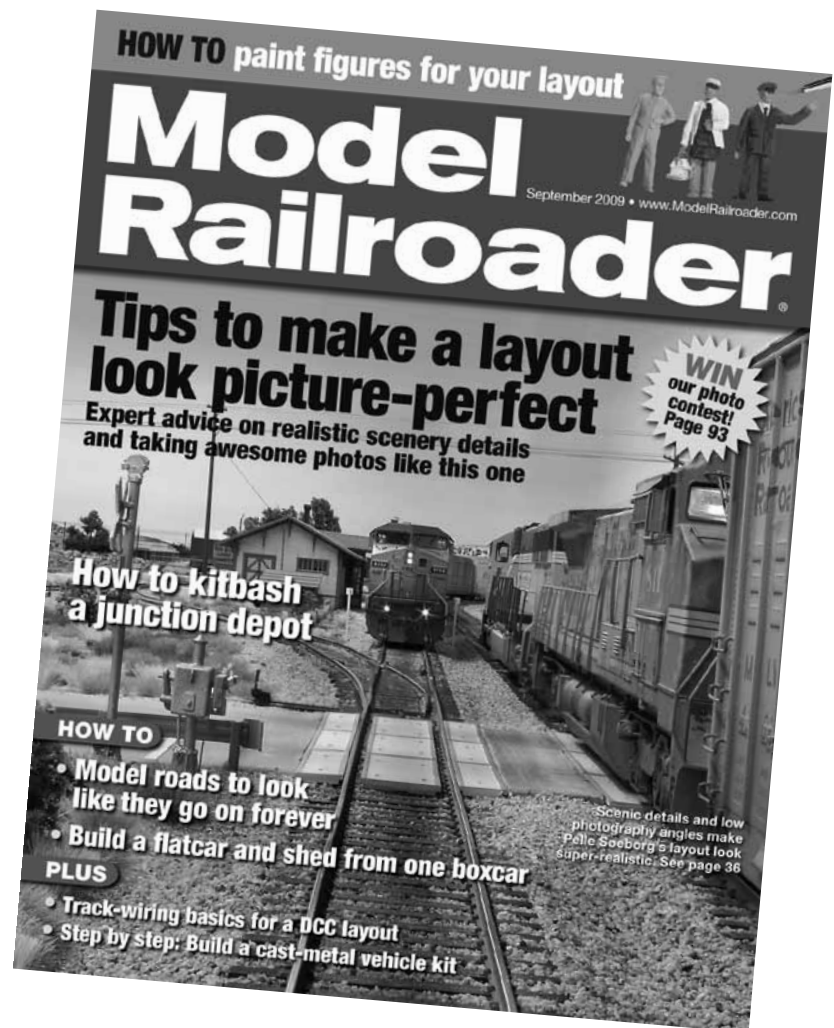
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