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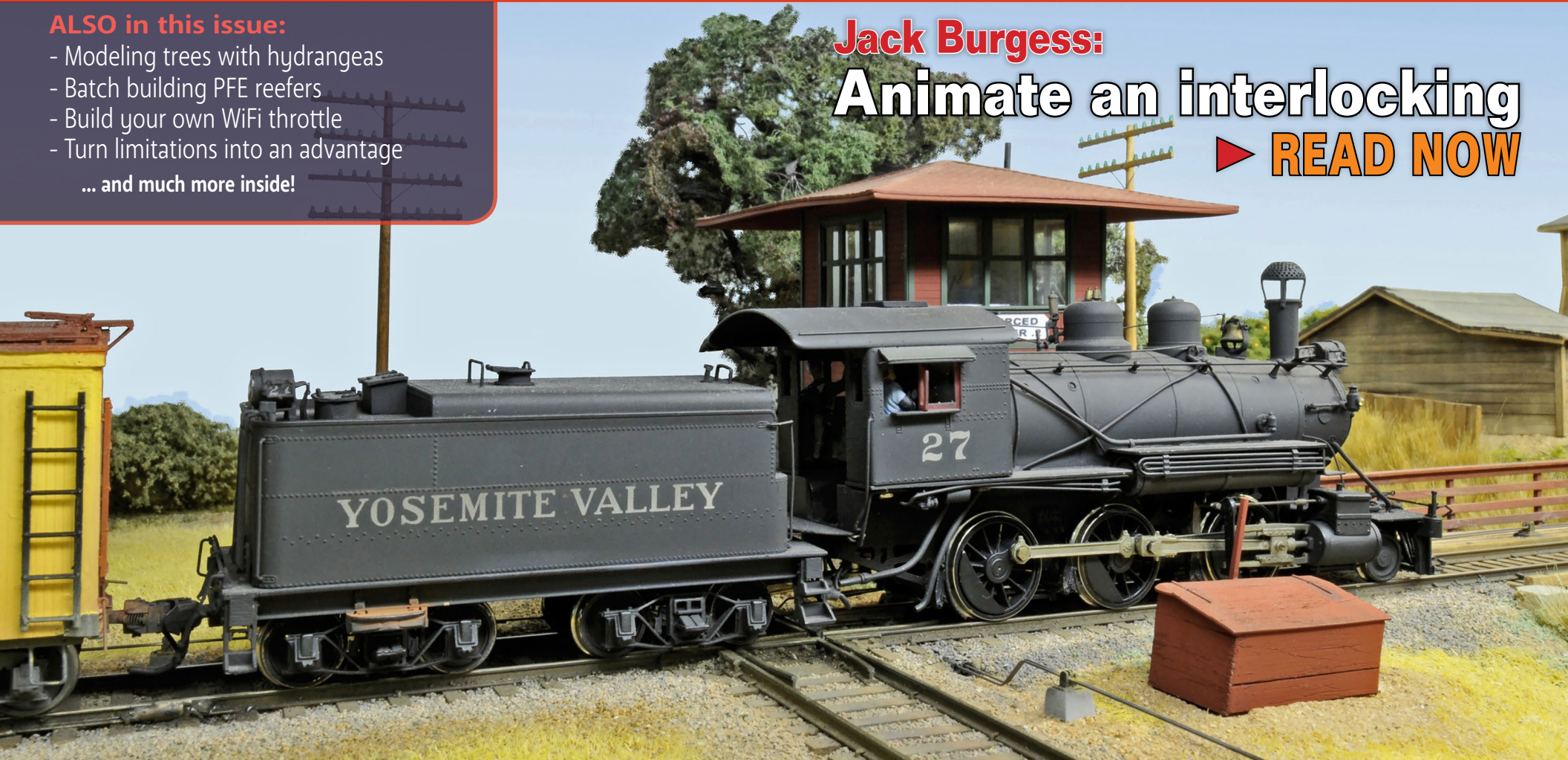


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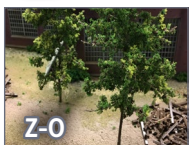
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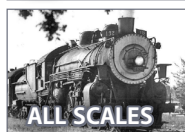
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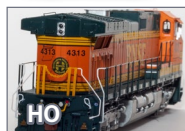
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PUBLISHER'S WELCOME

introduction



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JOE FUGATE: HANDY PLASTIC SQUEEZE BOTTLE NEEDLE APPLICATORS ...



RATE THIS ARTICLE

I KEEP FINDING MORE USES FOR PLASTIC

squeeze bottles with blunt needle tips, especially when I have a full assortment of needle sizes to go with them.

The different needle sizes give me a lot of control over how the liquid or powder I put in these bottles gets applied.

For example, I like using an 18 or 20 gauge needle to apply graphite powder to couplers. For applying liquid styrene glue (which flows very easily), I prefer a 27 or 30 gauge needle so I don't accidentally flood my model uncontrollably with styrene glue everywhere.

For more viscous liquids like heavy lubricants or resin soldering flux, the 14 or 15 gauge needles work nicely.

You can get a complete set of all the blunt needle sizes [1] from Amazon for only \$10: [amzn.com/B077NZ9RPD](https://www.amazon.com/B077NZ9RPD)

Amazon sells a package of eight 30ml plastic squeeze bottles [2] for \$12: [amzn.com/B07CMQSWKJ](https://www.amazon.com/B07CMQSWKJ)

NOW A DIFFERENT COVER STORY THAN MRH

Previously, we've been featuring the same cover story on both **Running Extra** and **MRH**. After all, Running Extra does have all the MRH pages in the back. But as we thought about it, featuring a different story on the RE cover better communicates the purpose of RE – *more* content that's *not* in MRH. This will be our RE cover practice going forward. ☑

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Spec	ID (in/mm)	OD(in/mm)	Color	Length	Qty
14Ga	0.061/1.55	0.083/2.10	Olive	1/2"	12
15Ga	0.054/1.36	0.071/1.80	Orange	1/2"	12
18Ga	0.033/0.84	0.050/1.27	Green	1/2"	12
20Ga	0.024/0.60	0.036/0.92	Pink	1/2"	12
21Ga	0.020/0.51	0.032/0.82	Purple	1/2"	12
22Ga	0.016/0.41	0.028/0.72	Blue	1/2"	12
23Ga	0.013/0.34	0.025/0.64	Amber	1/2"	12
25Ga	0.010/0.26	0.020/0.52	Red	1/2"	12
27Ga	0.008/0.21	0.017/0.42	Clear	1/2"	12
30Ga	0.006/0.16	0.012/0.31	Lavender	1/2"	12

↑1. You can get this huge assortment of plastic squeeze bottle blunt needle tips from Amazon for less than \$10 US. The set comes with a dozen of each tip – a life-time supply for most modelers!

→2. Amazon sells this set of eight 30ml squeeze bottles for just \$12 US. The set comes with a few 16-22Ga needles and caps (in red), but if you get the needle assortment in [1], you'll have just about every combination you'll ever need.



THE LIMITED MODELER

column



MRH Running Extra | April 2019

JIM SIX ASKS IF PERSONAL
LIMITATIONS ARE REALLY A
DISADVANTAGE ...



WHILE I HAVE MANY LIMITATIONS, I HAVE NEVER let them stop me from being a *railroad modeler*. I have reversed *model railroader* to read *railroad modeler* because I am a modeler. “Railroad” is simply an adjective describing what I model.

That said, I am also a *model railroader* because am a person that railroads with models – that is, I operate my models! So, I am both a *railroad modeler* and a *model railroader*. That jumble of words said, I view myself as more of a modeler than an operator.

I love to operate my layout, but I haven’t as much experience operating as I have building models. As I grow older, I expect to place more emphasis on operating my models, as I expect to start losing some of my modeling skills as I age.

In spite of my limitations, I have managed to build a lot of credible models – at least in my not-always humble opinion!

► DOING MORE WITH LESS

THE LIMITED MODELER | 2

Here is a scene on my layout [1] back when I was modeling a 1955 setting in northern Indiana.

One of my limitations is picking *a time* and *a setting* to model, then *sticking with it*. Though I presently model 1927, I could return to the New York Central in 1955 in a heartbeat! I love New York Central lightning-striped diesels!

But clinging to some common sense, I won’t do that. It would mean having to give up too way much – primarily in the area of operation. The farther back I go in time, the more operation there is to model.

Face it – railroads did a lot more a hundred years ago than in more recent times. Modeling 1955 simply does not allow the operational possibilities you find back in the 1920s and earlier.



1. Jim started out modeling 1955, but that changed to 1927 and all steam, thanks to Jim’s love of steam.

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Over the past editions of the “Limited Modeler” column, I addressed personal limitations we each have.

This month I’d like to talk about some limitations imposed by the time and setting we choose to model. I just pointed out how modeling 1955 is more limiting than modeling the 1920s. Permit me to explain.

Most of us are space-limited, so we look for other ways to satisfy ourselves. My solution for getting the most out of the least space was to shift my era to the 1920s from the 1950s that I had been modeling. This is doing a great job managing and working with my limited space.

Yes, you can use a modeling era to manage limited space. The era or time setting will absolutely affect how much operation any given space can yield.



2. Norfolk and Western freight just rolls right on through town without stopping.

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Modern railroading has little operation to offer compared to earlier times. I’ve said many times that the farther back in time you go, at least to the 1890s, the more railroad activity there was. Lots of businesses, companies, and factories were railroad-served.

Today, only the largest industries tend to be rail-served. Keep in mind that the more rail-served customers there are, the more time you will spend switching them.

Most of us enjoy switching. Switching is a time-eater. Going back to the 1920s or even earlier will provide many more customers – which take a lot more time to switch. This is how you can get several hours of operation from a relatively small layout.

THE SMALLER LAYOUT

So tell me: is having a smaller layout necessarily a disadvantage?

Isn’t operation a reason, if not the primary reason for having a layout? If you answer yes, then ask yourself what you mean by operation. If you answer no, then you don’t need to read any farther – we’re done here!

Deciding how important operation is to you sounds simple, but I don’t think it is simple. Not all model railroad operation is the same.

For many years when I thought of operation, I envisioned Allen McClelland or Tony Koester and their large layouts which are/were operated like a real railroad. But there is more.

I have been personal friends with Tony for more than 30 years, so I am comfortable using him in this example. Tony’s layout represents a division of the Nickel Plate Road, with several locations and towns modeled.

As much as I like and appreciate what Tony has done, I cannot build such a railroad due to my limitations. I believe most

railroad modelers are in a similar situation. We are challenged by our limited layout space and/or time for such a layout.

RUNNING A RAILROAD RATHER THAN RUNNING A TRAIN

I see operation like that of Tony Koester and some others as primarily about running the railroad instead of operating a specific location or two. I assure you Tony is dead-serious about doing so as realistically as possible, and has achieved that.

Yes, there may be some switching along the way, but Tony's railroad is much more about getting trains from point A to point B. This kind of operation is very popular, and is highly promoted by magazines, the NMRA, and by other organizations – yet few of us will ever be able to have this in our own home.

You will need to join an operating club or participate with those who have a layout that supports such operation. There is nothing wrong with this. In fact, I encourage model railroaders to do so. We can have fun and make many friends.

Few of us have the space or resources for modeling a large operation. We are much more limited.

But again, is this really a disadvantage that keeps us from building a model railroad that is satisfying and fun to operate? I suggest that it is not, unless you let it become one.

MODELING JUST A SPECIFIC LOCATION

Instead of modeling divisional operation, how about modeling the operation in one specific location? Don Hanley (former *MRH* Assistant Editor) and I call this building a one-town layout.

One thing that should be obvious is that one town can fit into a limited space much easier than two, three, four, or more towns. That's a no-brainer.



J. Shultz

ONLY RUN-THROUGH TRAINS?

It's true rail service today includes a lot of run-through trains handling coast-to-coast freight, but that's hardly all there is.

Big modern diesels like a Dash-8 40C do tend to power run-through trains rather than locals. But more modern MP15AC's or slightly older GP39-2's almost always run switching jobs and locals. The same was true in the steam era – you found more 2-8-0s and 2-6-2s on locals and switching than you did 4-8-4s or 2-10-2s.

There's also the rise in modern shortlines who do plenty of switching. These shortlines also tend to have a lot of hand-me-down power, including rebuilt first generation diesels. For example, our local Portland & Western is hardly a "nothing to switch" line!

But with one town, wouldn't your Dash-8 40C and other modern locomotives roll through town and be gone in seconds? Yes, they would. That is exactly why I prefer modeling earlier times like the 1920s.

In these earlier times, many trains – including some passenger trains – must stop and work the town. Modern trains don't stop, as there is nothing for them to do. Most rail-served customers are long-gone or are served by trucks.

As an example [2] shows a Norfolk Southern train rolling through a small town. Beautiful picture but there is nothing here for a railroad modeler to do. No coal dealers, no oil dealers, no freight stations, no small factories or industries to switch.

So yes, modeling a one-town setting in the age of wide-cab diesels most likely would be very boring.



3. Rail-served power plant in Bluffton, Ohio from the 1940s.

THE JOYS OF SWITCHING

Many of us love to switch a town with a local freight. If you are modeling a modern setting, an industrial park could work for you.

I like to switch. My fun is derived from bringing a local freight into a town, then switch local industries, picking up empties at a local coal dealer and spotting a coal hopper or two.

The same for tank cars at a bulk oil dealer, and boxcars at any number of different industries. Local train operation is my sweet spot.

I also enjoy switching a large industry with a dedicated train. I am building a power plant where about 20 coal cars move every day.

I bring in a train loaded with coal, switch the cars as needed, then leave the plant with empty coal cars. This typically takes about an hour.

I find this switching to be great fun, and it fits into a short evening when I don't have time to operate the entire layout. It also provides a job when I have a few friends over to operate the railroad.

This coal train interferes with local freights and passenger trains. The objective is that all interact in a realistic way.

POWER PLANT OPERATION

How is power plant operation affected by the era we model?

Simple. Modern power plants are much larger than power stations of the 1920s and earlier. They take large coal trains – like 100-car unit trains.

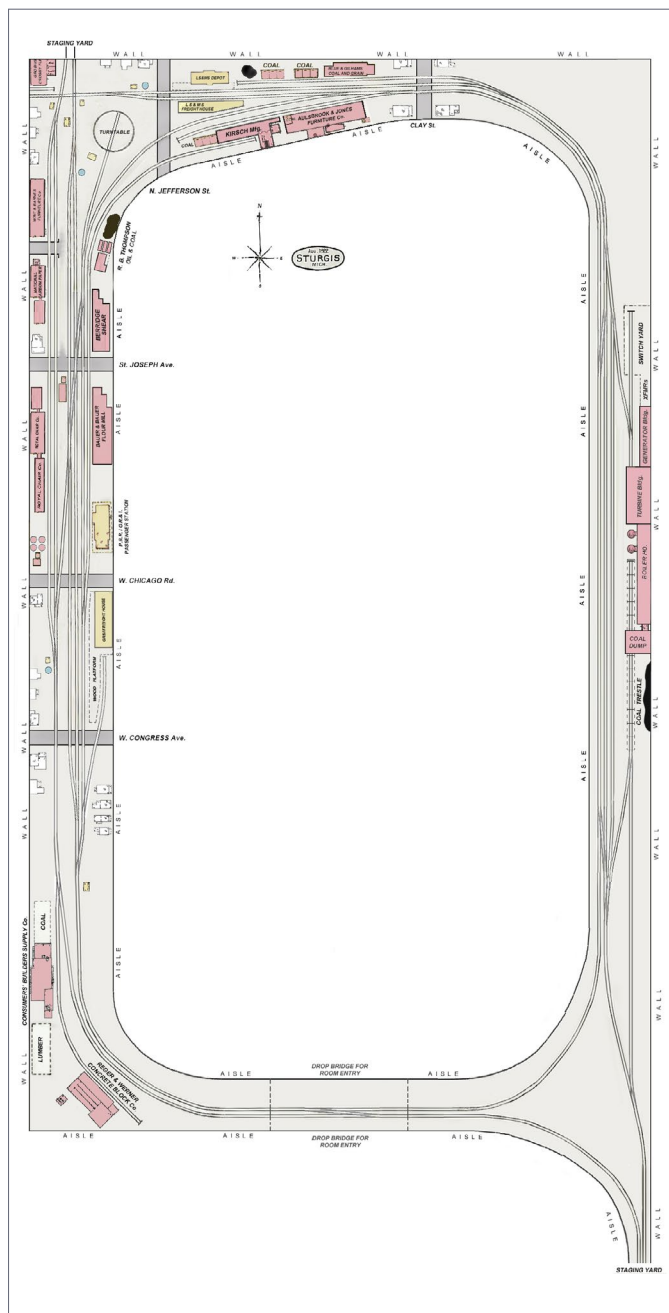
It is next to impossible to model this on anything but a large layout. My 1920s power plant is much smaller, and takes only about 20 cars per day.

This takes a lot less space to model and operate. My hoppers are mostly short 32-foot cars with some 40-footers mixed in.

A Bluffton, Ohio plant [3] is the basis for what I am modeling, but am backdating it to the 1920s. This will necessitate some architectural changes. Coal hoppers will provide fuel for the boiler and the storage coal pile for use when coal delivery is interrupted. You know – wrecks, track washouts, or even a labor strike.

Tank cars will provide oil for the auxiliary boiler during times when the generator is shut down for maintenance. Gondolas, and flat cars will bring, deliver, and pick up heavy equipment like transformers, turbine and generator rotors, etc.

★★★★★
RATE THIS ARTICLE



4. Even with the smaller space for a 1920s power plant, I am dedicating about 12 feet to mine. It will pretty much occupy half of one side of my layout. The power plant is the only industry on the right side of this layout plan.

This is a big sacrifice of space, but building being able to switch this plant means a lot to me. I worked in the electric power generating industry for more than 20 years, so I *know* it – and I like it.

Boxcars will deliver various supplies and equipment. This will be a busy industry. Time will be needed to pick up and spot all these cars.

FITTING THE POWER PLANT ON MY PLAN

You can see that I am somewhat space-challenged, but have devised ways to turn this supposed limitation into an advantage. Since I cannot focus on running trains over distance, I found ways to focus on the work and duties trains must do in my Sturgis, Michigan location.

My freelanced power plant on the east side of town [4] is a bonus that satisfies my desire to build and switch a power plant. The key here is that if you are limited in one area, then focus your attention on maximizing another aspect of model railroading. In my case focused on railroading in one town.

Here are some ways to do this. If you are space-challenged, look for ways to turn this into an advantage is by modeling smaller, slower trains with small freight cars pulled by a single locomotive.

Since I am modeling 1927 – before the Great Depression – I can have 36-foot and shorter freight cars as my typical rolling stock.

Pre-Depression freight cars were dominated by less-than-40-foot

I can still smell coal-fired plants! My desire to not forget makes me want to model one. Much of my power plant is imagined on the other side of the wall. I only represent parts needed to convey its presence, and what is needed for operation.

Spreading out industries will increase the time needed for operation. This is operational realism!

prototypes. There were almost no cars longer than 40 feet. Fifty-foot cars were a rarity, and nothing longer than 50 feet.

Short cars make short trains. Single locomotives like 2-8-0 and 2-8-2 steam locomotives could not pull a hundred or more cars like today's diesel locomotives. Local trains with fewer than 10 to maybe 20 cars were typical.

I target 10 cars in my local trains, sometimes more, sometimes fewer. With short freight cars and short trains, a layout effectively grows in size by perhaps a factor of two, compared to contemporary railroading.

RAILROADING BEFORE THE DEPRESSION

Prior to the 1930s, particularly between 1890 and 1920, railroads were the center of activity in most American towns and cities.

After the 1920s, each passing year saw a diminished role of railroads, as use of automobiles and particularly trucks increased. In a 1911 scene in Sturgis, Michigan [5], there isn't an automobile in sight. The scene is focused on the two railroads – the Grand



5. Sturgis, MI in 1911, looking south.

Rapids & Indiana (later PRR) at the left and the Michigan Central (later NYC) at the right.

During the great depression of the 1930s some of these tracks fell into disuse and were abandoned as the economy took a toll on railroad business. Those were certainly hard times.

During the 1950s, the Michigan Central tracks in this scene were abandoned and later removed, leaving only a reduced GR&I (PRR) to serve this area. By then most business in Sturgis was served by trucks and not by railroad.

By the 1970s the GR&I had long been the PRR and finally the Penn Central before being further reduced and sold as a local short line. Today the railroads are gone from this scene except for one former GR&I track that is used just once or twice each week to serve a single customer.

My point is that with each year you move from the 1920s toward the present, the less there is of your railroad and the less there is for it to do.

During the 1920s and earlier, there are railroad customers and activities that did not exist in the years after the Great Depression. Therefore, modeling those early years is a big advantage for the model railroader.

So much for being limited!

RETHINKING "LIMITED"

Many of us need to recalibrate our thinking.

How big is a layout section that trains simply roll through in less than a minute? How big is a layout that has three, four, or more on-line customers that need to be switched? Hmmm . . .

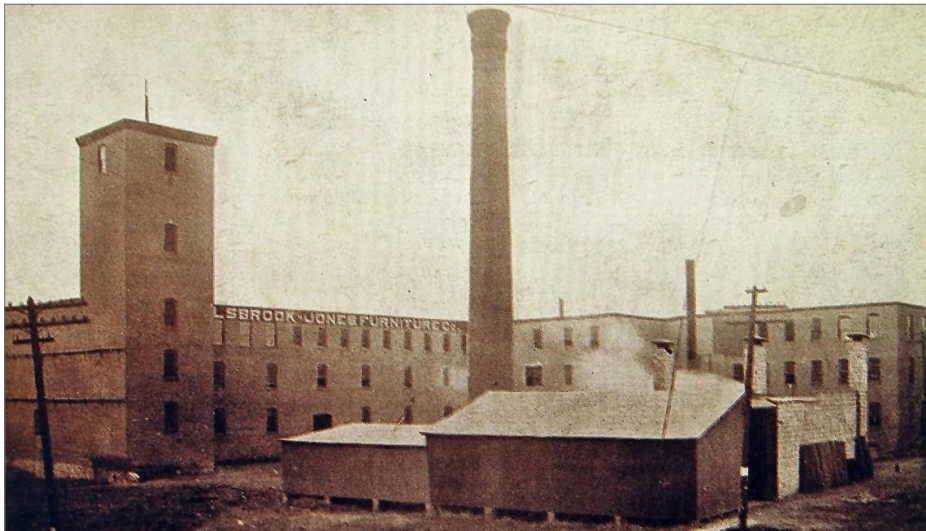
It typically takes 15 to 30 real minutes to switch the layout with these customers, compared to 30 seconds to roll through without customers. Tell me, which is bigger?

I measure layout size by how much time it takes to get from point A to point B, not by how many feet of mainline it has. A small layout with on-line customers has this advantage that large a contemporary layout does not have.

Let's see what we've learned. How does modeling a pre-Depression setting have to offer that later times don't? Simple – "on-line customers" and lots of them.

In 1922 Sturgis there were seven rail-served coal yards, plus nine factories that received coal for their boilers. This is 16 locations that received coal.

Then there were oil dealers – five of them in Sturgis. All received tank cars. And get this – five of the coal yards also sold oil!



6. Aulsbrook & Jones Furniture Co., Sturgis, MI circa 1900.

How many of these are in business today? Zero! How many were still around in 1970? Zero which were rail served. What about 1950? As far as I have been able to determine there were two rail-served coal dealers and one rail-served oil dealer.

So, let me ask, do you see the advantage of modeling a setting before the Great Depression?

HOW ABOUT FACTORIES?

There were far more small rail-served factories before the Great Depression. One, two, or three such factories can be fit into a small layout, and will provide more than enough operating fun. I believe it is safe to say that small layouts and early settings go hand-in-hand.

Not just Sturgis, Michigan, but in towns all across America, most small and medium factories are long-gone. Look at the Aulsbrook & Jones furniture factory [6] back about 1900. This factory grew and prospered through the 1920s. It received coal and oil, along with a lot of lumber shipped in boxcars. It shipped out furniture via boxcar.

This was one of five furniture factories that operated in 1922. How many remain today? Zero. Most did not survive the Great Depression, and the remainder were gone before 1970. With the loss of each factory, there was less to model.

Small and medium factories offer plenty of switching and generate a lot of rail traffic that drives model railroad operation. This rail traffic does not roll through town without stopping.

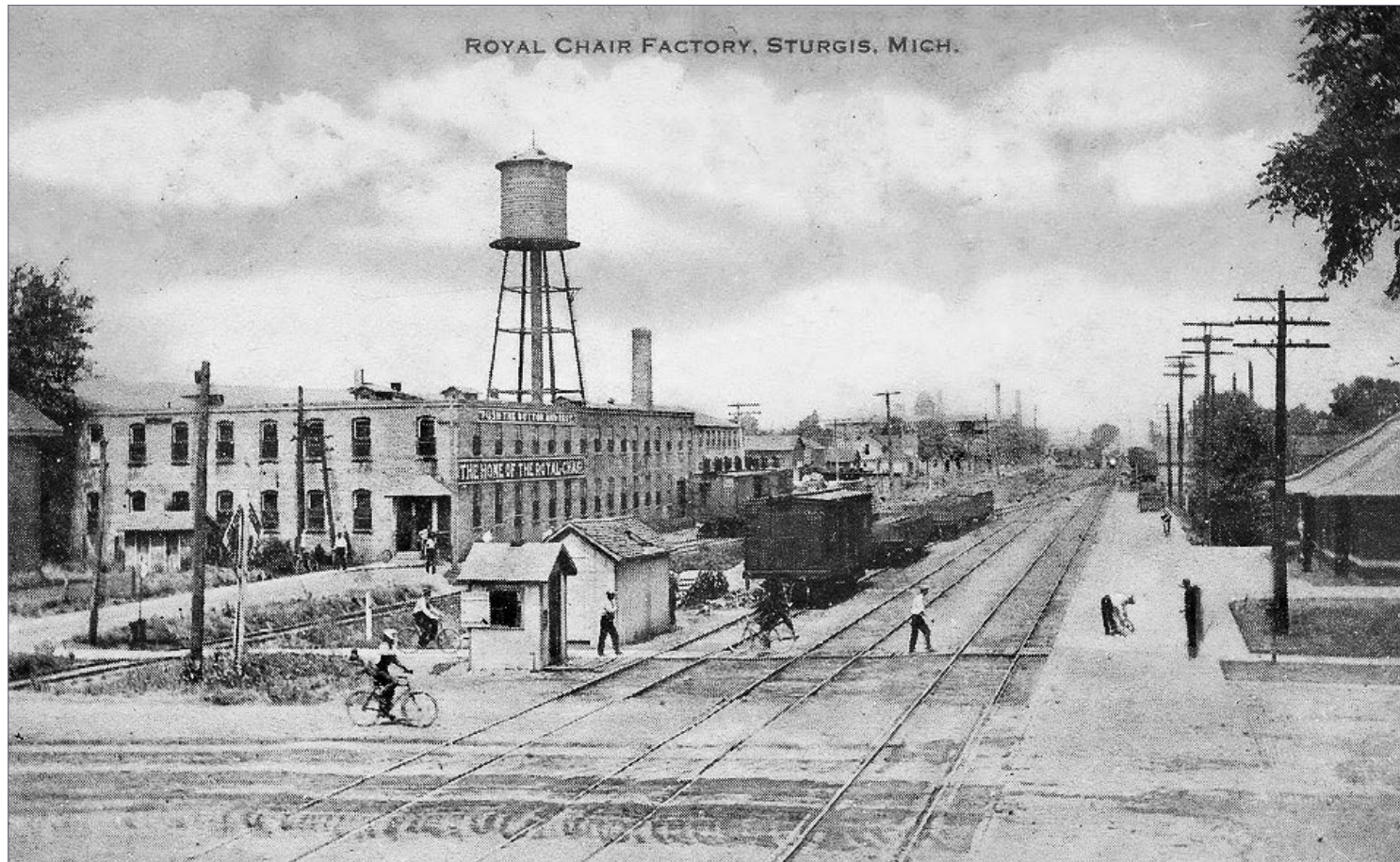
Instead, the factories bring in freight cars that have to be set out and others picked up. This all takes time and is great fun!

Looking at a factory photo from the early 20th Century [7], this

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truly is a dream-setting for the model railroader who likes to do switching *and* run through trains. There is the obvious Royal Chair factory. There are smaller factories beyond Royal Chair. There is a team track in the center.

And let's not overlook the GR&I (PRR) depot at the right. Virtually everything in this scene has to be switched by the railroad. There is nothing left here for the contemporary railroad modeler. Nothing!



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Note all the people and detail in [7]. There are even a couple of people riding bicycles. A southbound train is approaching in the distance on the GR&I/PRR – probably coming into town from Grand Rapids. A boxcar and three gondolas are on the team track. Two more boxcars are spotted at Royal Chair.

Tracks are all but gone in contemporary railroading, but they were vital and plentiful in earlier times. I count eight smoke stacks in this scene. Smell the coal smoke? I do.

All these smoke stacks represent factories, which means rail traffic. Note the wood sidewalk that crosses all the tracks, and the watchman's shanty in the middle of the scene.

Much of this scene can be built into a small space. Such a setting is a great way to manage your limitations.

The next page has another view of Royal Chair [8]. This image appears to be in the 1920s. Note the 36-foot wood boxcar. Factories like this mean rail traffic and switching.



7. Royal Chair Factory, Sturgis, MI.

I'M NOT THE ONLY ONE

I am not the only person modeling an early setting in order to deal with limitations. Rob Clark models a generic Appalachian setting representing the early 1930s. [9] is a photo of Rob's beautiful layout.

This is a very believable and well-composed scene indeed. Rob has chosen a mountain setting in a time when Ford Model A cars and trucks were the norm. He has made good use of photo backdrops of the distant mountains with foreground trees added to blend it all together.



The mountainous backdrop provides the impression of distance and great depth. This is a great help when you have little space. I would love to visit Rob and operate on his layout.

This photo makes me feel like I am standing there looking at the real thing [9].

Another layout photo [10] shows a scene on Ray Breyer's 1929 layout. Ray models the Nickel Plate Road with some New York Central mixed-in for good measure.

Pictured here is an Oriental brass NYC H5 2-8-2 Mikado pulling a train of Accurail boxcars and a resin gondola. This scene shows again how modeling an early time helps manage your limitations.

A single locomotive pulls a train. If Ray were modeling contemporary railroading, how many locomotives and freight cars could fit into this same space? Not many.



8. Another view of the Royal Chair factory in Sturgis, probably from the 1920s.

THINKING SMALLER

How about this scene [11] that requires little space, yet is not modelable on a contemporary layout.

In this scene, manure is being loaded into an old composite gondola from a wagon! I don't believe I would like to have done that job standing up to my knees in manure!

The scene is in Pittsburgh, PA where manure was picked up from city streets and hauled out of town in rail cars. Still, all you need is a team track, and you are in business.



9. Rob Clark's Appalachian area layout set in the 1930s.
Rob Clark photo



10. Ray Breyer's layout set in 1929. *Ray Breyer photo*



11. Early railroading scene – can you imagine this being on a modern-era layout?



12. Very model-genic scene from early 20th Century railroading.

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Early 20th-Century scenes [12] often can provide a setting that's perfect for a small shelf layout. I believe that most railroad modelers will see this as one of several potential scenes along the line.

I see this same scene as possibly an entire layout. There are enough customers for plenty of switching. I can see fitting this scene onto one side of a 4' x 8' layout with a staging yard on the other side.

You could stage and run trains through this scene from either direction. Some trains might pass through without stopping. A local freight could arrive and do its switching, then continue back to the staging yard. The same could be done for a passenger train or two.

I keep harping on featuring local freight trains. The point is, local freight trains are a key, if not *the* key, ingredient to designing and operating a small model railroad.



13. Another typical small customer for your layout.

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You can spend hours of enjoyable time operating your local freight train on a small layout.

Here is a small customer [13]. It has two tracks, one where coal hoppers are spotted and unloaded to dump trucks across the second track where empties can be spotted.

The local freight drops off more loads and picks up the empties.

I plan to have this scene on my layout, but it will be switched with shorter two-bay hoppers like the USRA hoppers Accurail and others offer.

In reality, this scene will work for the early 1900s to the late 1960s. It could be positioned against or near the backdrop, taking very little space.



14. Another small coal unloading facility, perfect for a steam-era layout.

SPEAKING OF COAL UNLOADING

Here is a similar coal unloading facility, [14] this one even simpler than the one in [13].

The car is similar to a USRA two-bay hopper car. There is only one track, meaning less space is needed to model it.

There is a utility pole for electricity, a small shack where the conveyor controls and electrical equipment probably is located, and



15. Here is a coal yard on my layout a few years ago. Today, it is complete with a wood fence around it. In this closeup you can see the pit below the tracks for unloading coal, the conveyor, and even an electrical disconnect box near the utility pole. There's even an old metal trash can nearby. A couple of workers are chatting while waiting on a hopper car of coal to be spotted over the pit.



E. Hansmann

GET BROAD OPS EXPERIENCE

Most of us build a model railroad to run it. As we gain prototype understanding, we apply that to our layout operations. We are always "running a railroad" on our layouts.

In my experience running on large and small layouts, the goals are often to include some level of prototype practices. Each train or job has specific tasks to perform. Not only must trains run from A to B, but cargo must be delivered to industries. Empty cars go to customers with goods to move – it's how railroads made money. As modelers, we can emulate these prototype practices for any size model railroad layout built in any scale.

As an example, my own HO scale Wheeling Freight Terminal was a 10x16-foot U-shaped layout. Some 95 freight cars would be spotted and/or pulled from spurs and spot at locations during an op session. A pair of two-man crews kept busy during a three-hour session using switch lists to determine car movements. I did not use a timetable or train orders on my circa 1926 layout. Crews returned each month, so they must have enjoyed the layout op sessions.

Operate on a variety of layouts as you develop your layout plan. These first-hand experiences will guide your layout design as to what you enjoy most and lead to the best long term hobby satisfaction.

of course, the small conveyor for loading coal into an awaiting dump truck.

There is a small pocket beneath the track to dump coal onto the conveyor. This is simple as it gets, and would work great on even the smallest of layouts.

Model railroaders seem to have had a love affair with coal trains and coal mining for their layouts since the 1970s when Allen McClelland presented articles about his Virginian & Ohio layout. Unit coal trains are generally long – too long for a small layout.

But in earlier times coal was not always hauled in unit trains of 100-ton hopper cars. Much coal was delivered to local yards [15] and to factories with boilers for steam heating and steam-driven machinery.

Modeling factories in settings 75 or more years ago is great for small layouts. Most were much smaller than today's factories, and most all were railroad-served. See [16] to see a coal yard as part of a factory on my layout.



While not yet complete, you can see I added a boiler house and coal unloading facility.

In this case it is my Royal Chair Company. The factory needed steam for heating and operation of equipment. Have you added a boiler house to your factories, and a small facility for unloading coal to fire the boiler?

Small two-bay hopper cars and gondola cars were found in freight trains to be set out at factories and coal yards.

Often they were found at grain elevators and feed mills in rural areas, as these dealers sold coal, oil, feeds, and various supplies including lumber.

CONCLUDING THOUGHTS

Space limits might prevent a large layout, but they offer several advantages.

A small layout will cost less money than a large one, you will not need as many locomotives or pieces of rolling stock, and you can get the layout built in less time – allowing you the luxury of adding more detail and realism than you could with a large layout. Please tell me that these are not advantages! ☒

16. Another coal yard to supply a coal-fired factory boiler.

GETTING REAL

column



MRH Running Extra | April 2019

1. On an early August morning, an eastbound freight train with 2-6-0 No. 29 on the point waits for a PROCEED signal to cross the AT&SF tracks east of the Yosemite Valley Railroad Merced station.



JACK BURGESS ANIMATES AN
INTERLOCKING PLANT ...

★★★★★
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MY PROTOTYPE, THE YOSEMITE VALLEY RAILROAD,
crossed the mainline tracks of the Atchison, Topeka, and Santa Fe Railway a mile from the YV station in Merced. That crossing

► **MODELING REAL RAILROADS AND WHAT THEY DO**

GETTING REAL | 2

was controlled by an interlocking plant in a 14 x 15-foot two-story tower maintained by the AT&SF [1].

In the late 1970s, I scratchbuilt a model of this AT&SF tower based on a limited amount of prototype information and used it on an earlier layout. I later replaced it with a better model [2]. But more prototype information ultimately led me to replace that model yet again with a more prototypical building.

By this time, I had about a dozen photos of the building and was quite certain that I had all the dimensions and details correct [3]. I even had a color photo of the tower, taken in 1945, showing the paint scheme of the building [4]. However, one photo of the tower taken in July 1940 – I model August 1939, had a completely different paint scheme and this confused me for decades [5].

Fortunately, just before painting my newest structure in that yellow and tan color scheme, I learned that the AT&SF had an earlier paint scheme of red with green trim. I found a color photo online of a restored SF depot in Littleton, Colorado and, after converting the photo to B/W, it exactly matched that B/W photo [6].

As I completed that third tower building, I began envisioning a much more involved project and one which turned out to be challenging and thus very rewarding. Those are the types of projects which I really enjoy.



2. This model of the AT&SF tower was the second one that I built. It replaced my first one, constructed with very limited prototype information.

THE PROTOTYPE TOWER

This AT&SF interlocking tower featured a manual 12-lever machine with 9 levers in operation. The plant controlled four derails (one for each direction on each railroad), four home signals (one for each direction on each railroad), and one distant or advance signal for the southbound AT&SF traffic.

The signals against the YV were standard three-position semaphores limited to only two aspects— STOP or PROCEED. The towerman controlled all the semaphores, derails, and the advance AT&SF signal via a mechanical system of 1¼" black pipe controls set from the tower. Derails were the split-rail type and were always left in the protected, or open, position against the YV with the normal aspect for the signals at the STOP position.

I don't have the room to model the AT&SF signals on my layout so my original crossing installation modeled just the YV semaphores using a pair of Tomar Industries US&S Lower Quadrant Semaphores (custom-built by Tomar using their H-840 models but without the cases).

A Circuitron Grade Crossing circuit board was used to control the semaphores. The signals themselves were activated by a pair of Tortoise Slow-Motion Switch Machines. While the interlocking plan worked, I even-

tually also wanted a working derail on each approach and for the semaphores and derails to move sequentially per the prototype.

A pivotal point in this expanded project occurred when I read the article in the July 2009 issue of *MRH* about using servos for controlling turnouts and signals. I then had the opportunity to meet and talk to the author of that article, Duncan McRee of Tam Valley Depot, at the 2009 NMRA Convention in Hartford, Connecticut.

Servos used in remote-controlled aircraft and ship models have several advantages for the control of semaphore signals. Unlike

stall motors, the end points or stop points of servos can be set precisely and electronically rather than mechanically.

The control logic sequence of the interlocking plant (based on photocell detector inputs) can be set by a simple computer program running on a programmable microcontroller chip.

In addition, the speed of the servos and the delays between various movements can be set by “constants” in that computer program. That allows those factors to be easily modified once the physical plant has been built and tested.

Since I wanted to control two semaphores and two derails in my interlocking plant, I purchased four servos and a Quad Servo Accessory Decoder board from Tam Valley Depot (www.tamvalley-depot.com/moreproducts/quadservodecoder.html).

I also purchased an LED Indicator Board which was very helpful in setting delays and fine-tuning operations. (Those boards are no longer available.) For detection I purchased a pair of Logic Rail OD-1 Optical Detectors.

The last component was the software code. The code for my project was written using a “logic” outline I provided. A specific sequence of events begins when an approach photocell is covered by a train. After the derails have closed and the approach signal has changed from STOP to PROCEED, the train can move through the interlocking plant. It then covers the photocell for the opposite approach.

Once that departure photocell has been covered and is then uncovered (indicating that the entire train is clear of the interlocking plant), the derails and semaphore return to their protected states.

The delays between each action can be easily changed and set by the computer code uploaded to the Quad Servo board. This was



3. This is one of a dozen photos of the AT&SF tower and dates from 1945. No. 3, a mixed train, is pulled by 2-6-0 No. 28. *Al Rose Collection*



4. This color photo taken after abandonment was the source for the color scheme on my second model of the AT&SF tower. *Al Rose*

done via a standard USB cable connected to a laptop computer loaded with the code.

The code on the laptop could also be used to change constants for delays and servo speeds after testing. Installing the servos is much like installing a stall motor turnout controller though the fact that the end-points are electronically controllable makes adjustments much simpler [7].

As I refined my ideas for prototypically duplicating the working semaphores and derails for my interlocking plant, I also began to think about also duplicating not only the cranks and pipes which drove those semaphores and derails, but to also animate them in concert with the devices that they controlled.



5. Wilbur C. Whittaker took this photo of a passing AT&SF train at the tower in July 1941 during a railfan trip. I wrote about that fan trip in my *Getting Real* article in the May 2016 issue of *MRH*.

Thus, when a derail moved from the open to closed position, the crank nearest that derail would also move, which in turn would move the pipes all the way into the tower building [8].

Decades earlier I experimented with having scale switch stand targets rotate when the points of a turnout move, but it was nearly impossible to get the target to move 90 degrees in sync with the points.

Ultimately, I devised a way to use a single switch motor to both move the points and rotate the switch stand target. I used the same approach for the cranks associated with the semaphores and derails — four servos would control the two semaphores and two derails and directly drive the cranks for those devices through the same levers.

This is the reverse of the prototype (where the pipes and cranks drive the device) but it solves all the problems with things being in sync [9, 10, 11, 12].

The final software code and hardware installation resulted in a prototypically accurate replication of such a crossing. When an eastbound train approaches the crossing, the derail west of the crossing will close and then the derail east of the crossing will close.

The semaphore facing the eastbound train will then change to PROCEED. The semaphore facing a westbound train will not change. I'm ignoring the changing of the signals and derails on the AT&SF in the timing sequence, but each operation is separated by about 2 real seconds to allow the simulated "tower operator" time to move from lever to lever.

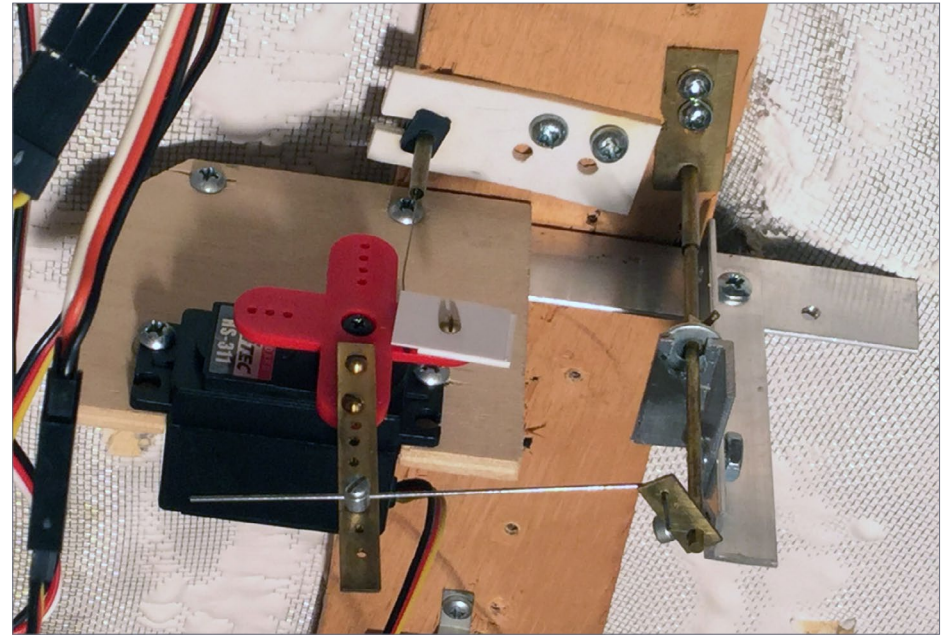
After the train passes through the interlocking plant, all the derails will open and the semaphore will revert to STOP. If a train approaches from the opposite direction, the sequence is reversed.



6. (Above) My third effort at replicating the AT&SF tower has not only the correct paint scheme for 1939 but also the narrower band around the now-correct sign board and a full interior on the second floor.

7. (Top right) Looking up from under the layout toward one of the semaphore installations. I wanted to get the servo (black) a few inches below the track to make adjustment easier, so it was mounted to a 2½"x3" piece of 1/8" plywood with one corner notched to clear the scenery (the plywood was notched to fit around the servo). That piece of plywood is screwed to a section of 1/2" aluminum angle which was then screwed to the plywood supporting the track.

The brass tube which is part of the semaphore itself comes down through the piece of white styrene also screwed to the bottom of the track base. The brass wire which connects



to the semaphore arm can barely be seen extending out of the tube and connecting to the servo cross horn (red). The piece of white styrene screwed to the cross horn keeps the semaphore arm wire in place.

The amount of movement needed to raise and lower the semaphore arm is very small and I wanted to turn the crank lever from the same servo. That crank lever needs to turn about 53 degrees so a piece of 1/4"-wide brass was screwed to another leg of the servo cross horn to move the crank lever. That crank lever is attached to the vertical brass rod on the right. The vertical brass tube and rod extend up through the track base and the rod is soldered to the crank for this semaphore. Note that the brass lever on that rod has a screw to tighten it to the rod. That let me set it so the crank lever was at one stop location. Then I could adjust the location of the driving rod to set the other stop position of that crank lever.

REPLICATING THE PROTOTYPE

While the “under the layout” servos control the derails, semaphores, and cranks, the visible details “on the layout” are also important. I am deeply indebted to Bill Darnaby for his comprehensive article in his January 2004 article in *Model Railroader* on modeling mechanical interlocking plants.

Bill discussed all aspects of static modeling an interlocking plant including the cranks, pipes, and carriers. I used Bill’s information



8. All the rods connecting the semaphores and derails extend into the first floor of the tower. While the rods paralleling the AT&SF tracks on the left are dummy ones, those on the right to the YV semaphores and derails are totally functional.



9. This is the eastbound semaphore and derail with the semaphore at the STOP position.



10. Here the eastbound semaphore is at the PROCEED position and the derail is closed.



11. Looking more closely at the lever for the semaphore when the semaphore is in the STOP position. One of the carriers for the pipe can be seen to the right of the lever.



12. As the semaphore moves from the STOP position to the PROCEED position, the crank also moves. The crank lever for the derails also moves in relationship to the derail points.

and ideas along with prototype photos of the YV/AT&SF installation to model all these details.

Bill also patiently answered a series of questions regarding such trivial minutia as the angle subtended by a crank as it moved from the STOP position to the PROCEED position (at mid-stroke, the crank arm should be 90 degrees to the pipe, and there should be 4-3/8" of stroke either side of center).

This resulted in a crank movement of around 53 degrees. This was a very difficult factor to accurately model given the multiple factors of the lengths of the drive arms on the servos and cranks, but on a model a 53 degree angle of motion or a 75-90 degree angle isn't that noticeable. I needed several major components to accurately duplicate a prototype interlocking plant.

While a more complicated installation might involve multiple signals and possibly turnouts, my installation included only the pipes which transmit the actions of the levers from the tower, carriers for the pipes, and the cranks (and their supports) which transfer the motion of the rods from one direction to another. I wanted the cranks to move in sync with the semaphore blades and derails, and for all the visible components to be in scale.

Since they needed to work while also being to scale, I decided to use 0.015" steel music wire for the pipes. Since I needed several pipe and crank supports, I built masters for them from wood and styrene and then cast a couple of dozen in resin from rubber molds.

The cranks were fabricated from two pieces of scale 3/4"x4" brass strip. Since the "throw" on these cranks was critical and needed to be consistent, I built a jig to drill a pair of holes a scale 11" apart on these strips, typical of the prototype cranks.

The brass strips were then soldered at right angles to each

other, and to a vertical piece of .015" brass pivot wire which could be inserted into a crank support to allow each crank to move horizontally.

For both aesthetic and operational purposes, the crank supports and pipe carriers need to be carefully aligned both vertically and horizontally. Based on prototype photos of the YV/AT&SF plant, it appeared to me that the rods along each mainline were positioned slightly above the height of the rails.



While this might have been a correct deduction, I didn't realize until much later that the height of the rods controlling the YV semaphore and derail on the far side of the tower gradually "dipped" to pass under the AT&SF tracks to reach the tower. Since I didn't duplicate this "dip" in the rods and their carriers, I had to add "offsets" to the pipes to pass under the rails.

While either solution might have been prototypical in some situations, dipping the pipes (and their supports) would have been a better solution. However, I also have very limited space to dip the pipes under the tracks and back to grade.

Due to the varying elevation of the ground along my track, each pipe support and crank support needed to be a different height above the ground to make the rods level.



13. After getting clearance, eastbound Yosemite Valley Railroad No. 27 rattles over the diamond crossing with the AT&SF tracks east of the station in Merced.

To solve this problem, I built a styrene jig that fit between the track rails and extended out to provide both vertical and horizontal alignment of the rods and thus their supports. This allowed each support to be glued in place in both precise vertical and horizontal alignment.

ADDING THE TOWER ANNUNCIATOR BELL

After completing the installation and watching some visiting operators interact with it, I realized that I needed a way to make sure that engineers pulled far enough forward to cover the detector photo cell.

I added small, non-prototype, white boards indicating the location of each detector photocell, but that didn't completely solve the problem.

My final solution was to add another photocell on each approach, just past the detector photocells which control the interlocking plant. These two new photocells were connected to an Arduino microprocessor configured as a sound amplifier which turns on a bell sound when either of those detector photocells is covered.

The bell sound was purchased and downloaded from www.sound-dogs.com. After listening to dozens of bell sounds, I chose one which sounded like the school bell at my high school in the early 1960s. I then emailed the file to the late Andy Sperandio who had spent hours in his youth at an interlocking tower and he confirmed my choice.

The sound file was then uploaded to the Arduino board. When a locomotive covers the sound effects photocell it also covers the detector photocell and the alarm bell sound is played, ensuring that the plant will be set up to allow passage of that train.

After years of "automatic operation by photocells," something died in the main control board so I switched to push buttons for each semaphore and derail.

Now during the pre-operation talk with visiting operators, I not only show how the interlocking plant works but also ask them to return the semaphores and derails to the STOP position after clearing the plant. I also point out that the eastbound derail is at the top of a slope dropping down to the fascia, which is only about 4 inches away.

I tell them "If you don't remember to close that derail, that brass locomotive will hit the floor..." So far no operator has forgotten to close that derail before proceeding. ✓



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Model trees *using Oakleaf Hydrangea*

MODEL TREES WITH OAKLEAF HYDRANGEA | 2

MRH Running Extra | April 2019

1. The nice looking model trees made from Oakleaf Hydrangea on my layout.

★★★★★
RATE THIS ARTICLE

MICHAEL ANTEAU makes model trees from a common flowering bush ...

I'VE SET MY HO SCALE NICHOLAS & ASHLEY CREEK Ry in mid-summer West Virginia and, like many model railroads, it will require hundreds of deciduous trees. I'm constantly searching for methods to make foreground trees that are (1) inexpensive, (2) quick to make, and (3) detailed. I've tried several commercial options, and they all create terrific trees. But none of them satisfy all three of my criteria.

One of the keys to a detailed foreground tree is the armature. I've used several types of weeds for armatures but I have never been satisfied with them. Then, while doing yard work this past fall, I found a great source for tree armatures, the Oakleaf Hydrangea. My wife loves this bush, and we planted one a few years ago.

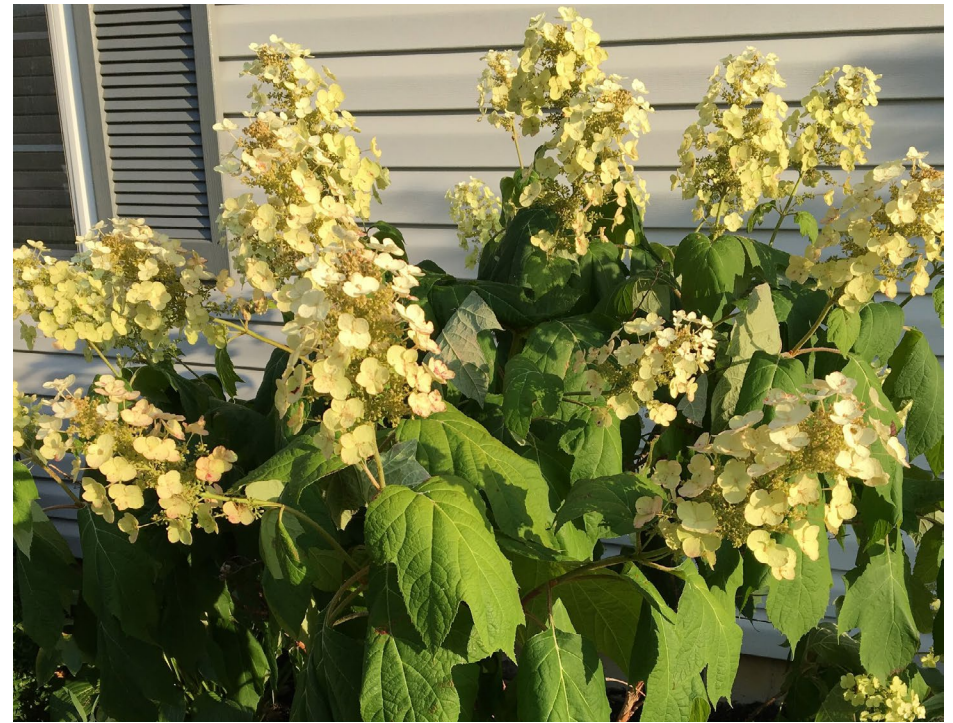
The Oakleaf Hydrangea grows in USDA zones 5-9 [2], which cover most of the continental United States. It produces a flower that is about 3-5 inches wide and 6-12 inches tall, a perfect size for HO or N scale trees! The flower armature, called a panicle, is detailed but not too fragile, and looks like a miniature oak tree. Perfect! Our two-year-old bush currently produces about 50 panicles per year [3]. These are the white flowers in the image. You can read more about the Oakleaf Hydrangea on Wikipedia at en.wikipedia.org/wiki/Hydrangea_quercifolia.



2. The Oakleaf Hydrangea bush can be found in most of the continental U.S.

With permission from my wife, I harvested the flowers in the late fall, after the color had faded and the bush was going dormant. I then developed a quick method to turn them into foreground trees.

I estimate the time required per tree is less than five minutes, including harvesting, and the cost is pennies per tree. I like the airy detail of the final product, so these trees satisfy all three of my criteria. Follow along as I turn some Oakleaf Hydrangea panicles into HO scale trees.



3. The Oakleaf Hydrangea in full summer bloom.



E. Hansmann

PAIN AS THE ADHESIVE

I've also made trees using Oakleaf Hydrangea. I avoid using the 3M spray adhesive as it goes everywhere. After spraying the armatures with the brown or gray rattle cans, I sprinkle on the ground foam. The paint becomes the adhesive.

STEP 1: CUT AND TRIM THE PANICLES (1 MINUTE)



4. End of summer dried Oakleaf Hydrangea panicle.

Begin by cutting the panicles from the bush. This is a quick process with a garden shear. While I'm at it, I use scissors to cut the small flowers from the ends of the twigs, keeping the mess outside. When I'm done, I have a box full of ready-to-use armatures. The panicle in the image has some insect evidence on it. I cleaned this off before proceeding. The tiny buds can be left on, as they help hold the ground foam later, and seem quite permanent.



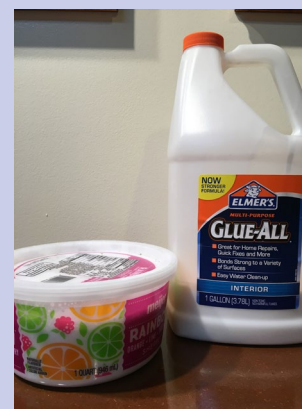
STEP 2: INSERT MOUNTING PIN (30 SECONDS)



I cut the "trunk" of the armature to length. I then dip a short wire pin in CA glue and insert it into the armature. There is a natural hole in the armature that makes this easy. You can use pins or any other source for wire. I use scraps from installing Tortoise switch machines, and scenery and structure projects involving wire. I use the pin to handle the tree and to mount it in my foam scenery base.

5. Wire mounting pins inserted into the bottom of the trunk.

STEP 3: DIP THE TREE IN GLUE SOLUTION (10 SECONDS)



I dip each armature in a 50/50 mix of white glue and water. I mix enough glue to fill a shallow bowl big enough to fit most of a tree. The glue preserves the tree and strengthens it a bit for better handling. I insert the dipped trees into a piece of foam and let them dry overnight.

6. Make a 50/50 solution of white glue and water.

STEP 4: SPRAY PAINT THE ARMATURE (10 SECONDS)



7. Brown and gray rattle can spray paint.

When the armatures are dry, I spray over them lightly with brown and gray spray paint. Any paint will do. I spray the whole group at once, while they are still stuck in the foam, so I get a random pattern over the trees. The natural color of the armatures is great already, so I'm going more for color variation than painting the whole armature. The paint also helps further preserve the tree. Wear latex gloves so you don't spray paint your hands.

STEP 5: SPRAY WITH GLUE (5 SECONDS)



Next I select an armature and spray it with 3M Super 77 Adhesive. I direct the spray more on the ends of the branches of the armatures where I want leaves. I saturate them well. Again, wear latex gloves for this to keep your hands from getting sticky.

8. 3M Super 77 adhesive.

STEP 6: FLOCK WITH GROUND FOAM



9. Various shades of coarse ground foam used on the trees.



10. Some of the trees made up using this method.

Working over a dish pan, I then pour coarse ground foam over the armature. I use several shades of green, adding the darker colors with the trees upside down, and the lighter ones from the top. This gives the effect of leaves highlighted by sunlight. On some trees I use only one shade of ground foam, and on others I use two or three for variety. I repeat the glue and ground foam application on some trees for denser foliage.

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STEP 6: FLOCK WITH GROUND FOAM *CONTINUED ...*

11. Trees compared to a real tree in the back yard.



12. Planting the trees, mixed with Woodland Scenics trees and puffball trees.

The first time I did this, I happened to be in my backyard, and I compared the trees to the real ones at the back of my property. I was surprised how realistic they looked for so little effort. On my layout, planting a tree is as easy as sticking the mounting pin into the foam and adding some ground cover.

Concluding thoughts

I plant the trees in groups, mixing them with Woodland Scenics trees and background puffball trees [12]. I add ground foam, clump foliage, twigs, and stones to complete the scene.

The trees are surprisingly sturdy, and I get a lot of compliments on them. They are much quicker to make than reading or writing this article! I'm now adding them to all my foreground scenes. If you have access to an Oakleaf Hydrangea bush, I encourage you to give this a try. If not, plant one today! ☒

MICHAEL ANTEAU



Michael Anteau comes from a railroading family: his grandfather was an engineer for the C&O, and his father was an engineer for CSX.

Michael was bitten by the model railroad bug while watching his dad's Lionel trains. He built his first 4x8 layout at the age of 10, on a sheet of plywood on the dining room floor!

These days, Michael works on his "dream" layout, a prototype freelanced coal hauling railroad set in transition-era West Virginia. His wife, Angie, leased him the largest room in the basement, and she actively encourages his hobby.

Michael lives in Northwest Ohio and works in Information Technology has two grown children. When he is not working on the Nicholas & Ashley Creek Railway, he enjoys playing piano, biking, hiking, traveling, and winemaking. ■





Six PFE Reefers

MRH Running Extra | April 2019

JIM PROVIDENZA builds several variations on the Tichy PFE R-40-2 ice reefer ...

LIKE MANY OF US, MY GOOD FRIEND BILL KAUFMAN USED a somewhat-motley collection of freight cars to get his State Belt RR up and running (*Railroad Model Craftsman*, April 2007). And so, during the last four or five years, Bill slowly has been upgrading the fleet.

Some cars have left to find new homes because they were not era-appropriate – the State Belt is set in 1944. Others have been sent to the shops to get upgraded details and lettering. Recently Bill purchased a Tichy Train Group six-pack kit #6024 model of the Pacific Fruit Express R-40-2 wood refrigerator car. These cars are highly

Six PFE REEFERS | 2

1. Six reefers in a row – The results of research, a good kit manufacturer, and a bit of work.

★★★★★
RATE THIS ARTICLE

detailed and would make a substantial improvement to the PFE reefer fleet that serves the many piers and industries on the Belt.

Since I was the one who told Bill about the advertisement for the six-pack, I figured I should volunteer to assemble the kits. I was intrigued by the prototype information Tichy included that indicated I could build several different classes of PFE reefers from the kit.



2. Bill Kaufman with the Tichy six-pack kit. On the right is a closeup of the box, six cars all done in undecorated plastic.

I quickly pulled out my copy of *Pacific Fruit Express (PFE)* by Tony Thompson, Bob Church, and Bruce Jones (Signature Press, second edition, 2000). I have used this reference book extensively to model several classes of PFE's mechanical refrigerator cars for my own Santa Cruz Northern.

I knew the information on ice reefers was at least as detailed as that on mechanicals, and would give me more information than Tichy had room for in their instructions.

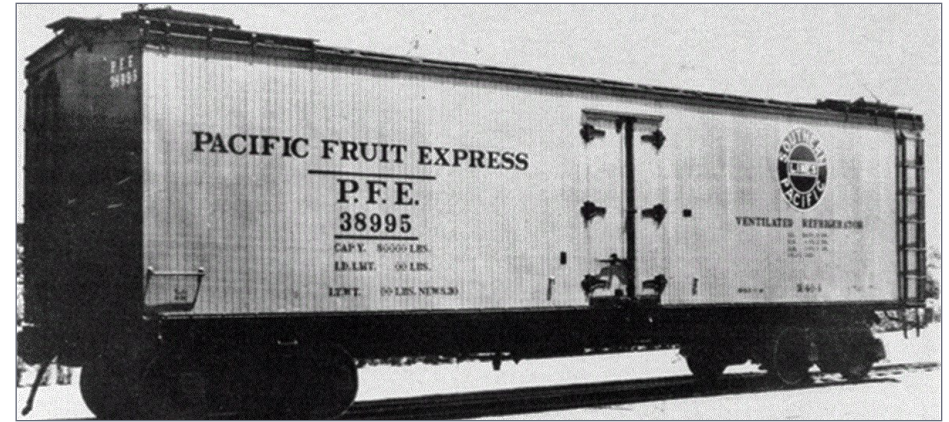
PROTOTYPE HISTORY – VARIATIONS!

The *PFE* book is the authoritative reference for anything related to Pacific Fruit Express, whether it be cars, facilities, or operations. I will give you a summary of the information I gleaned from this wonderful book (still in print), but I recommend buying a copy if you want to model any aspects of Pacific Fruit Express.

The R-40-2, the second series of PF&E's new 40-ton capacity refrigerator cars, was built in two lots of 1,000 cars each in 1928. The first lot, car numbers 36563-37562 were built by Pullman. The second lot, car numbers 37563-38562 were built by Pacific Car and Foundry.

The cars featured a newly designed built-up underframe but continued to have wood car body framing (what PFE called superstructure) and an outside metal roof. This roof consisted of a wooden roof covered with thin sheets of metal. Metal-clad battens were applied over the seams between the sheets.

The Pullman cars were the first PFE reefers equipped when built with the then-new power brake wheels. The PC&F cars, conversely, were the last PFE reefers built new with vertical brake staffs. The wood superstructure framing would not last more than a decade before it had to be replaced.



3a. PFE class R40-4 reefer. The car had orange sides, black roof and ends. They were done in this style with the SP logo on one side and the UP logo with the Overland Route on the other side. These cars had full ladders (not grab irons) and were built in 1930. *Photo courtesy of Tichy Train Group*

The 500 cars of the R-40-4 class were built in 1930 by PFE, car numbers 38563-39062 (there were no cars built to the competing R-40-3 design). They appeared from the outside to be almost identical to the previous R-40-2 cars, but were built with steel framed superstructures.

“The cars featured a newly designed built up underframe but continued to have wood car body framing ... and an outside metal roof.”

While they would be repainted, repaired, and “reconditioned” during their lifetime, they would never have to be completely rebuilt like the contemporary R-40-2 and previous 30-ton designs. The one visible difference between the two classes was that the R-40-4 class was built new with ladders instead of grab irons.

Some 2,775 cars in the PFE fleet were “the WP Cars” (they were never given a PFE car classification). Built in 1923, Western Pacific owned the cars, but they were managed and maintained by PFE. PFE numbered the WP cars in the 50000-52775 series. They were built to PFE’s R-30-13 specifications with one exception.

The first 2,000 cars were built with the proprietary Hutchins outside metal roof. The Hutchins roof had 12 narrow formed metal battens between 13 roof panels, unlike the standard PFE outside metal roof which had 10 flat battens between 11 slightly wider roof panels.

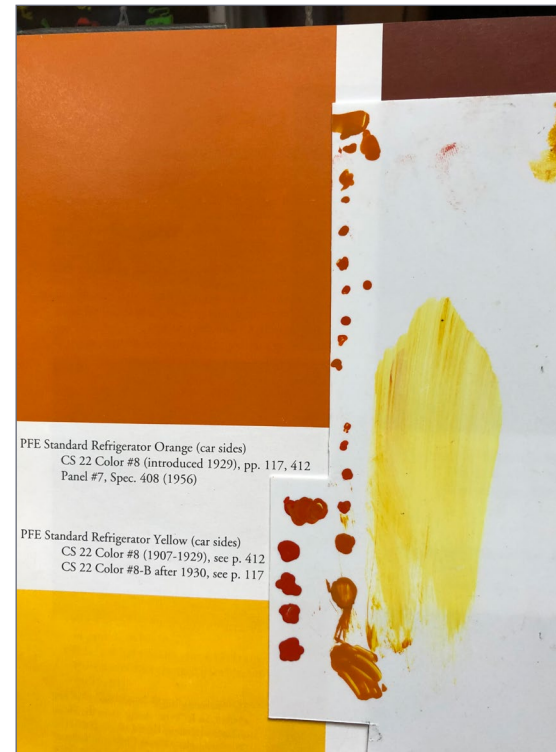
Unless you turn the cars over to look at the underframe, there is no other visible exterior difference between the WP cars and the R-40-2s other than the use of the WP heralds instead of the SP or UP heralds.

“This rebuilding was necessary, given the cars’ wood superstructure lasted only 7-10 years before joints worked loose and meant the superstructure needed to be replaced.”

THEN THERE WERE THE REBUILDS...

From its earliest days PFE had a program for reconditioning (essentially rebuilding in-kind with new superstructure framing) or rebuilding the oldest cars their fleet (really nothing less than jacking up the reporting marks and putting a new car underneath them).

This rebuilding was necessary, given the cars’ wood superstructure lasted only 7-10 years before joints worked loose, which meant the superstructure needed to be replaced.



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3b. Custom color-matching is a slow and somewhat individual process. Scalecoat Morency Orange sample is at the bottom; successive samples using more Scalecoat Orange were mixed and then sampled next to the drift card until the author was satisfied with the match.

Regardless of the type of work, the objective was to bring an older car up to the current standards of insulation, mechanical appurtenances, icing/cooling improvements, along with regulatory-mandated upgrades.

By the time the R-40-2 and R-40-4 classes were being built, PFE’s original R-30-1 and R-30-2 cars built in 1906 and 1907 had already had their superstructures replaced twice. They were now in need of a complete rebuilding, as were cars in classes R-30-5 and R-30-6, which were five years younger.

While it was PFE’s usual practice to add a numerical suffix to a rebuilt class (for example R-30-12-17) to indicate it was rebuilt to a specific standard, the company did not do so here. Instead PFE

rebuilt almost 2,000 of these earliest cars and classified them as either R-40-2 or R-40-4.

These cars were numbered 70001 to 71953, with the two classes intermixed within the number range.

THE TRUCKS

For several decades PFE standardized on the “T-section” Bettendorf-style truck side frame. As these trucks aged in service, they started to develop cracks in the side frames.

PFE’s 30-ton reefers were less prone to this than other, heavier, freight cars, but the problem still existed.

By the time the R-40-2 cars were built, PFE had switched to the stronger “U-section” side frame for new cars. Rebuilt cars, however, often kept the “T-section” trucks that had been reconditioned.

PAINTING AND LETTERING

This is the final variable. Whenever a car had damaged wooden siding repaired, or was reconditioned or rebuilt, it was repainted and lettered in the then-current scheme.

While there were minor changes in painting diagrams, the biggest changes occurred in the style and arrangement of the medallions or heralds on the cars. A full discussion would take a book (there is one!). I used the text and the reproduced PFE painting diagrams in *PFE* as my guide to determine exactly how to paint and letter each car I decided to model.

Even with all the information in this authoritative text, there are areas that are not entirely clear. One of them is the timing of the change in color of the car roofs. PFE painted the board or

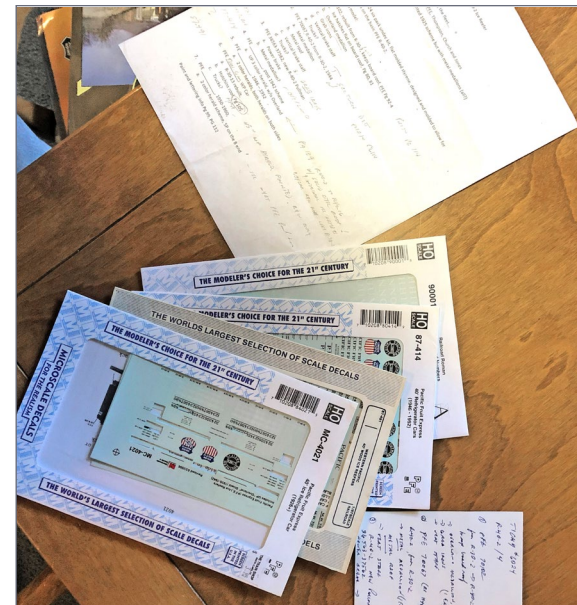
wood roofs on its early cars Common Standard (CS) Color #11, Freight Car Red.

As a point of information, this wood roof consisted of three layers – a waterproof membrane was sandwiched between the interior and exterior wood layers. All metal work on PFE cars was painted CS Color #13, Black. So, when PFE started to apply outside metal roofs to new classes of cars, they painted the metal roof Black.

At some point during 1935 PFE began to repaint the outside metal roofs on existing cars Freight Car Red. The exact date of the change remains unclear according to PFE expert Tony Thompson. But by the time Bill is modeling, it is likely that many of the outside metal roofs would be red instead of Black.

With the demise of so many model railroad paint brands, I resorted to custom-mixing paint to represent PFE’s CS Color #8

Orange for the car sides. In my case I worked with Scalecoat



4. A sampler of the Microscale decal sheets used in this project.

II paint. *PFE* has a page in the Appendix that reproduces PFE color drift cards and I worked to match the one for #8 Orange for the car sides.

As [3] shows, I used a piece of white styrene sheet to sample the test mixes. Scalecoat #S2030 Daylight Orange appeared to be too yellow when compared to the drift card, so I kept adding drops of the Daylight Orange to their darker/more reddish #S2152 Morency Orange until I had a match that satisfied me.

I did this work under an Ott Light True Color lamp that gives an accurate rendition of sunlight. I ended up using a ratio of about 25 to 1 [3b].

I used Scalecoat II S2013 Box Car Red and S2010 Black as required for roofs, ends, underframes and hardware. Two things to remember – after a short time out of the paint shop no two cars looked exactly the same due to the effects of sunlight, weather and dirt. And, “your mileage may vary” depending on the paint you use.

Microscale has several decal sets that can be used either alone or in conjunction with each other to come up with the appropriate lettering for the individual cars. These include MC-4021 for post-1926 schemes, 87-414 for the 1946-1952 era, and 87-491 for the WP cars [4].

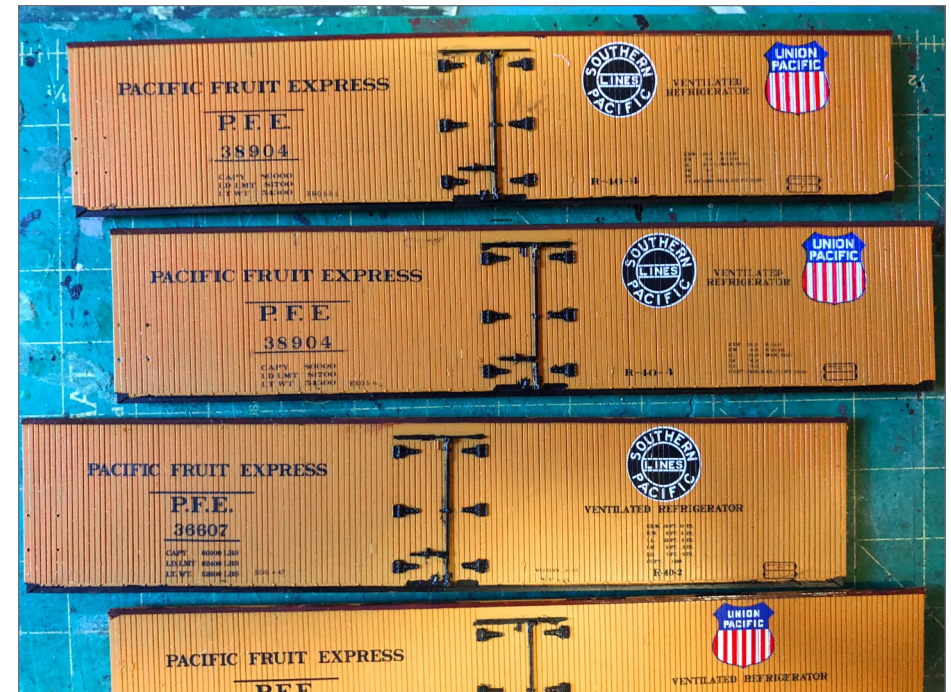
SOME THOUGHTS ON ASSEMBLY

The Tichy kit is an injection-plastic flat-mold kit. It is thus similar to many resin kits where you attach the individual sides and ends to the roof and floor. Unlike resin kits, you do not have to worry about cleaning up flash from the individual parts, and Tichy has done a good job of designing the parts to make the kit easy to assemble.

The really big benefit from having sides, ends, floor/underframe and roofs separate is that you can paint them and letter them separately, then assemble them afterward.

First I built the underframes following the kit instructions. I then built or modified two roofs (see the text for individual cars below), and added the ice hatches and their platforms to all the roofs. I then taped the ends, running boards, and three of the roofs to a piece of cardboard and airbrushed them “Freight Car Red” all at the same time.

I then sprayed the underframes, ladders and the rest of the roofs S2010 Black, at which time I realized I would have saved myself



5. Sides for two cars showing some of the variations possible with the Tichy kit.

some work by leaving the ice hatches and their platforms off these roofs, as they need to be red not black. Lastly I painted all the sides.

After all the parts were dry, I decaled the sides and ends. I gave all the decals several applications of Walther's Solvaset to make sure they adhered properly. I made a special point of slitting the decals along the board grooves between Solvaset applications.

Photos [5, 6] show some of the sides at this point. When I was satisfied with how the decals looked, I sprayed the sides and ends with Testors Dullcote to seal the decals and help hide any decal film. I separated the parts into six plastic baggies, along with a



6. More car sides, Walther's Solvaset, with one of the 3x5 information cards barely visible at the extreme top.



7. The sides, ends, roofs and underframes were sorted into the correct combinations and each pile was given a 3x5 card to help keep track of the work to be done.

3x5 card with the information about what characteristics each car would have.

Photo [7] shows the sorting in progress, and [8] shows one set of parts with card in a bag.

It was only after finishing assembly of the second of these cars that I learned it was much easier to do some of the detail painting before final assembly, rather than waiting until the car was assembled.

Two examples will give you the idea. First, the outside edges of the ends actually are the last boards of the sides and need to be painted Orange. This is much, much easier to do before the ends are assembled to the sides. Second, the upper fascia board at the top of the sides needs to be painted Red.

Again, this is much easier to do well with the side lying flat on your work table.

AND THE WINNERS ARE...

With all the variations possible with the Tichy kit, the only question was which cars to model! I decided that there were five that would fit into Bill's WWII era.

PFE 36607 models a new Pullman-built R-40-2, with a power brake wheel and outside metal roof. This was basically a stock kit. The only change I made was to replace the plastic grab irons with metal ones, something I did on all the models. It is painted and lettered in the post-1942 paint scheme where the UP herald is three-color red, white, and blue, but the "Overland" banner has been discontinued. Its outside metal roof is painted Black.

PFE 70102, modeling an R-40-2 rebuilt from R-30-5 8752, had more extensive work done to model it. A photo in *PFE* showed it retained its original board roof and corner grab irons when



8. R-40-2 in a bag, with notes! In this particular case the card lists the fact that this will be a new, rather than rebuilt R-40-2, and will have ladders and an outside metal roof.

SIX PFE REEFERS | 15

rebuilt. The grab irons were easy to do, if somewhat tedious, using the excellent jig for drilling the holes in the car sides and ends Tichy includes in their kit.

I built the board roof using Evergreen #4040 .040" spacing V-groove styrene sheet. This appears to match what PFE used for their board roofs, based on photos and plans in *PFE*, and matches the Tichy car siding. The board roof is built from two pieces of the grooved sheet stock, cut to the same size as the Tichy roof halves.

After gluing the two roof halves together and bending them to the same profile as a Tichy roof, I glued strip styrene to the underside of the joint to hold the shape. I then carefully measured the location of the inset on the outer roof edges and glued more strip styrene to make the same inset.



9. PFE 36609 and 70102 at King St. on the State Belt RR.

SIX PFE REEFERS | 16



10. PFE 70067 at the piers – its metal medallion a distinctive, if subtle, addition to the car.

This allows the roof to sit square against the sides with a slight overhang. I finished the roof work by adding lateral strips at the end, helping to hold the roof halves at the proper pitch.

PFE reefers with outside metal roofs all had wooden platforms around the ice hatches, which protected the relatively thin outside metal roof sheets and provided ice dock crews with a stable footing. The Tichy kit models these accurately. The earlier cars built with board roofs, and those rebuilds that kept their board roofs had no need for such platforms.

A diagram in *PFE* showed the way the ice hatches were built on the board roof, making modeling them easy. See [9] for a closer view of these two completed cars. The differences between the two types of roof are clear.

I built PFE 70067, an R-40-2 rebuilt from an R-30-2, similar to how it appeared in a 1944 photo in *PFE*. Photo 10 shows the completed car. It has an outside metal roof, a vertical brake staff, and metal porcelain medallions; the UP medallion has the Overland banner.

I applied ladders instead of the grab irons in the photo, as I already had done one car with side and end corner grab irons. The outside metal roof is painted Black. No. 70067 has kept its T-section trucks – Athearn replacement parts in this case. Photo [10] catches the 70067 at one of the many piers along the State Belt.

PFE had started removing the metal medallions from its cars in the late 1930s, as they tended to work loose from the car sides and fall off in service, creating a hazard. Most were gone by WWII, so it was good to have proof that I could legitimately include one car with these metal medallions for Bill.

I modeled the porcelain medallions by cutting pieces of 0.005" styrene to the exact size of the UP and SP herald decals, applying the decals and then spraying them with a clear semi-gloss protective coat to help them stand out from the car sides that had been sealed with Dullcote.

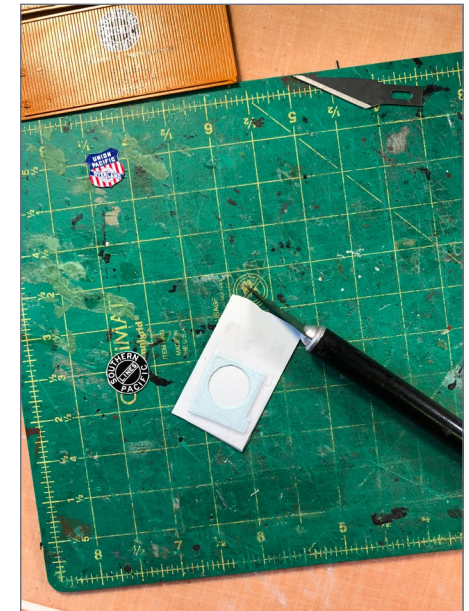
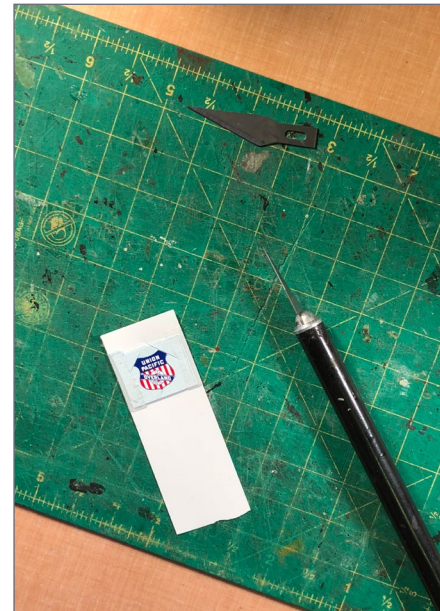
Gluing the medallions to the car sides was the very last thing I did to this model before it went into service. Photos [11, 12] show how the I constructed them.

PFE 38347 models a PC&F-built R-40-2, also with the post 1942 paint and lettering scheme. The original as-built vertical brake staff was replaced with a power brake wheel. The outside metal roof is painted red [13].

PFE 51506 is a member of the first group of 2000 WP cars, and has a proprietary Hutchins outside metal roof and a vertical staff brake. The model is essentially a stock kit except for the roof.

I modeled the Hutchins brand roof by sanding off the batten detail on a Tichy roof, marking the location for new, closer battens, and then applying Evergreen Styrene #8102 HO scale 1x2 strip styrene to model them. Photo [14] shows the result with the narrower battens.

I added T-section Bettendorf-style trucks – in this case ones made by Walthers. In [15], PFE 51506 is basking in the



11. (Left) The UP Overland medallion has been cut out from the Microscale decal sheet. Rather than trim it close, I left a generous border. I then taped the medallion down onto a piece of 0.005" styrene and a cutting mat and made many light cuts with a fresh no. 11 blade.

12. (Right) The UP medallion is complete at the upper left. The SP medallion had been cut out of the sheet, leaving light cut marks on the underlying styrene sheet which will guide the final trimming.

occasional afternoon sunlight along one of the many piers on the Embarcadero.

Lastly, I modeled PFE 38904, a new R-40-4, in the 1946-1954 paint scheme which features both UP and SP heralds on both sides of the cars. The UP herald is 3 color red, white and blue. The SP black and white herald is always to the right end of the car regardless of which side of the car you are looking at. This paint scheme is too new to appear on the State Belt in 1944. The car is slated to go to another local railroad modeling the mid-50s.

It has the power brake wheel it was built with by PC&F; the brake system has been upgraded to a Westinghouse AB type from the original K type. It of course has a red roof [16].



13. PFE 38347 on the Embarcadero with the ferry building in the background.

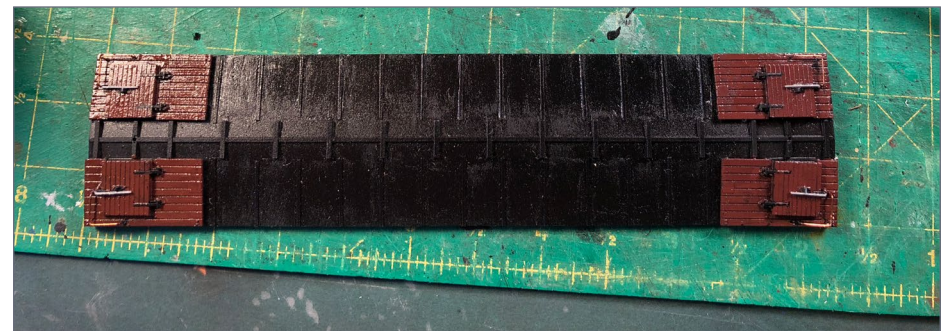
AND THE ONES THAT GOT AWAY!

There were more good cars I could model from this kit than I had models to build.

The low-hanging fruit would be an R-40-4 in its original number series painted in its original paint and lettering scheme. Or it could be done in the 1952-1960 paint scheme. With this scheme, PFE reverted to one herald on each side of the car. The SP herald was always toward the B end of the car. The UP herald changed from three-color to black and white. Not Bill's era of course, but still ...

Since I was changing roofs with abandon, the final option would be a member of the 3,554 strong class of R-30-16 and R-40-16 cars. This group of cars of both 30 and 40-ton capacity were rebuilt between 1940 and 1942. They were renumbered into the 73001 – 76554 series.

The cars retained their wood-sheathed ends but were given structural steel roofs – what we modelers refer to as “Murphy” steel roofs. Since there is no model roof currently available of a quality to match the rest of the Tichy kit, I initially decided to pass on this



14. This closeup of the Hutchins roof of PFE 51506 shows off the thin battens and narrower panels characteristic of this proprietary roof system.

one for now, even though it would have been perfect for the Belt. Sometime in the future maybe....

But then I learned of the limited and now-out-of-production Terry Wegmann-modified Red Caboose PFE reefer kits. Terry had



15. PFE 51506 is properly painted in PFE's CS Color #8 Orange as were all the "WP cars" in the PFE fleet.

Text continues on the next page ...



BATCH BUILDING

Actually, batch building models like Jim does in this article can be a most effective way to get a lot of models produced quickly.

Not only does this work for rolling stock, but it also works for structures and locomotives.

If you need more than one of something, just making, gluing, and/or painting more of the parts while you have the tools out and are at your workbench can be a real time-saver.

produced add-on structural steel roofs for the Red Caboose R-30-12-9 kits.

I was able to obtain one – so now it will be “sometime in the future for sure” that one will appear in service to the piers and industries the State Belt was serving during the hectic days of World War II. ☑



16. PFE 38904, a R-40-4, in PFE's first post-WWII paint scheme, sits for its portrait on Pier 45. It will never actually turn a revenue wheel on the 1944 era State Belt, as the paint scheme would not appear on PFE reefers until 1946.

JIM PROVINDENZA



Jim Providenza has been a model railroader, to his own amazement, for over 55 years. He retired after a 38-year career in law enforcement, is married, has three adult children, and one granddaughter. Jim took up Masters Water Polo after retiring in 2012, and plays as a goalie. Jim is active in his church, and continues to railfan whenever possible.

A life member of the NMRA, Jim has given many clinics at regional and national conventions, as well as authored a number of articles on a variety of model railroad topics. Jim is active in the Layout Design and Operations SIGs. Jim's first version of his Santa Cruz Northern, begun in 1976, was one of the first intentionally designed double-deck layouts. Jim powered the Santa Cruz Northern with Alphatronics Carrier Control starting in 1977, and switched to DCC in 1994. Jim continues to develop and operate on the SCN using Timetable and Train Orders.

Over the last 10 years, Jim has been slowly building a model of the Sandy River & Rangeley Lakes RR in his backyard. Centered on Strong, Maine, this two-foot gauge railroad is built in the Proto 20.3n2 combination of scale and gauge, using wheel and track dimensions derived from the NMRA's Proto 20.3n3 standards. ■





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WiFi Throttle: Bonus extras



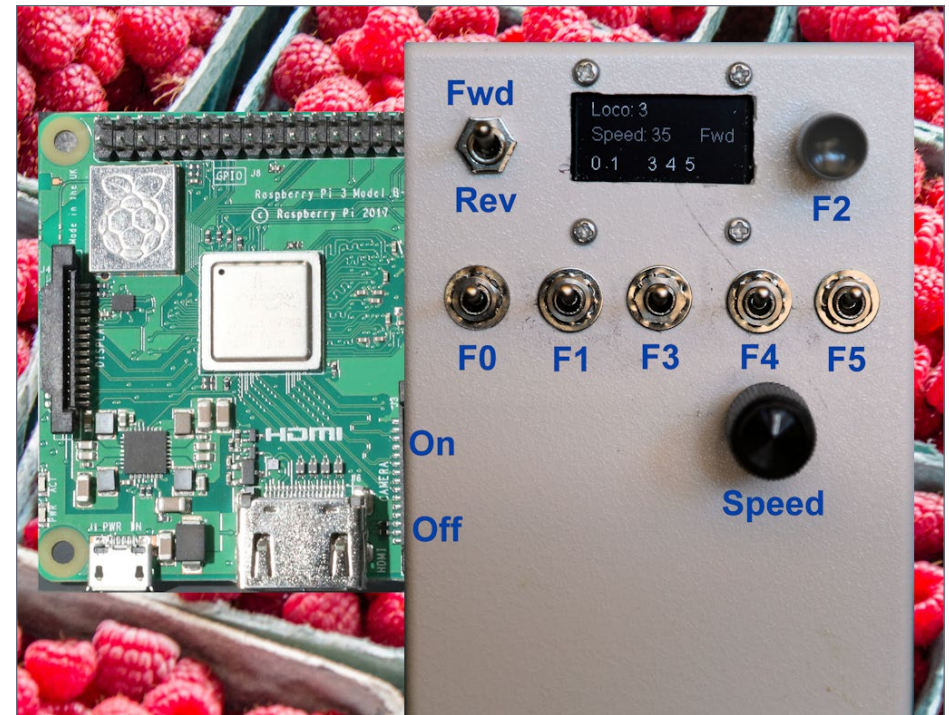
changing things visitors know nothing about). This article describes the construction of a simple WiFi throttle that connects directly to the JMRI WiFi server, just like the one described in the previous Raspberry Pi article. It is not dependent on your DCC command station connected to JMRI. It will support loco address selection, six (or more) function switches, speed and direction control, and runs on a standard nine-volt battery. While providing basic throttle functions, it can be customized

Build a Wi-Fi throttle

MRH Running Extra | April 2019

DR GEOFF BUNZA shows how you can build your own Wi-Fi throttle ...

MODEL RAILROADERS RUNNING JMRI HAVE THE capability of connecting their cell phone or wireless tablets as a remote throttle for DCC control. I have often heard modelers who would like newcomers to operate their layouts with a simplified throttle (reducing the possibility of inadvertently



1. The simplified remote throttle.

and expanded by the inventive modeler to perform multiple functions at the touch of a button. You can also limit its functionality as you wish. It uses simple readily available parts for a one- or two-evening project.

The heart of the throttle is a relatively new module, the ESP32, or more accurately, the ESP32 Development board from EzSBC.com. It needs to be loaded in a manner similar to an Arduino controller, with nearly the very same tools. The ESP32 has a small voltage regulator on board so you can power it with a 6V-12V DC power supply (I use a standard 9V battery). The higher voltage is lowered to 3.3 volts for the ESP32. As with most of my projects, you don't need to know any programming to use this. Everything is pre-built for you. Additional instructions will guide you if you want to make changes. If you can operate text editor software, you can build your own throttle – and more than one can be used simultaneously with JMRI. Let's get started.

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STEP 1: GATHER YOUR PARTS

Here are the materials you will need:

QTY	DESCRIPTION	
1	ESP32-01 breakout and development board	www.ezsbc.com/index.php/wif01-35.html
6	SPDT subminiature toggle switches	www.allelectronics.com/item/smts-4/spdt-on-on-sub-min-toggle-switch/1.html
1	SPDT mini toggle switch center-off	www.allelectronics.com/item/mts-5pc/spdt-on-off-on-mini-toggle-switch-pc-terminals/1.html
1	10K linear miniature potentiometer	www.allelectronics.com/item/ptw-10k/10k-bourns-pot-pre-wired/1.html
1	Knob for potentiometer	
1	0.96 Inch OLED display white (or other color) with SSD1306 controller & I2C interface	www.ebay.com/itm/382557870211
1	Plastic case	www.ebay.com/itm/131978994077
2	Micro JST 1.25mm 6-Pin connector sets wired	www.ebay.com/itm/302746030692
1	9 volt battery holder snap	www.ebay.com/itm/163376406979

Use whatever knob fits your 10K pot.

The JST connectors are optional. Anytime I want disassembly ease, I use these.

STEP 2: LAY OUT YOUR CASE AND PREPARE IT

Here is the general layout of my throttle.

I installed only five subminiature toggle switches and one push-button for the six functions (F0-F5) I wanted. You can add more or use fewer.

The code has one value to set:

```
int num_functions = 6;    // Number of functions
supported by this throttle UP TO 8 MAX
```



2. Simplified throttle internal names.

Your component choice may be somewhat different from mine. Lay out the switch holes and small window for the OLED display. I started by mimicking the Digitrax throttles which power on when the battery is inserted. But I later added a small switch to turn the battery on and off – quite simple.

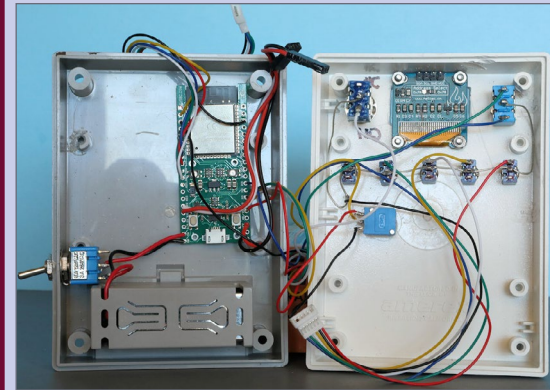


3. Simplified throttle functions assigned.

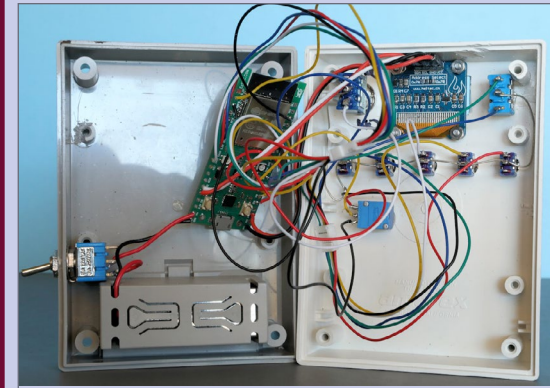
STEP 3: INSTALL YOUR COMPONENTS

Once you decide where everything goes, drill all your holes, insert, and lock down your components. You can see my internal layout in [4] and [5].

Many people like a large knob for their throttle. It is not a big deal to me, but in the box I chose there is plenty of room for a bigger knob, and even a bigger potentiometer. If you want to mount a six-inch knob, simply use a larger enclosure (try www.digikey.com, mouser.com, or allelectronics.com).



4. Component placement inside.



5. Wiring harnesses connected.

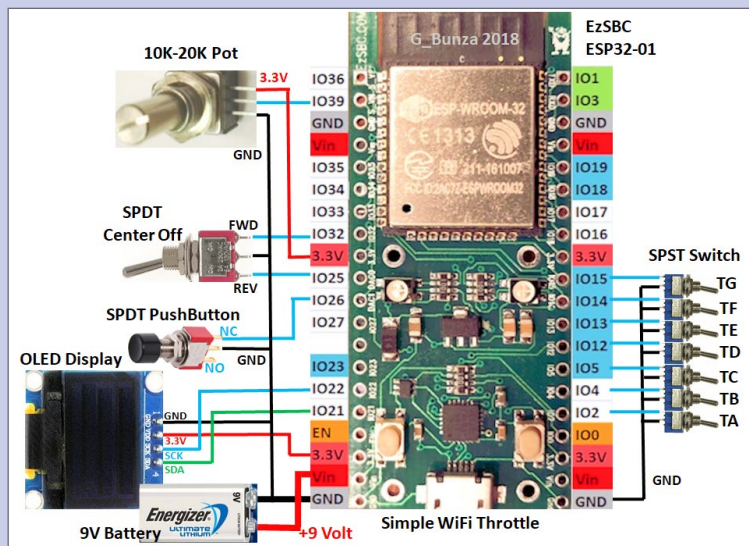
STEP 4: WIRE EVERYTHING

I found it easier to wire after installing all the switches. Since I knew I would take this apart again and again (this was the prototype, remember), I used small connectors with pre-attached wires to connect everything. Diagram [6] shows the basic interconnections, color coded.

The on-off switch is optional, but I recommend it to save battery life in the long run. The battery connector is hidden behind the cover of the battery compartment.

Note that the connections to the SPDT pushbutton need to connect to the common-middle and the normally closed connection. You should take note that the ESP32 is a 3.3V part. All digital connections are therefore 3.3 volts maximum.

Also realize that you can light most “normal” LEDs with the 3.3 volts and a small dropping resistor (like 220 ohms ¼ watt).



6. WiFi throttle diagram.

STEP 5: DOWNLOAD THE ARDUINO DEVELOPMENT EDITOR AND SOFTWARE

I have previously written about installing and loading Arduino software:

- *MRH* December 2016, “A modeler’s introduction to the Arduino” mrhpub.com/2016-12-dec/online.
- *MRH* March 2017, “DCC projects using the Arduino” mrhpub.com/2017-03-mar/online/html5.

The ESP32 is a different controller that will make use of the Arduino editor and loading environment, but with a different configuration and library. The same free tools that can be downloaded here: www.arduino.cc/en/Main/Software.

Download and install this if you have not already done so.



Please include a phone number when emailing us if you need a reply!

(Just in case your spam filters eat our email response ...)

STEP 6: LOAD THE ESP32 LIBRARY

Start up the Arduino application you installed. On the top left menu select **File -> Preferences**.

In the field after “Additional Boards Manager URLs:” paste: dl.espressif.com/dl/package_esp32_index.json.

And click OK.

Go back to the top menu bar and select: **Tools-> Board -> Boards Manager...**

Look toward the bottom in the new Boards Manager list that opens, and find the entry labeled “esp32 by Espressif Systems” and click on that entry. A small label “Install” should appear on the lower right of the entry. Click on “Install.” After it finishes installing, click “Close” in the lower right corner of the window.

Now click on **Tools-> Board-> Esp32 Dev Module** from the board list (likely near the bottom).

Close the Arduino IDE application.



WiFi Throttle: Bonus extras



STEP 7: DOWNLOAD SIMPLE THROTTLE SKETCH FROM ADDITIONAL MATERIALS WITH THIS ARTICLE

[Download the Additional Materials](#) that accompany this article, and unzip.

Move **folders** labeled **ESP32_Throttle** and **Blink7f_ESP32** and their **contents** into ...\\Documents\\Arduino\\ and **esp-oled-ssd1306** and **ESP_EEPROM** into ...\\Documents\\Arduino\\libraries\\.

STEP 8: LOAD THE ESP32 CONTROLLER WITH THE SIMPLE THROTTLE SKETCH

Connect the micro USB connector to your ESP32, and the other end to your Windows computer. As of this writing, all the Arduino/ESP32 software should work on a Windows PC, and an Apple PC. I know it will not work on a Raspberry Pi.

Start up the Arduino editor, making sure you have selected the ESP32 Dev Board from the Tools-> Board menu.

Next, select from Tools->Board->Port menu the Port your ESP32 is connected to.

I have tested all this with Windows10 and Windows7. If a “Port” number does not show up after you plug in your ESP32, the Win10 and Win7 current Silicon Labs USB drivers are included so you don’t have to hunt for them.

I included a special “Blink7f_ESP32” sketch you can use for testing your setup to the ESP32.

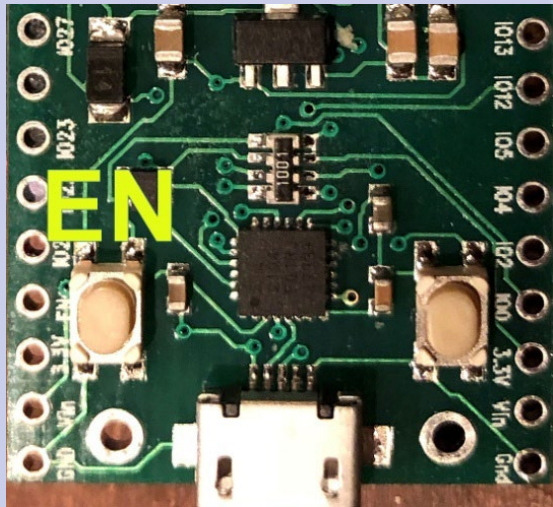
STEP 8: LOAD THE ESP32 CONTROLLER WITH THE SIMPLE THROTTLE SKETCH *CONTINUED ...*

Open the sketch in the folder **Blink7f_ESP32** and download it onto your ESP32. After a short delay, two LEDs should blink in succession red, green, blue, and blue.

When this succeeds, open the folder labeled **ESP32_Throttle** and download the throttle sketch onto your ESP32. If you are using a Windows 7 PC, you will have an additional step:

After the download starts, at the bottom of the Arduino editor window you will see a message like: **Connecting.....**

As soon as you see this on screen hold down the “Enable” (EN) button to the left of the USB micro connector (it is immediately next to the pin marked “EN” [7]) and release the button as soon as the text changes in the window.



I have not been able to get around this method on Windows 7. I have not tried this on a Mac nor on any other Linux machine other than an RPi.

7. Enable button.

STEP 9: CONNECTING TO YOUR RPi

This assumes you set up a Raspberry Pi per the article in the March 2019 *MRH*. If you do not have your RPi powered up, you should get the message on the small OLED screen:



This means your Simple Throttle has started up and is trying to connect to your WiFi named (SSID) **model-rr**.

When you turn on your RPi and it finds the **model-rr** WiFi server, it will then display in sequence:

8. Start-Up screen.



9. Loco assigned and functions test.

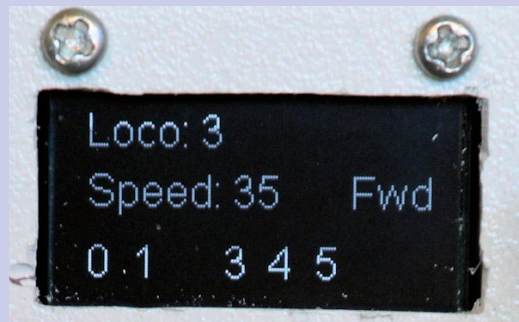


10. Loco 3 selected, speed is 0, and Fwd toggle is set.

★★★★★
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STEP 9: CONNECTING TO YOUR RPi *CONTINUED ...*

When you flip a function switch “ON,” the function number will be displayed like [11]:



11. Operating Loco Functions 0, 1, 3, 4, and 5 ON.



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MRH/RE index
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STEP 10: SPECIAL OPERATIONS

Direction Neutral (Center-off): When the direction switch is set to center-off during normal operation, then the speed control will be ignored, and the last known speed sent to JMRI will be displayed. If you change the speed setting while in Neutral, then set the Direction to either FWD or REV. The current knob setting will be sent to JMRI as the new speed setting.

Changing addresses: Even if you are using this throttle for a young visitor, you may want to change the address of the throttle occasionally, without having to reprogram the ESP32. This can easily be done with the following sequence:

1. Start with the throttle **powered off** and the **Direction** switch set to **center-off**.
2. Push and hold down the pushbutton normally used for F2, then power-on the throttle.
3. Release the pushbutton and the screen should blink: “**SET ADDR?**” with the last address set displayed.
4. Set the **Direction** switch to increment up (FWD) or down (REV) and push the button to change the address.
5. When done setting the address, release the button, place the **Direction** switch to center-off, and hold the button down for one second. The new address is saved and you can start running the loco at this address.

Turning DCC Power ON: Before you release the button in the previous step, and after placing the **Direction** switch in the center-off position, if you flip all function switch up (ON), then when

STEP 10: SPECIAL OPERATIONS *CONTINUED* ...

you release the button the command will be sent to JMRI to turn on DCC power. This is not something one would normally expect a novice user to do on his/her throttle but it is provided here for your convenience.

If you are not changing the loco address, then:

1. Before powering on
2. Set the **Direction** switch to center-off
3. Turn all function switches up (ON)
4. Turn Power On or connect your battery
5. The command will be sent to JMRI to turn on DCC power.



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STEP 11: CHANGING YOUR THROTTLE
CONFIGURATION

You can change your throttle to work with any JMRI WiFi server. Near the beginning of the sketch you loaded into your ESP32 you will find the statements:

```
// WiFi Server Definitions
const char* ssid      = "model-rr";
const char* password  = "model-rr";
const char* host      = "192.168.6.1";
const int  tpPort     = 12090;
```

With the Arduino editor you can change the name (SSID) of the WiFi server, the password to access the server, the server's network (IP) address, and the Port number for the server access. When you edit them be sure to change **only** what is between the quote marks (" ").

You can also limit the number of function switches that can be used by the throttle from 1-8 by changing the "6" in the statement:

```
int num_functions = 6;      // Number of
functions supported by this throttle UP
TO 8 MAX
```

You can also change the switch/button assignments to their respective functions by changing:

```
#define F0_pin  TA  // Function 0 pin assignment
#define F1_pin  TB  // Function 1 pin assignment
#define F2_pin  PB  // Function 2 pin assignment
```


STEP 11: CHANGING YOUR THROTTLE CONFIGURATION *CONTINUED ...*

```
#define F3_pin    TC    // Function 3 pin assignment
#define F4_pin    TD    // Function 4 pin assignment
#define F5_pin    TE    // Function 5 pin assignment
#define F6_pin    TF    // Function 5 pin assignment
#define F7_pin    TG    // Function 5 pin assignment
```

You can see the pins assigned to each label here:

```
#define PB      26    // Pushbutton Active LOW
                    // usually assigned to F2
#define TA      2    // SPDT toggle active HIGH
#define TB      4    // SPDT toggle active HIGH
#define TC      5    // SPDT toggle active HIGH
#define TD     12    // SPDT toggle active HIGH
#define TE     13    // SPDT toggle active HIGH
#define TF     14    // SPDT toggle active HIGH
#define TG     15    // SPDT toggle active HIGH
```

This gives you the ability to assign the pushbutton to a different function, and to rearrange the order of all functions any way you want.

There are many more variations you can build into your throttle. This article should get you started on a whole series of new adventures in model railroading, quickly, and for relatively low cost! Have fun! ☒



RATE THIS ARTICLE

DR. GEOFF BUNZA



Geoff Bunza started as a model railroader when he received a Mantua train set for Christmas, at age 6. He fed his interests through college, becoming a member of the Tech Model Railroad Club (TMRC) at MIT while getting his doctorate and three other degrees in electrical engineering. He has collected Lionel HO trains for many years, which spawned his interest in realistic model animation and lighting. Primarily, he models the New York Central Railroad.

Geoff is a member of the New York Central System Historical Society, a life member of the NMRA, and holds an Extra Class amateur radio license. ■

WiFi Throttle: Bonus extras



We're always looking for more articles and videos. We do pay for articles and videos, too!

THE AH-HAH MOMENT

column



MRH Running Extra | April 2019

JOE FUGATE: TEMPORARY CAR SORTING & SWITCHING AID - TABS ON CARS ...

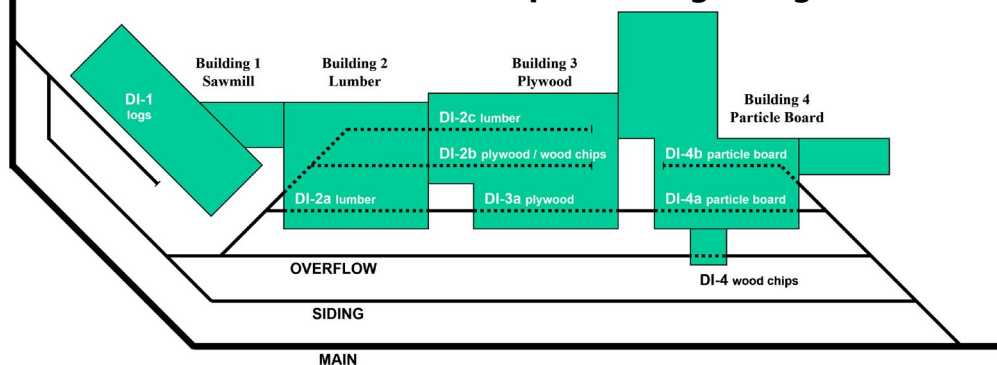


I TYPICALLY AM NOT A FAN OF JOHN ALLEN'S tab-on-car method of indicating where cars go when switching. They just aren't prototypical!

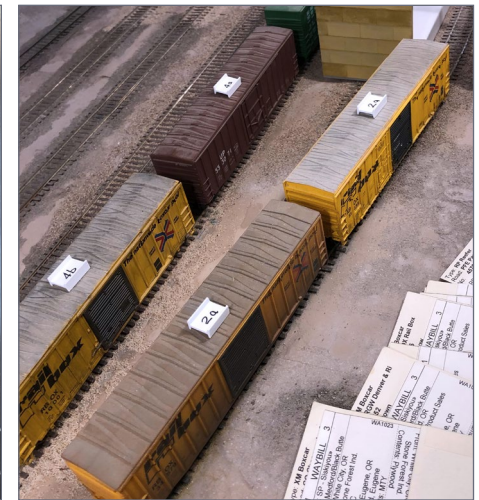
But I also find shuffling car cards can get involved when there's more than a couple of places the cars need to go. I was at a layout op session a few years ago that used car cards, but they had a bin of tabs at each town as an aid for switching. *Ah-hah!*

I found the tabs made quick work out of the car sorting and switching, so I was happy to look the other way regarding the tabs. I've since made up a set of tabs for use at the Dillard complex on my layout (diagram below). With eight different car spots, the tabs really help when switching this complex industry. ✓

Dillard Forest Products complex on my Siskiyou Line



THE AH-HAH MOMENT | 2



1. I set my chopper to length for these tabs, then crank them out in quantity from 1/2" styrene H-beams.

2. Using the town/industry key, I write the various spot numbers on both sides of the tabs with a sharpie.

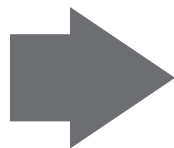


3. These tabs also stay put quite nicely on covered hoppers or tank cars.



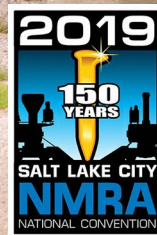
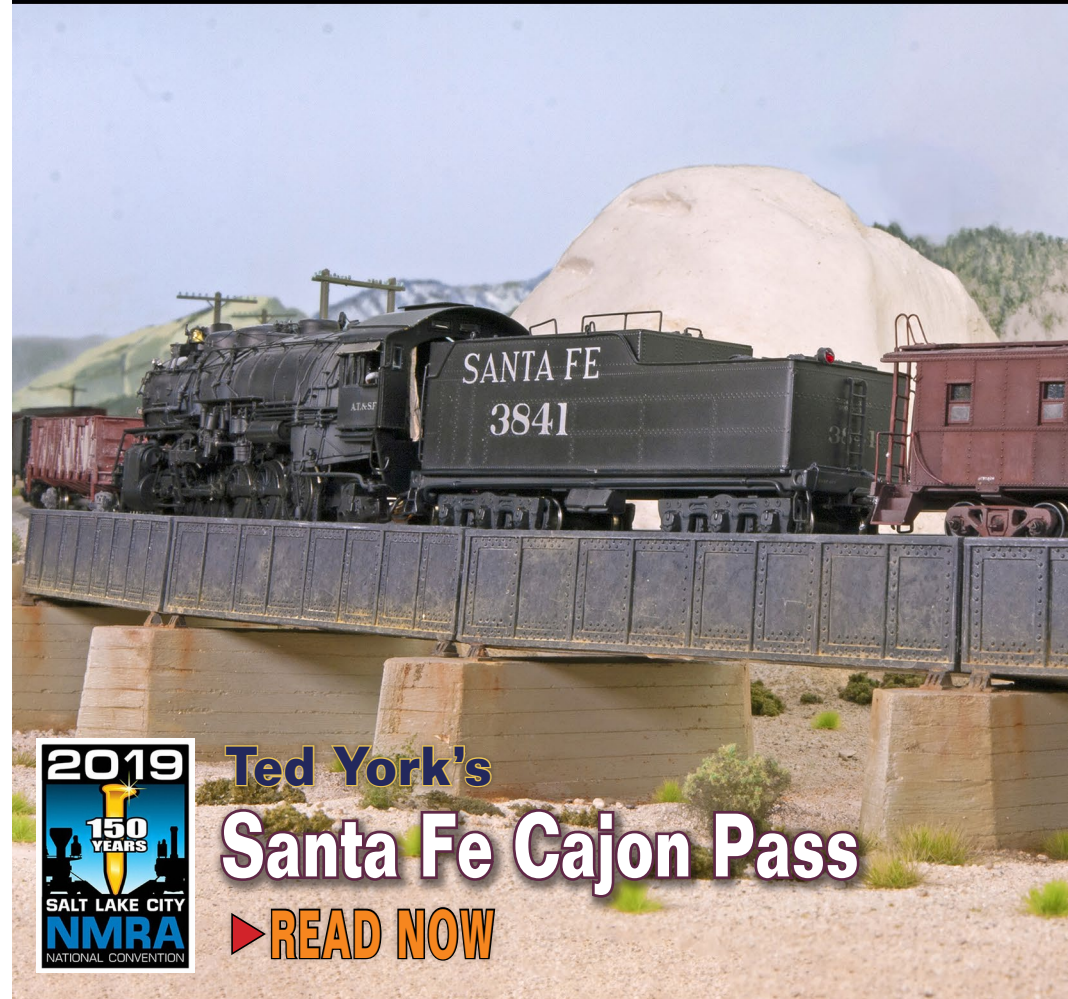
4. A business card holder from the local office supply store makes a neat storage bin for these tabs on my fascia shelf.

Here are all the pages
from the April issue of
*Model Railroad
Hobbyist* magazine
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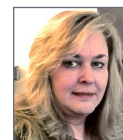
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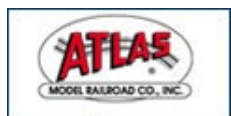
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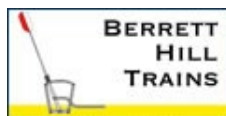
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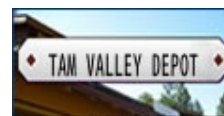
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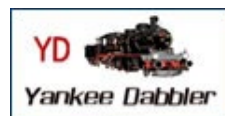
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by Ken J Johnson
Production model shown



HO
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PUBLISHER'S MUSINGS



Model Railroad Hobbyist | April 2019

JOE FUGATE: OF GRAPHITE, STYRENE GLUE, AND COUPLER TRIP PINS ... PLUS MRH NOW HAS MORE ARTICLES

★★★★★
RATE THIS ARTICLE

I USE POWDERED GRAPHITE AS A COUPLER

lubricant, but I take a more economical approach than using the Kadee squeeze tubes or even the hardware squeeze tubes (they sell graphite squeeze tubes for use in locks to lubricate them).

You can get a pound of graphite – that's a lot of graphite, certainly a lifetime supply for modelers – at an amazing price of just \$15 with free Prime shipping on Amazon: [amzn.com/B008CQFMGG](https://www.amazon.com/dp/B008CQFMGG).

I dispense the graphite using a squeeze bottle with a blunt needle tip. I talk all about these squeeze bottles and needles in this month's *Running Extra*.

A more environmentally-friendly styrene glue

For many years, I've used MEK (Methyl Ethyl Ketone) as a styrene glue. It's fast working and you can get it in quart cans at many of the DIY hardware stores like Home Depot or Lowes.

However, MEK is nasty stuff and it stinks to high heaven. If you read the environmental warnings for MEK, the list is long. I've been looking for a more environmentally friendly glue for styrene and I finally found something I'm quite pleased with: ethyl acetate.

PUBLISHER'S MUSINGS | 2

If you don't know what ethyl acetate is, it's a naturally occurring substance in fruit like apples and bananas, and it's what gives wine that fruity taste.

You can get ethyl acetate in quart cans on Amazon for \$20 here: amzn.com/B06XRKPGD8.

Even though ethyl acetate naturally occurs in fruit and wine in small amounts, I don't recommend guzzling it straight from the can – that won't do your liver any good!

I find ethyl acetate is just a tad slower acting than MEK, but only slightly. The more environmentally friendly nature of the stuff more than makes up for it. It's so close to how MEK works for gluing styrene that I'm quite happy with it.

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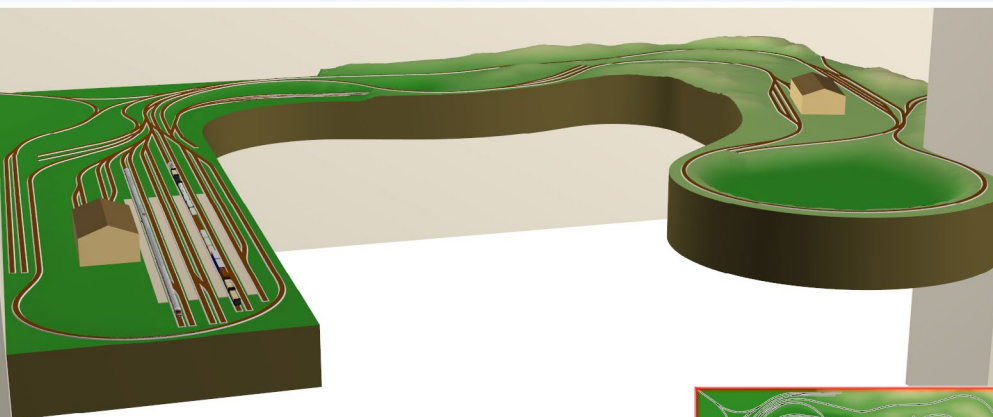
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PUBLISHER'S MUSINGS | 3

I use the same plastic squeeze bottles with blunt needles to dispense the EA quickly when I'm building a model with styrene. I find I can move more quickly with the squeeze bottle than I can dipping a brush in an open bottle of styrene glue. Plus the needle bottle limits the fumes. EA fumes are less onerous than MEK, but the straight stuff does have a strong odor.

As I mentioned, I discuss all the squeeze bottle details in the April issue of *Running Extra*.

Coupler trip pins

In my Run like a Dream book series (see last month's editorial), I cover dozens of simple tips that counteract Murphy and are preventative in nature. In other words, if you do these things, you are less likely to



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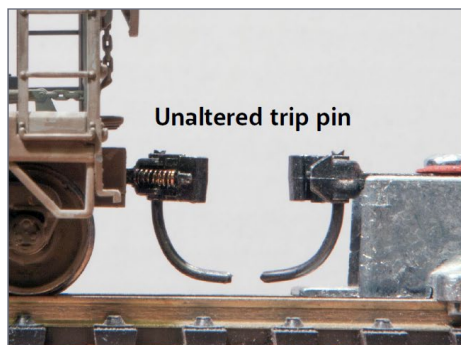
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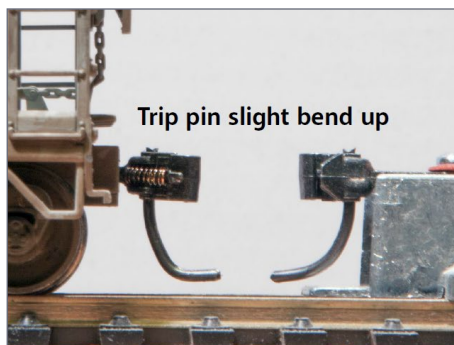
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PUBLISHER'S MUSINGS | 4



Unaltered trip pin



Trip pin slight bend up

1. In my Run like a Dream book *Rolling Stock*, I provide this coupler trip pin tip, along with dozens of other preventative tips like this.

encounter problems later. I would have given my eye teeth to have had all these tips available at my fingertips back in my early days in the hobby!

One such tip involves the couple trip pins on Kadee or Micro-Trains couplers [1]. The unaltered pin tends to catch on turnouts, grade crossings, or bridge guard rails. As a preventative measure, take a few moments and bend up the end of the trip pin slightly so it will tend to clear any obstruction if it does encounter one – see [1].

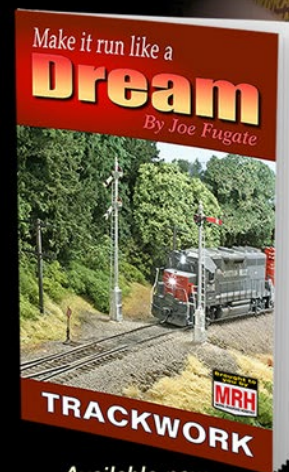
If you're like me and use skewers to uncouple during an op session, I can anticipate your next question: why not just cut the trip pins off?

I don't like to do that for several reasons. First, from the aisle the trip pins actually look like air hoses between cars and I like that look.

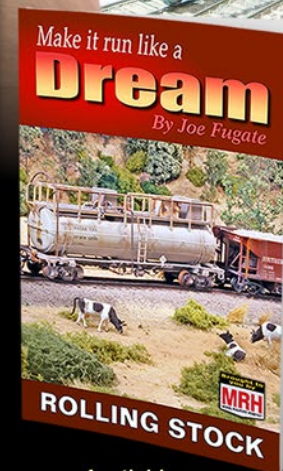
Second, I don't like model air hoses that just hang loose on cars because they don't connect up, they just look wrong. Having both the lose air hoses and the coupler trip pins creates visual clutter, so I remove the lose air hoses and leave the trip pins.

And third, that trip pin actually comes in handy sometimes if the skewer is having trouble separating the couplers. The trip pins form

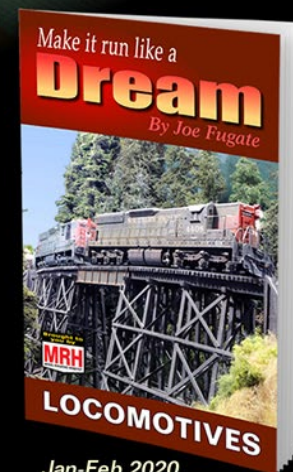
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Make it run like a
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a backup lever I can tap with the skewer to get the jaw to open, and that's handy. So I prefer the trip pins, actually.

Of course, if you do use magnets, then this tip is even more helpful because it will also ensure the trip pins are less likely to catch on any between-the-rails magnets.

For dozens of more tips like this, check out my [Run like a Dream book series in the MRH Store](#).

More how-to articles in MRH

With the reduction in MRH page count over the last year to realign the magazine with a page count that ads will pay for, we have been rethinking some of the content that's been in MRH.

The lowest rated content in MRH is what we call "editorial content." That tends to be opinion or less actual how-to material that you can really sink your teeth into. Some might use another term for the editorial content: *fluff*.

In rethinking how to convert editorial content pages over into something more how-to related, we're retiring two features in MRH: Yes it's a model and Derailments.

In place of Yes, it's a model, we're now doing "The best of the MRH website this month." The MRH website gets some really great threads now and then that are absolutely superb. They're every bit as good as the articles in the magazine.

So we're using this new feature to highlight a few of the best of these threads that have appeared over the last month. Some of this material is excellent, and it's a lot more useful than just some pretty model



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PUBLISHER'S MUSINGS | 6

photos, as inspiring as those
superb images have been.

That all said, there's nothing
keeping us from highlighting one
of the Weekly Photo Fun threads
from our website in this new
monthly feature! This weekly
recurring thread, by the way, is
where we got most of our Yes, it's
a model photos.

The other feature we're retiring
is Derailments. That humor /
bizarre facts feature gets mixed
reviews, and is almost always the
lowest rated feature in the maga-
zine each month.

So Derailments clearly fits the
category of what many might call
filler or "fluff".

With a leaner magazine, we need
to jetison fluff, so Derailments
is being replaced by a new
feature we're calling "Savvy
Modeler online." This new fea-
ture is still only one page just like
Derailments was.

However, instead of silly or fluffy
content, we're giving you some

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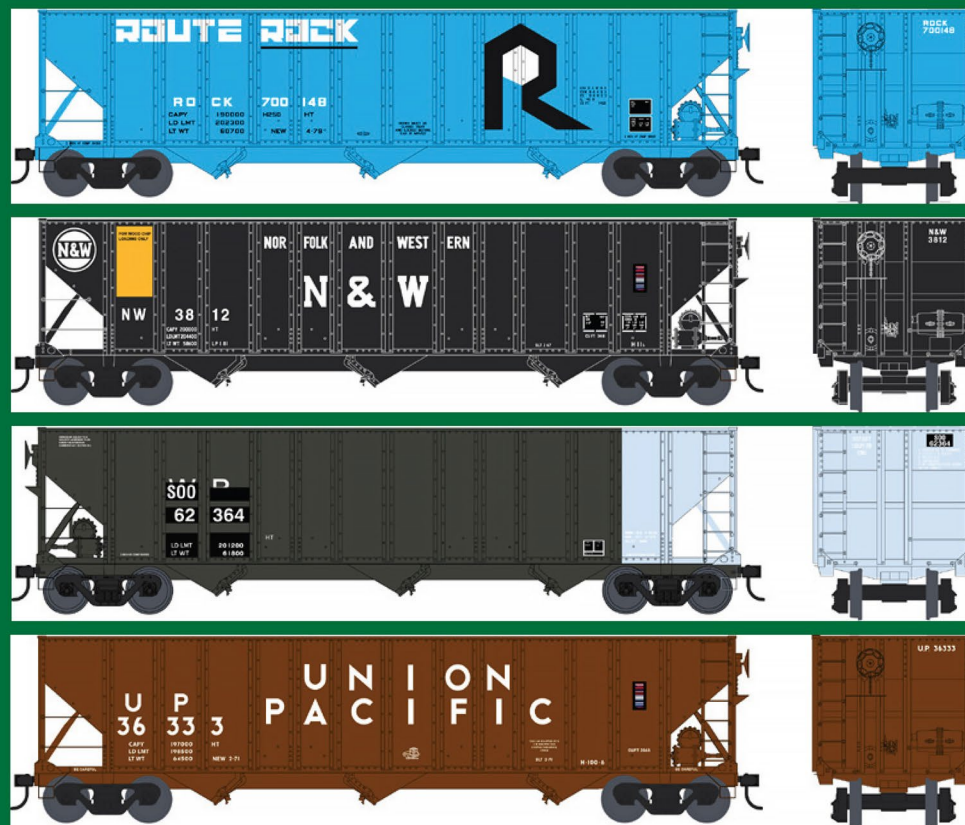
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PUBLISHER'S MUSINGS | 7

excellent modeling video we've run across that demonstrates some great modeling technique. We'll be throwing the net far and wide on this one, pulling in videos from military modelers or other disciplines that we feel can benefit model railroaders as well.

With these changes, we're making the leaner but still free MRH magazine into a meaner magazine once again. We're replacing the fluffy stuff with some new low-flab meat that will further our goal of helping you achieve your hobby dreams – just like the MRH motto says. ☒



THE Ah-HAH MOMENT

Joe Fugate: Tab on cars switching ops aid

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Joe Fugate: Squeeze bottle needle applicators for every purpose

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★ LAST ISSUE'S RATINGS

The three top-rated articles in the [March 2019 issue](#) of *Model Railroad Hobbyist* are:

- 4.7 Raspberry Pi for model railroaders
- 4.7 Lee Nicholas' Utah Colorado Western
- 4.4 Animated rollup door

Issue overall: **4.1**

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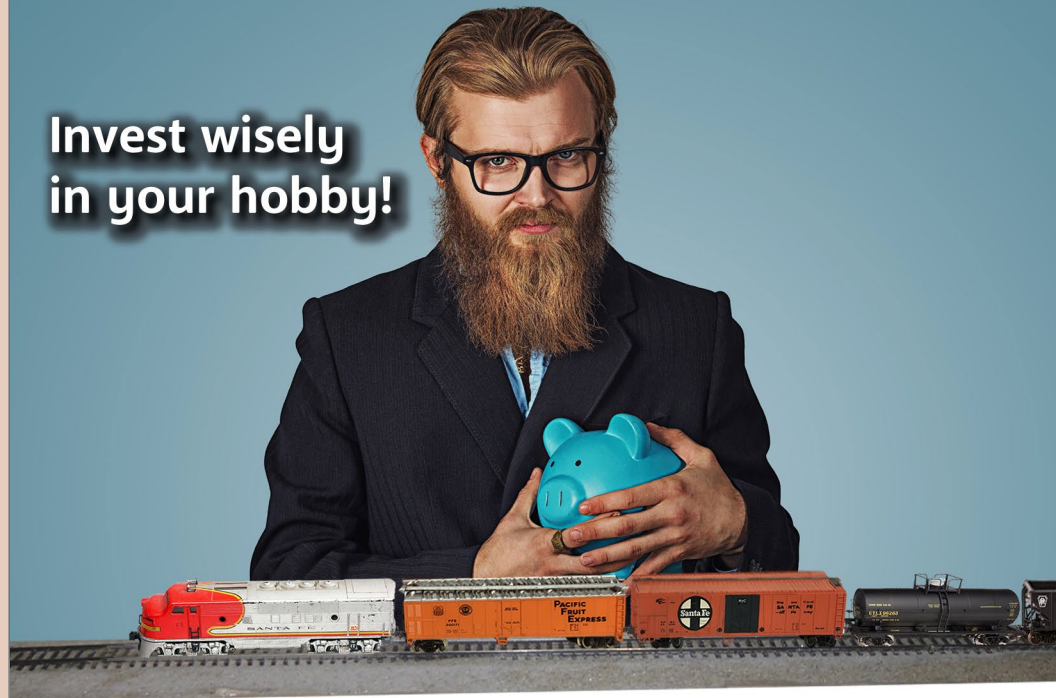
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**Conversations from the MRH
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Model Railroad Hobbyist | April 2019

compiled by **JOE BRUGGER**

★★★★★
RATE THIS ARTICLE

Pilot truck details

Q. I have a Bachmann 2-8-4 steam loco that was a terrible puller. I added weight to it to equalize the weight on the drivers as most of the weight on this loco was on the rear driver. It now pulls quite well.

My problem is that the front pilot wheels weigh practically nothing and need only the tiniest excuse to derail. They will derail where nothing else will (usually on turnouts), and the NMRA gauge does not show any issues. I'm thinking more weight on the pilot would be my friend.

—John C.

A. Before we go messing with weight, let's examine a few things. Checking the track and wheel gauge is the first step. Balancing the locomotive's weight over the drivers is another excellent step.

A big steam engine is going to have a long rigid wheelbase – the drivers just aren't going to wrap themselves around a small-radius

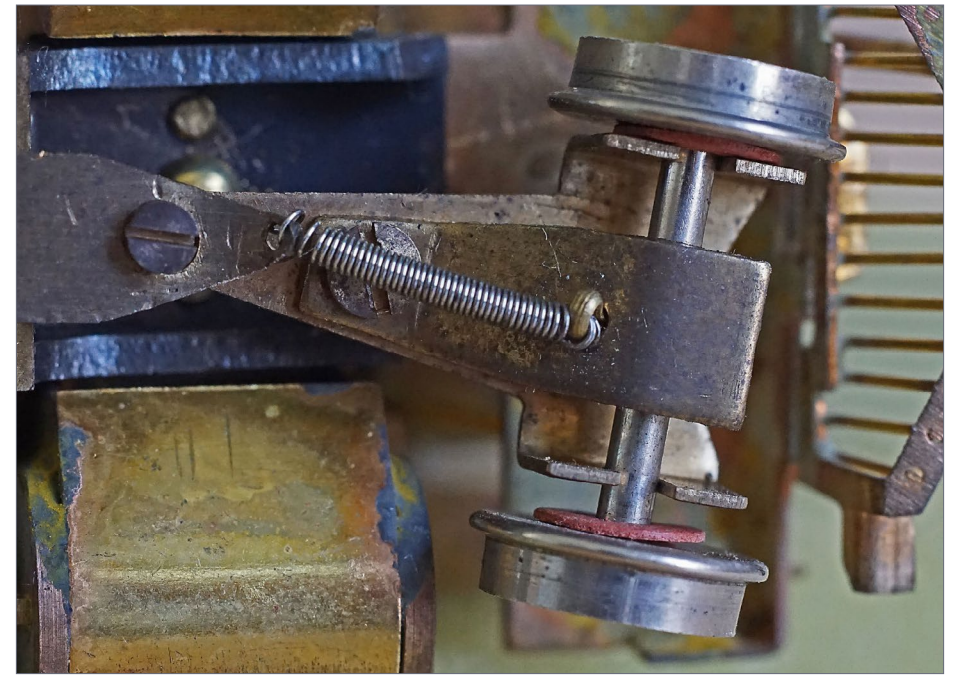
► **MRH QUESTIONS, ANSWERS, AND TIPS**

curve. Get down to track level and watch carefully as the engine rolls slowly through the problem spot. Watch to see that the pilot truck has enough side-to-side movement and is not forced to push up and over the outside rail. Be sure the pilot wheels don't hit anything that would cause them to stop rolling.

Sometimes a small rise or dip in the rails will be enough to derail an engine. If the curve is broad enough for the pilot truck to follow the rail correctly but it still derails, then adding weight may help.



1. HVT Dave chose not to reduce weight on the drivers of his engine, so he removed the pilot truck spring, then added a weight directly to this Bachmann 2-6-0 pilot truck. The changes solved his derailment issues instantly. The top view (left) and bottom view (right) show the automotive stick-on wheel weight. *HVT Dave photo*



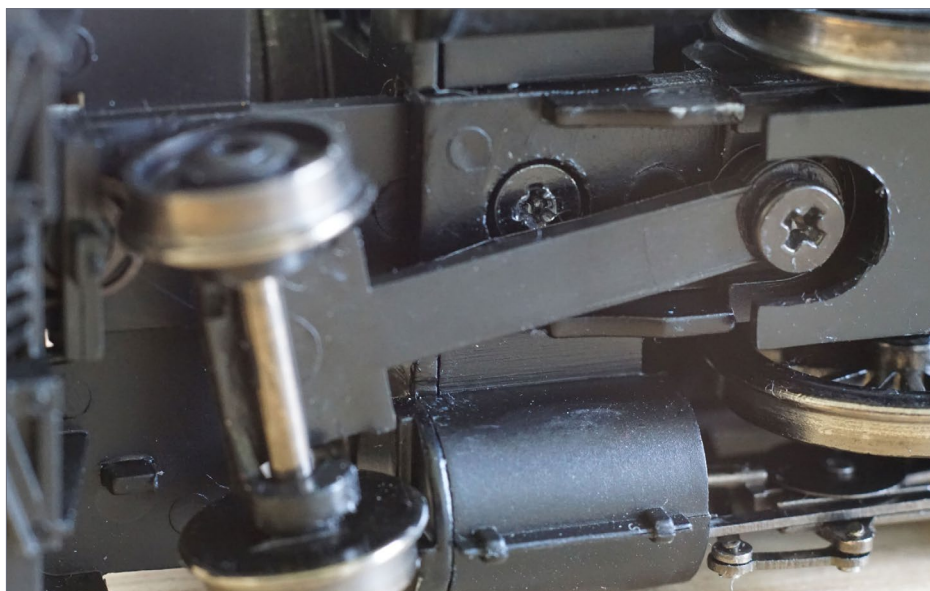
2. Some engines have a coil spring attached to the frame (left) and to the pilot truck (right). A longer spring will reduce down-force and a shorter spring increases it. Other engines will have a coil spring placed vertically to exert pressure. Clipping off one coil could increase pressure. Adding a spacer or stretching the spring will decrease pressure.

R Meyer: Depending how much space there is between the pilot axle assembly and the bottom of the loco body you may be able to glue a small piece of lead to the center of the pilot axle assembly. You may also be able to glue a small piece of spring steel to the loco body that will put some downward pressure on the axle assembly. You probably do not need a lot of pressure. Too much would tend to lift the weight on the leading driver axle.

Geoff Brigham: I had the opposite problem, where the pilot truck was taking too much weight and my solution was to weaken the spring. Sounds like you could try a stiffer spring.

Brodie Washburn: I have an Athearn Genesis MT4 4-8-2. I had the same issue, and stretching the small spring between the frame and pilot helped. R Meyer is correct in noting that too much pressure can lift the front drivers. I do think the Genesis MT4 prefers a track radius broader than 24" even with good easements. It is never happy on curves of less than 28" radius. That pilot just wants to jump.

Michael Whiteman: To add weight, I have wound solder around the pilot truck axle. Just make sure it doesn't touch both wheels at once and cause a short circuit. A fiber washer cut and slipped over



3. This plastic pilot truck could be weighted, if necessary. This one, on a small HO Bachmann 2-8-0, functions very well as it is.

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the axle on the insulated wheel side solves this. Or you can glue the solder to the axle.

John C.: I've heard about the solder technique. I wonder if that alone will add enough weight. That said, it may be the only way to do it depending on what things are like around the pilot.

Rob in Texas: I have added a piece of sheet lead to the front axle and solved similar issues on steam locomotives. It works well.

Ken K.: On one N steamer I could not add enough weight to keep the pilot truck on the rails, and any added weight looked bad. So, I dug out some small neodymium magnets and epoxied one magnet on the truck just above the axle. I drilled two holes in the frame for mounting two magnets which applied enough force to the pilot truck to keep it on the rail. I have begun experimenting with using the same technique on larger engines, including one for the garden. The same technique should work with an HO engine. Just make sure the magnet on the truck is mounted to repel the magnets on the frame.

Switches for Tortoises

Q. What activating switches work best with the Tortoise switch motors?

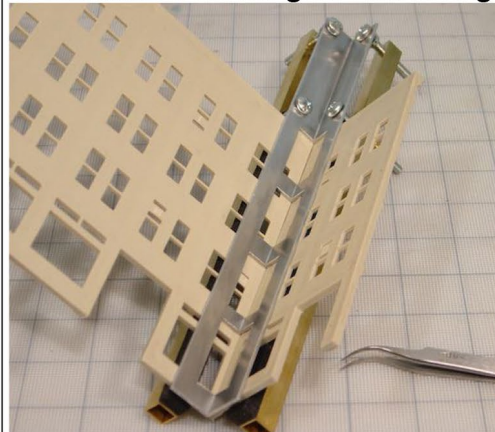
—John Griffin

A. The simplest way to run a Tortoise is to use 9 to 12 volts direct current (DC) switched through a double-pole double-throw (DPDT) switch. Tortoises draw only 15-16 milliamps at full stall, so almost any DPDT mini-switch on the market will work.

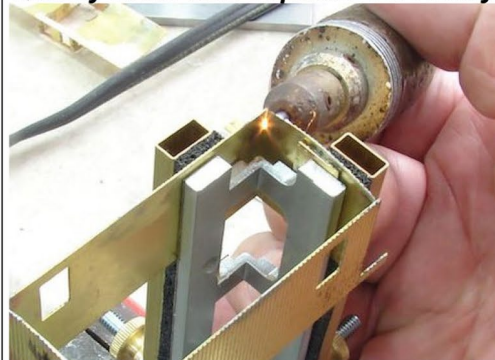
DPDT switches are available as toggles, as rocker switches, and in other forms. When wired according to the Circuitron diagram, flipping the switch one way will throw the points to the diverging route; thrown the other way it lines the points for the normal (straight) route.

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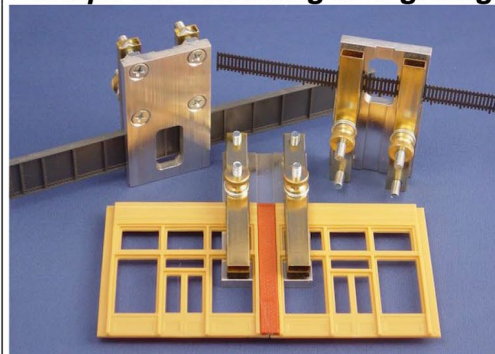
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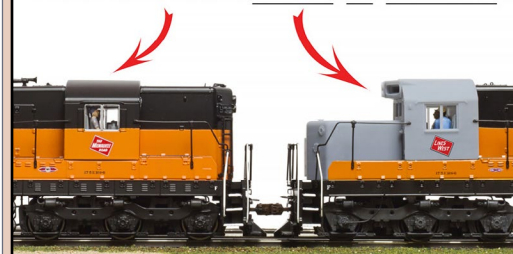
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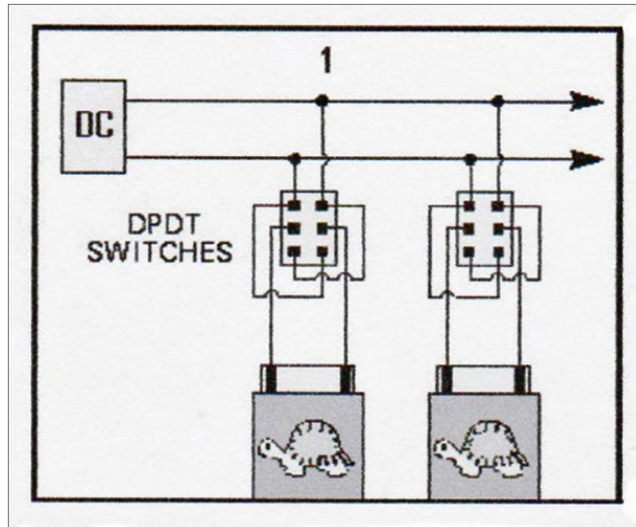
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Circuitron offers three diagrams for wiring its motors: with DC and DPDT switches, with bipolar DC and SPDT switches, and using alternating current with a pair of diodes to steer half-wave-rectified DC to the motors. The diagrams and directions are at



www.circuitron.com/index_files/ins/800-6000ins.pdf.

4. Wiring diagram for powering Tortoise switch motors with DC voltage and using a DPDT switch control. *Circuitron*



5. Miniatronics is one seller of DPDT switches suitable for controlling Tortoises. All Electronics, DigiKey, Mouser, and other sellers also can supply them.

DrJols: There are lots of considerations to determine what will work best for you. A partial list:

- Will you control the Tortoise from just one location or do you need more than one control point?
- Do the control switches go on a track diagram?
- Will the control switches be where operators can bang into them as they walk past?
- What kind of power supply will you use?
- How much work are you willing to do to install the controls? There is a gorgeous pushbutton circuit that our club prefers, but it's not a quick install.
- Can you solder wires to lugs on control switches without frying the switches' guts?

Related to frying devices with a soldering iron: there are connectors that slide over the contact fingers on the Tortoise. You solder to the connector instead of to the Tortoise. The connectors are available from Tonystains.com and probably elsewhere.

Without considering the above stuff, about the only recommendation to be made is that a double pole switch should not be the momentary contact type. The Tortoise depends on a small but continuous flow of electricity to function.

Catch up with the Tortoise thread at mrhmag.com/node/32474.

Coupler lever lift bars

Q. I'm looking for some coupler lever lift bars to put on my modern rolling stock. The only ones I've been able to find are made by Plano. I was wondering if there are any other bars out there. If I do order from Plano, which ones should I get? They

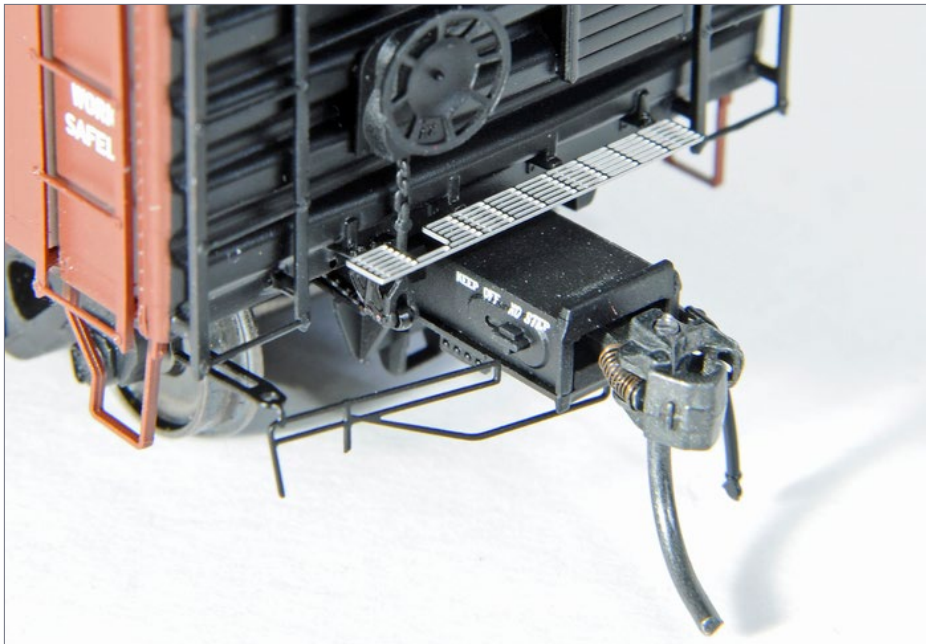
have a few different models. I want to put them on my boxcars and corn syrup cars.

—Patrick Hanz

A. Dave Branum: The usual way to get them is to bend them from brass wire, about 0.010" for HO scale. A photo of a prototype car like you are working on is a good guide to how they should be shaped.

Nick: A TrainmastersTV video shows how it's done. It's not a hard process and looks great!

Try mrhmag.com/node/30143?page=8#comment-312440.



6. The coupler release lever on this Tangent Pullman-Standard PS-1 Mini-Hy cube boxcar telescopes to accommodate movement in the cushioned draft gear.

Ed: As you mention, Plano Metal Products makes cut levers. You will need photos of the real thing to match their styles to what is on your prototype car. Tangent Scale Models sells a couple of styles. Also, search with Google for Athearn and BLMA parts.

www.planomodelproducts.com/coupbar_scq.html.

www.tangentscalemodels.com/product-category/unique-and-useful-parts.

You can find the full discussion at mrhmag.com/node/32049.



TIPS: Repetitive rock molds

I have duplicate rock molds that I inadvertently bought over the years, and finally figured out what to do with them.

I cut them into smaller pieces that obscure the larger rock pattern. By cutting them along the narrow axis, the resulting mold can be oriented perpendicular to the normal orientation. Thin mold strips can be oriented at any angle, or inverted, and recombined in different order to mix up the resulting rock face.

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Small, odd-shaped pieces can be used to fill the gaps where molds don't quite mate. Cutting the molds can make them less rigid, so you need to exercise care when filling them with wet plaster.

—Nancy Jean Burkholder



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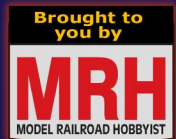
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Model Railroad Hobbyist | April 2019

compiled by JOE FUGATE

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new

Staging Moves around the Curves...

Mon, 2019-03-11 22:41 — JLandT Railroad

Today was a productive day as I managed to get the Staging Tracks all the way around curves on the Staging Deck.



1. How do you keep the tracks parallel in a curved yard? In this thread, Jason Miller shows exactly how, along with a lot of other great hints and tips. Make sure you explore the entire thread!

► MRH'S MONTHLY GREAT MODELER POSTS

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More progressforeground scenery in front of tracks

Sat, 2019-03-02 17:47 — Rich S



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Very nice Rich - a convincing

Sat, 2019-03-02 18:26 — Ken Rice

Very nice Rich - a convincing representation of the end of winter.

My blog: <http://rices-rails.blogspot.com/>

2. For some realistic scenery along with how-to's, check out this thread by MRH forum member Rich S. We're talking winter / early spring scenery and if we do say so ourselves, the results are stunning – no kidding!

Weekly Photo Fun March 17th to 22nd

Sat, 2019-03-16 21:01 — [traintalk](#) [Modeling general discussion](#) [Photo inspiration](#)

A new Shay was put into service pulling logs down to the mill.

This is a brass Shay in Sn3 with a LokSound decoder with customized sounds recorded off of the Dixiana Shay.



Shay #16 waddles over the high bridge

Sun, 2019-03-17 06:30 — [traintalk](#)

Shay #16 waddles over the high bridge pulling a string of logs.



3. The Weekly Photo Fun thread makes for some delightful viewing each week. Forum regular [traintalk](#) kicked things off recently with these gorgeous photos ...



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WHAT'S NEAT

column



Model Railroad Hobbyist | April 2019



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KEN PATTERSON THIS MONTH: We visit RAND HOOD and talk about his layout plans; Michelle KEMPENMA shares her visit to the CUMBRES & TOLTEC RAILROAD, and GEORGE BOGATIUK DRESSES UP A DIESEL WITH LED LIGHTING ...

THIS MONTH: WE VISIT RAND HOOD AND TALK



about his layout plans; Michelle Kempema shares with us her visit to the Cumbres & Toltec Railroad, and George Bogatiuk installs LED headlights, step lights,

truck lights, ditch lights and emergency lights on a locomotive. Steven M. Conroy provides us with some magnificent visuals in "Modeling Ideas from Above," flying his drone over Columbus, OH at sunset, and we interview Andy Edleman, the v.p. of marketing from MTH Electric Trains, in this month's video. ✓

► PHOTOS AND VIDEO OF SUPERB MODELING

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On the road with Michelle Kempema: The Cumbres & Toltec Scenic Railroad



1-3. (Above, Right top and bottom) The Cumbres & Toltec Scenic Railroad provides a beautiful railroading experience in Northern New Mexico and Southern Colorado. Powered by coal-fired steam locomotives and following parts of the original Rio Grande narrow gauge line (The Chili Line), a ride on the 64-mile narrow gauge is the best way to experience the authentic west of the 1880s. Michelle interviews Corrin Williams in this month's video, discussing the options to experience the railroad as a club or group booking a passenger car or caboose for a day to celebrate your special event on the railroad. They also discuss that the railroad offers fireman and locomotive training that lets the visitor get up close to the equipment and experience railroading as it was before the diesel locomotive was imagined. If you are planning a summer trip, look up the Cumbres & Toltec railroad on line at cumbrestoltec.com.



Also see the new "What's neat
this week" weekly video podcast!



MTH Electric Trains with Andy



4. This month, Andy Edleman from MTH Electric Trains talks about his more than 30 years serving and working in the model railroad industry. He is always smiling as he describes his recent six shows in the past nine weeks and he always finds the time to work at home after hours on company projects. He says "we provide happiness to consumers" through the products he sells and that in itself makes him the richest man in the industry as he lives his job. The latest big seller for MTH has been the S scale items recently added to the line of products. O, HO, and G scales have always been steady sellers. The recent addition of scale Christmas lights to some O scale models has been a very welcome special effect to modelers and these models sell out before they are even produced. The next time you see Andy at a train show, smile and thank him for helping to promote the best hobby in the world through the products offered by MTH Electric Trains.

Model Railroad artist Rand Hood



5. In this month's video we get a special treat, with an interview with Rand Hood. Rand is a prolific modeler of the Colorado mountain landscapes that he has shared throughout the model press in the '80s and early '90s in fantastic model photography. After taking a 14-year break from the hobby, Rand is back and better than ever with new ideas on how to model scenes that make the viewer believe they are real.



Also see the new "What's neat this week" weekly video podcast!





6. (Top) He still has a section of his original layout built from several years ago. This was a rugged landscape with lots of rock castings forming the canyons above the tracks.

7. (Top right) He is planning a new layout and has just about finished the layout room. He will share with us the progress of this latest work of modeling art as it is built over the next few years. When we met Rand, it was snowing heavily and the scenery of the Colorado Rockies was accented with white. Karen, Rand's wife, greeted Auston Allard and me at their house which was designed from the ground up with Rand's ideas on how a house should look, with art built into the architecture. This same magic is always evident in the museum settings Rand designs professionally and the model railroad scenes he creates. After a hot bowl of homemade chili, Rand talked to Auston about his ideas of layout design. With a little coaxing from Rand during the interview, you can watch as Auston forms new ideas for his upcoming layout design and build. This interview will run in May's "What's Neat." With a big smile, welcome back to the hobby Rand Hood!



George Bogatiuk's ES44 with LEDs



8-10. (Above, right top and bottom) This month, George provides a video about his latest passion. No, it's not the usual Missouri Pacific project he is working on. These days it's a modern ES44 GEVO BNSF in HO scale from Athearn Trains. He added lights on the steps and trucks, ditch lights on the front, headlights, walkway lights, and the red emergency lights in the cab. This month is just a first look at the model and how the effects look with the room lights on and off and shows how the function CVs will control each set of lights. In future segments George is going to get his hands dirty as he shows us the actual process of installing each set of LEDs into a diesel locomotive.



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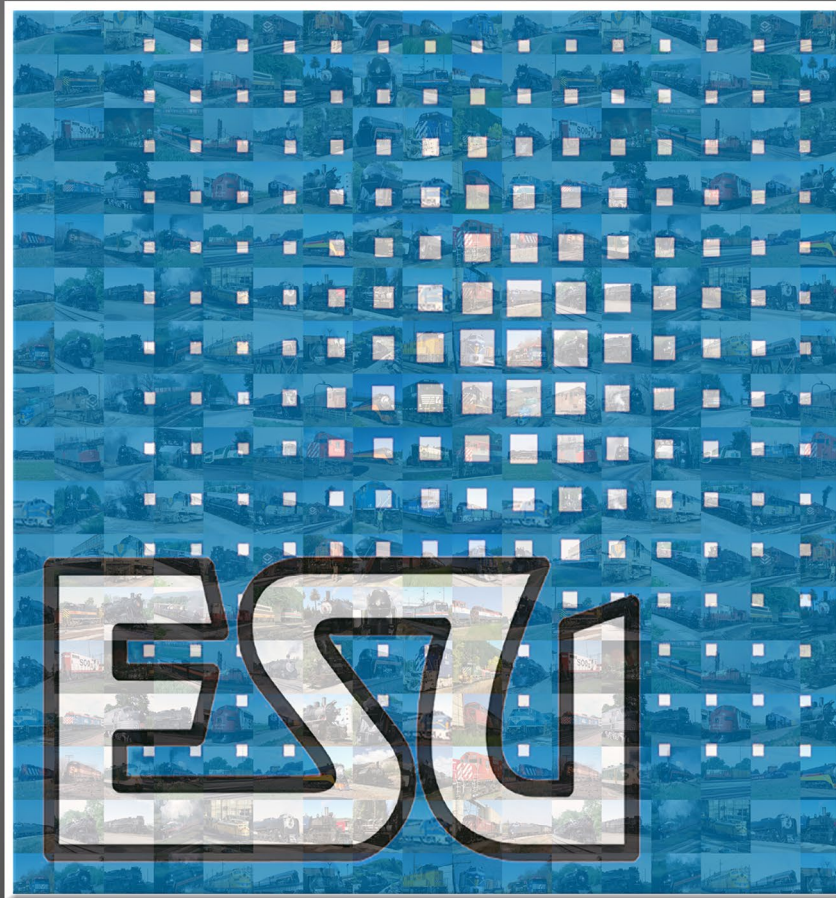


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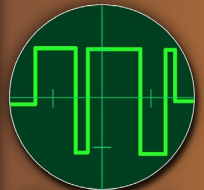
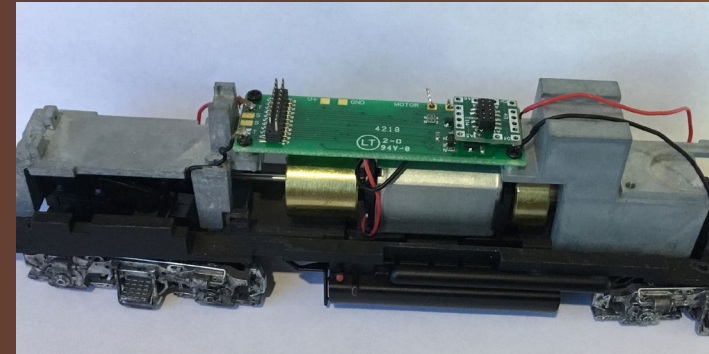
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The Decoder Buddy



Electrical
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Model Railroad Hobbyist | April 2019 | #110

Nick SANTO shows the board he designed
to solve 21-pin decoder install woes ...

★★★★★
RATE THIS ARTICLE

THIS NEW PRINTED CIRCUIT BOARD I DESIGNED
makes it super-easy to install 21-pin decoders from vendors such
as Digitrax, ESU, SoundTraxx, and TCS.

I created this new 21-pin-friendly board to replace the standard
DCC 8-pin loco motherboard, and to take full advantage of all
the functions and features of the latest feature-rich decoders.
Modelers can purchase it from my website (nixtrainz.com), and
selected dealers so you too can enjoy hassle-free installs.

The benefits of the new Decoder Buddy (DB) board include:

- It uses 21-pin decoders – ESU, SoundTraxx, TCS and Digitrax.
- 10-pin socket & plug with wire-outs for all 21-pin decoder functions.
- 10-pin plug is removable for easy separation of loco shell & chassis.

THE DECODER BUDDY | 2

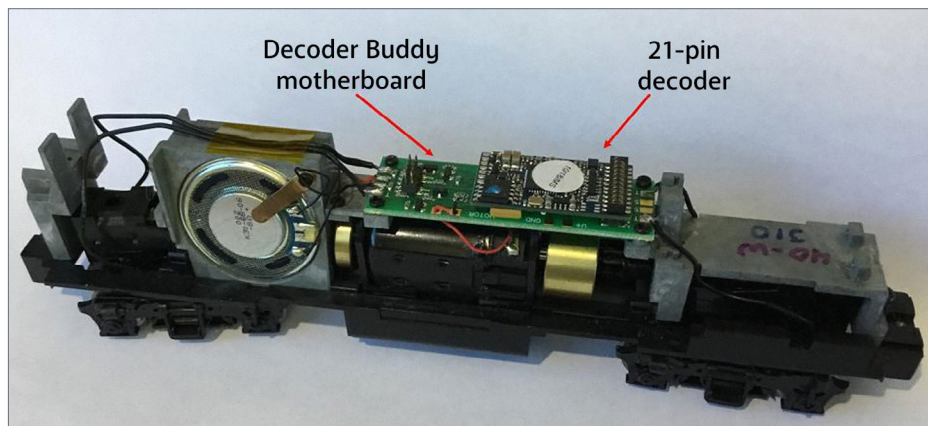
- On-board soldering pads for a stay-alive device of your choice.
- On-board resistors for LED lighting.
- Older 8-pin loco motherboard weaknesses solved.

Installing the board

Installation instructions may be found on my website at nixtrainz.com. Dealers and decoder installers are also listed there.

There are three standard methods of physically installing a Decoder Buddy. It is a direct replacement for most QSI decoders. Two, three, or four screws are sufficient to hold the Decoder Buddy in place. If there is any question about electrical isolation between the decoder and the locomotive frame, I recommend insulating with Kapton tape.

The eight-tab decoder replacement can be glued onto the connecting tabs with rubber cement or GOO. Two-sided foam mounting tape is acceptable also.



1. This is a completely installed and wired Decoder Buddy motherboard and a 21-pin decoder in an Atlas GP38 or GP40 frame.



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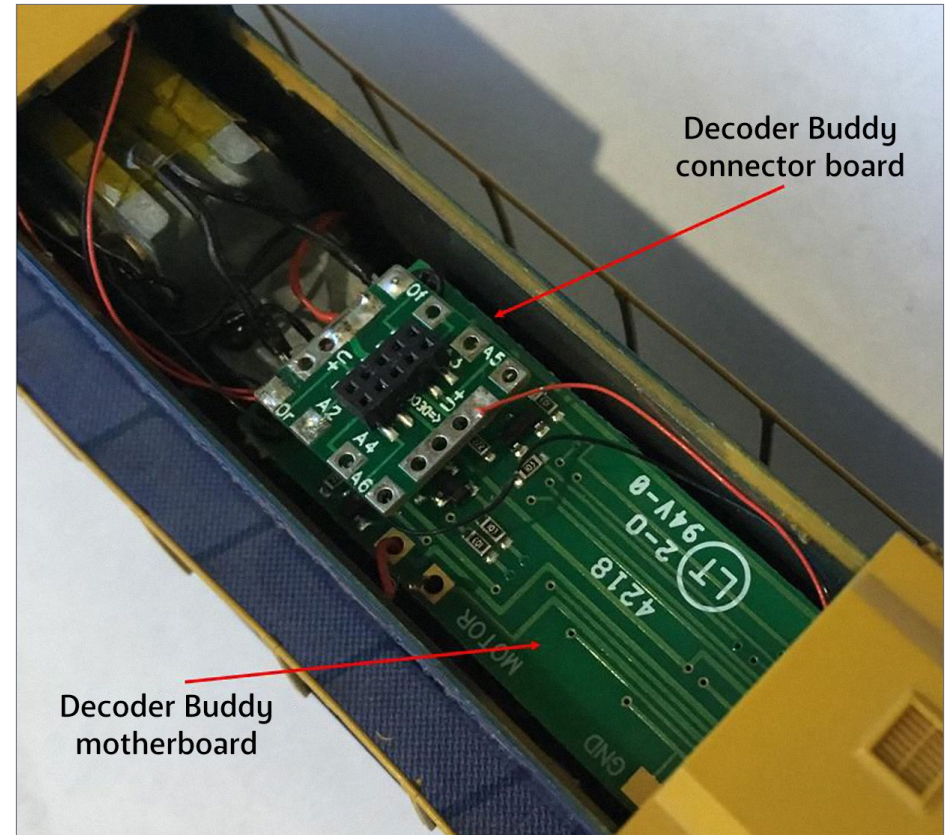
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THE DECODER BUDDY | 3

A DC conversion like a Blue Box would require a piece of Kapton tape placed on the bottom of the Decoder Buddy to assure electrical isolation.

A second piece of Kapton tape would be used to secure the decoder to the motor. A piece of two-sided foam mounting tape is an alternative if height is available.



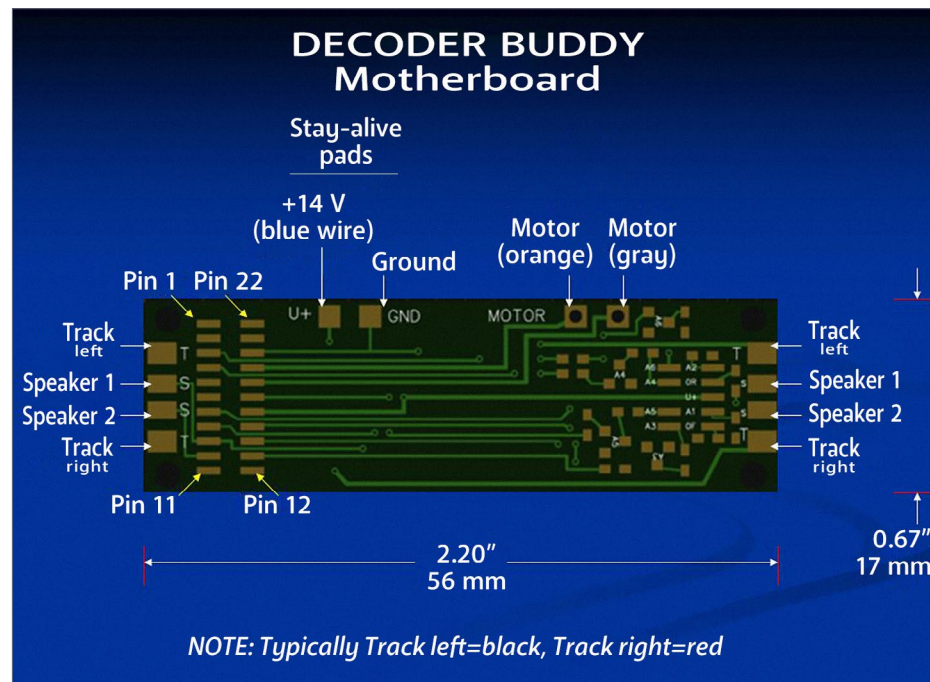
2. This shows the Decoder Buddy connector board installed with wiring to the LEDs attached. The 21-pin decoder is not installed for clarity. The shell is an Atlas GP38 of the dual-mode era.



THOUGHTS ON DECODER INSTALLATION

Here are some things to think about if you've never installed DCC decoders.

Motor wires, motor wire colors, and decoder boards have given me fits and wrong-way starts more than once. Thanks to this new board, I can solder the track wires and speaker wires to the Decoder Buddy, but just clamp the motor wires to the board.

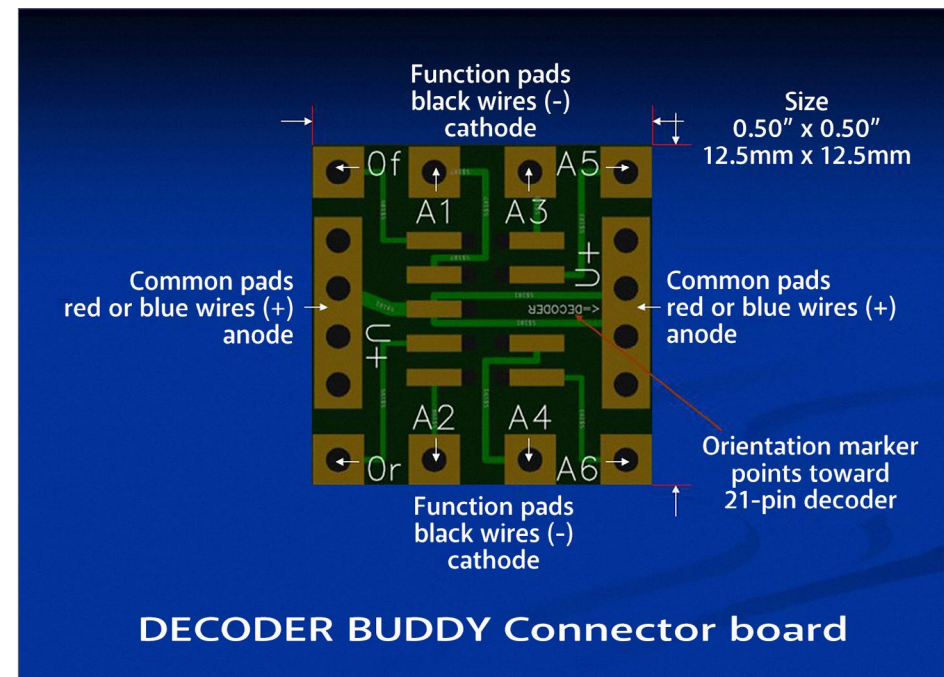


3. (Above left) Shows the connections on the motherboard, the 21-pin connector position, and the dimensions.

4. (Right) Shows the connections on the connector board and the dimensions. Pad labels appear on the board for

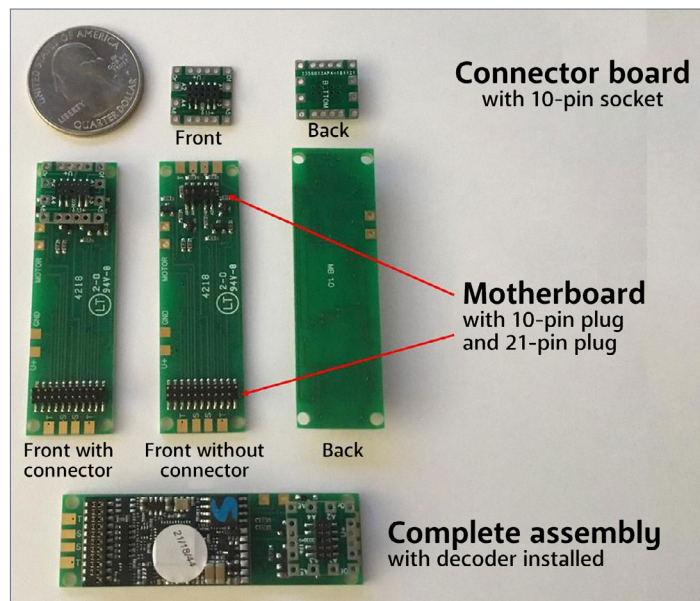
Next I place the decoder carefully on the 21-pin plug. When it is placed correctly on the pins I press the decoder onto the plug to seat it. Now I can test on a program track to make sure the locomotive moves in the direction that I want it to. If I need to change the direction of the motor, I swap the leads on the pads and then solder them onto the board.

The locomotive direction may also be changed with a configuration variable if installed backwards.



attaching function leads. With all function leads attached on this connector board, it allows for easily disconnecting the function leads when removing the loco shell for maintenance.

THE DECODER BUDDY | 6



5. This picture shows both sides of the connector board and motherboard, all the associated plugs and sockets, and an installed decoder.

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Here are some tips for installing the Decoder Buddy:

1. The large motherboard is single-sided, but to be conservative, place a piece of insulating tape (Kapton preferred) on the bottom of the Decoder Buddy before mounting it to any metal surface.
2. When mounting with double-sided foam tape the extra insulating tape is not required.
3. I prefer to cut the connectors off any of the wires from the track, motor, speakers, lights, or stay-alive device, noting polarities that are relevant.
4. Before soldering the wires onto the Decoder Buddy pads, I cut them so there is about ¼" extra. The extra ¼" of wire keeps the installation neat, and leaves a little play for contraction or routing.

Pin #	Decoder Buddy	ESU LokSound LokPilot	SoundTraxx T2 & E2	Train Control Systems
3	A6	A6		F6*
4	A4	A4	Fx6	F4
7	F0r	F0r	F0r	F0r
8	F0f	F0f	F0f	F0f
13	A3	A3	Fx5	F3
14	A2	A2	Fx4	F2
15	A1	A1	Fx3	F1
17	A5	A5		F5*

Table: Decoder manufacturer's function nomenclature mapping

* Note: TCS functions 5 and 6 are not programmable, and only output constant bright lights.

Input 1	1	22	Track right (red)
Input 2	2	21	Track left (black)
Aux 6	3	20	GND (ground)
Aux 4	4	19	Motor 1 orange
TB clock	5	18	Motor 2 gray
TB data	6	17	Aux 5
F0r yellow	7	16	(+) Plus (blue)
F0f white	8	15	Aux 1
Speaker	9	14	Aux 2
Speaker	10	13	Aux 3
Input 1	11	12	Vcc

6. Standard NEM 21-pin decoder pin configuration used by decoder manufacturers.

Please note that using this printed circuit board makes the locomotive usable for DCC only. It is not for DC operations.

5. Exception: I prefer to leave the motor wire long, and tuck it out of the way if possible.
6. I also keep the leftover wire for later use.

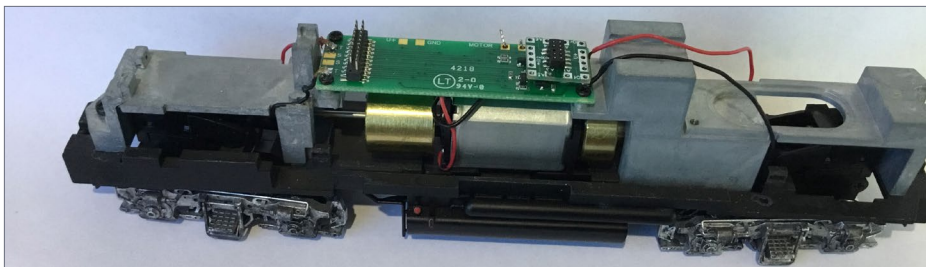
Installation examples

There are three common ways to install the motherboard in the post-Roco Atlas GP 38 and GP40 locomotives. These examples should give you a basis for installing your own decoders in other locomotives.

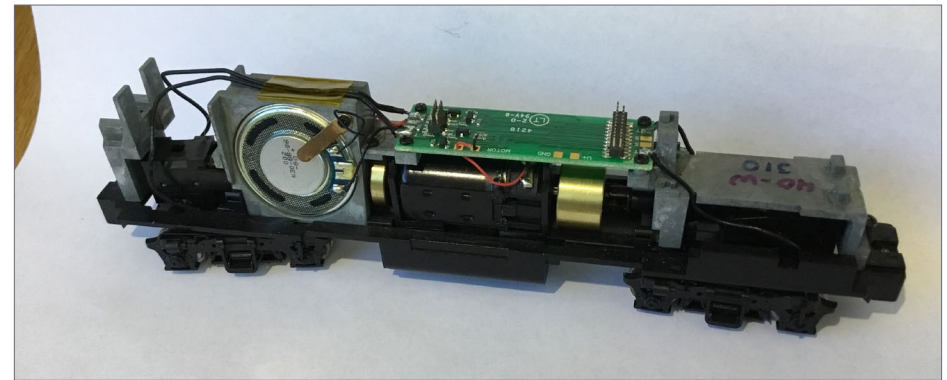
Some locomotives will still need to have their interiors modified to accept a decoder. I encourage everyone who installs a Decoder Buddy to send me pictures. I will post them on the website to help other people with their installations.

Blue-box locomotives, steam locomotives, and other pre-decoder-era locomotives are also good candidates for Decoder Buddy, because the board is compact. ☑

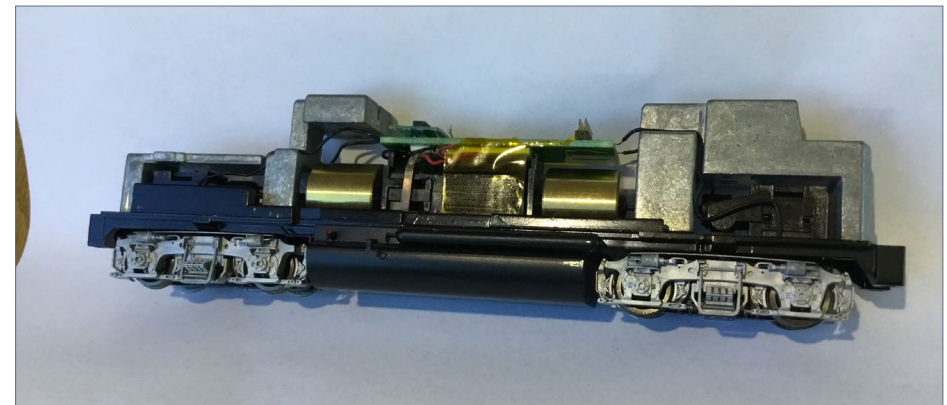
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7. This is a new Atlas Silver DC decoder replacement. The Decoder Buddy installs in both directions and screws-in directly. In this locomotive the connector board should be accessible through the hatch on top.

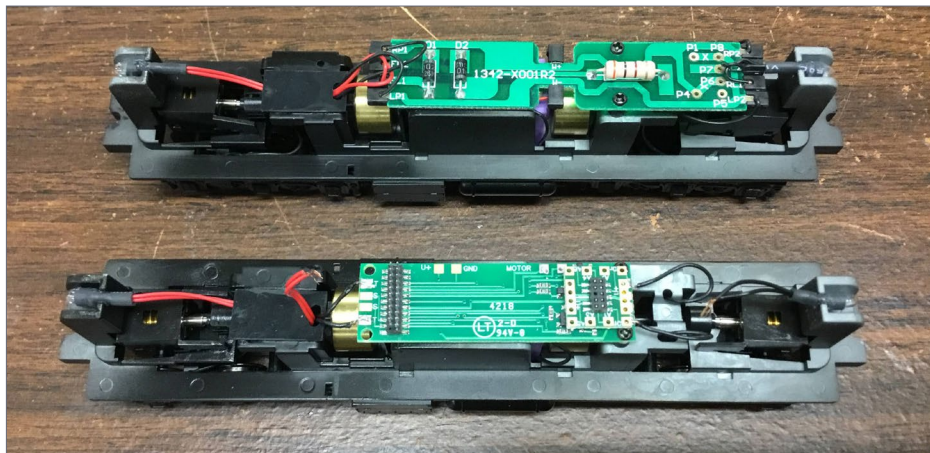


8. This is a mid-run Atlas Gold GP40 QSI replacement. There are eight wires to solder to the motherboard pads, or 10 if you include a stay-alive device.



9. This is an Atlas dual-mode decoder replacement. First, place Kapton tape on the bottom of the Decoder Buddy. Then attach it to the motor with a piece of Kapton tape from one side of the motor to the other. For a little more room and a little neater installation, the clips that held the old decoder can be cut flush with the decoder support before attaching the decoder with the Kapton tape.

THE DECODER BUDDY | 11



10. Two of Jim Moe's Proto1000 RSC2s before (top) and after (bottom) installing the Decoder Buddy. Sugar cube speakers might now fit in the extra space.

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DECODER BUDDY | 12



11. Now I can run locos that sound *and look like* the prototypes, with all the lights easily connected to their own functions!

Brian Miller photo



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GENESIS OF THE DECODER BUDDY

I have seen many articles and videos showing how to install LEDs into locomotives. These often recommend three-millimeter LEDs and surface-mount LEDs (with or without wire leads).

LEDs are used for headlights, ditch lights, number boards, cab lights, ground lights, and so on. They may be purchased with or without resistors.

Decoders come in many styles, and there are many decoder mounting schemes. The lists go on.

My frustration peaked when I wanted to have different decoder functions turn on and turn off selected locomotive lights. There was no provision to add separately controllable ditch lights to existing sound decoders. This was particularly obvious in QSI decoders.

Other manufacturers eventually came along and offered sound decoders that had six programmable lighting functions. This was a good development. The next problem was fitting these decoders into the space provided for QSI decoders. I had to cut off the front two track tabs and the two headlight tabs to make them fit.

Wiring the decoder became significantly more difficult after cutting off the four tabs. Soldering headlight wires to the available areas on the modified decoder board was difficult. A job for an expert!

After reading Dr. Geoff Bunza's and Peter Elsea's posts on the *MRH* website, I realized that designing circuits and making printed circuit boards was an interesting proposition.

I designed and produced a printed circuit board that is mountable in most HO locomotives. It accepts four major manufacturers' 21-pin decoders: Digitrax, ESU, SoundTraxx and TCS. The main printed circuit board (motherboard) is correctly sized to fit in place of a QSI decoder.

It is easy to replace the universal board-style decoders and motherboards also. Kapton tape can be used to insulate and mount the printed circuit board into blue-box and similarly configured locomotives. The motherboard also has a pair of pads to connect a stay-alive device of your choice.

The small square printed circuit board makes LED wiring much easier. It has discrete pads to connect each of the eight lighting functions negative lead, and two large four-position pads to connect the common positive leads.

The eight discrete lighting functions include resistors so I only have to solder the correct LED leads to the pads on the small connector board. Using the small square printed circuit board as a connector allows separating the locomotive shell from the metal frame when it's been wired with headlights and other functions.

This has been more of an evolution than a project for me. It's more like a hobby than a job. I hope it helps people achieve a little more realism in their modeling and happiness in their model railroading too. ■



NICK SANTO



Nick Santo was an environmental analytical chemist and a flight instructor and flight school co-owner in his working life. Later he was briefly a student conductor and student engineer on GP38 and GP40 locomotives. He is now “retired.”

He works-out most days in a gym or on his bicycle. Electronics and photography are his major hobbies. In the winter, Nick and his wife of 42 years,

enjoy traveling the warmer parts of the United States in their motor home.

Travel and meeting people on the road is his favorite winter pastime, especially when it involves trains. Real trains and model trains have been a lifelong passion.

A Marx figure-eight layout on plywood at age 4 and living on Depot Street listening to steam locomotive whistles were undoubtedly the seeds of Nick’s interest in trains. ■

See Nick’s website if you would like to get the Decoder Buddy shown in this article. Nick made some extra boards in case anyone would like to buy some:
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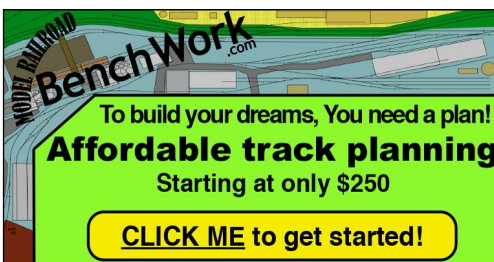
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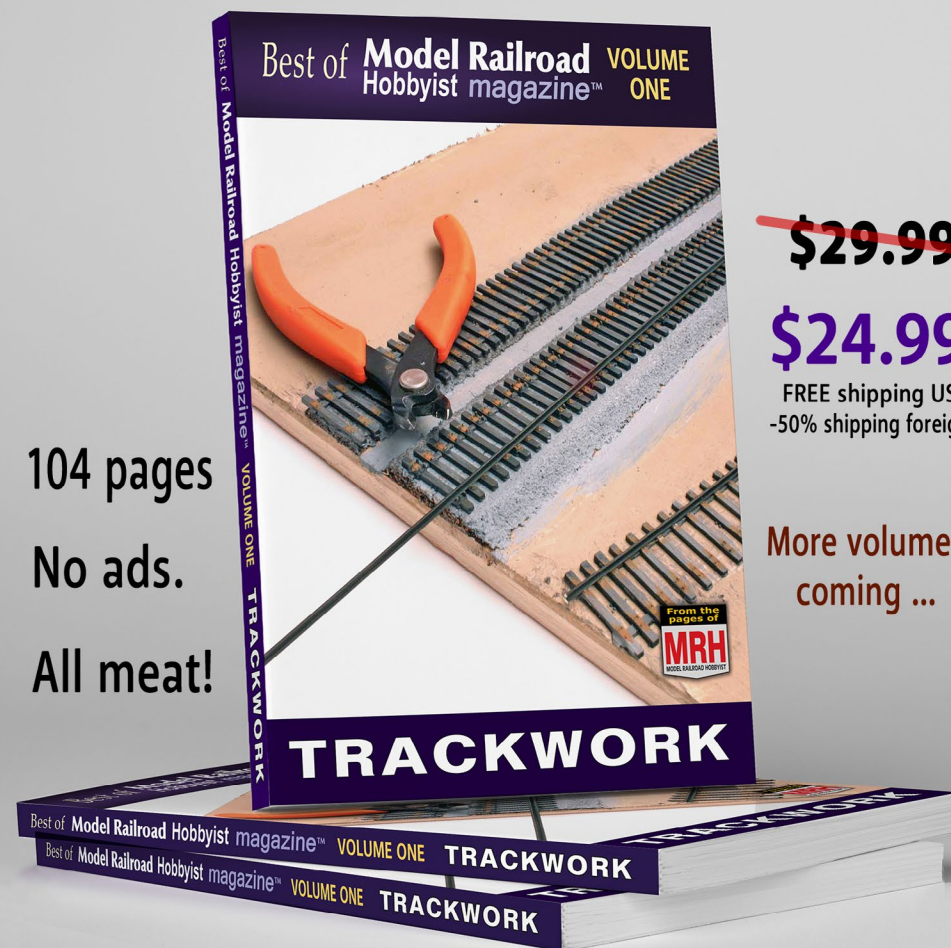
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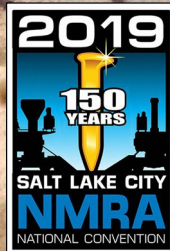
Ted York's Santa Fe on Cajon Pass



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MRH: HELLO, TED. LET'S START AT THE BEGINNING – how did you first get into the hobby?

Ted York: I've been in the hobby for as long as I've been alive. I was born on Christmas Eve, and the story is that my dad was home playing with my Lionel train set under the tree on Christmas day. We stuck with the Lionel for many years but finally moved into HO.

MRH: Tell us more about your journey in the hobby.

Ted: My dad was in the military. Of course, we moved from place to place over the years. When we got into HO, he built a 4 x 8 layout with sides, kind of a sandbox, and with a lid. We took that with us everywhere we went until my teens when he was stationed in Guam.

I remember the Christmas before we left Guam, I got an N scale train set – it was when N scale was brand new. So, I got into N

1. Ted York's Cajon Pass faithfully reproduces several prototype locations, such as this modeled scene of Sullivan's Curve, named after the famed railroad photographer Herb Sullivan.



SANTA FE ON CAJON PASS | 5

scale and I stuck with that pretty much until I left high school and went off to college – after which I gave up the hobby for a number of years.

After I got married and my first son was born, that was my excuse to head back to the hobby shop! I started with a small 4 x 8 that I messed around with for a number of years. When we finally settled down into this house, I went crazy and filled my basement with a layout that I had dreamed about forever.

Even growing up as a kid, one of the things that I would do is sit and draw train layouts. I learned drafting that way and just dreamed of things that I wanted to model.



2. Santa Fe helper 3841 pushes the train past Ted's model of Mormon Rocks, a famous rock formation along the Cajon Pass route. Compare to the prototype photo [3].

SANTA FE ON CAJON PASS | 6

MRH: If someone comes down here to your basement, what are they going to find?

Ted: You will find a model of Cajon Pass during the late '40s to early '50s. When I began this layout, I decided to model Cajon Pass for various reasons. I chose an era rather than a specific date because I didn't want to restrict myself too much on equipment.

I've always enjoyed steam, I like early diesel's and that kind of thing, so that's what I decided to model.

I hand-laid the track on this layout. It's a big dog bone except the dog bone is twisted all around the basement. The two ends of the



3. Photo of Mormon Rocks on the Cajon Pass route. *Photo courtesy of Wikipedia.*

dog bone end up on top of each other, which is where our staging areas are.

The trains come out of San Bernardino yard and make the climb up to the summit. We've compressed 24-25 miles into about four miles scale wise. We skip every other depot because I wanted long enough trains to at least look like they needed helper service.

That's one of the big things about our layout, about the operations that we do: helper service. .



MRH: Did you design the passing sidings for a particular length of train?

Ted: If I recall right, they're about 18 feet long. We run on average 23-24 car trains. Then you add to that an A-B-B-A lash-up of F-units and then one or two helpers and a caboose. I'd like to double that but obviously it's impractical, so that was my compromise.

MRH: Why did you pick Cajon Pass?

Ted: I picked Cajon Pass mainly because I had been collecting western railway equipment. I had a lot of Santa Fe, Union Pacific, and Southern Pacific equipment, and on Cajon Pass the tracks there were owned by the Santa Fe. Union Pacific had trackage rights and they ran about as many trains, and then Southern Pacific occasionally detoured over Cajon Pass.

That was the initial part of my decision. The next time I was down in southern California, I went up to the pass to pay a visit

4. Using this USGS 3D topographical map of the Los Angeles basin, it's easy to see why Cajon Pass made sense for railroads to get through the mountains encircling the LA area.



5. Railroads of the southern California region circa 1970. The Santa Fe shared trackage rights with the UP from San Bernardino to Barstow through Cajon Pass. In 1967, the SP opened the Palmdale cutoff, which included a route from Palmdale to San Bernardino through Cajon Pass, roughly paralleling the Santa Fe.

and just fell in love with it. The amount of traffic that was coming down the pass was just incredible and it was a beautiful area.

That was my decision and I just never looked back.

MRH: Why this era?

Ted: I model the late '40s to early '50s era because I like the steam diesel mix. I'm the typical old guy who loves that particular era!

MRH: How did you develop the track plan and did you go through a lot of iterations?

Ted: In developing my track plan, the biggest mistake I made was not doing a track plan before I built the house. I might have made some modifications, but to tell you the truth when we were building the house I really wasn't thinking quite as big as the layout I ended up building.

I designed it using a CAD program. I just started creating a bunch of circles for minimum radius of 36 inches that I chose. I just started moving them around the basement trying to determine where some of the best locations for modeling the various things that I wanted to model.

I was glad I did it on a CAD program because I was well past 64 iterations before I settled on what I have. It took a while to come up with the completed plan. It evolved as I learned things during the process.

MRH: Any big surprises getting the track plan to fit?

Ted: Yes. When I started the layout construction, I had done measurements and put them into a CAD program. I started my railroad at San Bernardino and worked up the hill.



When I got to the staging yard I ran into a problem. The yard sits in a section of the basement underneath the front porch. I had planned to make a U-turn up there, but somewhere I had made about a one foot mistake in my drawings. I could not do what I planned.

I fretted over it for a while, then I called a concrete cutting company had them come in and put a hole in a concrete wall for me. My in-laws were visiting and I think they thought their daughter had really married a wacko!

But we took out a big section of concrete in the basement because the railroad had to go through! I guess that was the biggest surprise.

MRH: If the railroad won't fit, then make more room!

6. Detailed map of the railroads that run through Cajon pass, circa 1970. Originally the Santa Fe (blue) had one route through the pass with a grueling 3% grade – but in 1913 they opened a slightly longer route from Cajon to Summit with only a 2.2% grade. The longer route became the uphill grade, while the steeper original route got repurposed as the downhill grade. In 1967, the SP (red) opened the Palmdale cutoff through the canyon, connecting Palmdale with San Bernardino. *Map terrain by Google Maps.*

Ted: Yes, I “made” the space bigger. I wasn’t about to go tear the railroad down and start over again!

MRH: That’s great! When did construction start?

Ted: We moved into this house in 1994. I think it was about a year and a half after we moved in that I began construction. There was a lot of planning that went into it.

MRH: Has construction gone like you expected? And did it go as fast as you would have liked?

Ted: People ask me how many years I have into this, and I tell them maybe 11 or 12 years. Even though in reality we’ve been in

the house about 24 years, and the layout’s been in existence to some degree for at least 22 years.

I made a lot of progress initially. I used L-girder construction for the most part, except in a few places where we have a little bit of double decking. There we used grid construction to maintain a thinner benchwork profile.

I used to have a couple of fellows that would come and help me with the construction. The building of the layout foundation went quickly. As I got into the track, that was another story. I decided to handlay the track.



7. Ted added San Bernardino station as mostly a flat against the backdrop in San Bernardino. This area isn’t quite finished yet and the foreground still shows a bit of bare plywood.

I also decided to use spline roadbed and that took me awhile as I learned the process. If I was building the railroad today, I would lay the track on Homabed. But I used pine lath for my sub roadbed at the time because I could spike into it.

Laying the track took me awhile – I had to kerf the pine out on the curves. It probably took me a year and a half to complete the mainline. Then another year and a half or so to put in the sidings and spurs. So, it was a long drawn-out process. Once the scenery started it was not too bad.

MRH: Oh? What made the scenery go faster?

Ted: We went through and did cardboard strip webbing and covered that with cheesecloth, then plaster of paris. The plaster of paris sealed the cheesecloth. We did the entire first plaster layer on the layout in about a day, day and a half's worth of time.



8. The San Bernardino roundhouse is Ted's latest project. The impressive structure is not finished, but he's making great progress!



9. Ted has faithfully modeled the upgrade and downgrade routes between Summit and Cajon. The left route is the upgrade one, while the right route is the downgrade one.

I had one of my kids mixing plaster, and another kid cleaning out the tubs we were using, and I would just paint it on. When I was just about done with one tub, I'd tell one of the kids to start mixing another batch while the other kid cleaned out the old tub. We just went like that. Like I said, we did the complete layout in about a day and a half..

MRH: Wow, that's amazing! Back on the track again – what code of track did you use?

Ted: I hand-laid the track using code 83 on the mainlines and the sidings we did code 70. The San Bernardino yard is done in code 70, and we have a little bit of code 55 in a couple of the spurs.

When I started out I was not able to get the rail I wanted, so I took old Atlas code 83 track and pulled all the ties off – and that got me started. Eventually the rail finally came that I had ordered, and I just pressed on.

MRH: What have been your greatest challenges to doing this layout?

Ted: Probably the immensity of the layout. Fortunately, being out on the desert it's fairly simplistic, there are not a lot of structures. Still, the biggest hold-up on the layout remains some of the structures.

I'm just now finishing up the roundhouse after I don't know how many years of construction. I've got a lot of structures in San Bernardino and some of the online industries that I need to do.

Part of the problem is they all have to be scratchbuilt. I don't have plans for any of them really, although on the roundhouse I've got some plans that somebody had done.



10. Ted has captured the parched desert look of Cajon with its many bridges across dry washes. Here, helper 2-10-2 number 3841 pushes a long train upgrade.



11. Local railroad artist Gil Bennett painted this Cajon prototype scene for Ted. Gil also painted Ted's superb layout backdrops – it doesn't get any better than that!

For most structures, I need to find pictures, then I have to put together drawings so I have something to build from.

I enjoy having a finished scratchbuilt structure that I've done. There is a lot of satisfaction to that, but when it comes to getting started it's hard sometimes for me to find the motivation to do it. So that's been one of most difficult things for me.

I enjoyed laying the track. It took a lot of time, but I just did 12-15 feet at a time and eventually we got things done. The thing about a large layout is everything takes a lot longer than you think it's going to take.

For example, when I started the layout, I envisioned myself casting all the piers for all the bridges. Then I soon realized they're all different.

I didn't really want to make forms and cast them all – too time consuming. So, I eventually took pieces of pine and cut them out on the table saw. Then I covered each one with Durham's Water Putty and put some cracks in it.

I've done a lot of them out of styrene also, and they look just fine. I'm not sure I could tell the difference!

MRH: Interesting solution. Any other challenges with this layout?

Ted: Let's see, no other really big challenges. Actually, a lot of things came together. In other words, if I was to tear this down and rebuild it, things would come out just about the same.

For instance, I had gone down to the actual Cajon Pass and collected dirt to use for my railroad. One of the problems was that when you put it out on the layout, it's too dark. That's because we don't have the same amount of light in here that you have outdoors.

I was standing out at my fence line watching a tractor do work on my neighbor's house and he hit a section of what out in the sun looked like white dirt.

I grabbed a little bit, threw it on the layout and it was perfect color! So, I took my wheelbarrow over that night after they were done and filled it up with that dirt. To be able to find that again – I don't know if I would find that again.

Another thing that happened was Digital Command Control. The NMRA had just standardized things and it was in its infancy.



12. As the track climbs up toward Summit on Ted's layout, it gets high enough off the floor that Ted added a raised floor so crews can see the trains better.

I was up at the Portland 1994 convention talking to people at Digitrax, and at the same time I was reading Bruce Chubb's book on automatic block selection.

As I read that, suddenly the light came on. I asked myself, why am I doing this when I can do Digital Command Control?

DCC allows us to operate like we do. When we're having an operating session, in San Bernardino there's the hostlers running locomotives in and out to put onto trains, and there's three guys running switchers, switching cars in and out. The only thing they have to worry about is not running switches and not running

into each other. They don't have to worry about selecting blocks – it just makes operating much more pleasurable.

Then when we run a train up the hill with a helper, we don't need to consist the helpers. So, every train going up the hill with a helper has a two man crew with the second operator running the helper engine. You can't really do that with block selection and you wouldn't enjoy it anyway.

Then radio control came out and going from plug-in throttles to radio throttles was almost as a big a jump as going from DC to



DCC. Now you don't even have to look for sockets and a place to plug in as you go along. You just watch a train!

I haven't signaled the railroad yet but seems to me the signaling systems are getting easier and easier. So, the longer I wait, perhaps the easier it will get!.

MRH: What do you like most about this layout?

Ted: I think for one thing it's the first one that I might get finished. There're a lot of things I love about this particular model railroad. One of them is the fact that I modeled a prototype. That's done a lot of great things – for one it's taught me to be a better modeler.

I have to come up with solutions. If I was doing something generic, I guarantee you I wouldn't scratchbuild. But I have to on this railroad because there's recognizable structures and a lot of the structures you just can't buy.

So, I've been forced to scratchbuild. A lot of the bridges on the layout are kitbashed or scratchbuilt to fit the actual bridges at the location. I've had to do a lot of research to figure those out.

The other thing I enjoy is the friends that I've met. The late Andy Sperandio was a good

13. Pine Lodge, partway up the pass, hosts the Big Pines Lime plant that's served by the railroad.

friend of mine because we had a similar interest in the Cajon Pass. We visited each other's layouts.

I also got to know a fellow in the '80s by the name of Chard Walker who had worked the railroad. He took photographs the entire time he was there. He was a railfan as well as a railroad employee. We would just go through hundreds of slides of finding little. But his friendship meant a lot more to me than any of that.

To this day, I have friends all over the world now just because of this model railroad. So that's been one of the fun parts.

My children never really took much interest in the trains – they claim they were slave labor having to put ties into the jigs and things like that! But for my grandchildren it's another story.

I have a granddaughter now who insists on coming down and seeing the railroad. So that's a lot of fun.

MRH: Yes, interest in the hobby can skip a generation. We've heard that before.

Ted: I had one boy that took an interest in trains until girls and paintball came along and that was the end of that. I had a daughter who would come down and crew call. So, that was kind of fun, but that was it.

MRH: What do you like least about this layout?

Ted: Perhaps the one disadvantage to a prototypical railroad is that there might be something that you would like to model, but you really can't model it because it doesn't fit on the railroad.

It depends I guess on how true you want to be to the original. I love truss bridges: there's a railroad line that runs out of Idaho Falls up to West Yellowstone, and there's a set of truss bridges I can remember seeing when I was a kid. They cross the Snake



14. Ted's layout is essentially a big dog bone, with loop staging at each end. Here is the upper staging, representing Victorville and beyond. The lower staging just barely visible in the lower right represents the Santa Fe tracks beyond San Bernardino.

River and I've always wanted to model those, but I decided to remain true to what I'm doing. So, I don't model those, although I have stretched some things a tiny bit here and there.

Sometimes we run into maintenance problems that I have to spend time on when I'd rather be doing something else. It has been pretty good though. One of the things that I said in the beginning: if this became a maintenance headache, I was out of here!

It's been pretty good, we do occasionally have to fix a switch or a locomotive – something may go bad and we have to work on

that, like a problem decoder. But I have to say that for the most part it's run very well.

I've been highly satisfied with Digitrax and I've been very satisfied with their products and how they work for us.

We hand-laid the track, and I was pretty careful about putting the track in. To me if, the trains don't run the railroad's no fun!

I put a lot of time into good trackwork. Derailments are pretty minimal, and they're usually because it's a new piece of equipment or due to operator error most of the time.

MRH: That's the sign of a well-done layout – issues come mostly from new equipment or operator error. If you had to do it over again, what would you do differently?

Ted: There are a few things I would do differently.

One of them is that I considered using engineered trusses under the railroad. Then for whatever reason, I backed off. It wasn't until I visited Lee Nicholas where he had done that that I wished I had gone ahead with it because the benchwork would have gone a lot faster. Just put in some trusses, run the joists.

The other thing on the island that we have from Cajon all the way around and back up to Alray, I would probably frame the center section as a wall in the house and then I would bring a layout out on either side from that wall.

Scenery-wise I'm pretty satisfied. Actually, I'm at the reiteration stage now – starting to go back and detail it a little more, fixing things and improving things. Everything else I'm generally pretty happy with.

MRH: Sounds good. Who did your backdrops?

Ted: Gil Bennett did my backdrops. He's a good friend, he's a railroad artist well known in that area, and he's been a part of the layout construction. He volunteered to do it, so that's how it got done.

MRH: Can't ask for much more than that! How did you set the layout height?

Ted: The layout height was a tough decision. I prefer, if the layout was flat, a fairly high level, somewhere up around my chest height. That's just how I enjoy looking at the trains. But I'm tall and my perfect height doesn't jibe with somebody else's perfect height.

Gary Coleman used to come down here and he was about as short as it gets – and he would walk around with a paint can and would stand up on that to operate..

The layout is on a grade, you start out at San Bernardino, which is the bottom of the layout and we run up the grade all the way up to the summit.

The entire railroad is that climb up Cajon Pass. So, I had to start the layout lower than I would like to have put it. Then go up a little higher. I eventually put in a raised floor up near Summit so we could see the railroad a little better, make it easier for operators.

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I tell people if we had modeled all 25 miles of the Cajon Pass, we would have had about 37 feet of climb! We would have been through the floor!

You have to manage that – in the station areas like Devore and Cajon we actually leveled the climb. For one thing, so we could store cars on spurs without them rolling.

The other thing we did – unlike the real railroad, we wanted the steep climb, the hardest most difficult climb, for the uphill trains. We wanted to justify helper service. So, the more difficult it was to get a train up the climb made it all that more interesting.

Steep grades on the way down create mechanical problems for locomotives. You have to fine tune to keep them from lurching and jerking about as they come down the hill. So, reducing that grade a little bit helps.

Like I said, it's a little bit different for our layout because of the constant grade from the start to the finish. If I was doing a level granger type railroad out in the Midwest, I would have picked probably about chest height.

MRH: This layout has a lot of uphill grades. What grades, specifically?

Ted: I think my steepest grade is about 2.5%. My ruling grade is Sullivan's Curve up to Pine Lodge – it takes a lot of effort for trains to get up there.

I can't run a train by myself if I don't put a helper on the train. I have these A-B-B-A units and I take the motors out of the B units. Particularly the passenger trains are heavy.

MRH: Tell us about the helper operation. How has it gone?

Ted: One of the chief operating schemes that makes this railroad fun are the helper operations. The hostler pulls the helper locomotives out of the roundhouse and he pre-positions them depending on whether it's a freight train – where they go on the rear – or a passenger train, where they go on the front.

An eastbound train comes into the San Bernardino yard out of the lower staging and they work the train and then they pre-position the helper with the train. And we don't consist the helper to lead locomotives, we call a specific helper engineer.

So, it's a two-man crew going up the hill. They start out of San Bernardino and they go all the way to the other end of the railroad which is Summit. At Summit, they cut off the helper engine.

The helper turns on a wye and comes back to San Bernardino light, while the main train leaves Summit and heads to the upper staging yard, which is east. Whether it's Victorville or Chicago, it doesn't really matter.

That's been a lot of fun, sometimes it's a challenge just getting the helpers back to San Bernardino! Often during operations, we shut down one of the tracks – we have two main lines, so we'll shut one down while the station operators are coordinating traffic between the two stations.

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I look at operations as kind of the social end of the hobby. When you have two guys working together to take a train up the hill, it makes it a lot more fun, I think.

MRH: Have any disasters with the helper service?

Ted: No, helper operations have gone really well for us. I can't think of any big problems that we've ever had. Generally, the guys will monitor the couplers and we teach new guys to look about mid-train where you go from pulling on the couplers to pushing on the couplers.



Some guys are better at it than others, but we haven't really had any problem.

It's a bit of a challenge because our grade is not constant, it changes so you have to keep track. The lead locomotive might hit a level spot and start to speed up and they have to deal with maintaining the same speed. Anyway, like I said, it's just a lot of fun for us.

MRH: Well, that's pretty cool. Tell us about the DCC system you use and why?

Ted: I use Digitrax DCC – I always hate to talk about DCC systems – it's kind of like talking about religion. People ask me what digital command control system I think is the best and I tell them buy the one your friends are using so you have tech support, have extra throttles, and things like that.

When I was looking around, the DCC systems were fairly new at that time and one thing I wanted was four-digit addressing. I knew I did not want two-digit addressing, which was the norm at the time. I believe in simplicity and it's so simple to look at an engine number and plug that whole number in.

The only system at the time that had four-digit addressing was Wangrow, but they were more than I wanted to spend at the time – I think close to \$1000 to get into a basic system.

15. A hefty Santa Fe 2-10-2 pusher rounds a curve as it helps push a train up the pass.

While I was in the middle of trying to make that decision, Digitrax announced the Chief which had four-digit addressing and they were right around \$400. There was a fellow by the name of Lloyd Sperlock who sold digital products and I ordered through him. I think it was probably at least two months before they finally got it out and got it to me.

That's the system I've always used. I'm not a technical guy, but Digitrax is peer to peer, it's like a computer so everything is pretty much instantaneous.

I think in the beginning their original throttle was a little hard to understand if you weren't the owner. It was difficult to teach



16. This train exits tunnel #1, the last tunnel before reaching Summit.

operators how to use the throttle safely without doing something we didn't want them to do.

I approached Digitrax about building what is now the UT 4, which has been a fantastic throttle for us. You can just hand that to an operator say, here's what you do and send them on their way. To me simplicity is the key.

Like I said, I tell people to go with the system that their friends are using because it makes it a lot easier. When they came out with the UT 4, I bought 20 throttles.

I can remember Lloyd Sperlock calling me up and wondering if that many throttles were going to cause some problems. He was wondering if we would need to put in some more radio receivers with a different frequency or whatever. But we've never had to do that, we've never had a problem. So, I can't complain.

MRH: What kind of decoders do you use and why?

Ted: I've got a myriad of decoders. Initially, I was pretty price sensitive, because there's a lot of locomotives on this thing. I had a lot of Digitrax decoders just because that's the system I'm using and it was just a natural to buy those.

I've got some TCS and now we're starting to put in SoundTraxx sound decoders and of course the new stay-alives, obviously various names depending on the manufacturer, but that system is just been great for us.

You can hit a piece of dirty track and it doesn't affect the operation of the sound because you have that stored power in the capacitors. I think that's the greatest thing since sliced bread

I like the SoundTraxx decoders. They've been pretty good for us, and I use the Econamis – I just love 'em. They're just what I need, I don't need to go overboard with five million different sounds and functions. With a good horn and dynamic brakes, I'm happy.

MRH: Sound decoders are great. What's your least favorite part of doing a layout and how do you motivate yourself to do it anyway?

Ted: I think my least favorite thing is scratchbuilding buildings. That's why it's the last thing that I've gotten to. I've scratchbuilt a lot of small depots and things like that, but now I'm to the big stuff.

It's taken me years to get the roundhouse ready to paint. That's my next project and I finally started construction on the pre-cooler and got the ice loading docks all done. Now I have to build the actual building that goes with it – the building where they actually created the ice.

Wiring is not my favorite thing either, but I get motivated to do that because I want to run the trains. So, when I was laying track, building turnout after turnout – it still took me about an hour for each one. It's tedious work because it has to be done right or you'll run into problems.

MRH: Speaking of turnouts, do you build them at the workbench or in place?



Ted: I built all my turnouts in place. I just put down a template and generally followed that. Although some of my turnouts curve a little bit, which is kind of the fun. You can go to one end of the yard, stick your head over the railroad and look down the track – and you could just see how smooth it rolls into curves and out of curves.

I'm not saying you can't do that with prefab, it just seems to be easier to make it flow using hand-laid track.

I think it looks good. I've seen people argue about hand-laid versus prefab track and I don't really care. I didn't hand-lay the track on this railroad because it was the thing to do. It was just one of those things on my bucket list, so I did it. I've been glad, it's been pretty reliable for me..

MRH: What are your thoughts on this layout and its size – and layout size in general?

17. Panoramic view of Summit. In the center is a wye for turning helper locos. On the right, a helper has turned and it's ready to run light back down the hill.

Ted: There are a lot of things to consider when you're designing a layout, in terms of the size of the layout. I can remember David Barrow saying the word money when he heard about what I wanted to do for my layout.

The larger your layout, the more money you will invest in that layout. Whether it's rolling stock, track, whatever it is. You will just spend more money.

There's also the investment of time. That's really important to consider, your ability to provide the time to get it all done. I don't think it's something you need to hurry and get it all done right away.

To me it's a hobby, it's a lifetime pursuit. When you finish a layout, it's not as fun anymore, I don't ever really want to be finished. I want to have something to improve on always.

Another thing that can eat you alive is maintenance. If you don't build it well, if you don't do a good job, you will run into maintenance problems. As I've said, if the trains don't run it isn't any fun. You must be really be careful of that.

It's amazing how long some maintenance problems can take you to solve. If you have a many problems going on, then it will take the fun out of the hobby right away. People don't want to come operate on a railroad that doesn't run!

MRH: Speaking of operating, do you host regular operating sessions?

Ted: Right now, I'm not hosting regular operating sessions. I'm pretty busy with my business. It's not so much the operating session, but it's getting enough operators down here.

It takes at least 20 guys to operate this railroad to make it work the way we envisioned it. That's a lot of guys to have to invite and get down here and get organized.

I do every couple of years, though – we hold what we call the Great Basin Getaway. It's a Utah operating thing, we've got maybe three to five layouts involved. I don't really manage that, but we'll have three teams in here over the course of three days.

They come in and operate and it's a blast because most of these guys are really into operations. They really do a great job of bringing the diorama to life, and I enjoy that.

We had ProRail guys came in here, I don't know, maybe a year and a half ago.

Anyway, I meet a lot of great guys from out of state and I really enjoy that. We got the NMRA National coming up this year and I'm really looking forward to that. We've got several operating sessions planned for that, so there will be a lot going on.

MRH: Sounds like it. How well do you like HO scale and would you ever consider doing a layout in a different scale or gauge?

Ted: I love HO, I mean it's the common average. It's what most people like, what most people work with.

I have had experience in other gauges. I like big gauges like O scale and G scale and just because of the massiveness. When I set up the G scale train upstairs at Christmas time, you can hear it running from down in the basement and you can feel that massiveness and that's fun.

But I think it's restrictive because of the size and the cost. If I had everything including all the time in the world, I would build a huge layout in O scale. In N scale, I like the track to scenery ratio.



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I often wonder what this layout would be like if I did it in N scale. But again, they have their issues. I wouldn't have easy access to Santa Fe 2-10-2s, which is a staple down here. So, there's pros and cons.

And in N scale, you have to be a really good modeler to make N scale photographs look nice, let's put it that way. I have a good friend down in California who does beautiful work in N scale.

Overall, I think HO scale has just the right compromise. It's easy



18. In this close-up of the buildings at Summit, you can see Ted has posted instructions for the Summit station operator. Ted's layout will be on tours at the 2019 NMRA Convention in Salt Lake City, and he will be hosting operating sessions. If you have any interest in operating trains up Cajon Pass, here's your chance!

to photograph, it runs well, and you can still see it easy enough during operating sessions. And there's a wide variety of products available.

MRH: What's your philosophy on doing a layout well? For example, how do you narrow the focus?

Ted: In just about anything I do, I try to do it to the best of my ability. In the case of a model railroad, I want it to look realistic; that's important to me. I tell people I'm not a rivet counter, but if I can make you think I'm a rivet counter I've done my job.

When I look at a prototype layout, it's not a reproduction of the prototype, it's a facsimile. It's an art piece to give you the feeling of that prototype railroad. You do that in several ways – the scenery's an important part.

I tell people the scenery is so important to a prototype railroad that if somebody ran a New York Central passenger train for instance down my railroad, people wouldn't ask me how long that I've been modeling the New York Central.

They would ask, "Hey, what's that New York Central doing on Cajon Pass?" And that's what I want.

Your model railroad is always compressed. I've got four miles that should be 25 miles. So, I've made a gazillion compromises.

For example, I have a story about somebody that bought the Life-Like Proto2000 PAs. He had an A-B-B-A PAs, and he contacted Life-Like to get the parts to motorize the B units. I asked him why did you do that? The two A units will pull your house down!

He looked at me and he said, when the Union Pacific orders dummies, I'll order dummies. So, I asked him can you show me where you put the diesel fuel? Life is a compromise.

MRH: That's a great answer. So, how do you narrow the focus?

Ted: Well, prototype model railroading does that for you..

MRH: Can you elaborate?

Ted: Narrowing the focus can be hard to do. First, modeling a prototype narrows things for you as it is. Since you're compressing the distance, you must decide on what you will model.

I tell people just pick scenes that you like about the railroad. If they have a tunnel that you like and you've always wanted to model, put that tunnel on your model railroad. Find a way to do it if you can.



19. Santa Fe 2-10-2 number 3841 has turned on the wye at Summit and is ready to run light back down the hill for assignment to another uphill train.

But you will encounter issues. I'm thinking about signaling at some point and I have a signal that is well known, well photographed, but it's not in a place I would put it on my model.

You know, you put it there because it looks right there, but it's not really a place where you would put a signal if prototype matched your model. So, the question is, do you put it there? Or do you not put it there?

You just must pick what you like and make it work for you. I remember one guy online I was conversing with who was in a tizzy fit: how do I select what to put in, what not to put in? Always being the devil's advocate that I am, I said, well it doesn't sound like a hobby. He asked, well how do you do it?

I started out saying, frankly, I quit worrying about it – I just don't care. Then I went on to explain that my philosophy is not an exact reproduction of the prototype. It's a feeling, it's a painting. If I had the skill to scratchbuild a locomotive, I might pay more attention to the details, but within certain limits.

If you get carried away on the model railroad, you start asking some vexing questions such as was this plant here in 1940 but not in 1941? To me it takes the fun out of the hobby. I just enjoy creating a painting. The more things I can do to make it bring out the feel of the prototype, that makes it that much better.

But, the things where I can't, I don't worry about. In fact, the late Andy Sperandio said he would encounter places where he couldn't do exactly what he wanted to do, so he said he just tried not to think about it. It's a hobby, so have fun!

MRH: Okay, last question. What advice would you give to someone just starting out in the hobby?

Ted: It's kind of hard to say what I would tell somebody new in the hobby. It depends on a lot of things. If we're talking about an adult who has a source of income, I would tell him to buy some quality products. I would tell him to go out and read some books and visit other people's layouts to get an idea of what he wants to do.

Get on an operating crew and operate on layouts to look around and see what he likes. Whether it's a specific railroad or just doing something generic. There's a million ways to enjoy the hobby.

I think when he starts buying equipment, I would ask him ... I would advise him to buy good stuff. Stuff that's going to run well so you don't have that worry like you do with a cheap train set.

Again, it's different than buying something for a kid, but buy quality equipment. Quite honestly, the majority what you see any more in the hobby is pretty good stuff.

It's phenomenal the quality of locomotives and rolling stock and other hobby items we have. I would just tell him to ease into it and take his time. Don't try to do something like I've got until he really knows what he wants to do.

MRH: Good advice! ☒



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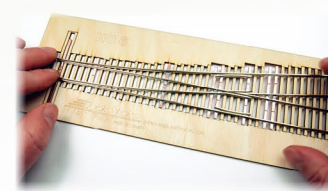


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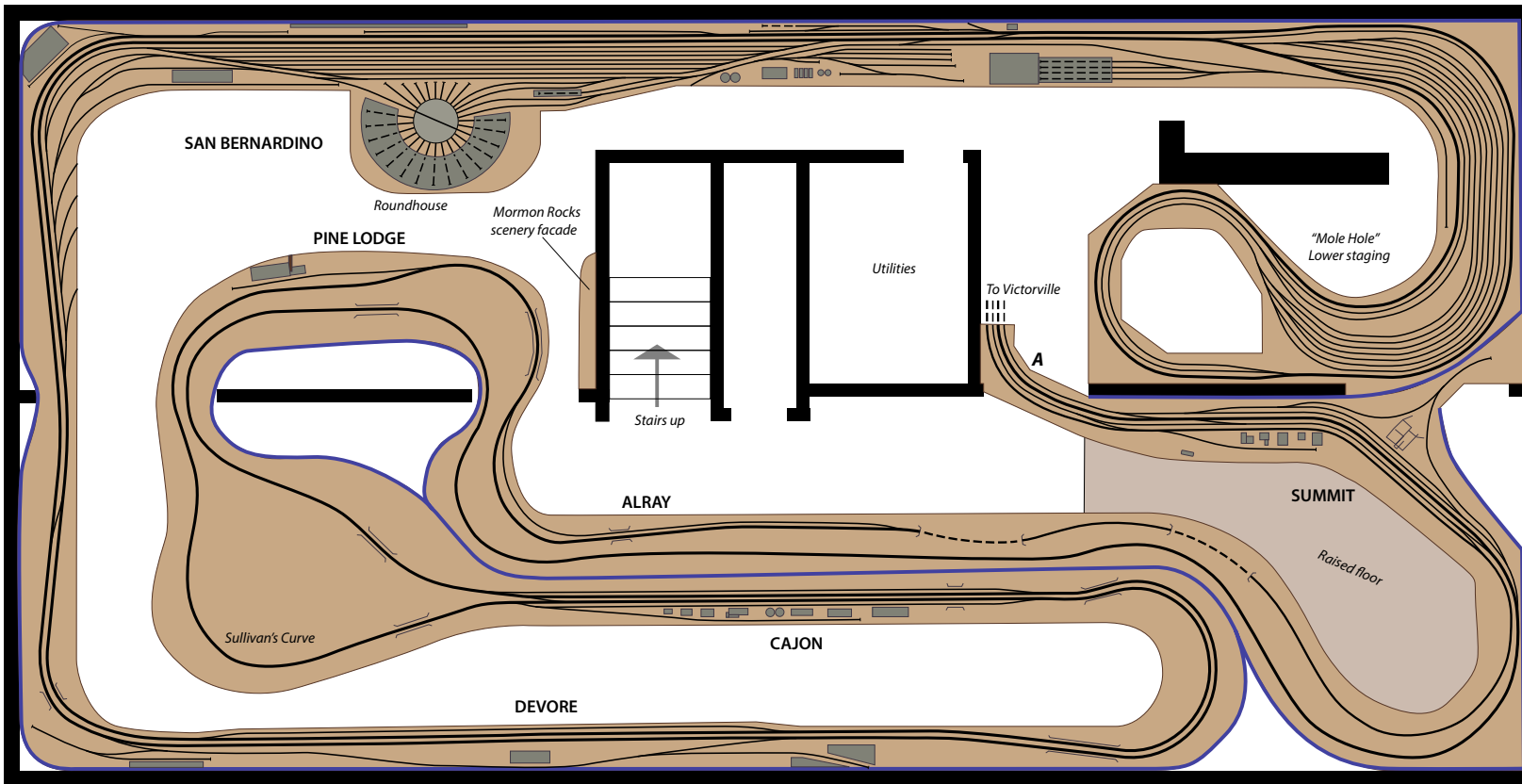


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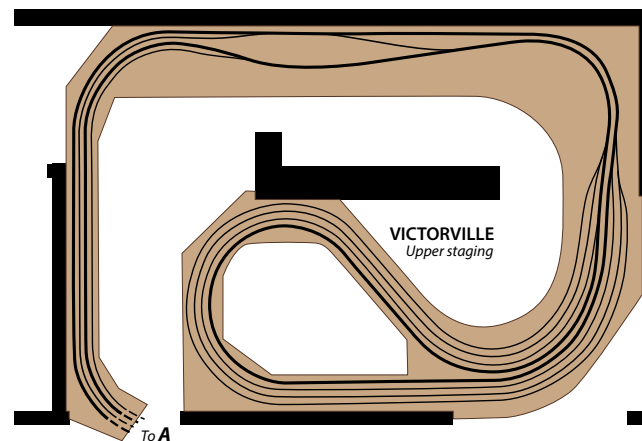
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Ted York's
CAJON PASS
HO Scale Approx. 57' x 38'
Era: circa 1945-1955

You can also download a zoomable PDF of this track plan in [this month's bonus extras](#) ...



Ted York's
**SANTA FE
ON CAJON
PASS**



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THE LOS GATOS LOCAL

Model Railroad Hobbyist | April 2019

WILLIAM SPARLING SHARES THE STORIES OF
PHOTOGRAPHER FRED STOES AND THE LATE RICK HAMMAN ...

I'VE ALWAYS BEEN FASCINATED WITH BIG THINGS; ships, boats, and especially trains. My Dad worked nights when I was little. He would come home, have a cup or two of coffee, then load me into our old 1936 Buick and we would go to watch trains. A favorite spot was the Bird Avenue over-crossing in San Jose. Hearing and watching the Morning Daylight storm over the bridge were burned into memory.

THE LOS GATOS LOCAL | 2

1. Fred Stoës caught Southern Pacific commuter train #132 pulling into Los Gatos with 4-6-2 #2476 in the lead. His 1955 photo was taken on the Mayfield Cutoff, a quicker route from San Francisco to Los Gatos and Santa Cruz that bypassed San Jose. Today the tracks are gone, train service is a memory, and the right-of-way is an expressway.



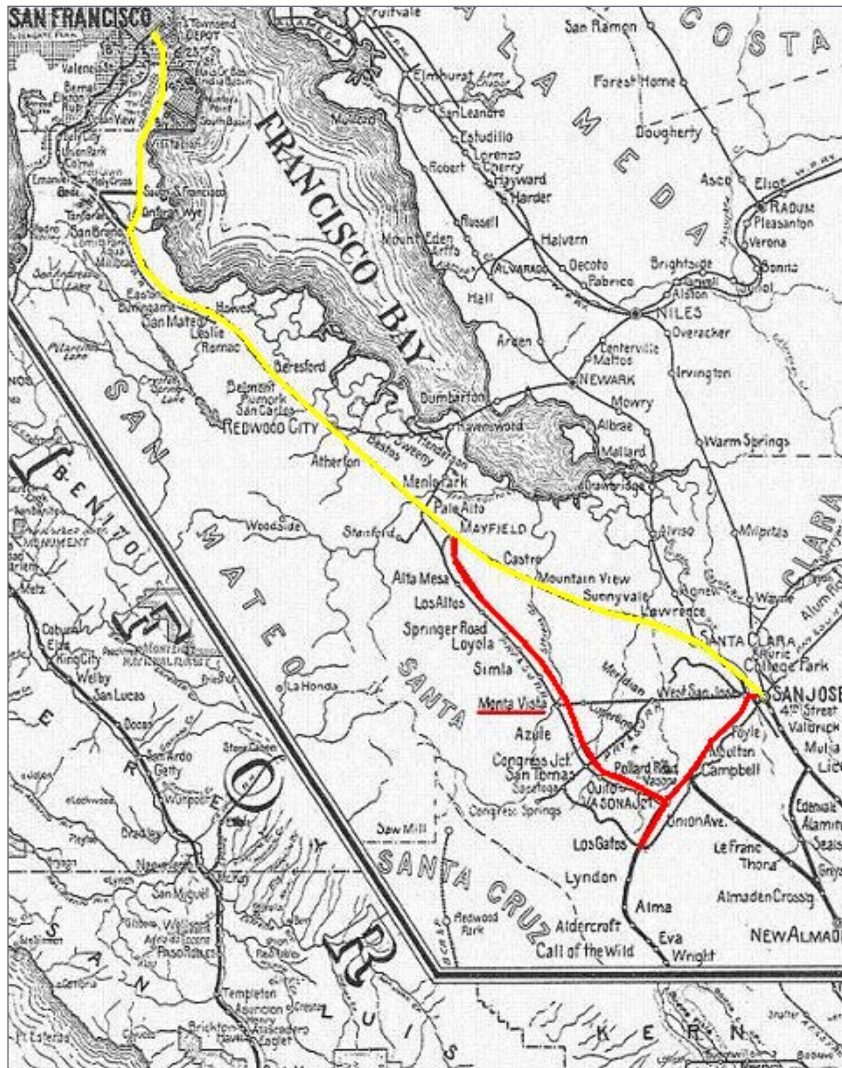
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Sometimes we would wait south of San Jose, where the Southern Pacific tracks swung through a curve to parallel the Monterey Highway. Dad would put our old Buick into gear and pace the Daylight all the way to Morgan Hill where it crossed over the highway. My memories of these times are so vivid I can almost smell them.

My favorites were the commuter trains. They were going somewhere with a trainload of people. The northbound train went through Monta Vista every day at 7:00 a.m. The evening southbound came through about 6:30 p.m. I would run out into the dirt street and watch the train speed north to the City, San Francisco.

A special trip

One morning Mother took me on a shopping trip to San Francisco. My eight-year-old mind was short circuited as I was in kid heaven on my first train ride. I had watched it leave Monta Vista many times and now I was riding it to the City. I met the conductor and examined his cruncher; my word for the ticket punch. It made shapes instead of just holes! He let me play with the cruncher and gave me a stack of destination stubs that I could punch to my heart's delight.



2. Trains left every morning using the red route between San Jose and Los Gatos, where trains would double back to a wye at Vasona Junction. Trains would proceed northwest through Monta Vista, where I lived, and to Los Altos. The branch connected with the peninsula main line at Mayfield (California Avenue) to continue to San Francisco.



J. Fugate

OPERATIONS

After the train pulled into the Los Gatos depot, the engine was uncoupled and run around to the rear of the train where it re-coupled. The empty train would run tender first about ten miles to San Jose, where it would be cleaned and serviced.

For the morning run, the locomotive ran tender first from San Jose to Los Gatos. The engine would be uncoupled, run around the train and re-coupled to run normally from Los Gatos to San Francisco. After dieselization, running backward was not a factor.

Late in the line's history, the tracks from the Vasona Wye into downtown Los Gatos were removed.

I saw familiar landmarks as we pulled out of Monta Vista. The Oak Tree, a favorite play spot for local boys. The Stevens Creek bridge, another exploration site, and Simla Junction. This was where engines struggled pulling long trains of hopper cars up to the Permanente Cement plant.

We passed through the Santa Clara Valley and huge fruit orchards with lineside packing plants and canneries. After passing Loyola Corners, we begin slowing down for the Los Altos station stop. More people got on board for their trip to the City and we were soon underway.

Mayfield Junction was next. This was where our train entered the San Jose to San Francisco main line. A nearby Quonset building at El Camino Real would be my workplace thirty years later.

On the high iron

Out on the main, our train picked up speed and we bypassed several stops on our way to San Francisco. We didn't stop until we got to Redwood City. I can still hear our engine whistle off those stations and remember the thrill of my young adventure.

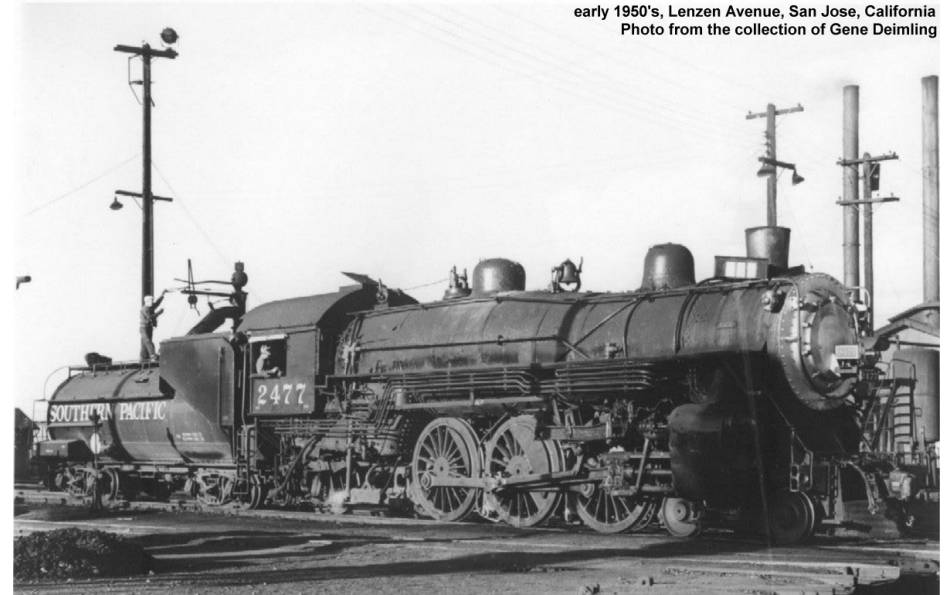
We pulled into the depot at Third and Townsend Streets, along with other trains arriving from San Jose and stations on the peninsula main line. I saw the Noon Daylight cars being spotted on an adjacent track waiting for their beautiful, big GS class locomotive to couple up for the run down the coast.

early 1950's, Lenzen Avenue, San Jose, California
Photo from the collection of Gene Deimling



3. The Mayfield Branch had two dedicated P-7 class Pacifics. These were the only SP Pacifics built by the Lima Locomotive Works. #2476 is turned at the Lenzen Avenue facilities in San Jose to prepare for another commuter run. *Photo from the Gene Deimling collection*

early 1950's, Lenzen Avenue, San Jose, California
Photo from the collection of Gene Deimling



4. Southern Pacific 4-6-2 #2477 is serviced at the Lenzen Avenue facilities in San Jose. *Photo from the Gene Deimling collection*

This was where other name trains would start their journeys; the Coaster, the Starlight, the Lark, and the Owl. There was also the Del Monte Express that ran from San Francisco to Monterey, as well as other commuter trains awaiting their return trip to San Jose. I've never forgotten this thrilling experience, even after seventy years.

Special people

As we got off the train, I thanked the conductor for letting me play with the cruncher. As I handed it back to him, he just smiled and told me I could keep it because he had another one. He handed me another huge stack of used destination stubs. As

we walked toward the downtown area all I could think of was, “How long before I get back on board that wonderful train to ride it home?”

As I recall, the homeward train pulled out of Third and Townsend at 5:17 p.m. and got back to Monta Vista at 6:30. Mother bought sandwiches, potato chips, cookies, and milk for the trip home so we didn’t worry about fixing supper. What a day it had been, full of vivid memories. Thanks, Mom, for my first of many train rides on the Los Gatos Local to The City.



5. A unique feature for the Mayfield Branch engines was a road pilot mounted on the rear of the tenders. This modification was made because the locomotives ran backward between Los Gatos and San Jose at the end of the runs. To my knowledge, no other SP locomotives were modified in this way.

Fast forward

While attending classes in San Francisco many years later, I chose to ride the Los Gatos Local back to San Jose one evening instead of my usual train. I relived the days when the Local was powered by one of the steam engines that now sat rusting on a Bayshore Yards dead line.

As the train swung off the main line onto the Los Gatos branch, it felt like I was going home again. The scenery had changed over the years but miles of orchards and the switch at Simla were all there. The bridge over Stevens Creek was still in use. My boyhood favorite oak tree was standing tall. The wig-wag signal even remained in place at the Stevens Creek Road crossing in Monta Vista.

This trip was different than the one I took with my Mother in 1946. The train didn’t feel the same as the old steam-powered one. There was no lurch and rattle as the train stretched out slack. Our modern diesel didn’t leave slack in the couplers. The clickity-clack of wheels on rails was almost non-existent as continuous welded rail and concrete ties had replaced the jointed ribbons of steel.

I rode all the way to Los Gatos and dead-headed back to San Jose. I was the lone passenger on the train when it pulled into the old depot on Cahill Street. That was my last ride on the Los Gatos Local.

I hope there are trains in heaven. ☑

★★★★★
RATE THIS ARTICLE

COMMUTER OPERATIONS

In our current rail system, we have forgotten the role that private railroads had in moving people in and out of the city. Several major cities now use public transit agencies to provide commuter service. In the steam era, private railroads moved thousands of people each day on several lines radiating from the urban core. Pittsburgh, Nashville, St Louis, Kansas City, Dallas, and many more cities had multiple railroads offering commuter service extending 20-50 miles beyond their terminals.

Adding commuter service to a steam era layout can offer another layer of operating interest. These trains do not need to be long and can use a short string of older coaches. Older 4-4-2 and 4-6-0 steam locos were frequently employed in commuter services after being downgraded from the main-line passenger trains.

If a modeled station is at the end of the commuter district, then a small locomotive facility can be used for the commuter power. A couple of storage tracks can become the coach yard where cars are cleaned out at the end of the day. Possibly an adjacent wash rack can be installed near these coach tracks so the terminal crew has another task to complete at the end of the day.

The Los Gatos story illustrates elements you can incorporate into an existing model railroad. One or two commuter station stops along a modeled mainline can increase the play value and operations on your layout. ■

WILLIAM SPARLING



Bill lived in the San Jose area until moving to Sequim, Washington in 2001. Most of his growing up years were spent in Cupertino, near the Mayfield Branch of the Southern Pacific route to San Francisco. Bill got his first train ride on one of those trains in 1946. His layout, in progress, is loosely patterned after that line. He is now working on a small 4'X8' island railroad.

Bill says, "While I can't build what most modelers build, I still get a lot of pleasure out of *MRH* each month. I enjoy the excellent tips and tricks to make my struggles easier.

I love to share my experiences with real trains when I was a kid. My wife and I have made several trips together by trains. One of our favorite trips is the Empire Builder between Seattle and Leavenworth, Washington, over the Cascade Mountains and through Cascade Tunnel. This is the longest railroad tunnel in the continental United States. Maybe I will meet one of you on that ride. We are planning our fourth trip on that train sometime this summer. Maybe we will see you." ■



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LOOK column

Model Railroad Hobbyist | April 2019 | #110

JEFF SHULTZ: The ScaleTrains.com General Electric Dash 9-44CW locomotive ...

IN THE EARLY 1990S, GENERAL ELECTRIC'S DASH 9 series succeeded their Dash 8 line, the locomotives that helped them take the crown of top domestic locomotive producer away from EMD in the 1980s.

Starting with a single demonstrator model in 1993, over 3,500 Dash 9 locomotives rolled off the line in Erie, PA before production ended in 2004, further cementing GE's position as number one.

Original owners of the Dash 9 in North America include ATSF (BNSF), BC Rail (CN), BNSF, Canadian National, Chicago & North Western (UP), CSX, Norfolk Southern, Quebec North Shore & Labrador Railway, Southern Pacific (UP), and Union Pacific. Norfolk Southern also rostered the similar Dash 9-40C and Dash 9-40CW locomotives. Of the US and Canadian Class 1 freight railroads, only KCS and CP did not own Dash 9 locomotives, preferring the similar AC traction AC4400 locomotives instead.

The designator Dash 9-44CW indicates that it's part of the Dash 9 line of locomotives, configured for 4400 hp, with C (3-axle) trucks, and a wide cab.

FIRST LOOK | 2



[ScaleTrains.com](https://www.scalettrains.com)'s representation of the Dash 9 will be available in both Rivet Counter and Operator versions in both HO and N scale. The two models released first, at the Amherst show, were BNSF 4313 and NS 9692. *MRH* was provided with a copy of the HO scale Rivet Counter brand BNSF 4313 for this article.



1. Engineer side view.



2. Elevated $\frac{3}{4}$ view.

The prototype BNSF 4313 was built as part of an order of 299 Dash 9 locomotives in 1999. Interestingly, some of the order were painted with orange paint under the lower yellow stripe on the nose and others with green paint. The 4313 has green paint and is decorated in the “as delivered” H2 paint scheme.

The Rivet Counter locomotive is equipped with an ESU LokSound V5 “Full Throttle” sound decoder mounted on a motherboard that contains a built-in PowerPack super-capacitor stay-alive system. The PowerPack is configurable via the ESU LokProgrammer to keep the locomotive powered from 0 to 8.36 seconds from when it loses power. The motor is a 5-pole skew wound type. Operator brand locomotives come equipped with the ESU-LokSound Essential Sound Unit and DCC Decoder. Both the Rivet Counter

and Operator brand locomotives are available without a decoder, and are equipped with a 21-pin DCC connector.

Interesting details on this locomotive include the walkway lights on the engineer’s side, front and rear of the locomotive that are configured to turn on when F8 is pressed to start the prime mover sounds. The Hi-Ad trucks feature rotating axle bearing caps, and spares are supplied in a small bag.

3. Frontal view.



4. Rear view.

The Operator brand models do not have prototype-specific details, sharing a common long hood and cab as well as fewer added details. Many of these details will be available separately in a GE Dash 9-44CW detail kit, which will include multiple unit hoses, trainline hoses, coupler cut levers, metal grab irons, windshield wipers, sanding lines and traction motor cabling. Operator brand models share the same motor and drive train as the Rivet Counter brand models. The model weighs within an ounce of 1 1/2 pounds.

The model had no difficulty managing 18” radius curves on my layout, and I measured its speed at 1 mph on speed step 2 of my throttle (there is no movement on step 1) and at 69 mph on speed step 32 with an Accutrack II speedometer. While I have no sophisticated pull-testing equipment, I did have it pulling 24 modern freight cars at throttle speed step 3 without any hesitation.

Several runs of the Dash 9 are planned, and Norfolk Southern’s standard cab Dash 9-40C “Top Hat” locomotive will be part of the

second run. When asked about the possibility seeing the nearly identical AC4400 in the future, Shane Wilson of ScaleTrains.com simply replied, “That would make sense, wouldn’t it?”

It will also be interesting to see if ScaleTrains.com releases the Dash 9 in either of the Australian paint schemes it has worn – Fortescue Metals Group and Pilbara Rail. ☒



5. Close-up of rear radiator section and truck detail.



6. Close-up of fuel tank and air tank details.



7. Conductor's side view.



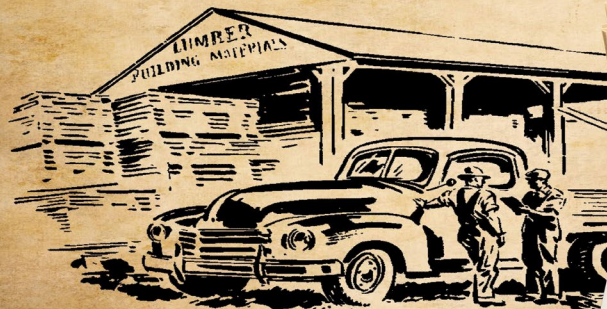
8. Illuminated number boards and front and side walkway lights.



9. Speed trap results at slowest and fastest throttle settings.



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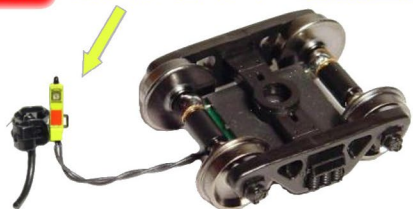
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Model Railroad Hobbyist | April 2019



Make concrete grade crossings from scratch

For the first rollout of our new monthly *Savvy Modeler Online* feature, here's a great 10-minute how-to on scratchbuilding a quite authentic-looking concrete grade crossing by YouTube modeler *railfan220*. Each month we'll be featuring some of the most savvy modeling we've found online. ■



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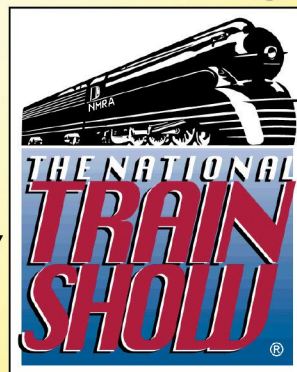
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APRIL NEWS

column



Model Railroad Hobbyist | April 2019

RICHARD BALE and
JEFF SHULTZ report the
latest hobby industry news

★★★★★
RATE THIS ARTICLE

INDUSTRY NEWS

NorthWest Short Line

NorthWest Short Line is shutting down after 60-years in business. The announcement was made by current owner David Rygmyr who purchased the Seattle-based company in 2008 and relocated operations to Hamilton, Montana. The company, which specialized in mechanical power components, precision gears, and wheelsets in all scales, was established in 1959 by Raoul Martin. On-hand inventory will be liquidated over the next few months ...



► THE LATEST MODEL RAILROAD PRODUCTS, NEWS & EVENTS

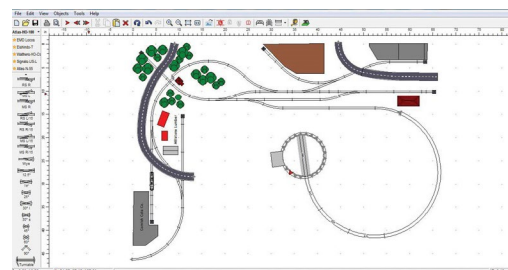
NEW CLUB BUILDINGS



Keystone Division Two and Division 1 of the NMRA Mid-Central Region are raising funds for the 2020 MCR regional convention by selling laser kits produced for them by Portland Locomotive Works. Kits for sale include a Fire Hose Shed in HO scale, an Oil/Coal Shed in N, HO, S, and O scales, a signal tower in O scale, and a telegraph building in HO and O scales. Also available are The Jaite Station and Freight House, a two building HO scale kit. The prototypes for the kit served along a B&O branch in north-east Ohio during the early 20th century and are still standing along tracks used by the Cuyahoga Valley Scenic RR in the Cuyahoga Valley National Park. For more information on all these kits please visit. www.keystonedivision.org.

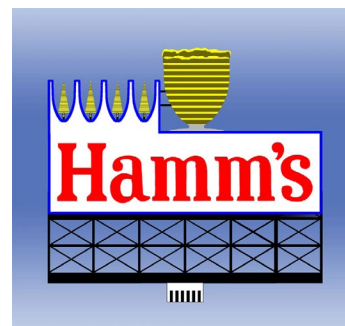
NEW PRODUCTS FOR ALL SCALES

Atlas has upgraded the paid version of its Track Planning Software introduced last fall (see MRH September 2018 #103). In addition to several fixes to the original release, the upgraded 1.5.0 version



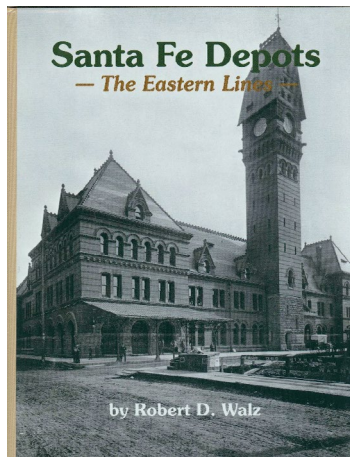
offers a new “Ramp” figure, automatic conversion from sectional to flex track, right-click menu item for hiding un-needed tracks in the current library, new options for drawing a grid in 2D mode,

new layers window buttons for rearranging layers (only in the licensed version), and a new fit-to-screen command. Atlas Track Planning Software is available as a free demo or as a paid licensed version with several additional features. To download the software or purchase a license go to shop.atlasrr.com/p-53321-atlas-track-planning-software.aspx.



New animated electronic signs from **Miller Engineering** include Hamm's Beer and Swingline Staplers. Both are based on prototype signs. The model signs are available in two sizes, making them suitable for N through O scale scenes. For additional information including seeing the signs in action, visit www.microstru.com/Coming-soon.html.

The **Santa Fe Railway Historical Society** is publishing *Santa Fe Depots: The Eastern Lines*, by Robert D. Walz. Containing a route-by-route and station-by-station look at the depots of the



Eastern Lines Grand Division of the AT&SF, this 208-page hardcover book includes 568 photos. Using a format developed by John McCall for the listing of stations and the arrangement of accompanying data in four previous books, the book covers the Santa Fe lines that ran from Chicago on the east end to Boise City, OK on the west. Other lines ran from Ottawa, KS to Tulsa, OK, Superior, NE through Wichita to Wellington, KS, and from Newton to

Arkansas, KS and Purcell, OK. There were depots and towers at over 620 stations in this area, from one-room wood frame buildings to large masonry buildings as depicted on the cover. For more information or to purchase the book go to sfrhms.org/product/santa-fe-depots-the-eastern-lines.

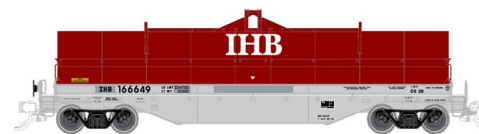
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SoundTraxx has posted a video explaining the multiple functions of its Tsunami2 Digital Sound Decoders, including how to add lights. Although the methods individual modelers follow in wiring their lights may vary slightly depending on which decoder they have, the video walks viewers through the process for various SoundTraxx decoder formats. To view the video go to view.bbsv1.net/bbext/?p=land&id=8257812EE8C615CAE0530100007FB91B&vid=d5cef23d-e554-4ae2-b53a-920d1d3873dc.

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O SCALE PRODUCT NEWS

Atlas O has announced road names for a new 42-foot coil steel car coming later this year. The names are EXNS-Indiana Harbor



Belt, CSX, Norfolk Southern, US Steel Geneva Works, Kansas City Southern, Inland Steel, and Republic Steel. The O scale Master line model will have see-through walkways, removable hoods, interior floor detail, and four simulated steel coils. Atlas O rolling stock is available with a choice of 2-rail or 3-rail trucks and couplers.



Also coming from Atlas O is a group of 1973 Ford F-100 pickup trucks. The ready-to-use model has simulated chrome bumpers and grille with plastic headlights and tail lights. In addition to the candy apple red scheme shown, the truck will be available in light green, light blue, and a pair of two-toned schemes: brown and white, and green and white. For additional information contact a dealer or visit atlaso.com.

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Berkshire Valley Models is selling kits for two versions of a 1930s-era O scale truck. The kit for the log truck includes white metal castings and laser-cut wood. The logs are not included.



Also new is a 1934 field service truck with numerous detail parts including 55-gallon drums, hand tools, oil cans, and a 200-gallon tank for refueling equipment in the

field. Decals for the drums are included. For information visit berkshirevalleymodels.com.



Sunset Models has announced the Alco FA1 and FA2/FB diesel locomotives in O scale for late 2019. Both two- and three-rail versions will be available, the

two-rail with QSI Q3 DC/DCC with sound and the three-rail with ERR Cruise, TMCC with Railsounds 5.0, remote coupler, and smoke. The units will come with fixed pilots and will have a minimum radius of 054 simple curves and 072 turnouts for the three-rail version and 48-inch minimum radius for the two-rail versions. Models will be Phase I or Phase II depending on the prototype being modeled. FA1 road names include Demo, Erie Lackawanna, Frisco, Rock Island, GM&O, GN, Soo Line (no B-unit), New Haven, New Haven Green, Reading, Seaboard Air Line, UP and Wabash. The FA2 roadnames include B&O, CN, Erie, L&N, Lehigh Valley, MKT (no B-unit), Missouri Pacific, NYC, PRR, SP&S, and Western Maryland (no B-unit). For more information visit 3rdrail.com.

S SCALE PRODUCT NEWS



Right On Track Models has released an S scale kit for Berkys Lumber. The kit includes an office and a lumber storage structure. Parts in the kit include laser-cut MDF

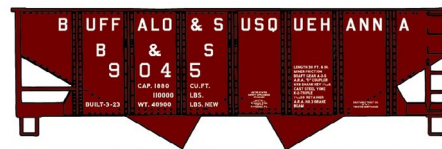
structure components, styrene windows and doors with glazing, cast metal detail parts, textured tar paper roofing, and step-by-step instructions. The office has a footprint of 4.5 x 2-inches. The finished storage structure measures 7.75 x 4.25-inches. For information visit rightontrackmodels.com.



Golden Gate Depot has announced three new S scale aluminum passenger car sets. The first set is the 1937 Santa Fe Super Chief with Baggage Car

3430, 8-1-2 Sleeper Laguna, Lounge Dorm 1370-Acoma, Diner 1474-Cochit, 6-2-2 Sleeper Taos, and 2-3-1 Observation Navajo. The second set is the 1938 PRR Broadway Limited Fleet of Modernism and post-war, including the 18 Roomette, two 12-5 Duplex, 4-4-2 Sleeper, Diner, and Observation. Extra 4-4-2 sleepers and diners will be available to reserve. The last set is the 1948 NYC 20th Century Limited, with an RPO, Diner, Kitchen, 12 Double Bed, Lounge, and Observation. Extra cars available to reserve include the 4-4-2, 10-6, 12 Double-Bed, and 22 Roomette. All the cars will be available with scale or HiRail wheels, and in scale length and "shortie" versions. For more information go to www.goldengatedepot.com/reservationS.html.

HO SCALE PRODUCT NEWS



Accurail has released several new HO scale freight car kits including a three-pack of Buffalo & Susquehanna twin-bay coal hoppers. The B&S

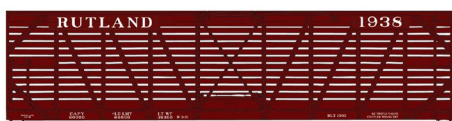


models are based on a group of USRA cars built in 1923. The prototype of this Chicago, Burlington & Quincy triple-bay covered hopper was built by Pullman-Standard in 1967.

Accurail's HO scale kit includes appropriate roller-bearing trucks.



Accurail is selling two new HO scale kits for Fowler 36-foot wood boxcars. Road names include a 1914 car decorated for Georgia Railroad, and a Toronto, Hamilton & Buffalo car built in 1932.



Also new from Accurail is an HO scale kit for a 40-foot Rutland Railway stock car with wood sides. The model follows a 1903 prototype that was rebuilt in 1921.

HO kits for Pullman-Standard triple-bay covered hoppers are available in white, gray, and mineral red with data only. All Accurail kits come with trucks and Accumate knuckle couplers. For additional information contact a dealer or visit accurail.com.

Athearn has announced the creation of their Genesis 2.0 product family, with the latest developments in modeling, LED lighting, and additional details. The first HO scale Genesis 2.0 product will be the Phase II SD90MAC-H, a 6,000 hp locomotive first produced by EMD in 1996 and purchased by the Union Pacific and Canadian



Pacific railroads. Featuring the 16-256H prime mover, fewer than 70 of the full 6000hp units were produced, with the majority of the SD90 series using the 4,300 hp 16-710 prime mover instead and informally designated as the SD9043MAC. The Athearn model will include "better than brass" detail, advanced LED lighting including illuminated numberboards and ground lights, see-through step-well steps, and dual sugar cube speakers. DCC+Sound units will be equipped with a Tsunami2 sound decoder with custom EMD 256H prime mover sound recorded by SoundTraxx. Roadnames available in this first release include Union Pacific, Canadian Pacific, and Fortescue Metals Group with four roadnumbers each, as well as the EMDX 90 prototype. The models should be available in Spring 2020.



Athearn also plans to release two versions of Union Pacific's SD70ACe diesel locomotive in December. Decorating schemes will be Spirit of UP No. 1943, and Union Pacific No. 9082 flag scheme.



Features of the HO scale Genesis models include LED lighting, correctly-sized working ditch lights, silver tipped front and rear trainline air hose and MU hoses, uncoupling bars, windshield wipers, tinted side windows, mirrors, interior detail including control stand, see-through radiator fans, etched dynamic brake

grille and screen with grid detail underneath; Chicago Blower brand air blower visible behind the see-through grilles, and wire grab irons.



Additional Genesis models coming in December include a group of SD60E diesels. A Norfolk Southern unit wearing the GoRail promotional scheme will be equipped with a 4300 gallon fuel tank.



Norfolk Southern No. 9-1-1, honoring First Responders, will have a 3900 gallon fuel tank. Units decorated in NS black horsehead scheme will come with 4000 gallon tanks.



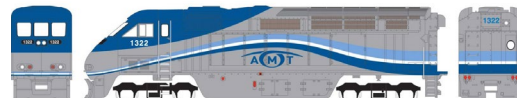
NS SD60E CABS

In 2010 Norfolk Southern launched a major rebuilding project for its SD60E locomotives. The program included installation of a completely new cab designed to provide the crew more room and better protection in the event of a crash. The original cab weighed 3,800 pounds compared to 12,500 pounds for the new cab. With its pronounced number board/headlight housing and flat front with a centered cab door, the SD60E replacement cabs look unlike anything else on North American rails.



New Genesis series SDP45 units coming from Athearn late this year with SoundTraxx DCC will

feature prototype sound recorded from EMD's 645E3 20-cylinder prime mover. In addition to the Southern Pacific unit shown, road names will be Conrail, Morrison-Knudsen, Great Northern, and Erie Lackawanna.



Athearn has included a new run of HO scale EMD F59PHI locomotives in its December schedule. In addition to Montreal's AMT-Agence Métropolitaine de Transport shown, liveries for the Ready-to-Roll model include Amtrak, Amtrak Cascades, and two Amtrak rail-safety schemes.



Amtrak began a campaign in late 2000 promoting better rail-safety awareness. Several locomotives in Northern California (No. 2007) and

Southern California (No. 455) Amtrak service received colorful printed vinyl wraps.



Paint schemes on additional F59PHI models coming in December 2019 include Utah Front

Runner, Metra Chicago, Union Pacific, Southern Pacific, Rio Grande, and Polar Northern Railroad in a Christmas scheme. See the N scale entry for more roadname illustrations.



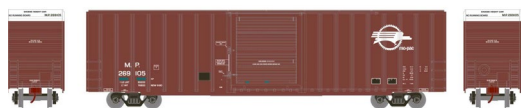
Genesis models coming from Athearn in February

2020 include GP40-2 diesels decorated for Denver & Rio Grande Western, CSX, and Norfolk Southern.



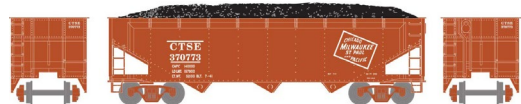
GP40-2s decorated for DT&I, GTW, Reading, Conrail, and Southern Pacific are also listed in

Athearn's February schedule. All Athearn locomotives mentioned in this report will be available for DC operation with a DCC-ready 21-pin NEM socket, and with factory installed Tsunami2 sound and DCC decoder.



Athearn rolling stock models scheduled for release in February 2020

include this 60-foot ICC Hi-Cube boxcar. Road names for this HO scale Ready-to-Roll car will be B&O, CSX, Family Lines, Angelina & Neches River Railroad, Burlington Northern, and Missouri Pacific.



A 40-foot triple-bay coal hopper with offset sides will be available next February decorated for

Milwaukee Road, Wheeling & Lake Erie, Alaska Railroad, Southern Pacific, Lackawanna, and Toronto, Hamilton & Buffalo. The HO scale model comes with a removable coal load and will be available in singles as well as four-packs with different road numbers.



In addition to Western Pacific, Athearn plans to release this 85-foot general purpose flat car decorated for Brillion & Forest Junction, Erie Western, Terminal Railroad Alabama State Docks, Conrail, Trailer Train (two schemes), Maine Central, and American President Line. Details include trailer hitches for trailer-on-flat-car service,

mounting brackets for use with 20- or 40-foot containers, wire grab irons, and 70-ton trucks with 33-inch machined metal wheelsets.



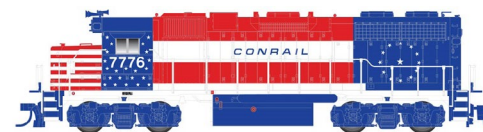
Roundhouse Brand products scheduled for release next February include a 30-foot three-win-

dow caboose with offset cupola. The HO scale ready-to-run model features wire truss rods. Road names will be P&E-New York Central System, Canadian National, Rio Grande, Chesapeake & Ohio, Great Northern, Pennsylvania, Southern Pacific, Union Pacific, and Santa Fe.



Another release of Roundhouse ACF quadruple-bay covered hopper cars is also planned for

February 2020. Road names for the HO scale ready-to-run model will be ACFX/BF Goodrich, CAI, Conrail, Chicago North Western, Luzenac America, BNSF, ADM, and Union Pacific. For additional information on Athearn and Roundhouse brand models contact a dealer or visit athearn.com.



Atlas plans to release HO scale versions of both GP38 and GP40 diesel locomotives during the third

quarter of 2019. In the late 1970s to early 1980s, many GP38s were fitted with a new air filter system that required modification to the dynamic brake blister. Atlas is producing both the original and modified DB blister and will issue the correct version based on the practice of the railroad being modeled. Road names for the GP38 will be Conrail, Conrail Bicentennial, Norfolk Southern, Norfolk Southern (First Responders scheme), North Shore, Bangor & Aroostook, and R J Corman.



Atlas will make its HO scale GP40 available for Pan Am, Seaboard Coast Line, New Orleans Public Belt,

Georgia Railroad, Western Pacific, Baltimore & Ohio, Southern Pacific (speed lettering), and New Jersey Transit. Details included but not installed on the GP40 include an electrical cabinet air filter box (ECAFB) and two engine compartment roof vents which were added by many railroads after delivery.

Atlas' GP38 and GP40 both feature golden-white LEDs, cab interior with crew, movable drop steps, walkway safety tread, uncoupling bars, MU and trainline hoses, individual windshield wipers, and metal grab irons. Atlas Gold series models will be equipped with DCC sound and decoder. Silver series models for DC operation will come with an NMRA 8-pin plug to simplify installation of an after-market DCC decoder.



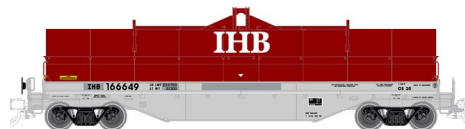
EMD GP38 AND GP40 ROAD SWITCHERS

In 1966 EMD introduced a new line of locomotives powered by its 16-cylinder 645-series prime mover. The four-axle locomotive with a rating of 3000 horsepower was christened GP40. Between 1966 and 1971 EMD produced more than 1,100 GP40s. Concurrent with the introduction of the GP40, a non-turbocharged version built on the same chassis and using the same body, was introduced as the 2000 horsepower GP38. It also carried a considerably lower price. More than 700 GP38s were delivered during the seven years it was catalogued by EMD.



Also scheduled for release during the third quarter of this year is another run of Atlas Master series 17,360

gallon tank cars. The HO scale ready-to-run model is based on an insulated car built by American Car and Foundry primarily for transporting chlorine. Road names will be PPGX, ACFX (black with orange stripe), ACFX Olin, GATX, GPBX, and HOKX.



Atlas has included a Master series 42-foot coil steel car in its third quarter release. The HO scale model will feature see-through walkways, removable hoods, interior floor detail, and four simulated steel coils. In addition to Indiana Harbor Belt, road names will be CSX, DLRX (GE Railcar), Inland Steel, and Norfolk Southern. For additional information contact a dealer or visit atlasrr.com.



HO scale wood chip cars are among a group of new hopper cars coming from **Bowser** this spring. Seventy-ton triple-bay hoppers with ribbed sides and ribbed upper side extensions will be available decorated for Norfolk Southern, Louisville & Nashville, and Gulf, Mobile & Ohio.



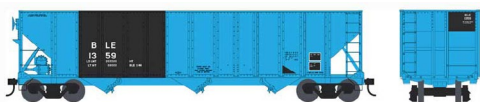
Ribbed side cars with flat extensions will be decorated for Seaboard System, and Georgia Railroad.



Road names for wood ship cars with offset sides and flat side extensions will be Boston & Maine, and Canadian National.



Completing Bowser's run of 70-ton triple-bay wood chip hoppers with offset sides and ribbed extension will be cars decorated for Milwaukee Road, Soo Line, and CP Rail.



Also coming from Bowser this spring are 100-ton triple-bay coal hoppers.

Road names on this release

will be B&LE, Baltimore & Ohio, Burlington Northern, Chessie B&O, Chessie C&O, Chessie (CSXT patch), Chessie WM, CSX (small logo), NS, P&LE, PPLX, RBMN (ex PPL), and Reading & Northern (ex PPL). The HO scale ready-to-run models will have knuckle couplers and roller-bearing trucks with 36-inch wheelsets. For additional information contact a dealer or visit bowser-trains.com.



Broadway Limited Imports is selling several HO scale versions of the Chesapeake & Ohio J3 4-8-4 steam locomotive. They include three black in-service schemes as well as the Presidential Express in unique green livery. Variations in tender lettering include Chesapeake & Ohio, Chessie

System Railroads, and Family Lines Rail System. Distinctive features on the J3 include the large flat sand dome, and the headlight and air pump radiator shield mounted on the solid pilot.

Broadway Limited's 4-8-4 models feature Paragon3 Sound & Operation System which includes Rolling Thunder sound and operation in both DC and DCC environments. The J3 is one of



BLI's Brass-Hybrid series models with the super-structures of both the locomotive and tender crafted in brass. The chassis and power train are die cast.

For additional information contact a dealer or visit broadway-limited.com.



R. Bale

C&O 4-8-4 GREENBRIERS

Beginning in the mid-1930s, the Chesapeake & Ohio Railroad replaced the Pacifics and Mountains on its major passenger trains with heavy high-speed 4-8-4 locomotives from Lima Locomotive Works. Given the class designation J3, the first five were delivered in 1935. Two more arrived in 1942 with the final five joining the fleet in 1948. They were among the last major steam engines Lima built. While most railroads called their 4-8-4s Northerns, the C&O dubbed theirs Greenbriers. Chesapeake & Ohio No. 614 was preserved and is on display at the C&O Railway Heritage Center in Clifton Forge, Virginia.



A structure named Sincere Towing is the first release for a new Kit-of-the-Month Club announced by **Fos Scale Models**. In the program subscribers will receive a new HO scale structure kit each month. The kits will be of laser-cut construction with designs ranging from trackside to waterfront to main street. The models will typically

have a footprint of 3 x 3-inches and will include laser-cut structural components, plastic windows and doors, metal detail parts,

color signs, and assembly instructions. The monthly subscription cost will be \$34.95 including shipping. The Kit-of-the-Month models, including Sincere Towing, will only be available on the subscription program. For complete details visit fosscalemodels.com.



InterMountain Railway has announced a few details on another production run of its HO scale ACF 4650 cu.

ft. triple-bay covered hopper. The ready-to-run model will have etched-metal roof walks and appropriate trucks with metal wheelsets. Cars with three loading troughs will be available decorated for SSW-Cotton Belt, Burlington Northern, Southern Pacific, Norfolk Southern, and Soo Line.



Cars decorated for NCLX-Scclair Polyethylene, ACFX-Sterling Salt, ACFX-ECC International, and Wisconsin Central (CN noodle)

will be equipped with six round loading hatches. The run will also include cars decorated for ACFX-French's and ATSF. A release date is pending. For additional information contact a dealer or visit intermountain-railway.com.



Kadee plans to release a Toledo, Peoria & Western PS-1 boxcar next month. The HO scale ready-to-run model follows a 1953 prototype built with 10 welded side panels

and narrow bolster tabs. The 7-foot, five-panel Superior door may have been installed when TP&W shopped No. 621 in 1964.



Also coming from Kadee in May is a 50-ton standard AAR twin-bay open hopper with off-set sides decorated for the Nashville, Chattanooga & St. Louis Railway.

The model is based on a class HM17 car built by Pullman-Standard in May 1949. The prototype was equipped with Enterprise discharge door latches, Apex Tri-Lok brake steps, and A-3 Ride-Control trucks. Kadee's HO scale version comes with a removable simulated lump-egg coal load. All Kadee ready-to-run models come with Kadee couplers and two-piece self-centering trucks. For more information contact a dealer or visit kadee.com.



R. Bale

1935 AAR TWIN-BAY HM COAL HOPPER

The HM classification indicates an open car with two self-clearing hoppers, fixed sides and ends, and hinged discharge doors perpendicular to the rails. Corrosion was always a problem on coal carriers and one of the principal goals of the 1935 AAR twin-bay design was to replace vulnerable fabricated centers sills, cross bearers, and body bolsters with impervious high-strength steel castings. Between 1935 and 1960 more than 127,000 hoppers of this design were built. The car measured 34-feet over the strikers, but the height varied slightly in various production batches. The design was used by several car builders resulting in variations but typically the car height over the rails was 10-feet 8-inches.



Monashee Laser Engineering has released three HO scale kits of Canadian enclosed 40,000-gallon water

towers. The kits are based on Canadian National, Canadian Pacific, and Pacific Great Eastern prototypes and have details appropriate to each railroad. The kits include 3D designed parts, scale chain and a positionable sway pipe. Windows, doors, and shingles are laser cut, and the kits contain a 15-page construction manual with over 30 photos. For more information see www.monasheelaserengineering.ca.



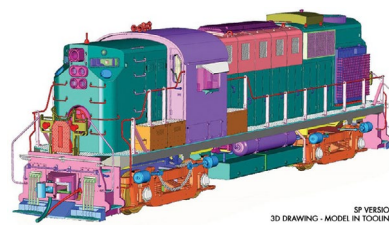
Rapido Trains has added Lehigh Valley locomotives No.7640 and No.7643 to the previously announced lineup of HO scale Alco RS-11 locomotives scheduled for

release later this year. The two additional models are being produced in conjunction with Anthracite Railroads Historical Society, a non-profit organization that will benefit from the sale of the two LV locomotives.



In making the announcement, Rapido noted that the position of the lettering and LV herald on No.7640 and No.7643 will be based on the unique appearance of the prototypes after they were repainted in Cornell Red in early 1973.

Lehigh Valley road specific details on Rapido's RS-11 will include correct steps, lights, equipment boxes, fuel tanks, and air intake louvers, straight metal side handrails with plastic



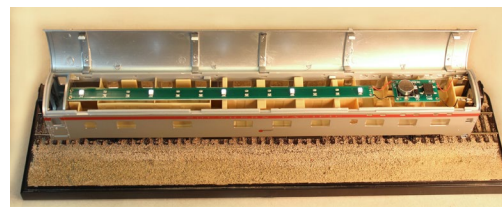
stanchions, and operating number boards, headlights and green and white class lights and cab control stand lighting. DCC sound units will have an ESU LokSound decoder featuring

sounds recorded from a full-size Alco 251B prime mover. DC non-sound units will come with a 21-pin plug to ease installation of an after-market decoder. For additional information contact a dealer or visit rapidotrains.com.



SP Daylight/Class 5 is selling an HO scale Union Switch & Signal H-2 searchlight signal. The Southern Pacific Railroad utilized the H-2 searchlight as a replacement for the original Type B semaphore signals. The kit includes the original one-piece concrete foundation, subsequent two-piece stacked foundations, and both narrow and wide signal cabinets. The model can be built with different signal heights and cabinet configurations.

The H-2 is the first release of a full line of exact scale kits for US&S signals the company plans to produce.



SP Daylight/Limited Editions has released a DCC/DC constant lighting kit for use in Walther's HO scale lightweight passenger cars. The kit is composed of two PCB peel 'n stick boards, wiring, and connector

spades designed for Walthers lightweight passenger car. No soldering is required. The light-bar features five equally spaced surface mounted cool white LEDs.



Up to eight more LEDs (or marker lights) can be added to the light-bar. The kit includes a power control board which can be placed in the car's restroom

or kitchen/pantry space. The two PCB boards are pre-wired together with spade connectors to match Walthers lighting contacts. For additional information go to spdaylight.com.



Tangent Scale Models has released a second production run of its Pullman-Standard PS-2CD 4427 cu. ft. triple-bay

covered hopper. The HO scale model appears to faithfully replicate the distinctive high-side prototype that was in production between 1966 and 1971.



Details on the ready-to-run car include accurate stirrup steps, see-through roof walks, etched metal crossover platforms,

wire ladder rungs and grab irons, jacking pads, tow loops, side air lines, air hoses, and coupler lift bars. Details specific to the prototype car being modeled include six different outlet gates, two different sets of roof hatches, two roof walk end supports, two crossover platform options, two different end ladder options, two different brake wheels, and two different center sill options.



Tangent is offering the HO scale ready-to-run model in nine decorating schemes including SLSF-Frisco (1967 version), Milwaukee Road (1967 and 2007 versions), and Rock Island (three versions, EJ&E 1980, NAHX 1980, Iowa Interstate 1987).



Additional decorating schemes available for Tangent's 4427 high-side PS-2CD include TLDX-Flamer (1967 yellow), TLDX-Landmark (1967 yellow), and TLDX Landmark (1977 red repaint).

The models come with Kadee couplers and 100-ton trucks with machined metal 36-inch wheelsets. For additional information visit tangentscalemodels.com.



Walthers is selling HO scale 70-foot RPO-baggage cars typical of standard heavy-weight equipment used by

many railroads between 1914 and the 1970s. The ready-to-run model represents cars with a 30-foot postal compartment complete with mailbag stanchions, sorting cases, and multi-direction catcher arms. The cars come with six-wheel trucks with electrical pickup. The type of truck is appropriate to the road name being modeled. Cars with clerestory roofs are available for New York Central Santa Fe, Great Northern, Milwaukee Road, and Soo Line.



Road names for cars with arch roofs are Union Pacific, Illinois Central, Denver & Rio Grande Western, and Southern Pacific.



www.walthers.com

Walthers is selling a kit for a modern yard office. Although simple in appearance, the HO scale model is composed of 91 different parts molded in three colors. Details include separate

doors and windows, air conditioner, electrical box, smoke jack, decorative panels, a printed interior, and signs. The assembled model has a footprint of 3 x 2.38 x .94-inches.

In our March report on Walthers new track we inadvertently included several items from the old Walthers/Shinohara product line that are not currently planned for the new line. We apologize for any inconvenience caused by our error. Availability of Walthers new line of HO scale nickel silver track components begins in April with the release of 36-inch sections of flex track. Additional items scheduled for release in October include #4, #5, and #6 right and left hand DCC-friendly turn-outs; rail joiners, pre-wired terminal rail joiners, and a Code 83 to Code 100 transition track. Insulated rail joiners and spacer ties will also be available. All items mentioned will be offered in Code 83 and Code 100. For more information contact a dealer or visit [walthers.com](http://www.walthers.com).



Yarmouth Model Works has released an HO scale resin kit for a 40-foot Delaware & Hudson 50-ton boxcar. The 1:87 model is a faithful replica of 300 prototypes D&H built in

its Oneonta Shops beginning in 1949. Construction of the all-welded cars featured flat side ribs, 3/4 Improved Dreadnaught ends with a short square rib at the top, and a Murphy diagonal-panel roof. The first 200 prototypes were fitted with Youngstown

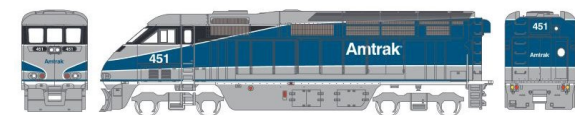
doors while the final 100 received seven-panel Superior doors. Yarmouth's HO kit features a one-piece resin body, an etched Apex Tri-Lok running board, Ajax hand brake, and Tahoe #106 Buckeye trucks. Speedwitch Media produced the D&H decals. For additional information visit yarmouthmodelworks.com.

N SCALE PRODUCT NEWS



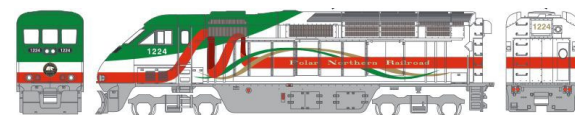
Athearn plans to release a new production run of N scale EMD F59PHI locomo-

tives in December. In addition to the Utah Front Runner version shown here, road names will be Montreal's AMT-Agence Métropolitaine de Transport, Amtrak, Amtrak Cascade, Metra Chicago, Union Pacific, Southern Pacific, Rio Grande, Polar Northern Railroad (Christmas theme), and two Amtrak rail-safety schemes.



Amtrak began a campaign promoting rail-safety awareness in the late 2000s. Several locomotives in Northern California (No.2007) and

Southern California (No.455) Amtrak service received printed vinyl wraps.



Features of the N scale ready-to-run locomotive include LED lighting, see-through

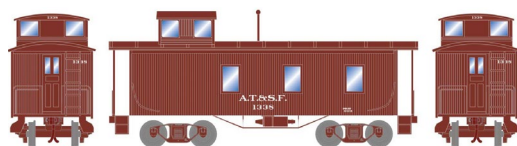
cab windows, and bi-directional constant lighting. Non-sound locomotives are DCC-ready. Sound equipped locomotives feature a

DCC decoder with SoundTraxx Tsunami2 sound. See the HO scale entry for other road name illustrations.



New N scale freight cars coming from Athearn next February include this

40-foot triple-bay coal hopper with offset sides. Road names will be Southern Pacific, Milwaukee Road, Wheeling & Lake Erie, Alaska Railroad, Lackawanna, and Toronto, Hamilton & Buffalo. The N scale model comes with a removable coal load and will be available in singles as well as four-packs with different road numbers.



Athearn has included a 30-foot three-window caboose with offset cupola in its list of new models

coming next February. The N scale ready-to-run model has wire truss rods. In addition to Santa Fe, road names will be P&E-New York Central System, Canadian National, Rio Grande, Chesapeake & Ohio, Great Northern, Pennsylvania, Southern Pacific, and Union Pacific. For information on all Athearn products contact a dealer or visit athearn.com.



InterMountain Railway has announced a few details on another production run of its N scale ACF 4650 cu. ft.

triple-bay covered hopper. The ready-to-run models will have etched-metal roof walks and appropriate trucks with metal wheelsets. Cars with three loading troughs will be available decorated

for SSW-Cotton Belt, Burlington Northern, Southern Pacific, Norfolk Southern, and Soo Line.



Cars decorated for NCLX-Sclair Polyethylene, ACFX-Sterling Salt, ACFX-ECC International, and

Wisconsin Central (CN noodle) will be equipped with six round loading hatches. The run will also include a car for ACFX-French's, and ATSF. A release date is pending. For additional information contact a dealer or visit intermountain-railway.com.



Bachmann is offering an N scale 4-8-2 Light Mountain locomotive in the Sound Value-Equipped line.

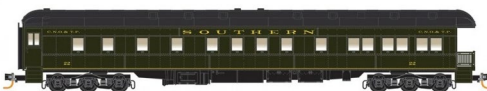
Roadnames in this release include Southern, Louisville & Nashville, NC & St. Louis, and Missouri Pacific. The locomotives feature NMRA-compliant dual-mode Econami DCC & Sound decoders, operating headlight, completely hidden drive train, gear drive, and E-Z Mate Mark II coupler in the rear and a dummy coupler on the front. Separate details include the bell, whistle, pop valves, sanding lines and handrails..



Also available soon from Bachmann are the Old Time Gondolas and Water Tank cars. These cars feature body-mounted E-Z Mate Mark II couplers and blackened metal wheelsets. For more information visit a dealer or bachmanntrains.com.



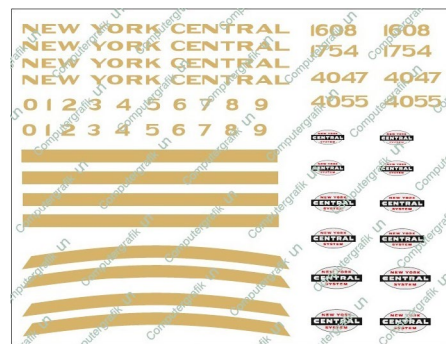
Micro-Trains has released two ready-to-run N scale versions of a 3-2 heavyweight observation car. The two-tone green Northern Pacific car was rebuilt and converted into a business car for company officials in the 1950s.



The Southern Railway car represents a heavyweight prototype built in 1903. It was rebuilt in 1939 with two staterooms, a dining room, and a small galley.



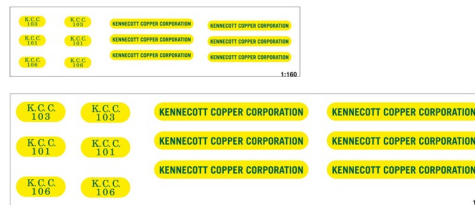
Micro-Trains has added two cars to its series of Heinz 57 Varieties vintage billboard reefers. At its peak H.J. Heinz operated a fleet of 700 truss-rod ice refrigerator cars that promoted its products. The newest cars from M-T are decorated for Baked Beans and Spaghetti. For more information on Micro-Trains products contact a dealer or visit micro-trains.com.



NEW DECALS, SIGNS AND FINISHING PRODUCTS

Modelrailroadworks has released two new water-slide decal sets. The New York Central experimental gold

cigar band scheme shown above contains sufficient material to decorate two HO scale locomotives.



This Kennebec Copper Corp set will decorate three locomotives. It is available in both N and HO scale. For additional information visit info@modelrailroadworks.de.



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! BRIEFLY NOTED AT PRESS TIME ...

Blaine Hadfield of **Arrowhead Models** has announced plans to introduce an HO scale ACF 4600 cu. ft. covered hopper in 2020. In making the announcement Hadfield acknowledged that Athearn offers a Genesis model based on the same triple-bay prototype ...

Atlas has released a helpful series of videos for hobbyists and budding photographers wanting to capture their railroad empire and equipment in realistic scenes. The video, titled Layout Photography Tips and Tricks, can be viewed at www.youtube.com/watch?v=qoCtlGGnlt0#action=share ...

ExactRail has just released several versions of Johnstown America AutoFlood II hopper cars. The N scale models are based on smooth-side aluminum prototype that could be unloaded through the five outlet bays or by a rotary machine ...

ScaleTrains.com has released its HO scale Rivet Counter version of Tier 4 GEVO ET44 locomotives in several road names include Navajo Mining and the Union Pacific version with angled exhaust. Models decorated for BNSF, CSX, Canadian National, and Norfolk Southern are also in this release ...

SoundTraxx has posted a video on YouTube that offers step-by-step guidance on installing a TSU-4400 Digital Sound Decoder in O scale equipment. To view the video go to view.bbsv1.net/bbext/?p=land&id=83BEF43DD0E95B7CE0530100007F819B&vid=d121df21-2e78-4e8c-9e3c-3ce675565631.

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SELECTED EVENTS



Model Railroad Hobbyist | April 2019

APRIL 2019

(Many events charge a fee. Check individual info website for details.)

AUSTRALIA, NEW SOUTH WALES, ERINA HEIGHTS, April 19-21, 14th Australian Narrow Gauge Convention, at Central Coast Grammar School. Info at www.austnarrowgaugeconvention.com.

CANADA, ONTARIO, MISSISSAUGA, April 14 Lakeshore Model Railroaders' Association Flea Market, at John Paul II Polish Cultural Centre, 4300 Cawthra Road.

ALABAMA, GADSDEN, April 13, 33rd Annual Train Show sponsored by Coosa Valley Model Railroad Club, at 210 At The Tracks, 210 Locust Street. Info at coosavalleymodelrailroad.com.

CALIFORNIA, HAWTHORNE (Metro Los Angeles), April 6-7, Los Angeles Model Railroad Society Open House, at 14005 Crenshaw Blvd. (Up stairs). Info at lamrs.org.

COLORADO, COLORADO SPRINGS, April 13-14, TECO 35 Model Train Show – The Golden Spike, at Chapel Hills Mall Event Center, 1710 Briargate Blvd. Info at tecoshow.org.

CALIFORNIA, SAN BERNARDINO, April 27, Western Prototype Modelers Meet, at San Bernardino Train Depot, 1170 West 3rd Street. Info at railroadprototypemodelers.com.

SELECTED EVENTS | 2

INDIANA, INDIANAPOLIS, April 13, Indianapolis Spring Train Show, sponsored by NMRA Central Indiana Division at Manual High School Gym, 2405 S. Madison Avenue. Info at cidnmra.org.

KENTUCKY, NEW HAVEN, April 6, Kentucky Railway Museum Annual Train Show & Sale, at St. Catherine Academy Gym, 413 North 1st Street. Info at kyrail.org.

MAINE, WESTBROOK (metro Portland), April 6, Train Show at Westbrook Community Center, sponsored by Southern Maine Model Railroad Club. Info at southernmainemrc.wordpress.com.

MICHIGAN, WYOMING (metro Grand Rapids), April 13, Spring Train Show, sponsored by Grand River Valley Railroad Club, at HSB Inc., 5625 Burlingame Ave SW. Info at grvrrc.org.

OHIO, MARION, April 26-28, Central Ohio Railroad Prototype Modelers Meet. Request info from dblake7@columbus.rr.com.

TENNESSEE, MEMPHIS, April 27, Memphis Model Railroaders Open House, at AZO Inc, 4445 Malone Road. Info at memphismodelrailroaders.com.

May 2019, by location

CANADA, BRITISH COLUMBIA, BURNABY, May 3-5, Railway Modellers Meet of British Columbia, at Simon Fraser University, Burnaby Campus, West Mall Centre. Info at railway-modellersmeetofbc.ca.

CALIFORNIA, SAN PEDRO, May 18-19, Belmont Shore Model Railroad Club Open House, 3601 South Gaffey Street, Bldg 824. Info at belmontshorerr.com.

CALIFORNIA, SANTA CLARA, May 23-25, O Scale West, S West, and Narrow Gauge West combined meet, hosted by O Scale West, at Hyatt Regency Hotel. Info at oscalewest.com.

SELECTED EVENTS | 3

CONNECTICUT, FARMINGTON, May 31-June 1, New England-Northeast Railroad Prototype Modelers Meet, at Farmington Marriott, 15 Farm Springs Road. Info at nerpm.org.

MASSACHUSETTS, WAKEFIELD, May 18, Model Railroad Flea Market, sponsored by North Shore Model Railroad Club, at Lakeside Inn, 595 North Avenue. Info at nsmrc.org.

NORTH CAROLINA, DENVER, May 31-June 2, Modular Layout Display sponsored by the Sipping and Switching Society of North Carolina, at Salem United Methodist Church. Request info from Glen Frix at gafrix@charter.net.

TENNESSEE, JOHNSON CITY, May 31-June 1, Scale Model Train Show & Sale, sponsored by Mountain Empire Model Railroaders, at George L. Carter Railroad Museum, East Tennessee State University. Info at memrr.org.

TEXAS, TAYLOR (Metro Austin), May 4-5, Austin Area Train Show, at Williamson County Expo Center, 5350 Bill Pickett Trail. Info austinrailway.org/trainshow.html.

Future 2019, by location

AUSTRALIA, QUEENSLAND, TOOWOOMBA, June 1-2, Model Trains & Hobby Expo, sponsored by Toowoomba Model Railway Club, at Toowoomba Showgrounds, Glenvale Road. Request info from Ted Freeman at tmcexpo@gmail.com.

ARIZONA, MESA, (Metro Phoenix), September 25-29, Arizona Junction, 2019 NMRA Pacific Southwest Region Convention, hosted by PSR Arizona Division, at Sheraton Mesa Hotel at Wrigleyville West, 860 North Riverview Mesa. Info at azdiv-nmra.org/psr2019convention.

SELECTED EVENTS | 4

CALIFORNIA, CROCKETT, June 8-9, Carquinez Model Railroad Society Open House, at 645 Loring Avenue. Request info from Dave Tateosian at davetateosian@sbcglobal.net.

CALIFORNIA, RICHMOND, June 15, San Francisco Bay Area Prototype Modelers Meet, at St. David's School Hall, 871 Sonoma Street. Info at www.bayareaprototypemodelers.org.

ILLINOIS, COLLINSVILLE (metro St Louis), July 26-27, St. Louis RPM Meet, at Gateway Convention Centre. Info at www.icgdecals.com/stlrpm.

MARYLAND, LINTHICUM HEIGHTS (Metro Baltimore), September 19-22, Mid Atlantic RPM Meet, at Double Tree by Hilton, BWI Airport, 890 Elkridge Landing Road. Info at marpm.org.

NEW YORK, LIVERPOOL, (Metro Syracuse), September 19-22, NMRA Northeastern Region Empire Junction 2019 Convention, at Holiday Inn, 441 Electronics Parkway. Info at empirejunction.org.

OREGON, PORTLAND, August 27-31, 35th National Garden Railway Convention, hosted by Rose City Garden Railway Society, at DoubleTree by Hilton Hotel, 1000 NE Multnomah Street. Info at www.ngrc2019.org.

TEXAS, FRISCO, June 27-30, 2019 Texas Special NMRA Lone Star Region Convention, at Drury Inn & Suites, 2880 Dallas Parkway. Info at www.2019TexasSpecial.com.

UTAH, SALT LAKE CITY, July 7-13, 2019 NMRA National Convention and National Train Show. HQ at Little America Hotel. Info at nmra2019slc.org.

Beyond 2019, by date

ENGLAND, BIRMINGHAM, 2022, NMRA National Convention and National Train Show.

CALIFORNIA, SANTA CLARA, 2021, NMRA National Convention and National Train Show.

MISSOURI, ST. LOUIS, July 12-18, 2020, NMRA National Convention and National Train Show. HQ at Hilton St. Louis at the Ballpark. Info at gateway2020.org. ■



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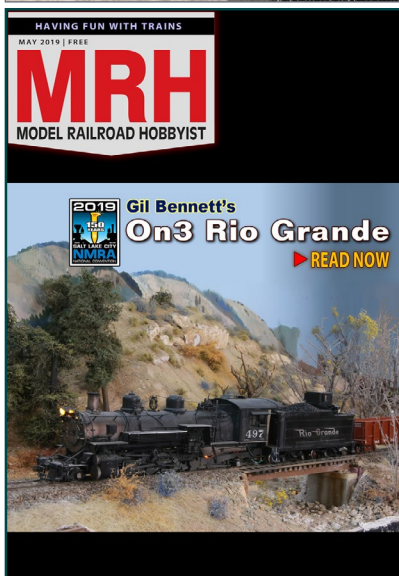
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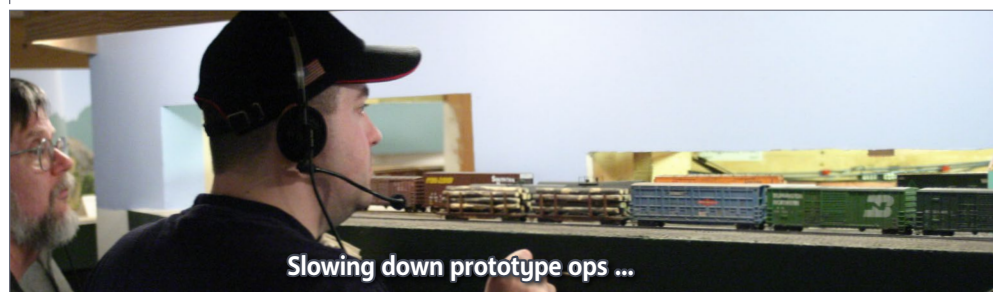
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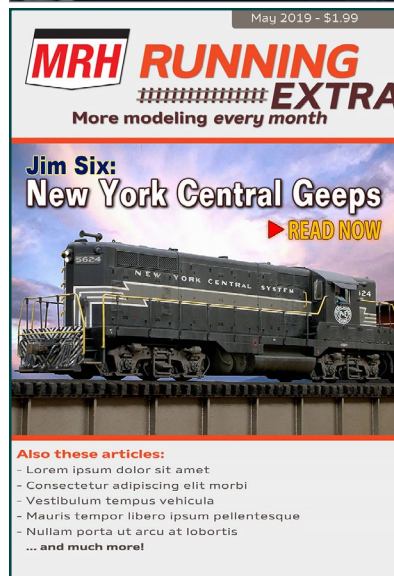
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