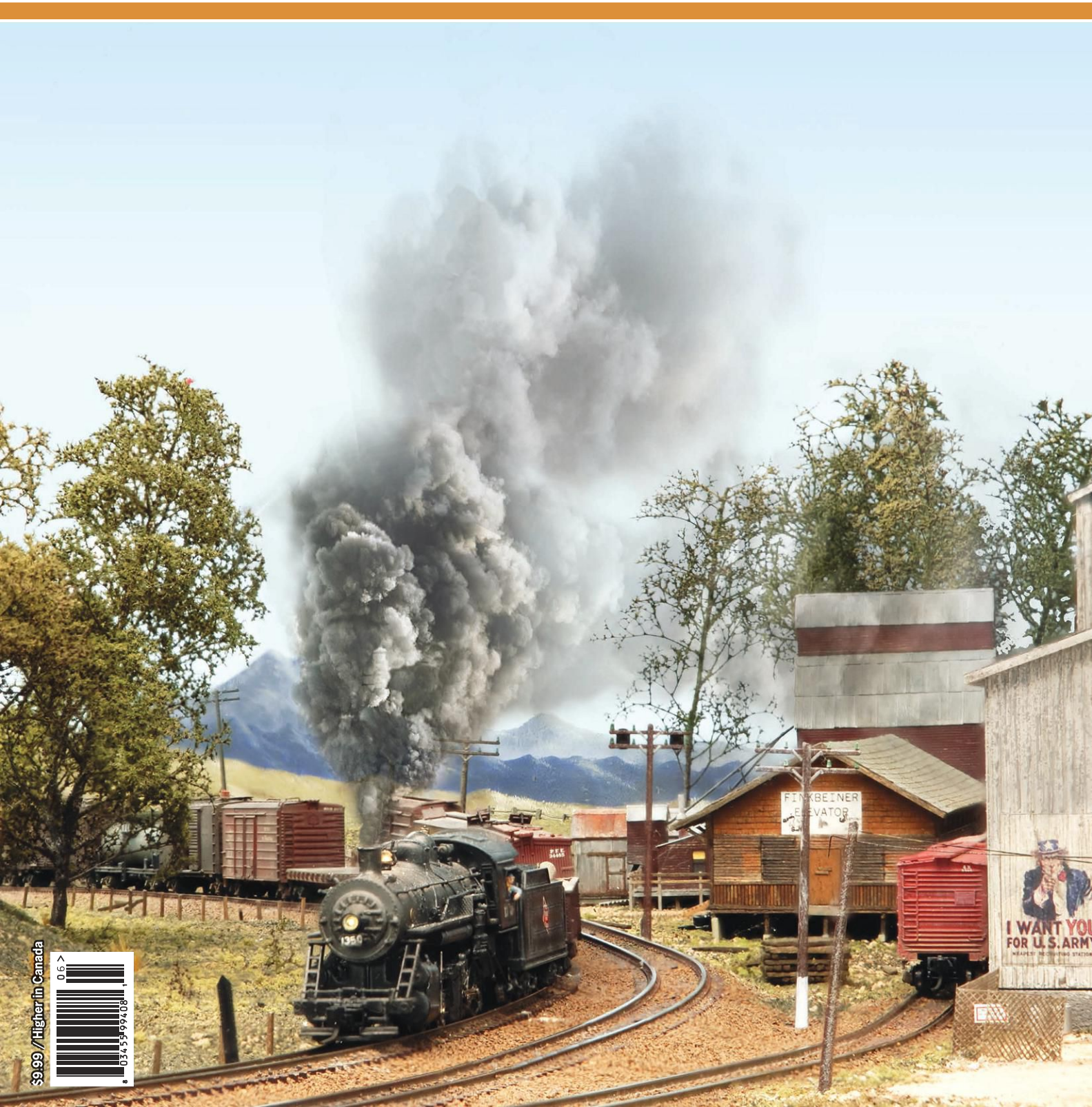
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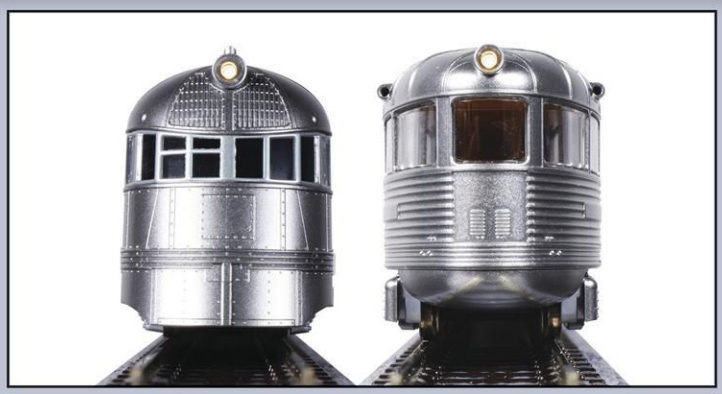
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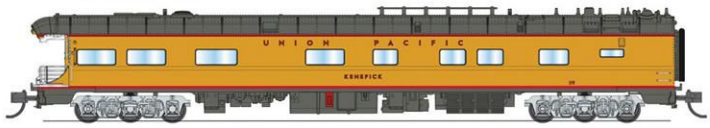
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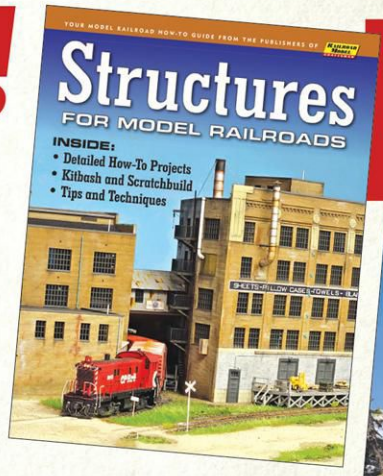
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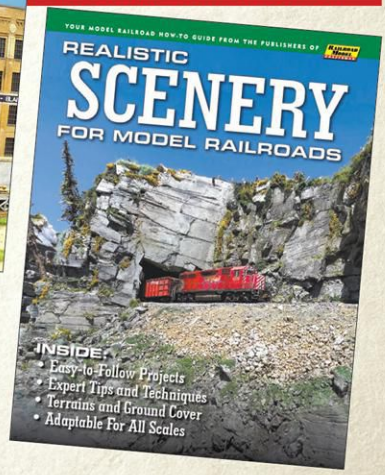
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September/October 2026

N-Scale



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On the cover: A Light Mikado blasts out of the snow shed on Dan Lewis' North Montana Line layout. Plausibility in modeling extends beyond locomotives and structures, and it includes the freight car fleet as well. Read more about it on *Building A Plausible Freight Car Fleet*, starting on page 16.

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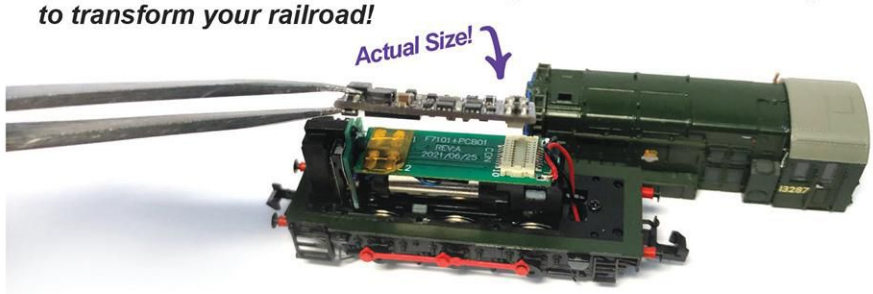
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EDITORIAL

To Be (DC)... Or Not To Be (DC)... That is the question! Well, that is one way to start a guest commentary, don't you think? It really is quite the relevant question these days, and it has more than one answer I'm afraid.

What exactly am I talking about here. Nothing less than that age-old question of should you have your layout set up for that newfangled DCC, or stick with that old tried and true DC system. Without any doubt, there are pros and cons for both choices.

First off, a bit of information might be in order for those of you out there that are not real rock solid on the difference between DCC and DC systems. With the DCC system, once you get it up and running, you can run multiple different locomotives in different directions on the same track at the same time. Sounds cool, doesn't it?

This is great, but if you were never able to figure out how to program that clock on your VCR or microwave, then this might not be for you. Granted, the new stripped-down DCC control models are much easier to use, but still not pain-free.

With DC, when you add some power to the track, all of your locomotives start at the same time and go in the same direction. If you will be running only one locomotive at a time, this is the hot-ticket for you. You certainly can run more than one locomotive using DC, but then you run into the problem that most all power units run at different speeds! You might even find they run in different directions when you're playing with older locomotives! (This is NO problem with anything fairly new.)

If you want to run a lash up of two (or more) locomotives, the way you get around this little problem of running at different speeds is simply put the slowest one in front, and the fastest one at the back (on the same train). Problem solved.

With DCC, the control unit talks directly to each locomotive, not the layout as a whole. Once you get it up and running and you actually understand how it works, it opens up an entirely new universe for model railroading. You can run your Train World just like a real railroad. Boy, doesn't that sound like fun! (Yup!)

But with everything in life, there are pros and cons. With DC, you are limited with how things move around at one time. With DCC, you can have locomotives running all over the place (the up side). But with DCC, you absolutely need to keep your track spotlessly clean (the down side). If your track is even the slightest bit dirty, you will get, at best... poor performance.

I myself have solved the age-old question of DCC or DC. I have a double-pole double-throw switch where I can change the entire layout over from one to the other, and I have two controlers. Of course, you will need to change out your locomotives on the track to use the other power source.

The way I get around this is I keep the DCC locomotives on one set of isolated sidings, and the DC locomotives on a different set of isolated sidings. That way I can change the entire layout at a moments notice.

There you have it! Clear as mud. I hope this cleared things up a bit for you. If not, drop me a note and we'll work on it. Have FUN with your hobby!

Dennis Murphy

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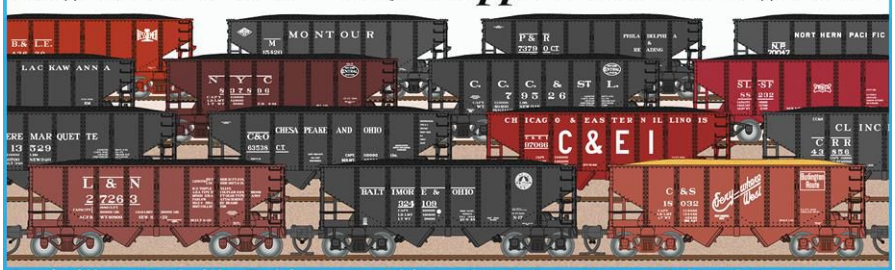
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Historical Perspective

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Review: Hamilton Firearms

Showcase Miniatures

by **Raul Perez**

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This is the new N scale "Hamilton Firearms" model from Showcase Miniatures. The finished three-story model measures approximately 3" wide, 3" deep, and 5" tall at the top of the shot tower, so it fits easily onto almost any N scale layout. This is the second of the "Cottage Industries" kits from Showcase Miniatures.

Like most Showcase Miniature kits, "Hamilton Firearms" is made primarily from several types of laser-cut and laser-scribed materials, like the easy-to-assemble tab-and-slot inner structure that fits together very well. There are laser-cut, peel-and-stick window and door backings that you apply to the inner structure for easy placement of the doors and windows later in the assembly. The backsides of the interior walls are laser-scribed to help ensure accurate placement of the door and window backings.

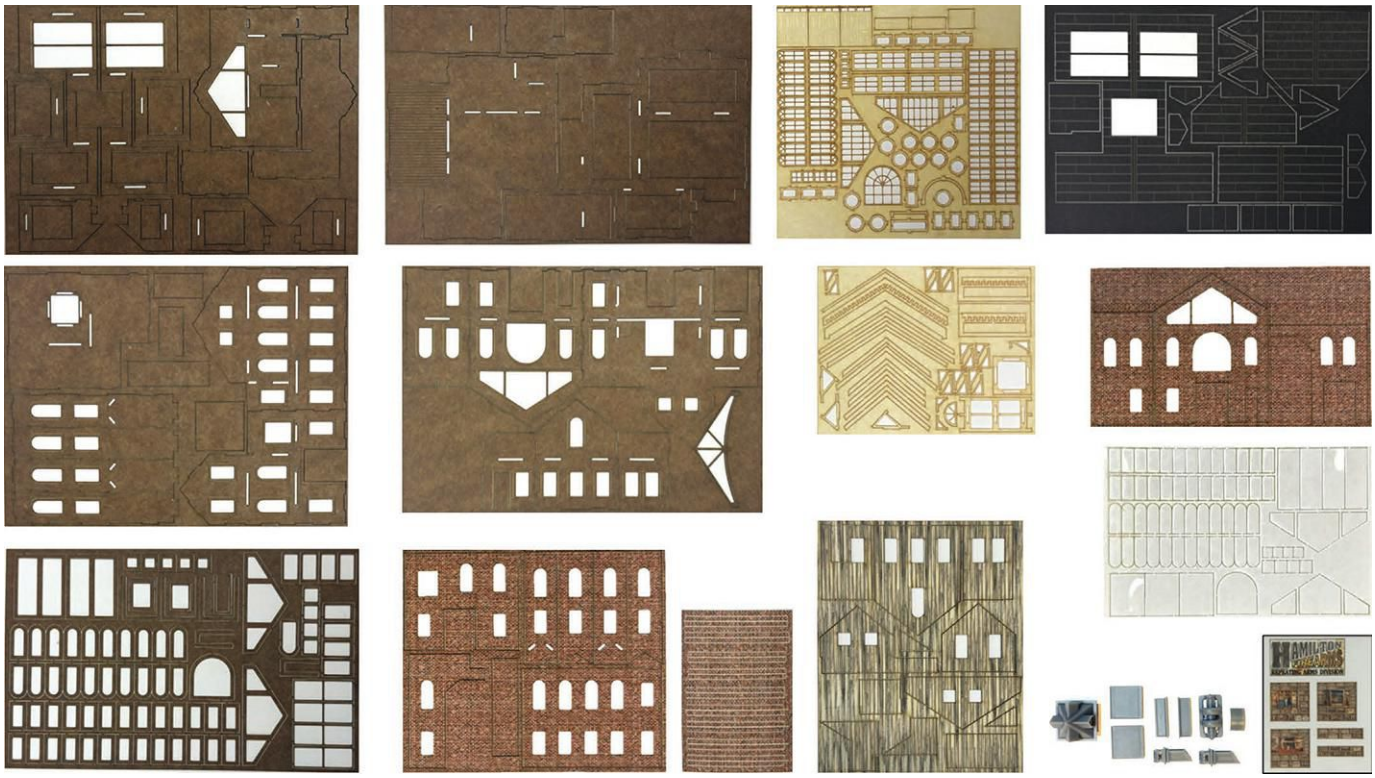
The top of the shot tower, the two rooftop vents, the barrel-shaped awning over the front door, and the detailed interior pieces (including a large generator, two work benches and two large shelving units) for the highly visible machinery room on the second floor are finely made, 3D resin-printed parts.

The exterior wall panels already have the preprinted, very nicely detailed, brick and wood patterns applied to them in the kit. The material for the rooftop pieces is also laser-cut for an accurate fit. Additionally, the panel lines for the wooden exterior walls are laser-scribed for a realistic appearance. The only parts needing paint are the 3D printed parts. For added realism, I also painted the doors, windows, and weathered the rooftop material.

I added interior lighting to the machinery room, (that is visible from several of the front larger windows), by attaching a pair of gooseneck lights to the center truss. This is the model that was used for the box art, the website pictures, and will be shown at the trade shows.

If you are interested in history, search the internet for "shot tower." I found it quite interesting to learn how shot was made by pouring molten lead from the top of the tower.



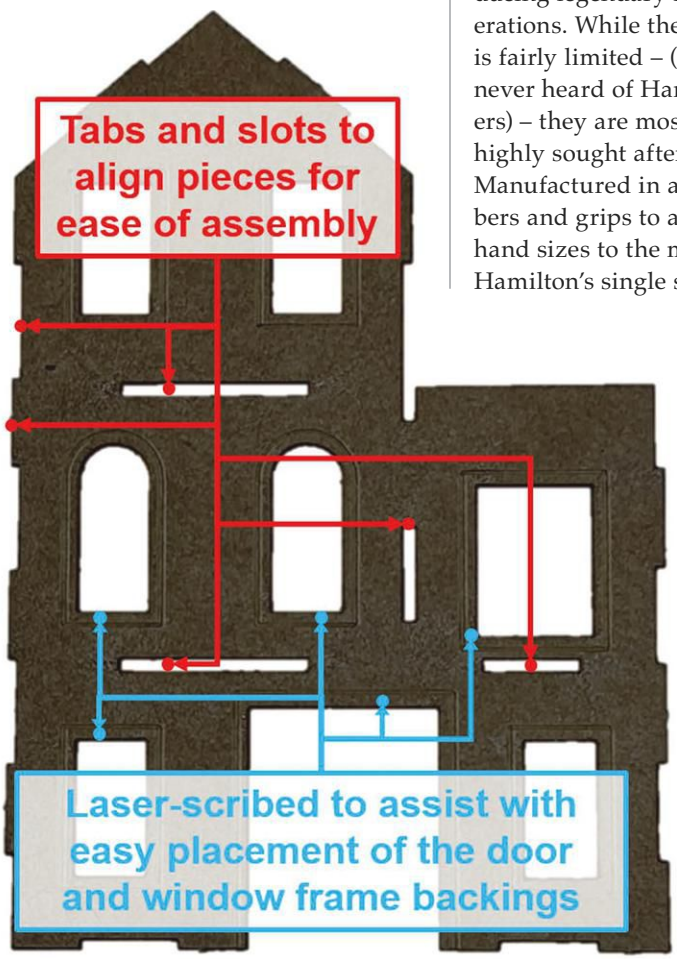


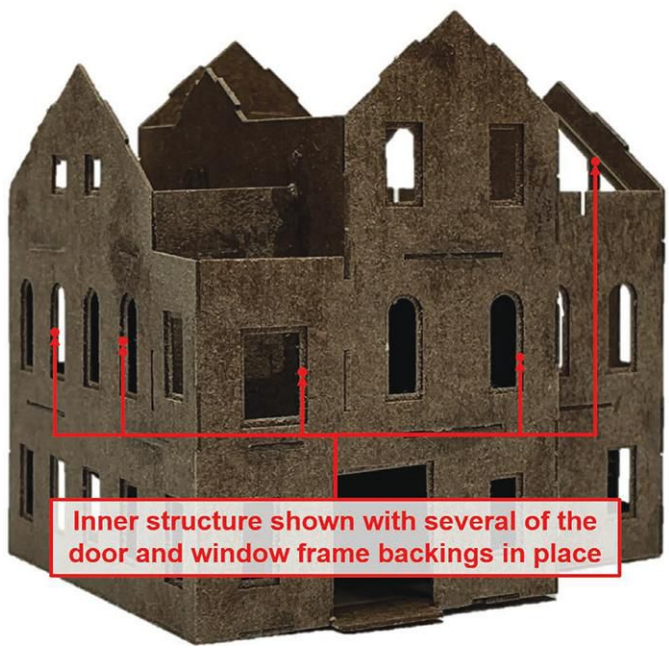
As it fell, it formed into shot pellets. This process was patented in 1782 by a British inventor named William Watts.

Here is the backstory for the Hamilton Firearms building:

Hamilton Firearms has been producing legendary handguns for generations. While their scope of sales is fairly limited – (most people have never heard of Hamilton repeaters) – they are most famous for their highly sought after dueling pistol sets. Manufactured in a variety of calibers and grips to accommodate large hand sizes to the most petite palms, Hamilton's single shot dueling pistols have decided many disputes.

The owner's greatest personal conflict came in the early '60s when Burr's Sporting Goods opened directly across the street from Hamilton Firearms. No one knows exactly what transpired in the street between the two buildings about six months after the opening, but two gun shots were reportedly heard around midnight. Two months after that, Burr's quietly closed and has remained unoccupied since.






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BUILDING A PLAUSIBLE FREIGHT CAR FLEET



Part 2

by **Dan Lewis**

Photo 1: Building a satisfying freight car fleet involves consideration of multiple factors. Here in Part 2, we'll look at some additional aspects of railroading that will assist you in the quest for plausibility.

In the first installment of this presentation, we looked at some of the factors that work toward building a plausible freight car fleet, including shippers and receivers, locale, era, and some of the operational features that control the types of cars you might acquire for your layout. Much of what we covered was applicable to the Golden (1910-1940) and Transition (1940-1970) eras of railroading. Here, we will extend that discussion into later eras as well, seeking to offer some further tips on balancing one's freight fleet.

I live in a suburb of Detroit, and the Stoney Creek Model Railroad Club, where I'm a member, and makes an annual trip to Fostoria, Ohio to do some train-spotting at what is known as the "Iron Triangle Railpark." A full 24 hours might see as many as 100 trains per day from CSX, N&W, BNSF, UP, and occasionally some others. All this is modern stuff of course, with nary a roof-walk in sight! So, if you model an era that is more contemporary, train-spotting is to your advantage! You can have a look at things first-hand. Still, all the things described in Part 1 of this presentation should still be generally applicable.

Trackage Rights

One feature that immediately will affect your freight car fleet is trackage rights to a foreign road. Trackage rights are negotiated agreements, allowing one railroad to operate trains over the tracks of another to improve efficiency, usually



Photo 2: GN Train 368 merges from GN trackage to MILW trackage as per their trackage rights agreement. This includes the use of Spring Creek Trestle a few miles northwest of Lewistown, which both railroads used for access into Lewistown. When first built, this trestle had a gauntlet track arrangement, but by the 1950s, it was traversed by a single track, though trains from both railroads had to stop and register before using it.



Photo 3: Roundup coal arrives in Falls Yard as Extra 377. The mines at Roundup, Montana were somewhat east of the Northern Montana Line, but coal drags reached Harlowton and then headed northward another 200 miles on the long branch-line toward the industries in Great Falls.

for a fee based on mileage or tonnage. Such agreements often limit the foreign road to bridge traffic, which is to say, they cannot serve local customers along the line of someone else's railroad. Their presence, however, means that if you model a railroad with trackage rights to another road, the trains of the foreign road will now show up on your railroad, thus expanding the types of cars you can plausibly run.

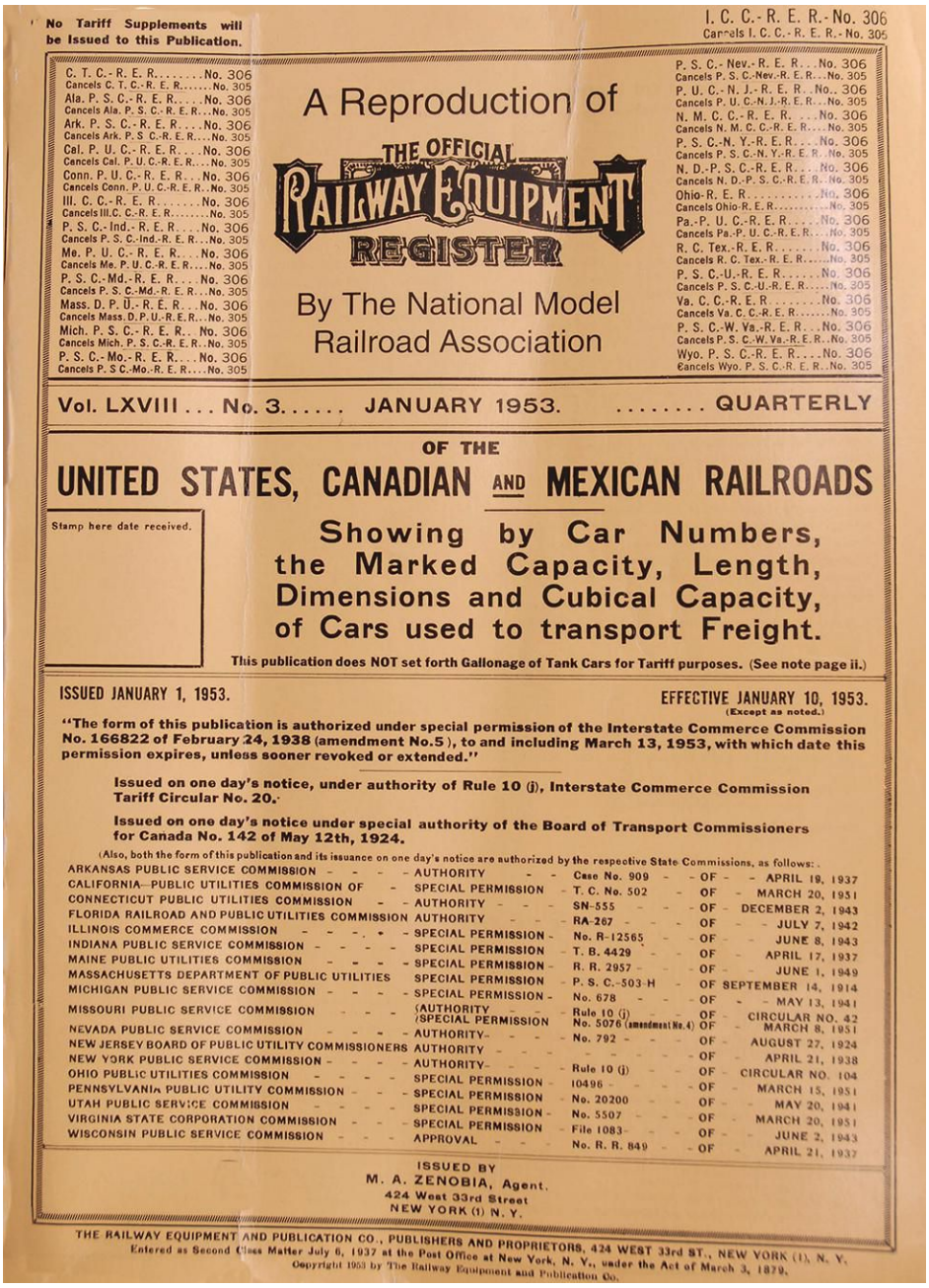
In the modern period, a well-known trackage agreement includes the UP's use of the BNSF tracks through the Tehachapi and Cajon Passes. Of course, Amtrak, while it is not in the freight business, regularly uses the trackage owned by different freight railroads, especially in the west.

On my North Montana Line, I am fortunate to have trackage agreements following the prototype of the 1950s, where the GN had trackage rights on some MILW trackage. I model these trackage agreements, so a few GN trains show up on my line on a section of track between Spring Creek Jct. and GN Jct. (***Photo 2***). They must yield to MILW timetables, of course, but their presence widens the selection of cars in my freight car fleet.

Unit Trains

A unit train is a dedicated train with non-stop service between two specific terminals, reducing overall shipping time. Unit trains were introduced in the 1950s, the transition period when the railroads were moving from steam to more efficient diesel power. Diesel engines were capable of multiple lash-ups, and this, in turn, facilitated heavy, long distance, single-commodity trains. At first, the focus was primarily on transporting coal for power generation, hauling coal from the coal mines directly to power plants, plus environmental regulations were forcing power plants to receive coal from further and further distances. Gradually, the concept of the unit train came to be applied to other products, when after deregulation in the 1960s, such trains became economically viable for bulk cargos like grain, iron ore, cement, and potash.

While I don't model a contemporary era, my modeling for the Milwaukee Road includes coal shipments from the Montana Republic Coal Company mines at Roundup and Klein, Montana, which shipped coal throughout the MILW's Pacific Extension both eastward toward Miles City and westward toward Harlowton. Early on, this was primarily to provide a steady supply of fuel for steam locomotives. In time, Harlowton became a major operational hub for trains, hauling coal up the



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OF THE

UNITED STATES, CANADIAN AND MEXICAN RAILROADS

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Photo 4: The so-called "Big Yellow Book," the ORER, is an essential resource for discovering the precise types and numbers of freight cars on your railroad for any particular era and for any and every particular railroad. This one, a reprint by the National Model Railroad Association, is from January 1953—squarely within my chosen era.

Northern Montana Line to smelters in Great Falls, usually several carloads each week. For me, this means that coal could be part of my operational scheme, so I acquired a modest fleet of coal cars (***Photo 3***). Hence, even if you are not modeling contemporary railroading, don't forget the possibility of unit trains when you design your freight car fleet. Of course, if you do model contemporary railroading, unit trains will very likely be a central part of your scheme.

Car Carriers and Intermodals

In the middle of the last century, automobiles were shipped in boxcars with double doors (the XA type boxcar). Two to four autos would usually fit into such a railcar. Auto shipments continually evolved from boxcars with double doors to boxcars with end doors to bi-level flat cars with open auto-racks, and eventually, to tri-level cars capable of handling a dozen automobiles. Today, especially as the automotive industry has burgeoned in size, the railroads use auto-racks or auto carrier cars, a specialized piece of railroad stock designed specifically with automobiles and trucks in mind. They have fully-enclosed sides and roofs to prevent damage from weather or vandalism.

Intermodal freight is the use of containers to ship materials using multiple modes of transportation, like trains, trucks, and ships. The genius of this approach is that the container itself need not be unloaded until it reaches its final destination. As is obvious, I model a much earlier era, where intermodal freight was still on the horizon, but for those of you who model contemporary railroading, some serious research into both automobile shipments and intermodals might pay big dividends in building your car fleets. I've seen some pretty impressive auto-racks, as well as the well-cars advertised by manufacturers of N scale equipment!

The ORER

A very helpful resource when developing your freight car fleet is the Official Railway Equipment Registry (ORER), a publication going back to 1896. This tome, affectionately called the "Big Yellow Book," covers all the American, Canadian, and Mexican

Sidebar 1: SOME MAJOR CAR TYPES AND A.A.R. ABBREVIATIONS

TYPE	CODE
Boxcar	XM
Automobile boxcar	XAR
Stockcar	SM
Stockcar with drop bottom	SD
Stockcar with double decks	SF
Gondola	GB
Gondola with composite sides	GS
Gondola mill-type	GH
Covered hopper	LO
Hopper three or more bays	HT
Hopper two-bay	HM
Hopper ore	HK
Flatcar log bunks	FL
Flatcar steel underframe	FM
Flatcar with trucks or trailers	FC
Flatcar with wood racks	LP
Flatcar depressed	FD
Tank car	TM
Tank car acid tank	TA
Refrigerator with ice bunkers	RS
Refrigerator mechanical	RP
Caboose	NE

Sidebar 1

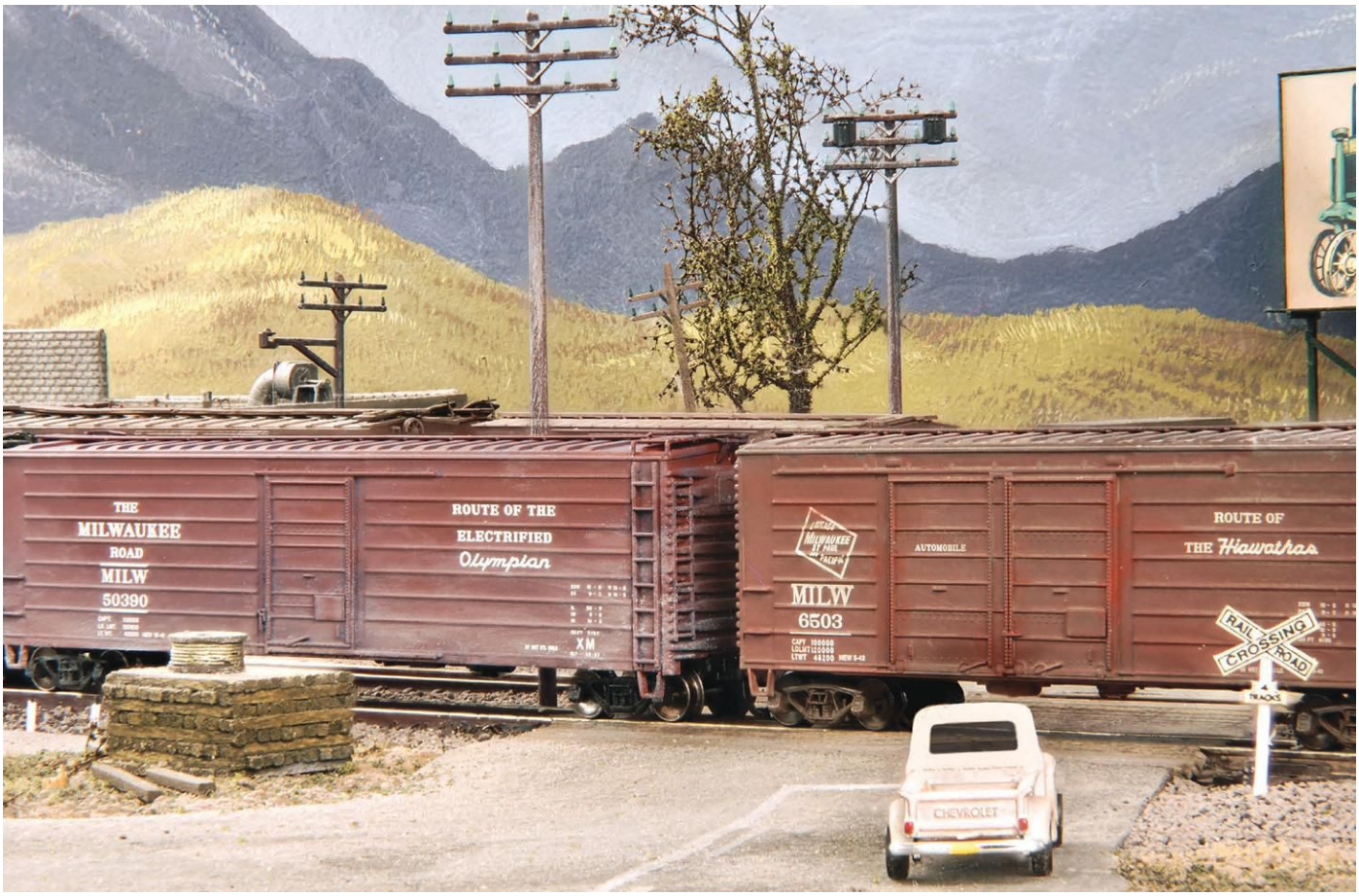


Photo 5: In the lower right corner of the 50' rib-side boxcar on the left you can see a rather bold XM. This designates the car as a standard boxcar. The boxcar on the right, though no car type identity is visible, is an XA, which is to say, a car suitable for shipping automobiles (note the double doors for loading cars).



Photo 6: Notice the URTX reporting marks on the two reefers. While both have MILW logos, neither are owned by the MILW. Rather, they are cars leased from the Union Refrigerator Transit Co., hence, URTX. Because they belong to a fleet of leased cars that the MILW uses continually, they are decorated with MILW logos and paint schemes.

Photo 7: Though dated due to their cast iron wheel types, Milwaukee stock cars like the scratch-built 36-footer, the first one behind the locomotive, lasted well up into the 1950s, so long as they were not used for interchange service. However, they were nearing their termination, since new requirements were making them obsolete.

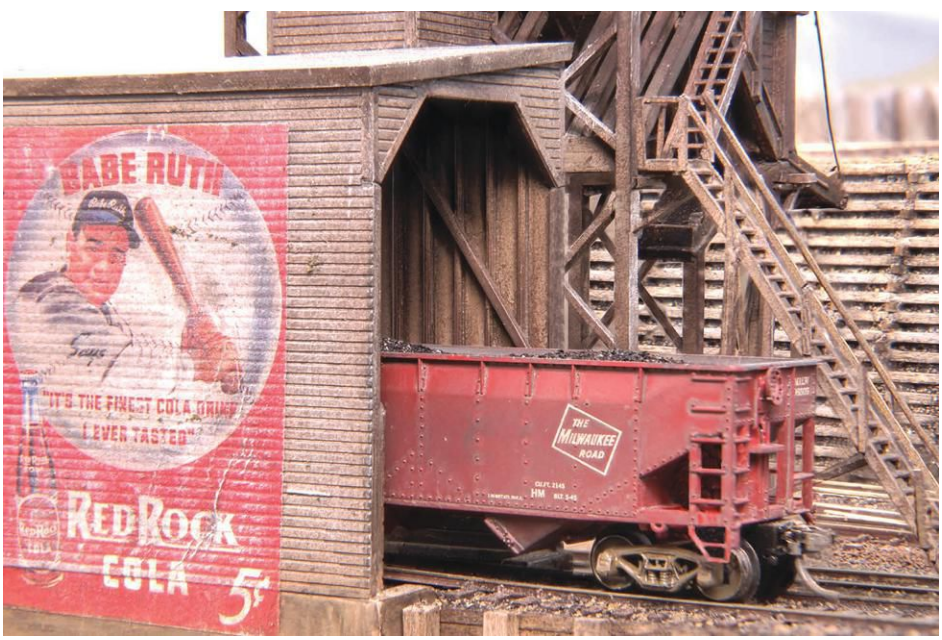


Photo 8: The BLT date on this coal hopper is 5-45 (May 1945). Be sure you don't confuse the BLT date with the NEW date. The NEW date is not when the car was first constructed; rather, it is the date when the car was last weighed to determine its empty weight.

railroad fleets, listing their freight car types, their numbers, their dimensions (including doors), and their capacities (***Photo 4***). You can subscribe to it annually (pretty pricey), but you probably only need one issue, the one that covers your era. Vintage copies and reprints are available on E-Bay and Amazon. Here, it will be helpful to familiarize yourself with the American Association of Railroads (AAR) designations for car types, which are standard abbreviations (***Sidebar 1***). Some railcars have the car type abbreviation prominently displayed on the side of the car (***Photo 5***).

Besides the listing of the major railroad car types and details about them, the ORER also lists private car owners and their fleets. These are leasing companies of specialized shippers who own large fleets of cars, leasing them



Photo 9: For precise car types, you must look beyond just the BLT date. The BLT date for these two GN cars is 10-49 (Oct. 1949), which at first glance seems squarely within my modeling era of 1953. However, the Big Sky Blue paint scheme was not adopted until 1967, which means that this color scheme is too late for my era. Also, notice the white linear paint rectangles along the bottom sill, which began being added to boxcars in the 1960s to enhance visibility and safety. These, also, mark the car as too late for my era.

directly to the railroads. Generally, the "X" in a reporting mark indicates a non-railroad-owned car that is part of one of these fleets. Designations like GATX (tankers and hoppers), UTLX (tankers), TTX (flatcars, boxcars, gondolas), PFE (refrigerator cars), WFEX (refrigerator cars), SHPX (tankers), and URTX (refrigerator cars or tankers) belong in this category. Some years ago, the InterMountain Railway company, an N-scale manufacturer, produced a dozen N-scale URTX car kits for reefers, each with a different road number, but decorated in MILW orange with a MILW Road logo. The actual reporting marks were all URTX, which meant, that, though they looked like MILW cars due to the MILW logo on the sides (and indeed, they were leased to the MILW), their reporting marks did not have the familiar acronym MILW or CMStP&P logo (***Photo 6***).

Terminated Cars, Built Dates, and New Paint Schemes

Railcars don't last forever. Some are terminated because they are beyond repair, some because they are replaced, and some because of outdated features like truss rods or older brake systems. Here, plausibility means paying attention to such terminations. For my model railroad, it was important for me to discover that the older stock cars in the MILW fleet (and according to the ORER of 1953, they owned some 3,727 of them) were gradually phased out because they had cast iron wheels, first banned in 1958. Since I model 1953, this meant I could still use these older stock car types (***Photo 7***).

Railcars also have a BLT date painted on the sides, which indicates when the car was first constructed (usually to be found on the lower right side). If you model the 1950s, for instance, you won't want to run cars that were built in the 1970s (***Photo 8***). Often enough, the font size on a typical N scale car is so small you may find it difficult to read the BLT date. For years, I used a magnifying glass, but a friend recently showed me a new technique, which is simple, but effective. Just use your phone camera, zero in on the side of the freight car, and enlarge the image. Presto. Everything is readable!

Another factor for the dating of cars concerns paint schemes. A car built using one paint scheme in the 1940s might be repainted with another paint scheme in the 1960s. The BLT date will remain the same, but the appearance of the car will be different. In the late 1950s and early 1960s, some railroads began painting or repainting their railcars in more diverse and colorful schemes. A good example is the Great Northern, who began transitioning from the traditional oxide red to Glacier Green (1961) and Big Sky Blue (1967) schemes (***Photo 9***). Another would be



Photo 10: The BLT date on these two mechanical reefers is 7-56 (July 1956), which is about three years after my adopted era of 1953. How much am I willing to fudge to keep these railcars in service on my layout? In this case, I'm willing to bend history for those three years and keep them going. A purist probably would not want to do this. So, it comes down to your personal comfort level, and each model railroader will have to decide for him/herself where to draw the line.

the New York Central and their Jade Green scheme. Of course, if you model the contemporary era, you can expect massive graffiti, something that would not be the case in the 1950s before spray paints were widely available.

Now, figuring all this out calls for some research, and not everyone enjoys this sort of thing. While most model freight car manufacturers don't tell you that a certain paint scheme began in 1967 (I wish they would!), some actually do so. Otherwise, you will be on your own to find out what is appropriate for your railroad.

Balancing Your Fleet

Very few railroads exist in isolation. Anyone who has seen a map of the American railroad system from any time period will immediately observe that the tracks crisscross each other all over the nation. To balance your freight car fleet, there are some basic rules-of-thumb that may be helpful. In the first place, about half your fleet should be for your home road. (The major exception would be if you model a bridge line.) This is only to be expected. Other cars, of course, also appear for limited amounts of time. When a foreign car comes onto the trackage of your home road, it is granted 1-2 days for loading and unloading. After the "free time" is up, the car begins to accrue per diem charges (per diem is Latin for "each day"), a fee set by the American Association of Railroads (AAR). In the early 1950s, per diem charges were relatively low, $2 to $3 per day. Gradually these charges began to rise. Today, modern per diem charges, depending on the type of car, can be upwards of $75 to over $300 per railcar or container. The point of such fees was to encourage the railroads to return railcars quickly to the railroad that owned them, often via a loaded return trip. If it was possible not only to send the car back to its home road, but also, to send it with a shipment to another customer en route, all the better. The long and short is that whatever railroads are geographically near your railroad are more likely to be the ones with the next highest number of cars in your fleet.

For my railroad, located in central Montana, this means more cars from



Photo 11: I have one ironclad rule from which I won't back down. I never put an unweathered car on the layout. If a car is newer, the weathering might be light, if older, it might be heavy. All railcars, however, have weathering on the trucks and wheels, regardless of how new they might be. Here, a cut of nicely weathered cars leans into a superelevated curve as a switcher pulls the string into the yard at Harlowton. Weathering significantly enhances plausibility.

the GN, especially since there were trackage rights along with interchanges at Judith Gap and Lewistown. Beyond that, I have a smattering of railcars from other railroads serving the west – and a few others from farther east (***Sidebar 2***).

Is there room for an oddball car or two? Certainly, but don't overdo it. A Pennsy car might theoretically make it to Montana, but not very often. If you model an eastern railroad, on the other hand, then you probably don't expect to find many GN or NP cars from the western states.

The remaining question would be, "How much can I fudge and still retain plausibility?" The purest doesn't want to fudge at all, and of those model railroaders who fall into this category, I have the greatest respect for their skills and research. Still, most of us fall somewhat short of this ideal, and whether from constraints of time or interest, we allow for more flexibility. Further, many modelers stretch their era somewhat, so rather than modeling a particular year, they model an era covering a few years. Personally, I lean toward prototype fidelity, and I model a particular year (1953), but like many if not most of you, I cross the line in a few places (***Photo 10***). However, I resist crossing the line very far. The farther I stray from prototypical fidelity, the less plausible my railroad fleet becomes. To be sure, I have some anachronisms that won't quite fit, and as we all say – and might even wear it as a badge – it's my railroad!

I suppose at the end of the day, it is a matter of one's personal comfort zone. What can you live with and still feel at ease? I've found that this comfort level is a moving target. Forty years ago, I could live with disjunctive features that I can't live with today. Mostly, it is the gradual growth of my familiarity with real railroads that determines my comfort level.

Weathering

One final feature in building a plausible freight car fleet should be considered, and it has nothing to do with era, locale, BLT dates, and the like. Rather, it concerns the visual appearance of your freight cars. Hardly anything is less plausible than a shiny new plastic freight car just out of the box that looks



Photo 12: In the end, plausibility is based on one's familiarity with real railroads and their history. The more you know, the more you find that anachronisms ruffle your comfort zone. Should I get rid of that red boxcar peeking out from behind the spur at the edge of Lewistown as time freight No. 163 rolls by? Its BLT date is fine, but the color scheme is a bit late. So far, I'm content to live with it, but maybe not much longer!

Sidebar 2: MY FREIGHT CAR FLEET

As is apparent, most of my cars are from western roads. There are a few outliers that come from eastern or southern railroads, probably more than I should have, but there is no scientific way of calculating such a moving target. On the other hand, one can arrive at a reasonable approximation, which is what I have tried to do.

MILW (Total 140)

Boxcars	48
Stockcars	15
Coal hoppers	19
Covered Hoppers	15
Gondolas	17
Reefers	9
Tankers (water)	2
Reefers (UTLX)	15

GN (Total 32)

Boxcars	20
Stockcars	7
Coal Hoppers	1
Flatcars	4

NP (Total 8)

Boxcars	5
Stockcars	1
Flatcars	1
Reefers	1

D&RGW (Total 7)

Boxcars	1
Stockcars	2
Flatcars	4

CB&Q (Total 5)

Boxcars	4
Stockcars	1

WP (Total 4)

Boxcars	3
Stockcar	1

Other Western Roads (Total 23)
CGW (2), RI (1), M&StL (1), SP&S (1), C&NW (1), AT&SF (3), CN (1), MKT (1), T&P (2), CP (1), DL&NW (2), SOO (1), Texico (6),

Other Roads (Total 30/1 or 2 for each road)

like it emerged from the railroad's paint shop earlier this morning. Railroading is a dirty business, and unlike passenger equipment, freight cars don't make regular trips to the wash rack. So, weather those cars (***Photo 11***)!

Should you want more information on my own techniques for car weathering, have a look at my two-part article titled *Quick and Dirty* in the Nov/Dec 2008 and Jan/Feb 2009 copies of *N-Scale Magazine*. Probably the single most important areas of a freight car to be weathered are the trucks and the lower edges of the shell.

At the end of the day, enjoy yourself as you work toward putting together a plausible freight car fleet. Wherever you land with respect to plausibility, it is fully in order to feel satisfaction in the result (***Photo 12***).

NORTHEAST FISHING PORT



Mudd Creek Models

by **Dennis Murphy**

Photo 1: The lineup of the first five Mudd Creek Models kits.

All right... We have had so much fun over the past many months of projects; it must mean it's time to start a new one. The Extra-Extra series was hosted by the fine folks at the Woodland Scenics, and I thank them.

This new series will be a bit different, and is being hosted by the fine folks at Mudd Creek Models (*www.muddcreekmodels.com*). Go have a look at their fine laser-cut, wood craftsman kits, and say hello to Frank and Natalie for me.

Anyway, the theme for this new adventure is, a small Northeast fishing port in the 1930s. What good fun. Some of you folks out there might remember that I have quite an expansive port on my main layout. Well, this time we will be building a nice new display for these first-class items to be highlighted on.

Here is the fun part. You can follow along and build these structures with me. Here is the order of builds, and the structure numbers if you would like to join in on the fun:

1) Wayman's Shipping - #MCM-030
2) Chrissy's Cove - #MCM-012
3) Ronnie's River Repair - #MCM-005
4) Jacobs Smokehouse - #MCM-023
5) Kruiswyk's Clam Chowder - #MCM-052

What a list indeed. Once this new series gets started, you can look forward to one new structure in each issue of our favorite, *N-Scale Magazine*.

These kits are first class, with tons



Photo 2: Just look at those really tiny birds.



Photo 3: Here is a look at more of the items that come in the detail package.



Photo 4: Another scene on my existing main layout.

of extra bits and pieces to make your model even that much better. In fact, one of these kits comes complete with a light included. (OK, I always include lighting in all of my structures, but it's fun if they include the lights). Look at the fine detail pack they sent to me! Wow, those birds are really tiny! (How did they make those items so small? I can barely see them.)

So, here we go on a brand new adventure in modeling. I truly hope you join in on the fun, and please be sure and send in photos of your projects along the way. Send photos to *info@nscalemagazine.com*

Be watching for the fun to begin.

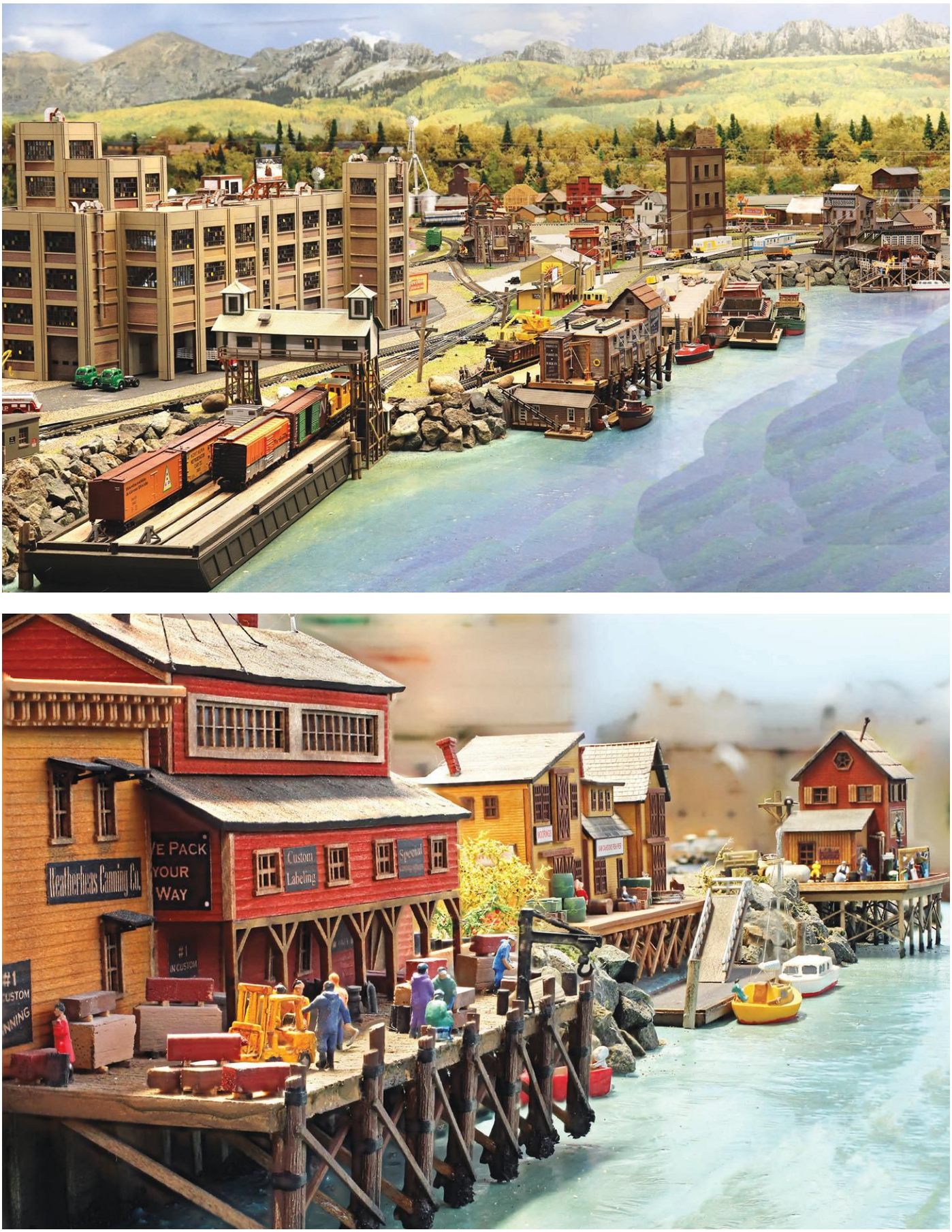


Photo 5: Here is one look at my existing port scene on my main layout. Let's hope I can exceed the existing scene with these new Mudd Creek Models buildings.

LOCOMOTIVE NOISE



A Troubleshooter

by **Ron Bearden**

I'm a performance nut. I like my locomotives to run smoothly and quietly. In fact, as I look over my publishing career with *N-Scale Magazine*, I see that I have published a lot of articles on making locomotives run better.

Well, I must not be alone in my preferences. At the Internet discussion boards where I hang out, questions regularly appear about locomotive noise. I think many would agree that it's very frustrating to have a locomotive that you know once ran quietly, but now does not. In fact, as I write this, I just returned from visiting a train friend in another city. He had a noisy loco he had not run in two to three years. I diagnosed his problem in about 15 minutes (he had a motor with a bent shaft).

This article is offered as primer on troubleshooting noisy locomotives. I'll treat this subject in different ways. First, I've prepared a flowchart that will attempt a systematic approach to problem solving. As you read the flowchart, start in the upper left corner.

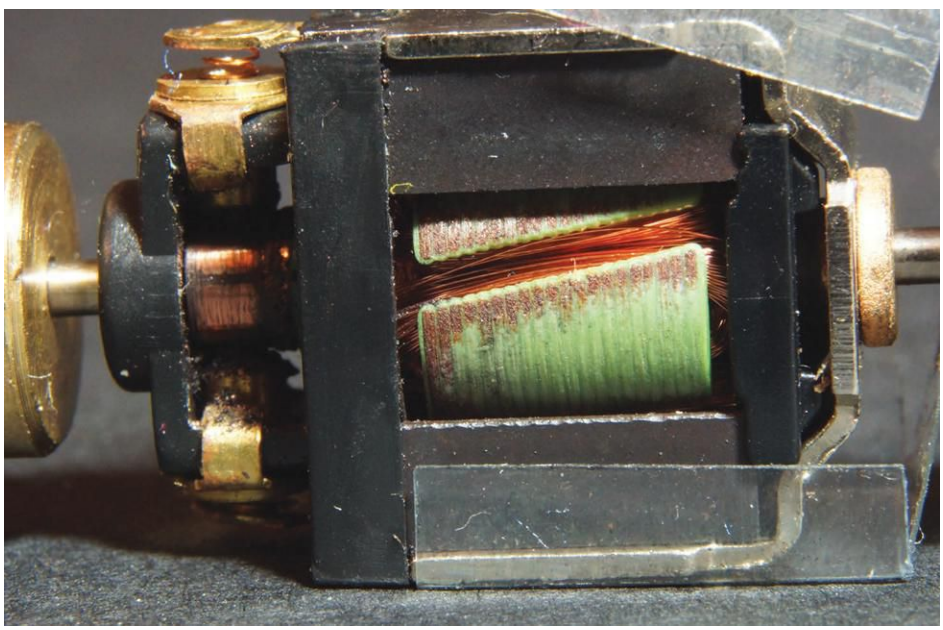


Photo 1: The worn spots with missing green paint point to the fact that these motor poles are scraping something.

The purplish boxes are actions. The blue diamonds are choices. The yellow boxes help isolate the problem area. The green boxes are solutions. By working through the flowchart, running the tests and seeing how things work, you can get an idea of exactly where to look for problems.

Photo 2: It is so hard for me to remember that this locomotive was made in 1989! When I acquired it at a swap meet 25 years later, the bearings screeched.

I'll also highlight the most common problems and my favorite problem solving techniques. After-all, while some problems are very rare in my experience (like a bent motor shaft), other problems are extremely common. Thus, between the most common scenarios and the detailed flowchart, hopefully, something in this article will help you track down the solution to a pesky noise problem.

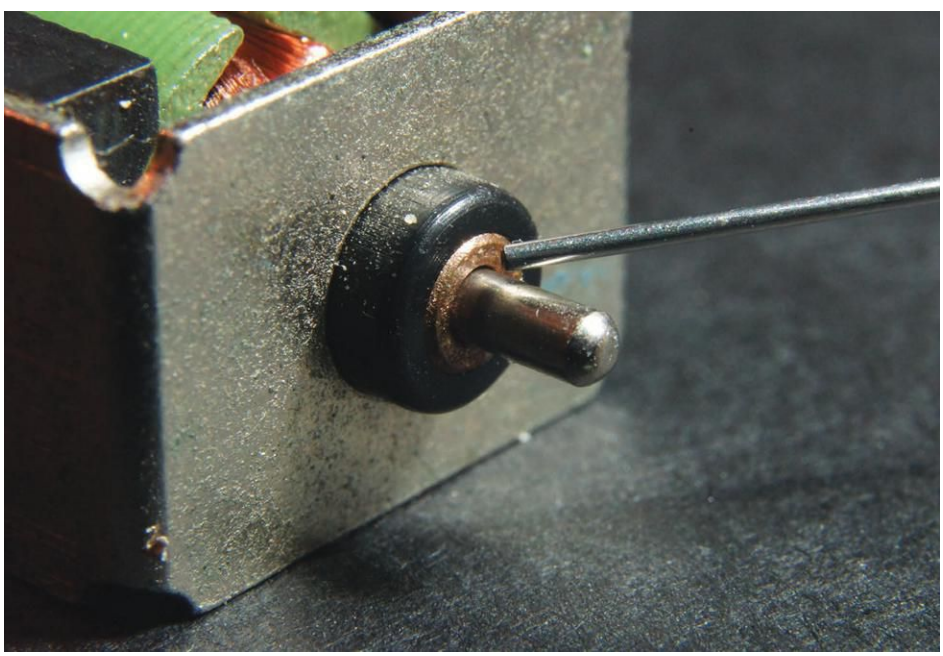


Photo 3: Motors need just a little bit of oiling where the shaft rides on the brass bearing.

The Likely Suspects

There are some very common scenarios that you will see over and over again. You can learn to recognize them from the quality of the noise (that is, each has a unique sound). The flowchart suggests there are six kinds of bad sounds: scraping, rumbling, clicking, whining, screeching and a ratcheting sound. With experience you can diagnose by the sound. Ratcheting is gears passing each other. Scraping may be as simple as a flywheel or a motor pole rubbing against a shell, maybe because of poor design, or because the motor is twisted slightly. The other noises can be a bit trickier, but they can also point to very, very common problems.

Dry Bearings Screech

The first common problem is dry motor bearings. When you buy a locomotive that just came from the factory,

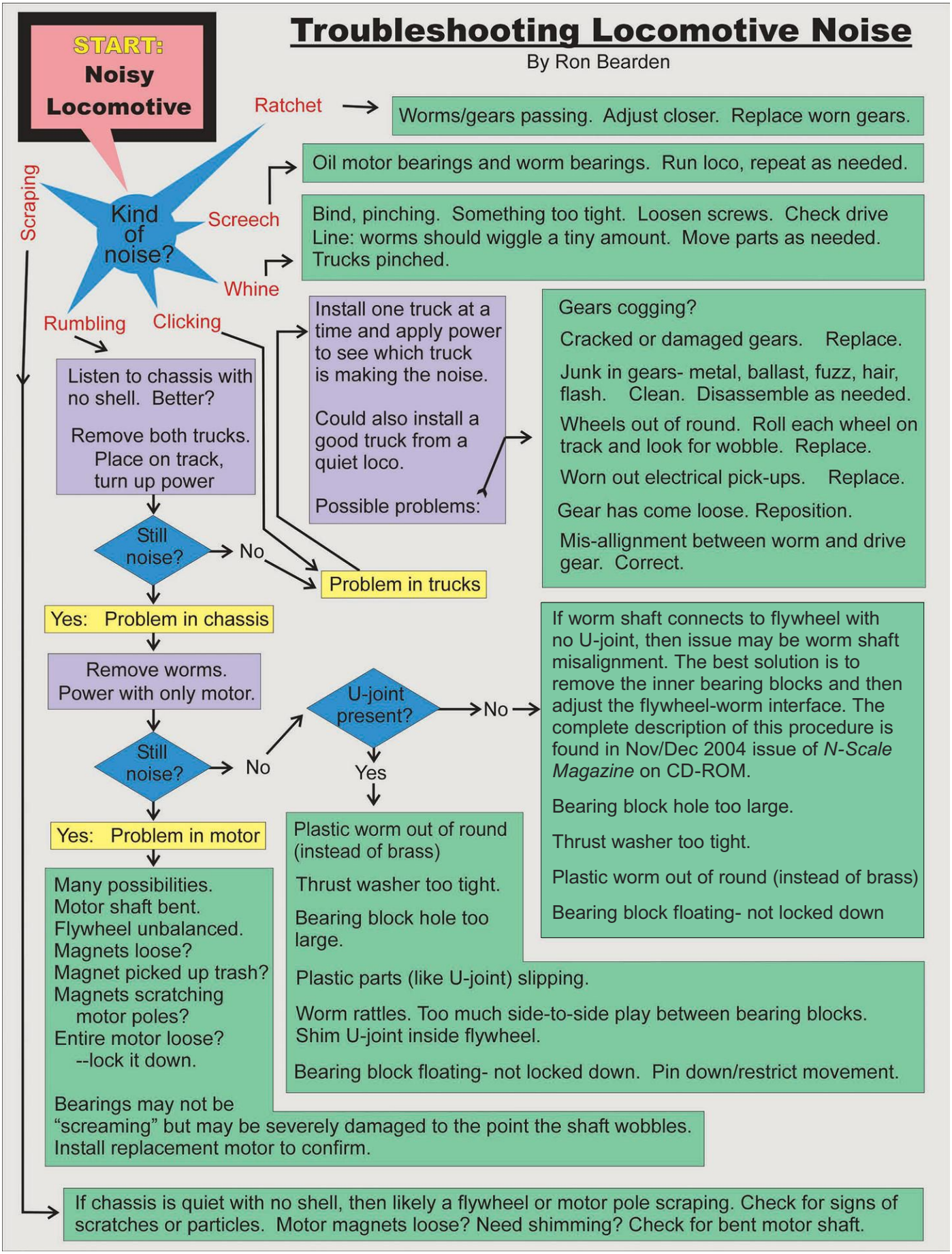

Troubleshooting Locomotive Noise
By Ron Bearden
START: Noisy Locomotive
Kind of noise?
Ratchet
Worms/gears passing. Adjust closer. Replace worn gears.
Scraping
Screech
Oil motor bearings and worm bearings. Run loco, repeat as needed.
Whine
Bind, pinching. Something too tight. Loosen screws. Check drive Line: worms should wiggle a tiny amount. Move parts as needed. Trucks pinched.
Rumbling
Clicking
Listen to chassis with no shell. Better?
Remove both trucks. Place on track, turn up power
Still noise?
No
Yes: Problem in chassis
Install one truck at a time and apply power to see which truck is making the noise.
Could also install a good truck from a quiet loco.
Possible problems:
Problem in trucks
Gears cogging?
Cracked or damaged gears. Replace.
Junk in gears- metal, ballast, fuzz, hair, flash. Clean. Disassemble as needed.
Wheels out of round. Roll each wheel on track and look for wobble. Replace.
Worn out electrical pick-ups. Replace.
Gear has come loose. Reposition.
Mis-allignment between worm and drive gear. Correct.
Remove worms. Power with only motor.
Still noise?
No
U-joint present?
No
Yes
If worm shaft connects to flywheel with no U-joint, then issue may be worm shaft misalignment. The best solution is to remove the inner bearing blocks and then adjust the flywheel-worm interface. The complete description of this procedure is found in Nov/Dec 2004 issue of N-Scale Magazine on CD-ROM.
Bearing block hole too large.
Thrust washer too tight.
Plastic worm out of round (instead of brass)
Bearing block floating- not locked down
Yes: Problem in motor
Plastic worm out of round (instead of brass)
Thrust washer too tight.
Bearing block hole too large.
Plastic parts (like U-joint) slipping.
Worm rattles. Too much side-to-side play between bearing blocks. Shim U-joint inside flywheel.
Bearing block floating- not locked down. Pin down/restrict movement.
Many possibilities.
Motor shaft bent.
Flywheel unbalanced.
Magnets loose?
Magnet picked up trash?
Magnets scratching motor poles?
Entire motor loose? --lock it down.
Bearings may not be "screaming" but may be severely damaged to the point the shaft wobbles. Install replacement motor to confirm.
If chassis is quiet with no shell, then likely a flywheel or motor pole scraping. Check for signs of scratches or particles. Motor magnets loose? Need shimming? Check for bent motor shaft.

Figure 1

it has been lubricated and will usually run well. However, after three or so years, the lubrication dries out. This will be true not only in locomotives that are run regularly, but also in a locomotive that has been sitting on the shelf for years (even a locomotive that is mint and never removed from its box).

Now, motor bearings that need lubricating make what I call a "screeching" sound. Sometimes it's more of a gentle "whooooooooo" sound. It's very distinctive. You will want to fix this quickly and not run a screeching locomotive since the screeching is a sign of increased friction, which may ultimately damage the bearings if not corrected.

The easy solution is to apply a couple of tiny drops of light oil to each motor bearing. Run the locomotive in forward and reverse and see if it quiets down within one minute or so. It may take multiple applications of oil in a very dry situation, and sometimes letting the motor sit after lubrication helps. Over-lubrication is a concern, but so is screeching bearings. Therefore, my philosophy is to keep lubricating (sometimes with periods of sitting) until the screeching stops (sometimes there is a stubborn piece of micro-grit in the bearing that needs to be almost floated out). The goal is not to drench the motor, and certainly not to foul the motor contacts (the commutator), but simply to get the noise to stop. Usually, a small amount of oil will do it. Then with the noise stopped, if I feel I used an excessive amount of oil (which is rare), then cleaning the motor to get rid of the excess oil may be required. Normally, though, a couple of tiny drops, and the problem is remedied.

When you choose an oil, you'll want a very light weight oil (which also happens to be often very light in color). Personally, I like the oil that Atlas sells (part #0193, HO & N MOTOR BEARING LUBE). I recommend it for two reasons. It's a good quality oil, but what I really like is the bottle it comes in. The ultra-fine tip allows the application of micro-precise drops of oil and its length often allows such application without disassembling the chassis. Now, be aware that some lubricants use a horribly big tip, which make precise oil placement difficult.

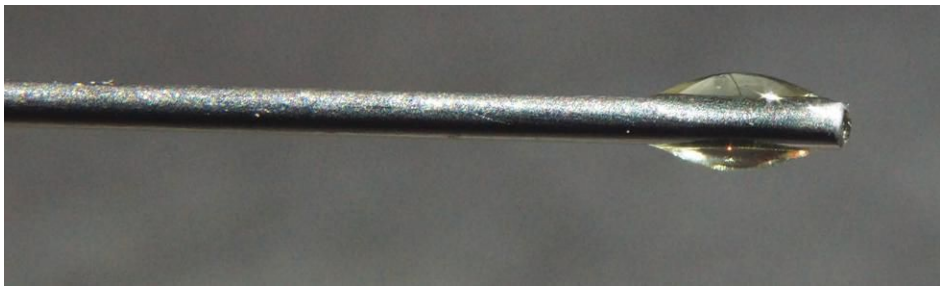


Photo 4: A VERY fine tip applicator with holes barely larger than a human hair can apply micro-drops of oil with precision.



Photo 5: Some companies may make wonderful oil, but be sure and know which tip you are getting. The white plastic tip is not nearly as good as the fine metal micro-tip.

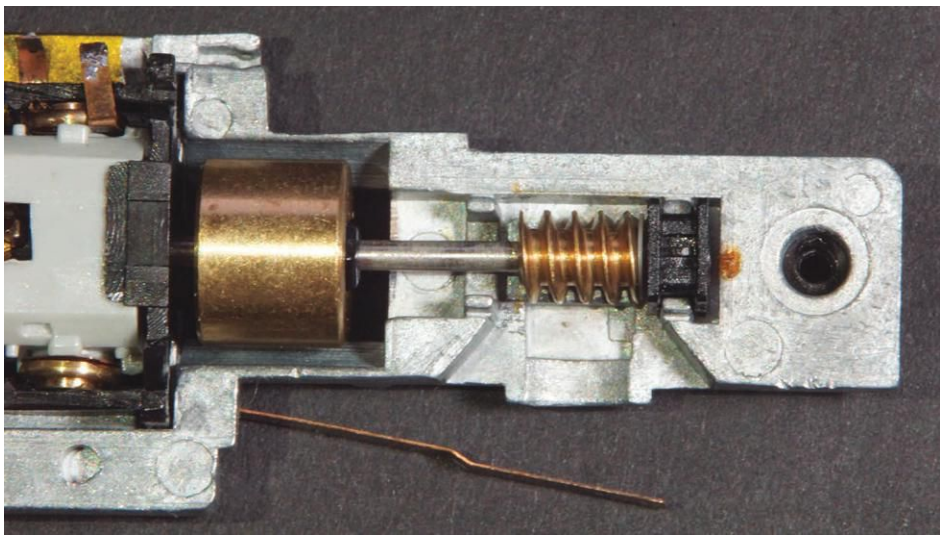


Photo 6: Removing the inner bearing blocks (as shown here) can dramatically lower noise and friction in shorter locomotives when all the proper adjustments have been made. This is what a "Beardenized" Atlas GP38 looks like.



Photo 7: Behold one of the most notoriously clicking locomotives ever made. Finding an Arnold S-2 on an auction site is not that hard. Finding one that does not have split gears; now THAT is almost impossible.

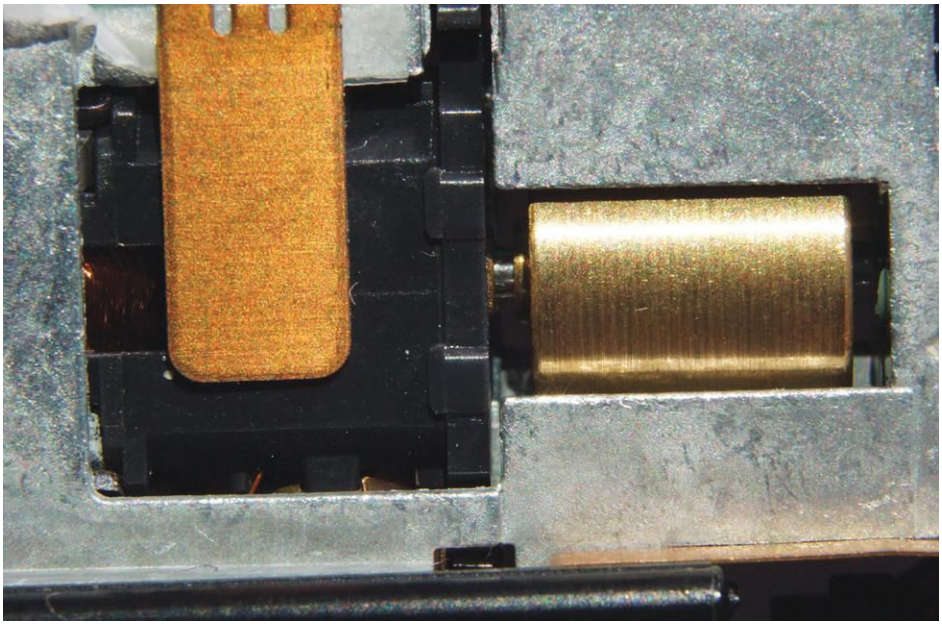


Photo 8: In many cases with modern locomotives, it is possible to oil the motor bearings without disassembly.

Rumbling Often Needs Magic

The second common problem goes like this. You have a quiet locomotive. You then disassemble it to add a decoder, kitbash it, or just clean it. When you re-assemble it, you are then astounded at how noisy it is, and no matter how hard you try, you just can't get it to quiet down.

Sound familiar? At least once every 60 days, someone posts this scenario on my discussion boards. The noise that is produced in this situation is often a rumbling noise (very different from screeching bearings).

If you have had this happen, I'd be willing to guess that the locomotive in question is a short-axle locomotive with no u-joints. Examples would include: the Atlas GP7/9/30/35/38/40 and their DASH-2 cousins. It will also happen with the Life Like GP18/20/60 and many others.

The problem is a misaligned drive train that has very little room for error. My favorite solution is to remove the inner bearing blocks. A thorough discussion of this procedure has been released to the public domain by *N-Scale Magazine* and me (the author). You can find the file at my website at: *tinyurl.com/y2bdacmv*

Read this file, do what it says, and you will be absolutely astounded by

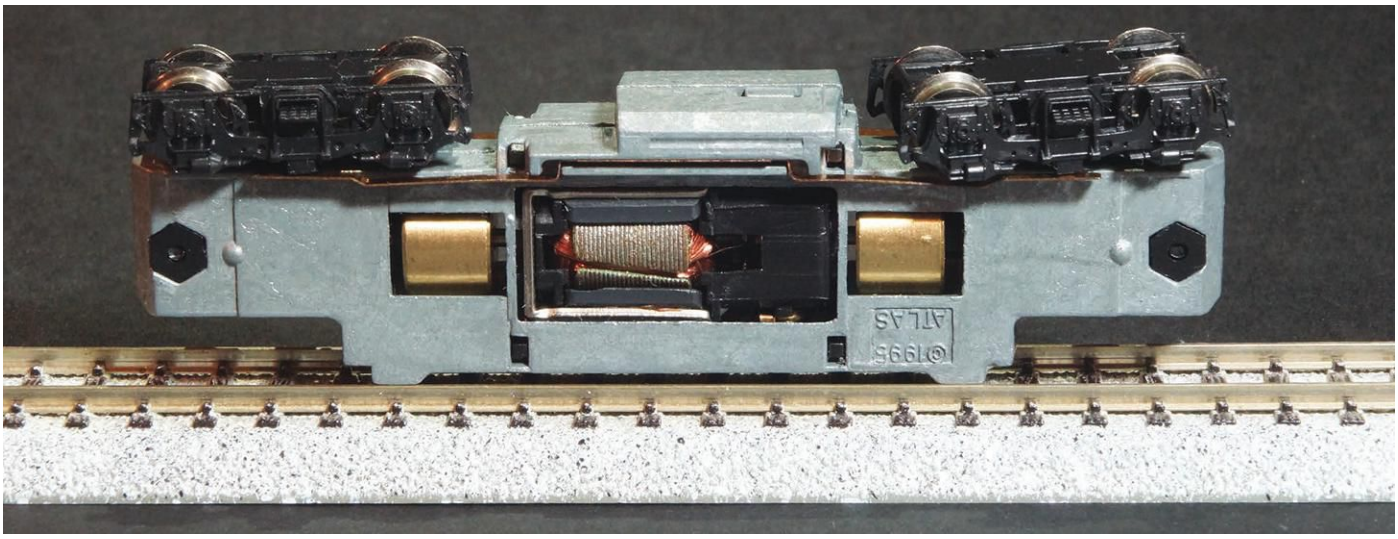


Photo 9: Listening to and observing a bare mechanism (with and without trucks) is often a key diagnostic step. Older locos can often be laid on the track, but don't do this if the loco is decoder equipped or you may short out the decoder. Alligator clips and jumper wires are better for testing DCC locos. Converting to analog is even better for testing.

how much better your locomotive runs. This file has been in the public domain so long (since 2006) and the technique has become so popular that people have humorously started to refer to "Beardenizing" their locomotives.

Whatever you call it, I can't stress this enough. Removing the inner bearing blocks from shorter 4-axle locomotives (which do not have flexible u-joints) works like a miracle. I've performed it on over 100 locomotives and have never had one that it did not help. Others say the same. And when a few complained on a discussion board that the procedure doesn't work, I sometimes got them to send the loco to me. It usually took me 15 minutes to do the procedure correctly, indicating patience and careful reading of the text yield great rewards.

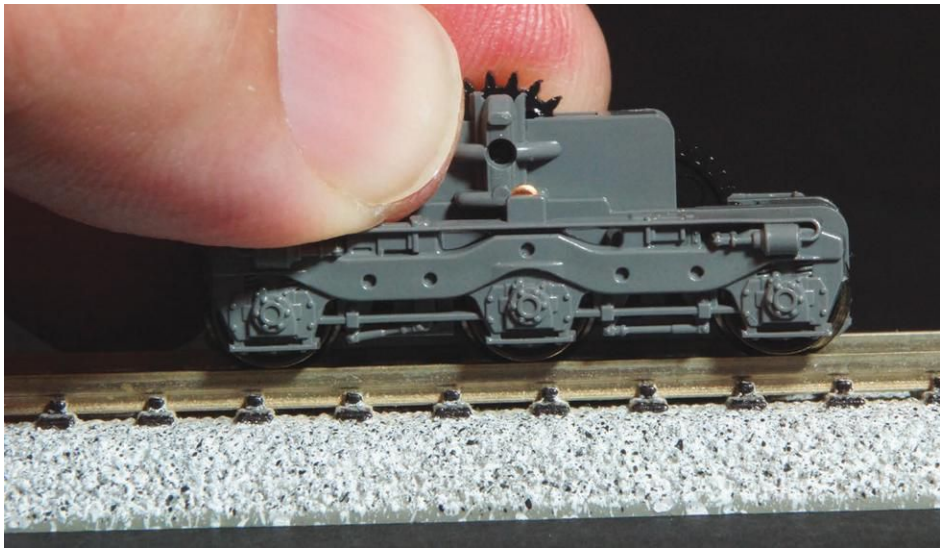


Photo 10: Rolling a truck by hand is a great way to feel for cogging in the gears.

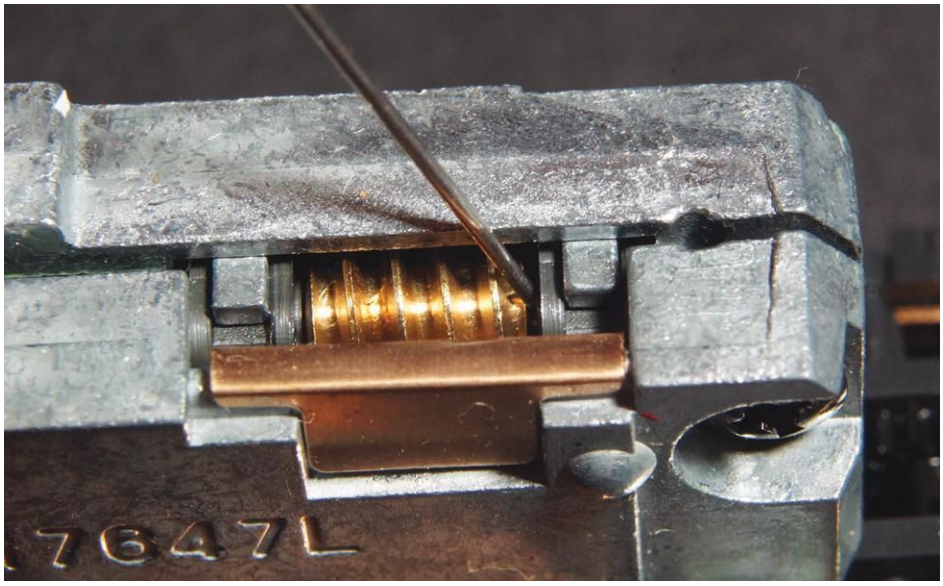


Photo 11: Without disassembly, some locomotives provide easy access ports to get at the worms.

Clicking

Clicking is almost always a gear problem. The clicking is caused by two objects periodically hitting each other. One common source for this noise is cracked gears. When a gear is cracked, the perfect symmetry of the gear teeth is lost and thus two interfacing gears occasionally have gear teeth crash into each other. This is the clicking sound and is otherwise known as cogging. Aside from some older brass locos, the most common locomotive to suffer from cracked gears was the Arnold S-2 switcher. The culprit gears are mounted on the wheel axles. There

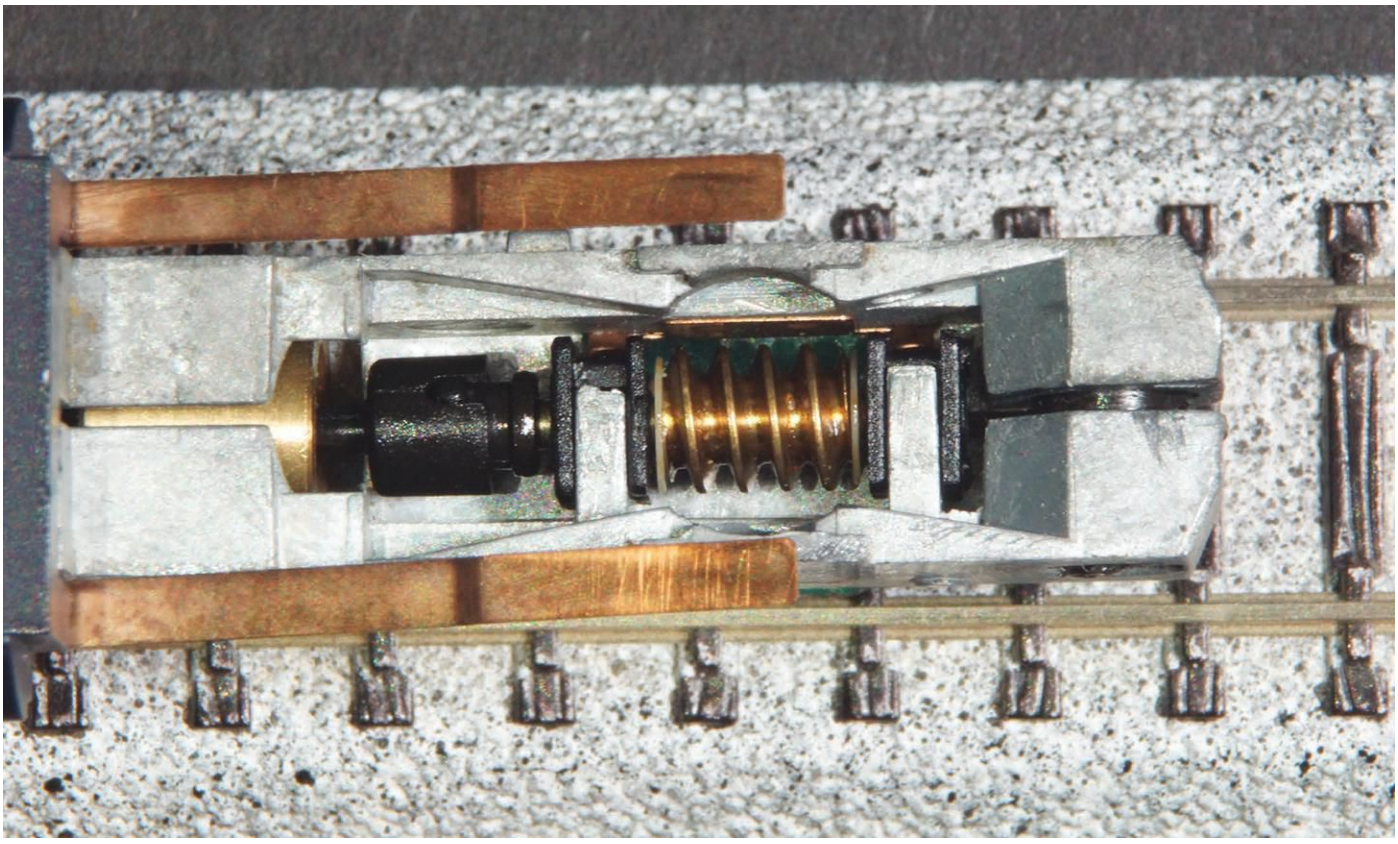


Photo 12: Here is a chassis up-side-down getting power from the track. I look for any unwanted movement in the worm or bearing blocks.

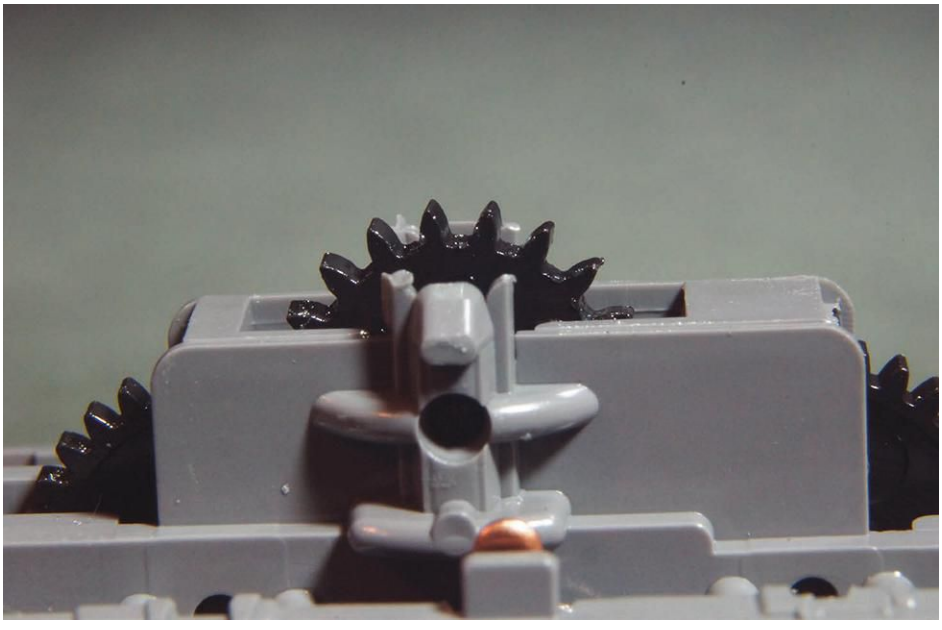


Photo 13: Sometimes you need to get a magnifier and inspect the gears. Note the damaged gear tip at 2 o'clock.

is a casting dimple on the plastic gear and that is always the spot where the gear cracks.

Another common source for clicking is one tiny piece of ballast has somehow made its way into a truck and is stuck in one crevice between gears. If this happens, then once per revolution, the opposing gear tooth tip may hit the ballast (producing the periodic click).

On very rare occasions, the source of clicking is because one single tooth on a gear may be damaged. If so, the likely culprit is the main drive gear, which may get damaged when a truck is inserted back into a chassis without due care. A tooth on the main drive gear (the top gear on the gear tower) may get pinched by the worm instead of meshing properly. The moral is: when inserting a truck, be gentle and never force the truck in place.

Normal Noise

One last oddity I should mention involves "normal" noise coming from the locomotive. In a few situations, I have had a locomotive which starts to move as the power is turned up, and then pretty much stops. However, the motor is still running with no unusual noise. If this situation happens to you, then you can almost be assured something in the drive train has come loose and is slipping. I have seen locos where the u-joint had a crack in it and I have seen locos where u-joints must change with age and no longer hold the worm shaft tightly. Replacement parts are the cure.

Specific Techniques

In the photos shown here, I have demonstrated a few specific techniques that I have used to solve locomotive noise problems.

The Sutter Creek Division



Phase Two, Part 2: Carbon Lake and the Estates at Carbon Lake

by **Ward Thorne**

A view of I70 and Carbon Lake.

Hello fellow model railroaders. In the last article, we left off with the creation of Interstate 70 and the ghost town of Rosita. With the addition of a contemporary neighborhood and a section of Carbon Lake, nearly one-third of the layout is now complete with scenery and structures.

N scale has long presented challenges when searching for period-specific details such as automobiles, trucks, household items, and watercraft. However, with so many talented 3D designers now creating products for the hobby, that situation has changed dramatically. As mentioned in previous articles, I model the modern era. For this layout, I wanted to create a neighborhood of contemporary homes that would look at home in almost any community across the country, complete with the vehicles, outdoor furnishings, and everyday details found in modern residential settings.

Like many mountain towns in Colorado, new developments are often strategically located near recreational areas. In this case, the Estates at Carbon Lake occupy the southern shore of Carbon Lake.

Please note that real names of towns, highways, rivers, and other Colorado locations are incorporated to help tell this fictional backstory.

The History of Carbon Lake

In 1870, Colonel Randolph E. Sutter was scouting potential mining claims in Colorado's central mountains when he



Pouring Carbon Lake.



Adding waterfall culvert detail.



Fishing.



Mallards swimming next to the dock.

came across a beautiful, serene lake after summiting what is now known as Iron Mountain. The lake was fed by several creeks and streams, the largest of which now bears his name: Sutter Creek.

Sutter did not found the town. General William Jackson Palmer and the Denver & Rio Grande Railroad established it in 1887. He did, however, name the lake in honor of his childhood home of Carbondale, Pennsylvania.

The lake played an important role in Denver and Rio Grande Western operations by providing water for locomotives, ice for refrigerated boxcars transporting produce, and drinking water for the town. Today, Carbon Lake is used primarily for recreation.



Afternoon canoe ride.



The Carters log cabin.



Sunbathers and jet ski.



Family fun on the pontoon.



Jet ski fun.



Beginning the construction of the Estates at Carbon Lake.

Building Carbon Lake

The base of the layout is 1-inch extruded foam insulation board, which can be easily shaped using hot-wire foam tools. I removed approximately one-half inch of foam to create a shallow bowl-shaped depression. Woodland Scenics Plaster Cloth was then applied over the carved surface to provide a smoother finish.

Once the plaster cloth had dried, I applied a thin coat of Plaster of Paris to create a hard surface capable of supporting the water products. The entire lakebed was painted with an earth-brown acrylic paint. The deepest portions of the lake were then painted dark navy blue, blending into a moss green and finally transitioning into the earth-brown shoreline.

After the paint dried, I applied Matte Medium and spread Scenic Express SE0403 Natural Soil & Dirt across the lake bottom. Arizona Rock & Mineral 109-EARTH Powder was added to simulate silt deposits. Along the shoreline, I used Silflor MN71822 2mm Summer Grass Pathways to represent reeds and aquatic vegetation. Scenic Express SE6112 Light Green SuperLEAF and Woodland Scenics T1345 Fine Turf Green Grass were added to create additional shoreline vegetation and moss effects. Various rocks and talus were then scattered along the water's edge to add realism.

Once everything had dried, I began pouring Woodland Scenics C1211 Realistic Water. For the first pour, I added a few drops of Woodland Scenics CW4519 Navy Blue Water Tint. This tint is very concentrated, so it should be added one drop at a time and mixed carefully to avoid introducing bubbles into the water product.

The second pour used Woodland Scenics CW4521 Moss Green Water Tint. The third and fourth pours consisted of clear Realistic Water with no tint added. Finally, Woodland Scenics C1212 Water Effects was used to create surface ripples and boat wakes.

The watercraft were sourced from several manufacturers. The jet skis came from Plaza Japan, the pontoon boat originated from Shapeways before the company ceased operations, and the canoes are Woodland Scenics A2200 models. The floating dock is scratch-built, and the sunbathers are Noch 36851 figures.

No lake scene is complete without waterfowl. The mallard ducks and Canada geese are from Miniprints and help bring the shoreline to life.

Estates at Carbon Lake

The Estates at Carbon Lake is the newest housing development in Sutter Creek. Construction began in 2012 under the direction of Leck Construction. The development

Creating the home under construction scene.



J Bond Aston Martin DB5.

consists of exclusive semi-custom homes with access to a private dock on Carbon Lake.

The only residence not associated with the development is a log home owned by the Carter family, who purchased their property in 1980 before the surrounding land was developed.



New home construction.





New home construction.



Riding a wheelie.



Carbon Lake Road.

One of the more interesting residents is J. Bond, who claims to work for Universal Exports. He mostly keeps to himself, but is the envy of many of the men in the neighborhood whenever he takes his cherished Aston Martin DB5 out for a drive.

Leck Construction is currently building the final home in the development, which is scheduled for completion next year. The project has proven highly successful and has received praise from homeowners throughout the community.

Construction of the Contemporary Neighborhood

I enjoy model railroad locomotives and rolling stock as much as anyone in the hobby, but I also enjoy creating realistic and believable scenes. Much of my vacation time is spent exploring Colorado's mountain communities and small towns, which provides inspiration for many of the scenes found on the Sutter Creek Division.

For many years, there was a shortage of model homes that accurately represented residences built after 1970. While browsing Etsy, I discovered 1One60Mo3DLs, a shop owned by Marc Fouillard of Winnipeg, Canada. In addition to producing an impressive collection of structures inspired by the Back to the Future films, he also offers some of the finest contemporary home models I have encountered in N scale.

I purchased five models for this scene: the Suburban Bungalow (Nutley), Suburban Home (6 Boone), Suburban Home (Frigate), Suburban Home (2 Boone), and the Suburban Home (Kingsclear).

The models are beautifully printed,



Neighborhood detail.



Mom and son enjoying the pool and hot tub.



Santa Fe 6365 passing a Rio Grande work crew.



Santa Fe beer train heading west.



Rio Grande Motor Ways Ford 900L and reefer.

but I added a variety of details to personalize each structure. These additions included Rail Scale Models 3-Tab Simulated Asphalt Shingles, WhistleStopModels 6-Foot Wooden Scallop Privacy Fencing, WSM Scale Utility Meters, WSM Scale Ladder Sets, All Scale Miniatures Grills with Propane Tanks, ASM Patio Lounge Chairs, ASM TV Satellite Dishes, ASM Garden Hose Reels, and Yellow Dwarf Hot Tubs and garden furniture.

The house currently under construction combines two Train Time Laser structures – one single-story and one two-story kit – to create a larger custom residence. Construction workers are from Preiser and Noch, with additional painting and detailing completed by the author.

Vehicles throughout the neighborhood are from Atlas, TrainWorx, and Shapeways. The landscaping was inspired by typical residential neighborhoods found throughout modern Colorado mountain communities.

In Conclusion

This phase of the Sutter Creek Division represented a significant project, but I feel it successfully captures the modern Colorado mountain setting I envisioned. The combination of



Summer on Carbon Lake.



Santa Fe B23-7 6365 waiting for a clear signal.



Southern Pacific track foreman and worker assess the situation.

Carbon Lake, the contemporary neighborhood, and the surrounding scenery helps establish a believable and lived-in environment that complements the railroad operations.

The next project for the Sutter Creek Division will focus on the Denver & Rio Grande Western/Southern Pacific yard and engine facility. That project will be featured in a future article.

Until then, thank you for allowing me to share my work with you. Happy modeling!



Santa Fe Caboose 044 on the tail of the beer train.



Southern Pacific 4617 tails a mixed freight headed east.



Aerial shot.

QUICK NOTES



Making Easy Power Poles

by **Dennis Murphy**

Power to the people. Every place all over the world has some way of distributing electric power, and you should also have this service for the little people in your train world. Making power poles is easy and fast, and they look way better than the plastic ones. You will need some of the smallest dowelling you can find, some wood stock to make the cross bars, and an adhesive of your choice; nothing you probably don't already have on-hand.

To cut these wood items, I love to use my Chopper II tool. There is no better tool to make (mostly) identical repetitive cuts of wood, plastic or paper. Chop… Chop… Chop… You might want to play with the size you cut things, but that's easy. I then press in a short length of stiff wire into both ends of the cross bar to attach the wires to.

Gluing the parts into place is easy. Personally, I like to first make a flat spot on the pole for a better attachment point of the crossbar. Then I glue the cross bar on the pole and give the adhesive time to set up. From there, I come back later and add the cross bar supports. Easy-Peezy.

OK… What's next? Now must be the time to break out whatever you wish to color your poles with. You might wish to paint them, or a nice alcohol-based stain works just fine (like what I used). If you are using these alcohol-based stains and you want the color to be darker, allow the first application to dry and then do it a second time.

So, what good are power poles if they don't have wires on them? I find a product called EZ Line works just great for this chore. This stuff is some type of synthetic product that is really stretchy and is very strong. It truly is an amazing product and comes in a number of sizes and colors. What's not to like?

At this point, I might add that this EZ Line, even though it is a wonderful product, is a bit dodgy to work with at times. This line is so small and light, that it seems to have a mind of its own.





Photo 1: Making power poles is easy and fast. You will need some of the smallest dowelling you can find, and some wood stock to make the cross bars. I like to cut a bunch of parts all at once and be done with it.

Photo 2 (*Left*): Once you have you poles cut, I like to make a flat spot for gluing on the cross bars. Not too much; just a bit.

To control this stuff, I built myself an applicator tool.

I happened to have some very small metal tubing left over from, who knows what, but it worked just fine. The hardest part of this new tool was convincing the line to go into it. And then I thought, why not suck the line through? Problem solved.

From there, glue the first bit of line

into place and allow the adhesive a moment to set up. Then use your applicator tool and move from one pole to the next. Don't pull the line very tight, as if you aren't paying attention, you can bend the previous pole over some. I suggest you come back and glue every line attachment point, as you don't want your wire to pop off the crossbar. (Your choice again.)

If you already have plastic power poles, you can certainly use this EZ Line product with them. Note the way I wrapped the line around the end of the cross bars. Personally, I prefer the line to come-and-go from the TOP of the crossbars, as you can see in the photo. It just looks more natural to me.

There you have it! Your train world now has all the power it can use. Making your power poles is an easy, fast process that anyone can accomplish. Give it a try and I bet you will have as much fun with this as I did. Enjoy!



Photo 3: Gluing the parts into place is easy. Personally, I like to glue the cross bar into place and give the adhesive time to set up. I then come back later and add the cross bar supports. Easy-Peezy.



Photo 4: Now is the time to break out whatever you wish to color your poles with. A nice alcohol-based stain works just fine. If you want the color to be darker, allow the first application to dry, and then do a second coat.



Photo 5: So, what good are power poles if they don't have wires on them? I find a product called EZ Line works great for this chore.

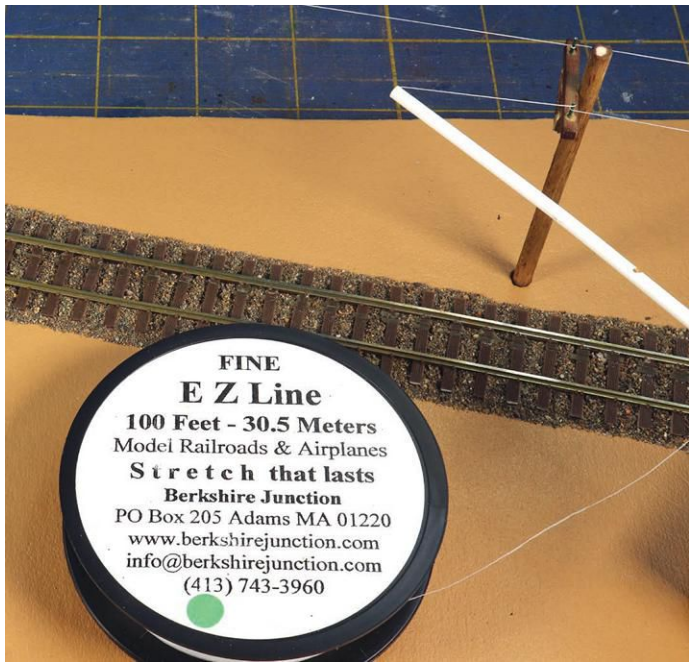


Photo 6: Note the applicator tool that I made to install the wire. This stuff is a bit unruly if used without something to keep it in line (Pun intended).

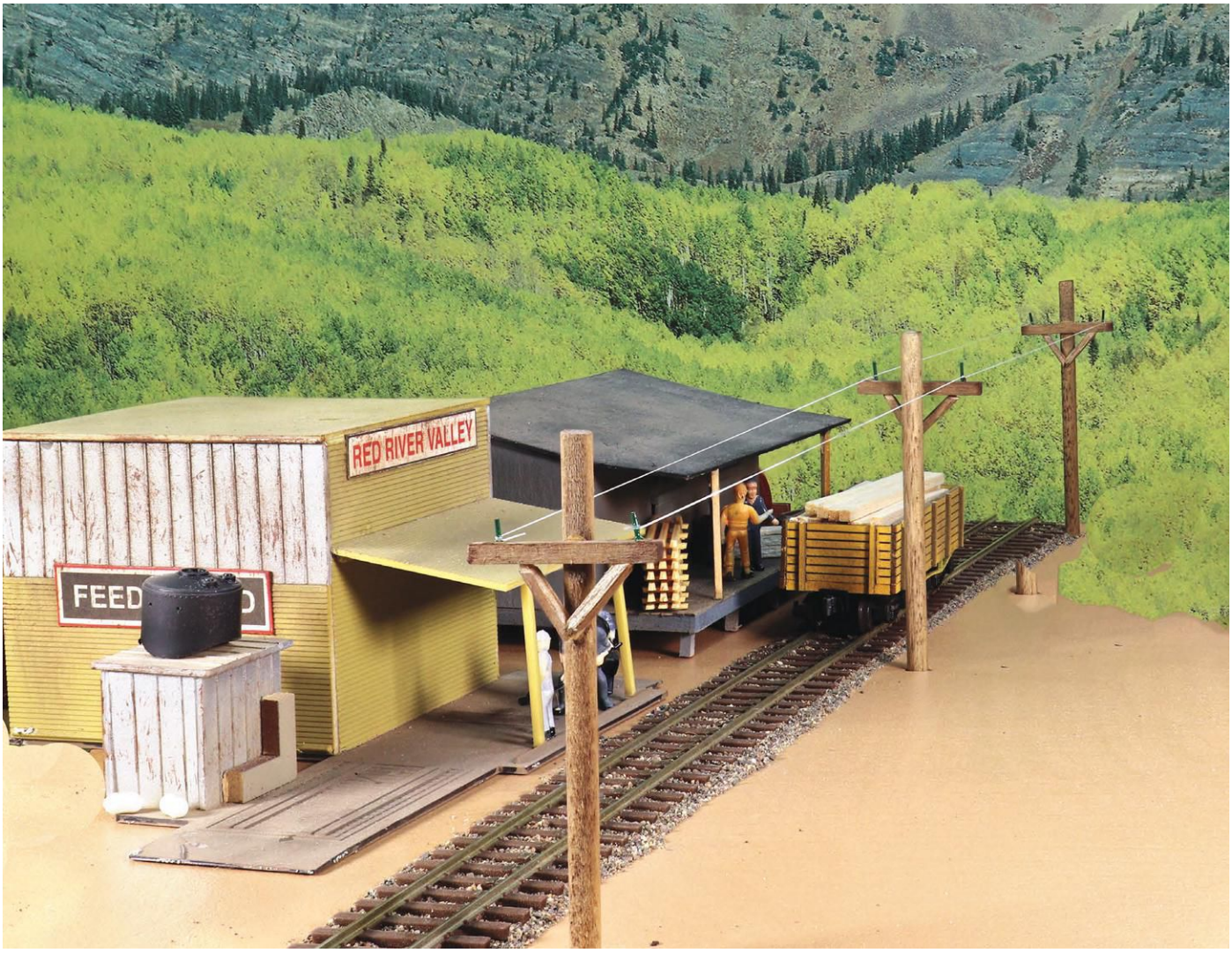
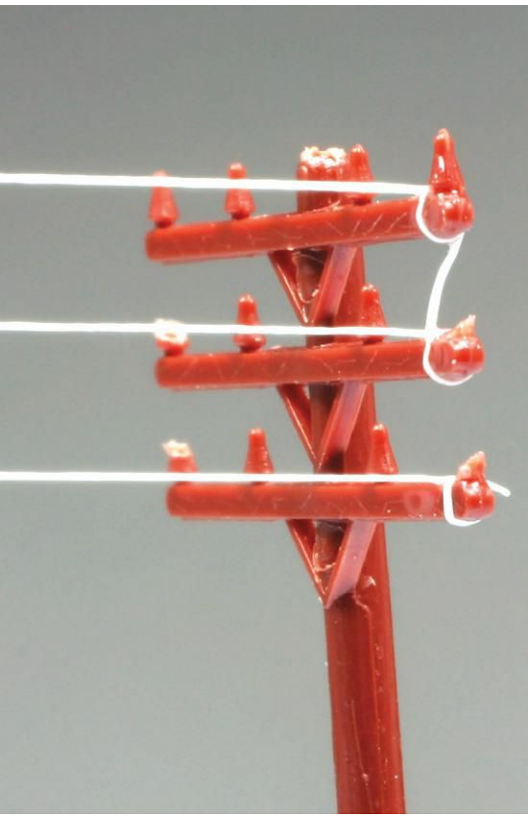


Photo 7: A look at some of these poles with wire on them.



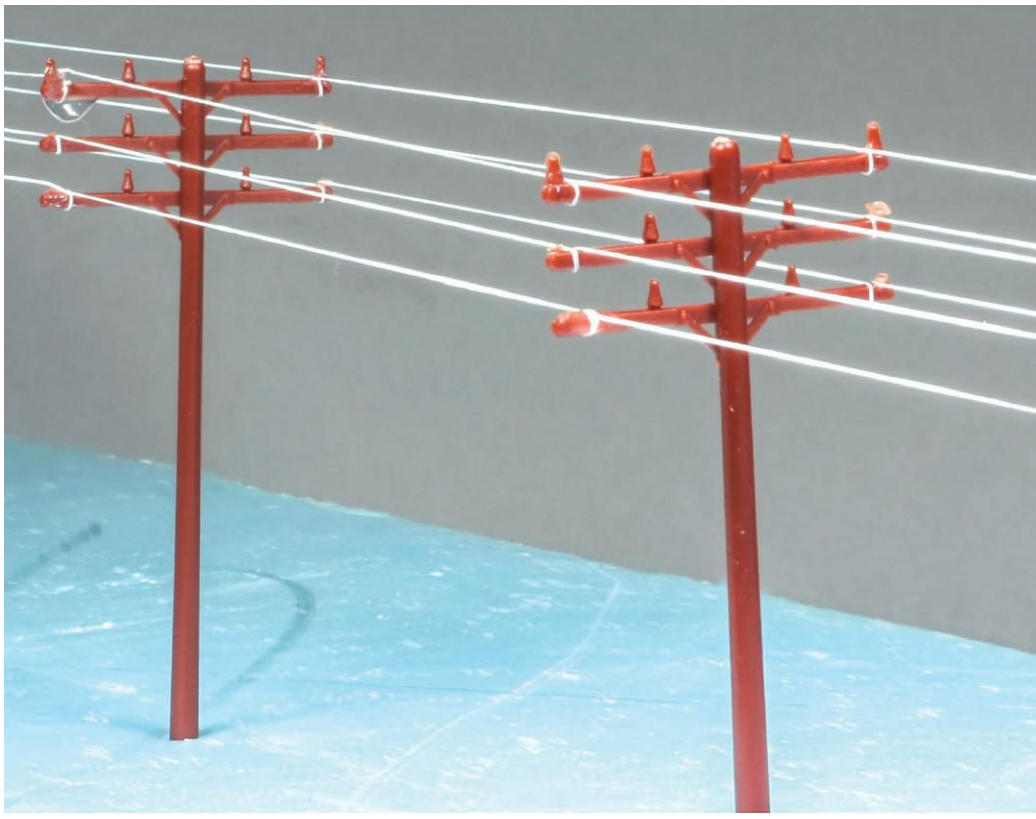


Photo 8: If you have plastic power poles, you can certainly use this EZ Line product. Note the way I wrapped the line around the end of the cross bars. Personally, I prefer the line to come-and-go from the TOP of the crossbars, as you can see in the photo. (Your choice again.)



Photo 9: A nice shot showing the poles and wire in place.

The Short & Nn3arrow

The OmniRGS in Nn3, Part 1

Gregg Cudworth

In the first edition of The Nn3 Manual (1981), author Bob Sloan noted it would be possible to model the entire narrow-gauge Rio Grande Southern railroad in Nn3 in a not-unreasonable space. Jump forward a few decades and that is exactly what Gregg Cudworth has been doing. Follow Gregg's adventure as he models the Omni (Latin for "all") Rio Grande Southern:

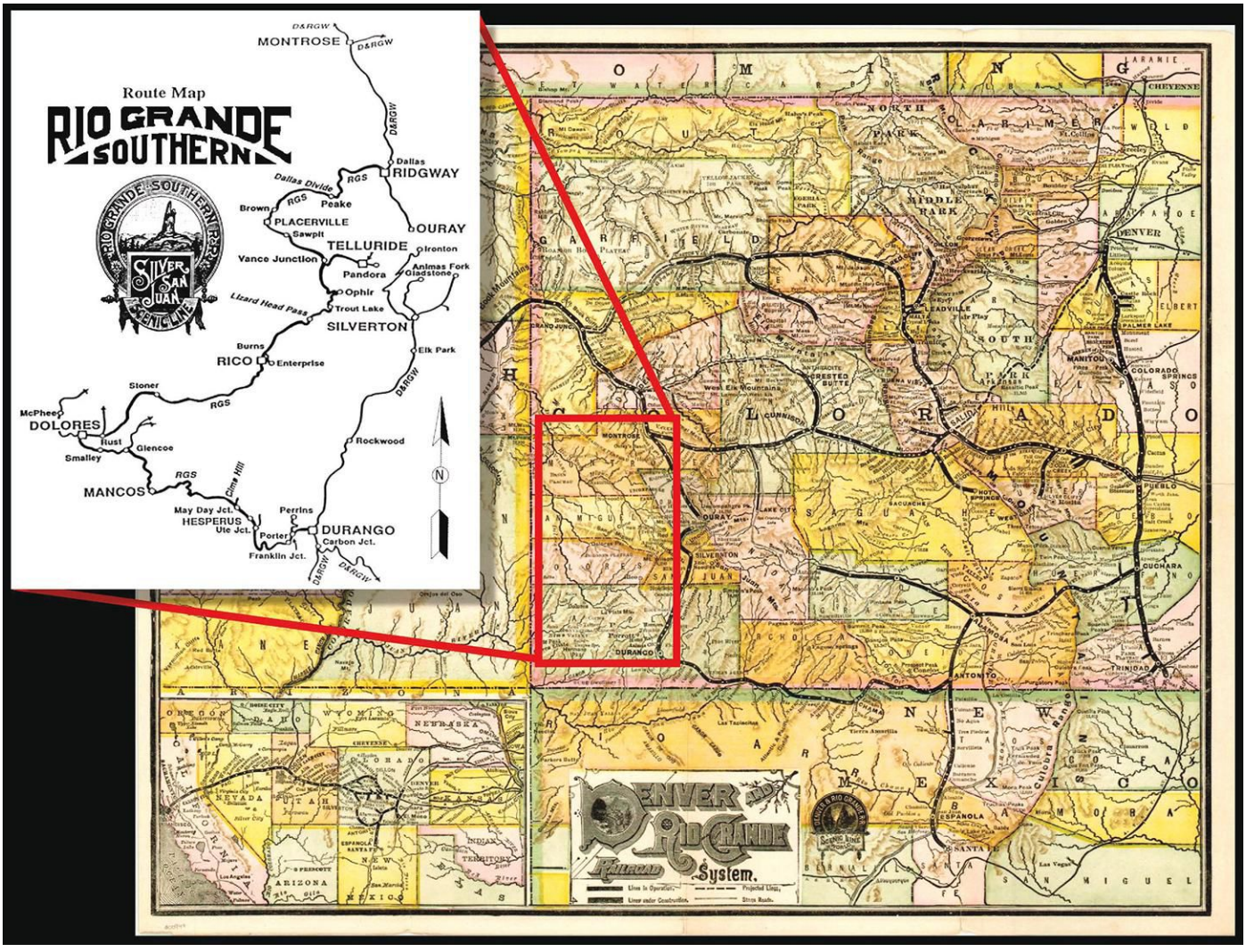


Figure 1: Rio Grande Southern Railroad layout and location.

Introduction

You might say I started my layout during the big Utah housing boom in the early 1990s. It was a good time to sell our current home and, for me, a great time to build a new larger one. So, I spent several months designing my new home while looking for property and working through the permit process. The house took a year and two months to complete, as I mostly worked on it myself after work and on weekends. I contracted some work, but did much of the work myself.

When I designed my house, I planned that most, if not all of the basement would be dedicated to some type of model railroad layout. The design included a basement with few obstructions. Walls were limited and the open nature of the space lent itself to a model railroad. My first inclination was a double track 60s-70s mainline railroad.

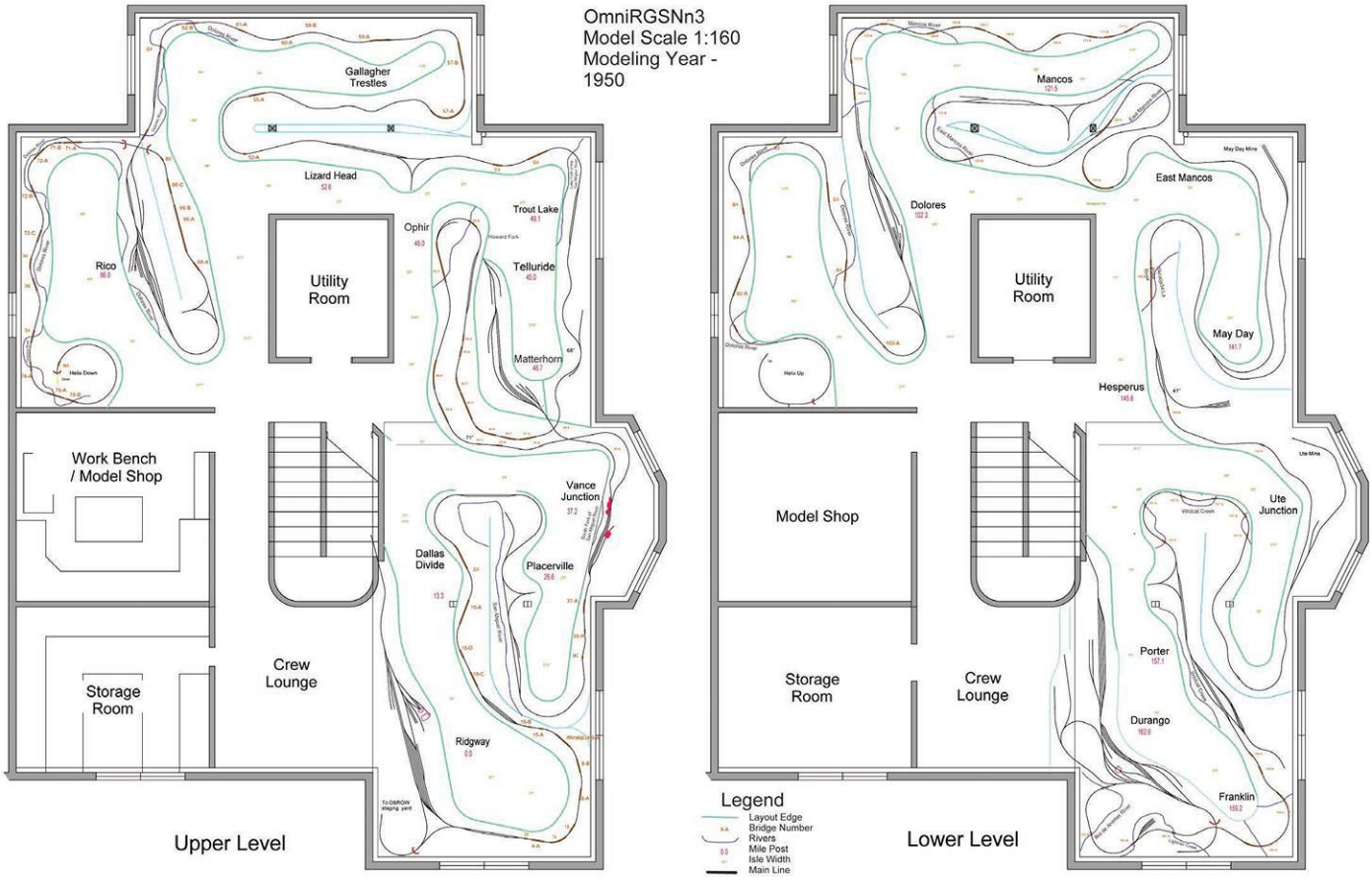


Figure 2: Upper- and Lower level layout track plan.

But a conversation I had with a good friend, Kelly Newton, a fellow N scaler, helped me decide to do something a little different. A question he asked me was a good one. He asked, "why just create another double track mainline railroad like all the others that folks had built here in the valley?" it was a good question and made a great deal of sense. It's been done many times before, so why recreate it. Maybe something a little different would catch the attention of myself and others and provide operational variety of railroading in the area.

Why N scale? Do you want "large models" or "large scenes?" Don't get me wrong, I love massive, large-scale locos fully detailed, of which I have several, but I also enjoy seeing complete trains meandering through mountain canyons and along mountain streams. I've always preferred large scenes, which meant N scale for me, at least in my basement. My large-scale equipment is for a future garden railroad after I finish this one. Haha.

It was a number of years before I settled on the narrow-gauge adventure that I find myself involved in now.

Being a third-generation model railroader gave me the foundation for this endeavor, as well as being a modeler most of my life.

The interest in narrow gauge railroading was bread in me from the onset. So, when I was asked to write an article for the 2003 Nn3 Handbook, I thought of the railroad I was most interested in, the Rio Grande Southern. So off I went.

The Southern is a 162-mile bridge railroad, connecting Ridgway to the north, with Durango to the south (see ***Figure 1***). Otto Mears couldn't find a workable railroad right-of-way between Red Mountain and Ouray, an almost impassable connection between the two, so a way around the "Million Dollar Highway" section was found consisting of 162 miles of amazing scenery, mountains, rivers and some quaint southwestern Colorado towns. Started in 1890 at Ridgway, Colorado and connected in 1892 to Durango, the railroad provided much needed industry and transportation to the southwest corner of Colorado. The railroad left Ridgway and headed to Dallas Divide and then down Leppard Creek, until reaching the San Miguel River and on to Placerville. Up the San Miguel Valley to Vance Junction, over Lizard Head Pass and down to Rico and then to Dolores, all along the Dolores River. Then out The Lost Canyon to Mancos and up over Cima Summit to Hesperus. Then it was a trip down Wildcat Canyon and along Wildcat Creek to Lightner Creek and then on to Durango. High desert plateaus, narrow mountain canyons, high mountain passes, switchbacks and amazing scenery, all along the way.

Concept, Planning and Design

My first design attempt had everything, Ridgway to Durango, all jam-packed into the allotted space. There was only a couple of feet of open mainline between most of the stops.

Photo 1: This photo of a 1950s excursion train captures some of the essence of the RGS in the late-forties/early-fifties.

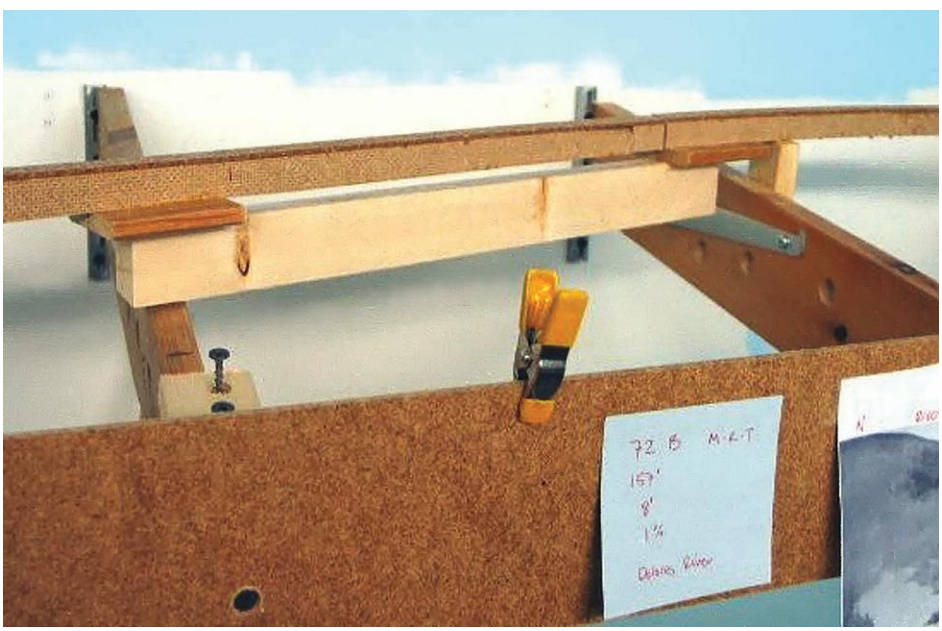


Photo 2: Example of metal shelf bracket attached to a 1"×4" support with bridge cut out of spline roadbed.

It's nice to have it all fit into the space, but I want more than just all the RGS stops packed in back-to-back. A railroad like the Rio Grande Southern (see ***Photo 1***, typical RGS character) is far more than just towns and stops. It's the high mountain backdrops, the trees, canyons, rivers, and scenery. The "climb," the bridges, and perhaps most of all, the journey in time and distance, through gems along the mainline, is what makes a railroad like the RGS special.

I either need more space or an alternative design concept; building onto the house was out of the question. So, I had to re-consider an old dislike of mine, double deck layouts. I checked a few websites and found some that I didn't mind and actually liked. The upper-level acts like a valance to the



Photo 3: Shows how to secure the spline roadbed alignment at the bridge ends once the spline is cut away. Must be done before cutting the spline.



Photo 4: Typical aisle with valance, fascia top and bottom. No screw heads or blemishes on the fascia surface.

Photo 5: General scenery, bridge 72A and the Dolores River.

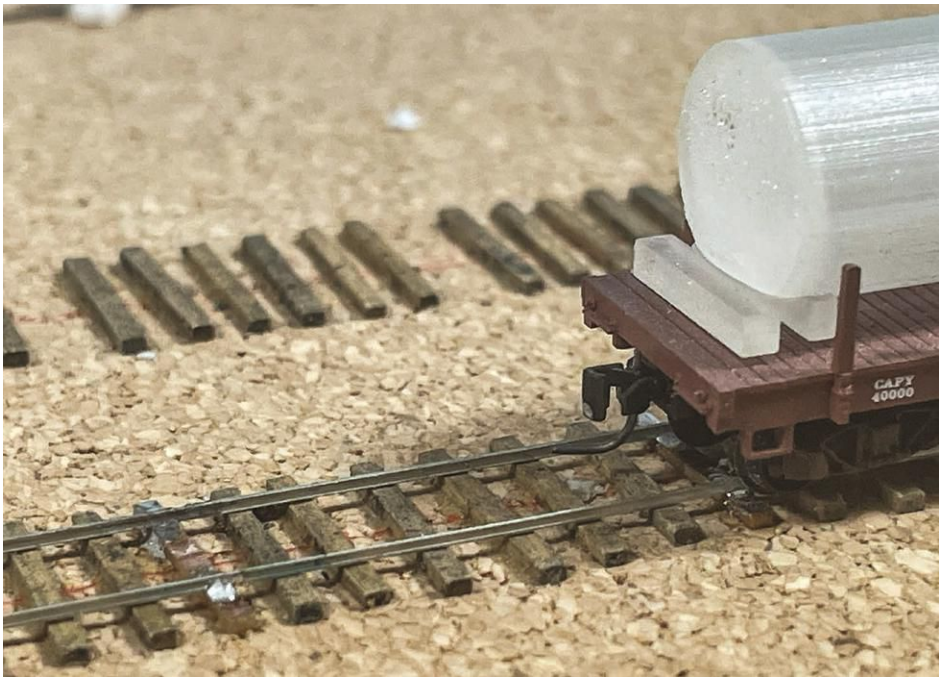


Photo 6: Example of my etched Code 30 rail in Dolores. Slight rail profile is discernible.

lower level. I'd always planned on having valances on my layouts, so this concept showed promise.

The results are found in ***Figure 2***. The basement is approximately 40'×50'. There is a utility (furnace) room and a stairway in the middle of the space that can't be used. Additional space that is spoken for is the storage area, workbench, and future crew lounge. The rest of the basement is the railroad.

I tried to layout all of the stops with proper orientation, that is to say each town would be viewed from a point in the middle of the river looking uphill at the town and that tracks to Ridgway and Durango went in the correct direction (either left to Ridgway (upper level) or right to Durango (lower level)) depending on the town. Three of the towns had to be modified to allow for proper orientation. To accomplish this,

the mainline had to cross over itself, creating an overpass that did not exist on the real RGS. This ended up as an acceptable compromise to keep each town properly oriented, as I was able to hide the overpass behind scenery. All the other stops fit nicely into the plan.

I was also cognizant of the operational aspects of the railroad from the human standpoint. So, aisles are wide and no operational areas, upper level to lower level, are placed at the same point on the layout. Generally, towns with switching areas are placed on opposite sides of peninsulas. That way, no one will be standing in the same place, trying to switch their town.

The RGS was a "bridge" railroad connecting Ridgway to Durango. Calling it a bridge railroad also seems quite appropriate, as there are over 100 bridges on the mainline and no tunnels. All bridges have been placed in proper order and orientation along the mainline and many will be built and made part of the layout.

One of the things I like about this plan is the "proximity justification" for motive power from both the RGS and D&RGW. D&RGW motive power from both the Durango and Ridgway ends of the railroad would be available. Additionally, these two connections to the D&RGW allow a variety of offline freight and passenger traffic onto the railroad, which will be generated from hidden fiddle yards and originating somewhere else on the D&RGW narrow gauge system.

Operating crew sizes would be kept under control, even with such a large layout. Perhaps 8 to 10 would be the normal operating crew size. Trains would be run on the mainline, and cars dropped off or picked up as indicated on the train orders. Multiple trains would be run at the same time, with meets being coordinated by the train crews. I will still be able to run trains when no one else is around, which was a goal from the planning stages.

Where my concept/plan/execution of the RGS drastically deviates from reality is that it is set in 1950 and the RGS has become a very successful railroad and is making a profit. Times are good and everyone along the Southern uses the railroad to get around and to



Photo 7: Standard tie configuration with rail at 2' gap joints. All Code 30.



Photo 8: Masonite roadbed and wood spline "Y" roadbed splitter.



Photo 9: Stepped transition from spline roadbed to yard sub-base, which is ½" plywood.



Photo 10: "Elbow" utility shelf with O scale harp switch stands.



Photo 11: Switch point rails and frog constructed to specs on the workbench.

ship goods to the rest of the country. There was no depression and the economy is booming. Fairy tales can come true, at least in my basement.

Layout construction:

Mainline – 650 LF. The layout is constructed with a 1×4 benchwork over a number of different support configurations. On the walls, there are shelf brackets screwed to 1×4s (***Photo 2***). Bridges were added after the roadbed was established. ***Photo 3*** shows how the spline roadbed was maintained when the bridges were cut in. There is little strength in the layout supports with this method until the fascia is attached to the 1×4s. The fascia is a two layered Masonite design, where the inner layer is screwed to the 1×4s and the outer layer is glued over the first. When finished and the joints filled, sanded and painted, there are no blemishes visible from the aisle (***Photo 4***). Some peninsulas are cantilevered over the lower level to maximize layout area, so backdrops don't always line up top to bottom and don't need to. The aisles are generally wide enough for two or more operators to pass by each other.

Operations: When the railroad is far enough along, it will be TT&TO.



Photo 12: Typical layout scenery at bridge 74B on the Dolores River.

Layout Specifics

(***Photo 5***) I've been working on the layout for about 20+ years with distractions over the past 4-5 years into laser cutting and 3D printing. The benchwork, subroadbed, valances, fascia and cork roadbed are all in place. I've laid track between Rico and Lizard Head and am currently completing the power feeds to the rail. During this exaggerated layout build, the 2mm Association, the supplier of the Code 30 rail stopped producing it, so that left me in quite a spot. I still have a fair amount of 2mm ribbon rail on hand, but not enough to complete the layout. I will be using Code 40 rail in Durango proper and on the helix, but I am still short on the Code 30 I need. So, I had some Code 30 rail double etched with a slight profile in the sides of the rail. It seems to have turned out well and I have laid (***Photo 6***) a small section with this rail. While it isn't as strong side to side as the 2mm ribbon rail, it provides me with options to continue, and appears to be satisfactory and generally is more prototypical looking than the ribbon rail

Ties are hand laid, with the rail soldered in place with PC ties every 7th tie or four ties at rail gaps (two each for the ends of each rail, and as needed (***Photo 7***). Roadbed is ⅛" and 3/16" × 1" Masonite spline with pine switch Ys (***Photo 8***) to evenly separate the splines (diverging tracks), except yards which are ½" plywood subroadbed with stepped transitions (***Photo 9***) into the spline roadbed, much like the switch Ys. Track power is fed every two feet. Switches are manual throw via O Scale harp switch stands mounted on an "elbow" utility shelf (***Photo 10***) and are scratch built starting with frogs, and the point rail assembly constructed at the workbench and then moved to the railroad (***Photo 11***). The utility shelf will also act as a Car Card holder if that's what I decide on for managing car movements (also shown in ***Photo 9***).

Several years ago, I completed a section of the layout between Rico and Dolores to see if what I could do with modeling scenery and bridges etc., was acceptable to me and my modeling standards. ***Photos 12 & 13*** are of this area, while ***Photo 14*** is a bridge on another part of the layout. I was satisfied, so I was committed… or should be.

Next time: Bridge building and scenery development.



Photo 13: More general scenery at Bridge 72B.



Photo 14: Bridge 58A around the Gallagher Trestles.

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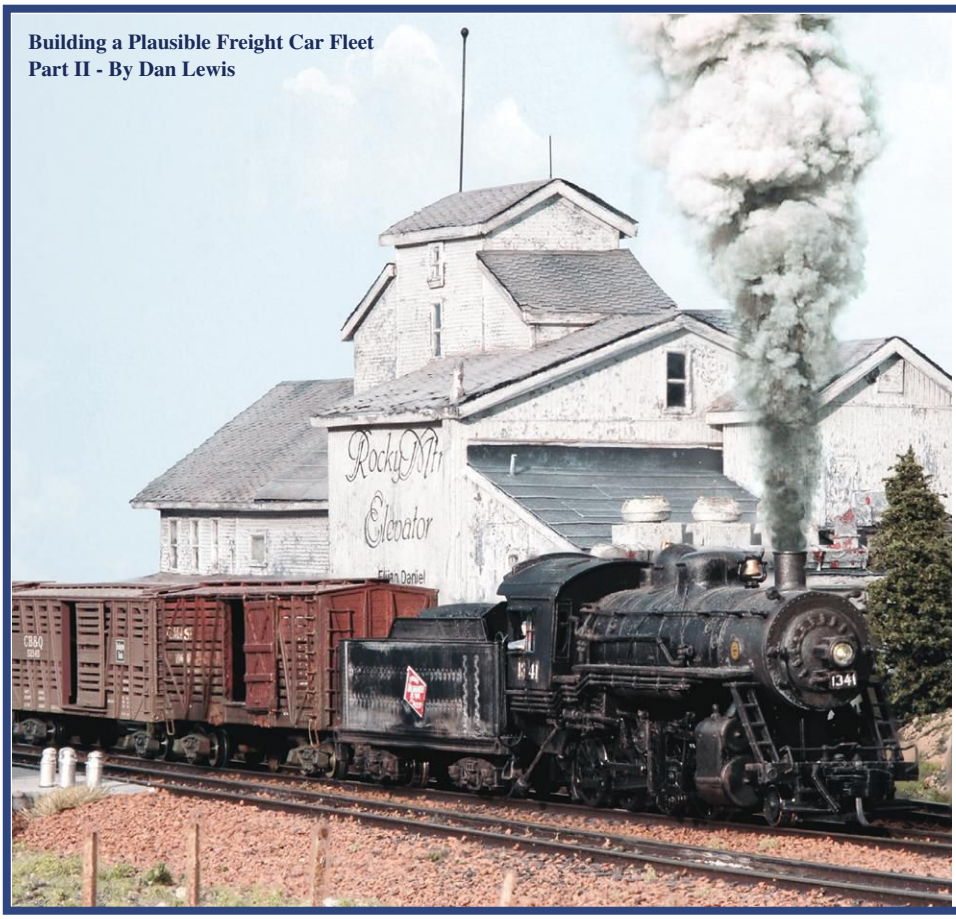
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