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My history of railroad interests stem from my retired grandfather (a 50 year veteran as section foreman on the Northern Pacific). When I was five years old he took me up in the cab of a NP W-3 class Mikado and let me blow the whistle and ring the bell. From that time on I was hooked on model railroading. I can remember that day as if it was yesterday.

After several years of On3 modeling and building an almost complete layout of the Rio Grande Southern, I became burnt out and decided to go back to modeling my grandfather’s railroad - the NP and its cousin, the Great Northern. I have always been a fan of mountain railroading; so I decided to model the western Montana to eastern Washington area. We had just finished building a new home and the layout’s size was determined by the basement. I ended up with 86 x 45 ft. L shaped layout with the small leg of the L at 22 ft.

**Design**

The first phase was to design a layout that would take advantage of the room’s size yet not put so much trackage in that it would become spaghetti central. I wanted a hidden storage yard and a large visible yard that could be viewed close up and a major passenger terminal. Mountain grades would be no more than 1-1/2 % and the mountain area would feature catenary for my GN electric locomotives. The hidden staging yard would receive and send out trains over the entire railroad. It could hold 18 trains, with approximately 650 cars. The visible yard would be based on Livingston MT and feature a 16 stall roundhouse, boiler shop and blacksmith shop. The main feature of the layout would be a scale model of the Livingston depot, almost 10 ft long.

After deciding on a track design, I built a 1/4” scale model of the track plan. The room walls and floor were made of foam board and then the track was cut out from the blueprint and also pasted on foam board. Little foam bents were placed under the track to provide a look at the elevation changes on the layout. I added clay alongside the tracks to simulate the mountain terrain. This proved very helpful in correcting mistakes both in the track plan and in the scenery phase of the layout. I would strongly suggest that if one is building a large layout, making a model really helps.

**Construction**

I installed all the benchwork before I laid any tracks to make sure they would fit in the given space. Because of the mixed type of terrain I was modeling, I did not go with the common L girder system. For example, in the mountainous area I didn’t really think I gained that much flexibility with the L girder system and all the extra work of building the girders wouldn’t have paid off. I did make the benchwork in segments no longer than 10 ft. and then screwed them together so that one could disassemble the layout. I have two 3 ft. doors leading into the layout room, so any segment can be moved without problems. Yes, cutting the wiring between segments would be a mounting task but at least it would be possible.

My track is Code 125 and Code 100 flextrack. My research on the two railroads found that during and shortly after the WW II era I am modeling, the NP and GN used 95 lb. rail on the mainline and 75 lb. rail in the yards and branchlines. Old Pullman has very good Code 125 flextrack and House of Duddy makes Code 100 flextrack. I used flextrack rather than laying my own since I had over 1100 ft. of mainline and more than that in yards and branches. The switches all came from Old Pullman. They are already laid on weathered ties and look very realistic. In order to
5000° and 6000° Kelvin lights on separate circuits placed in 2 x 4 ft fixtures in a drop ceiling.

**Control System**

I have a conventional block system for my railroad. DC powered. Every time I laid a track I had the power on in the block and if I got a short, the meter on the panel showed it immediately. In that way, I did not have to debug shorts afterwards. I use four Polk 5 amp RC throttles to control the layout. A unique switch I found on the Internet routes the correct power pack to each of the 19 blocks, with more to be added. It is made by EAO International [www.eao.com/global/en/products/product_search.asp], a Swiss manufacturer. It is called a 5 gang, illuminated, mechanical, interlocking push button switch. They can be ordered with as many pushbuttons as you desire (matching the number of your cabs) plus one for the off position. You can order the pushbuttons any color (they are simply colored caps); so I got them in red, blue, yellow, green, and white. Each RC handheld throttle was colored accordingly. Thus, if you wanted to have the red throttle active in a block on the railroad, you simply pushed the red button on the switch. If the green button was active and illuminated, pushing the red button cancelled it out and the red button was now illuminated and powered to the block. The white button is for an off position in the block.

**Scenery**

After the track was in and trains ran without derailments, I started on the scenery. Since my railroad was designed to be in the high mountains of Montana to eastern Washington, I had to have a fast way to make lots of mountainous terrain. After much debate, I settled on Joel Bragdon’s method of geodesic foam for my mountains. There was a small learning curve involved, but the effort paid off in that the terrain on the layout looks real, goes up fast, and has no mess in the house. I would never go back to the plaster technique again. The cost is a little more, but the savings in time and with no mess completely overshadows all the old methods. One can make changes with the foam method very easily and that cannot be said with the old plaster techniques.

Rather than have to paint 262 ft. of backdrop along the walls of the layout, I chose to go with wallpaper that had printed mountains made from actual Red tracks are Great Northern electrified track with catenary above.

![Diagram of railroad layout](image-url)
pictures. I used a company called Backdrop Warehouse. I printed out the catalog pages of the mountain backdrops I wanted and converted them via Photoshop into 1/4" scale, cut them out, and pasted them on the model of the layout I had made. In doing this, I was able to show to the best advantage some of the snow capped mountain peaks and incorporate them into the layout. The cost for the backdrops was about 1/10 of what an artist would have charged. They have a huge assortment of mountain scenes that are 3 ft. high x 10 ft. long and most of them are continuous so that the backdrop keeps flowing as if you are looking at a 360 degree view. In order to get 262 lineal ft. of continuous mountains, they had to computer “stitch” some of the scenes together. You cannot tell where they did it.

**Structures**

Since most of my structures were not offered by any manufacturer, I had to use other methods to build ones unique to the NP and GN. The only exception to this was the roundhouse that is a modified Korber Models kit. For all other structures, I received the original blueprints from the NP Historical Association. They were very helpful in my research. It is hard to believe that most of those blueprints even exist today. I contracted a professional model builder, M-Tec Models. He took the blueprints and entered the dimensions into a CAD system connected to a large laser cutter and cut out all the sides, windows, etc. What evolved was a custom kit. It would have taken me years to accomplish the same effect as I got with M-Tec. The depot complex took only 3-1/2 months to build and there are over 2000 parts. Making the mountains and buildings has been the real fun part of building the railroad.

**Equipment**

My motive power is a combination of off-the-shelf and custom models. Many of the NP and GN engines have never been reproduced. In order to build them at reasonable cost, I researched similar models that were already produced and had a professional builder just modify them to an NP or GN model. I was fortunate enough to get the blueprints of most the custom engines. I had a friend take pictures of his HO Scale NP and
GN engines for those that had no blueprints available. The cost was considerably less since we didn’t have to make a whole new frame, drive shaft, and gearing. I would guess that the cost of these conversions is about 1/4 the cost of a custom engine. My rolling stock is a combination of kits or pre-built models, combined with many urethane custom models put together by professionals and weathered properly. I have some brass rolling stock; however the cost limited my choices, as well as their availability.

**Conclusion**

I estimate the layout is approximately 50% complete so far. It has been my lifetime goal to build a model railroad that one could enjoy and feel that you are there in the middle of the Rocky Mountains watching trains go by. Hopefully I will have achieved this goal when the layout is complete.

I am constantly asked by visitors, “When do you plan on being finished?” My answer is “I am just having fun creating what I have dreamed about all my lifetime.” I plan on having annual open house visitor sessions to feature my layout in the community I live in.
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Potpourri

Some personal progress on roller bearing trucks

On a whim one evening, I decided to see what I could do with the sideframes from a pair of Atlas O and Lionel roller bearing trucks. I've settled on Protocraft wheelsets as my standard on the Indiana & Whitewater and the axles of these fit the journal bearings on both sideframes nicely, with good rolling qualities and almost no slop. I proceeded to try a scratchbuilt bolster to see if it would work and lo and behold, I was on my way to something good. However, looking through Protocraft's online catalog, I noticed their truck bolster and wonder if it would work too. The critical factor is the width of the opening in the sideframes. In the steam era, most bolsters were 12 inches in width and this seems to hold true for modern 70 and 100 ton trucks too (although I'm not absolutely certain of this). Looking at the Atlas and Lionel sideframes, their openings are more like 15” wide. I found two prototype truck manufacturer's websites that included their maintenance manuals containing a wealth of useful information. Amsted Industries’ site is [http://www.amstedrail.com/freightcar/index.asp] and check out Standard Car Truck Company [http://www.sctco.com/index.html]. This info shows that there are other components involved at the sideframe to bolster junction that might account for the difference in width. It is still very much a work in progress, but it is a start in the right direction. Rumor has it that a commercial model P48 roller bearing truck is in the works somewhere. Never fails does it? If I get things figured out to my satisfaction, then a leap forward in time on the layout may occur again.

Couplers

San Juan Car Company has announced the development of a new On3 coupler with a unique design that moves the knuckle spring to the inside of the coupler's body, which allows for all the correct detailing on the sides of the coupler. Named the Evolution™, this new design seeks to merge the reliable operation found in the standard Kadee® coupler's design with the excellent visual appearance of San Juan's existing operating scale Sharon couplers. The new couplers should be available starting in October 2009. Hopefully, San Juan will consider making them for us standard gauge modelers too!

And there's even more news on the coupler front. Protocraft is introducing a revised version of their Type E coupler. No word on their availability as of this writing, I'll let you know when I have some thing more. And finally, Santa Fe fans have reason to get excited over the possible production of the 3700 series Mountains and 2900 series 4-8-4 Northerns by Sunset Models. While they won't be done in P48, there may be some conversion possibilities with them. If you're interested let Scott Mann of Sunset [www.sunset3rdrail.com] know and get yours reserved soon.

Track and wheels one more time.

The observations column in OST #46, proposed the idea of a single track standard for representing the prototype's 4' 8-1/2” or standard gauge in 2-Rail O Scale rather than the two we now have - the NMRA's 1.252” and P48's 1.177”. The corrected standard already exists in the form of the P48 specifications. However, the proposal does not advocate an adoption of P48 standards, but rather using the correct track gauge of 1.177” along with the current NMRA flangeway dimensions and wheels (regauged), rather than the prototypically based specifications used for both in P48.

I confess that my initial knee-jerk reaction to this idea was, why do we need another set of standards? However, as the magazine's editor, I want this to be a place that encourages these conversations rather then shutting them down with partisan rhetoric.

A better question to ask of this proposal would be: How many fragments, niches, flavors (pick your term), will standard gauge modeling in O Scale support before each one becomes too small to be feasible financially? O Scale as a whole represents a very small portion of the overall hobby market, and a line of flextrack and turnouts built to a new set of specifications, plus the retooling required for locomotives and rolling stock to run on this track represents a huge capital investment. In a soft economy, a risk like this is something few manufacturers would willingly undertake without any guarantee of a positive response from the marketplace. The idea was also presented that it would be easy to convert from NMRA specs to P48 with this new track. Experience has shown me that this isn't exactly true. It's a headache in that steam locos will need the same involved amount of work to exchange the drivers and other wheelsets. The same holds true for diesels and freight cars. Additionally, flangeway dimensions will have to be altered in order for the equipment to track properly.

The truth is that a modeler is better off to pick one standard at the beginning and stick to it. Track and wheel dimensions are two sides of the same coin, and aren't as interchangeable as some would like to have us believe. No mention was made of what will happen to the all the existing 1-1/4” equipment? Would it be rendered redundant in time? My opinion, for what it is worth, is that further fragmentation from another set of standards would hurt the future growth of O Scale. While I wholeheartedly applaud the adoption of a single gauge track standard, I'm not a prophet or a visionary, and it'll be interesting to see where the future of standard gauge O Scale modeling wants to go.

Best regards,
Mike

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The Old Country Store

Located in the community of Townley, Alabama, about 15 miles west of Jasper at the junction of Alabama Highway 13 and the former, U.S. Highway 78 lays a small community founded in the late 1880s. Around the turn of the 1900s this was a farming community, which also supported the timber and coal mining industries. Small mining operations often referred to, as “wagon mines” were scattered throughout the hills of the area. The Frisco’s mainline from Birmingham to St. Louis runs through the community and, in years past, a depot and house track were located at the south end of the siding. Today only the controlled siding remains.

Located north of the mainline across a small bridge over a branch of water that’s called Post Office Crossing, sits an old country store. I would estimate from its construction and materials that this store was built around the early 1900s. The columns that support the structure are made from local fieldstones cemented together to form pillars. The floor joists and end sills are rough finished actual 2x10s and 2x12s unlike the smaller sized framing lumber we use today. Pine clapboards sides the outside of the structure while the roof is covered with triple ridge tin sheets. Since it is a two story structure with no access to the second floor from the outside, I’m inclined to think the store’s owner may have lived in the second floor portion at one time.

The store served the community and railroad crews up until the time it closed in 1980. It was not uncommon in the early days of my railroad career to sit in the siding here for extended periods of time while the locals worked Jasper or Carbon Hill on either side of Townley. Often the head end and the caboose crews would visit the store to grab a snack and soft drink while they were stuck in the hole. The famous railroad “Seafood Platter” was always a popular treat. A can or two of Sardines with a splash of your favorite Hot Sauce, Saltine crackers, a piece of hoop cheese and fresh sweet onion complimented the meal along with a soft drink of choice. The elderly lady who ran the store usually sat in her rocking chair close to the front door where she could catch the evening breeze and watch the action on the railroad and highway. The store only had a couple of small coolers for perishable items as well as floor coolers for the soft drinks. Home built shelves contained anything you might need to get you by until that next trip into town. Lighting was provided by several 60-watt light bulbs in their porcelain sockets hanging from the ceiling, as were the fans that turned slowly stirring the warm Alabama summer air.

This was life in the rural south before the invention of the convenience store and super centers. I can only imagine that prior to my days on the railroad this store served many a member of the community as well as steam engine crews and passengers when this was a regular stop on the train schedule.

Several years ago I took the time to make a photo record of all four sides of this structure for future reference. I plan to take these photos and calculate the dimensions of this structure, then draw an O Scale set of plans of the old store for modeling purposes.

This structure would be simple to scratchbuild in either wood or styrene. Door and window castings from Grandt Line or other suppliers could be used, and interior detailing and lighting could be added making this an interesting project.

No modeler should be intimidated by the word scratch-building. It’s like building a kit without a set of step-by-step instructions. You start with the basic materials, a set of rough or finished plans, simple tools and the desire to construct a one-of-a-kind model. The more you become involved the more your experience level grows as you work through trial and error construction procedures until you find the technique that works best for you.

Structures like the old country store are still with us today but their future is not guaranteed. When you have the chance to make a photo record of a structure that you may one day want to model, do so and possibly share it with others. You may find the structure gone when you get around to taking measurements and have to rely on your photos to calculate dimensions.

With all the other projects under way on the Alco Belt, hopefully at some point I’ll find the time to produce a set of O Scale drawings of the old country store and Joe may just grant me the space in a future issue to print these plans and do a construction article. The thing that stands out most in my mind about that store is the elderly lady that ran it, although I don’t remember her name, she knew and called her railroad men by their name, including me. It was always: “Service with a smile.”
This article was prompted by three things. First was the excellent article by Gerald Brothers: Sweeper/Track Cleaner in OST #38, May/June ‘08. The second was the letter to the Editor by Myron Levitsky: Sweeper Suggestions in OST #41, Nov/Dec ‘08. The third was that I had a Car Works O Scale double truck, double brush trolley sweeper that I had completely rewired using one DCC decoder to drive the car’s motor and the two motors that individually drive the brushes. My intent here is to tell you how I did it.

One of the first things I did was to open up the car and document all of the original wiring. In my specific case, it was a bad job and all that I salvaged was the wiring from the trucks. There were two wires from each truck - one from each rail. These were all connected together and to the body as a common ground. (I use live overhead and uninsulated track.)

Then I measured the current draw for the brush motors. I ran them on several voltages to find the speed of rotation that I liked; it turned out to be 5 volts at 60 milliamperes. This determined the decoder specifications. Also important was the drive motor. It was able to be driven by any "HO" decoder. So I needed an HO decoder with at least three functions. One for headlights, and the other two for the brushes. At the time I was building this, the decoder I chose was the Lenz LE080XS. It has two functions rated at 100 milliamperes each. I have not determined what usable decoders are available these days.

I chose to use regulators to determine the voltage being sent to the brush motors and the headlight bulbs. With respect to the latter, I like to use 1.5 volt bulbs fed at about 1.375 volts for longer life and a little lower brightness. This also allows them to be independent of variations in the track voltage. I used a LM317T regulator with programming resistors to get the 1.375 volts. There is also a series resistor for current limiting purposes ahead of this regulator to protect the decoder. To achieve the desired voltage, I used the 1% 10 and 100 ohm resistors from Digikey, and not the 5% ones from Radio Shack. (I started using regulators on plain DC and the bulb will be at a constant brightness from a track voltage of about 4 volts up to 24 volts. If you want to use resistors instead, it can be done but you will have to figure that out.)

The regulators used for the brush motors were the 7805 which puts out the 5 volts. The diodes across the output of the regulators are for handling the back voltage spikes from the inductive load of the motors. The full circuit diagram is shown in Figure 1. A parts list is included at the end of this article.

A plain PC board with holes on 0.1” centers and no cop-
per plating was used for the circuit. The decoder is held to it by double-sided foam tape. Wiring uses component leads and plain wire. (Note that the current drain on the regulators is low enough that no heat sinks are needed.) The whole board is held to the under side of the sweeper’s body by more double-sided foam tape.

The decoder’s red and black wires are connected to the trolley poles for an easy ground connection through the pole hook. With DC this would give pole reverse but with DCC, the forward direction is determined by the connection of the red lead. The headlight wires are directly connected since they are mounted on the top part of the car. The three motors are wired through connectors since they are on the floor of the car. You may need to experiment to get the proper rotation speed on the sweeper brush motors. The brushes should rotate so as to throw the snow forward and to the side. The circuit as I did it is shown in Photo 1. Note that I did not use foam tape but a thin double-sided cellophane tape. All you need now is some snow on the tracks.

<table>
<thead>
<tr>
<th>Parts list</th>
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<tbody>
<tr>
<td>Name</td>
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<tr>
<td>Decoder</td>
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<td>Regulator</td>
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<td>Resistors 10 ohm, 1/4 w</td>
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<tr>
<td>Resistors 100 ohm, 1/4 w</td>
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<tr>
<td>Bulbs 1.5 volt, 40 ma</td>
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<tr>
<td>Connectors PC board</td>
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<tr>
<td>PC board plain</td>
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* - there are other part numbers for other manufacturers.
# - bulbs from other places should work.
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Better Wheels #1

The Case for a Better Wheel Profile is great information. It explains a lot about how things work. What I got from the article is that the relationships apply to any gauge and not just NMRA standards 5 foot gauge as implied on page 27 where is states “I cannot stress enough that all three must be met in order to guarantee that a given wheel profile will run properly on NMRA track.”

John Houlihan via e-mail

Better Wheels #2

After reading Issue #46, I was felt that too much space was devoted to track and wheel standards, notably P48. P48 is a niche group, the hobby needs them if we are to progress. Do they need a platform?

Certainly the NMRA is aware that their standards and recommended practices lag [behind] current technology, particularly in the area of DCC. These problems are better left to publication in “Scale Rails.” One last thought, makers and importers can always ask the question “Do our non-conforming products sell?” Modelers vote with their dollars.

Phil Kohl via e-mail

Mike responds: Mr. Kohl your letter left me a bit confused about whether you like P48 or not. Does it need a platform? Does traction modeling, narrow gauge and modern era modeling need a platform? My response is yes to all the above. Our task at the magazine is to not only reflect on what O Scale was, but to also consider where it is today and what it can be in the future. Therefore coverage of P48 and other so-called “niche” modeling efforts will continue.

More Thoughts on Issue #46

The Modern Image: Why has no one used a depressed center flat car for track cleaning? A model with four 4- or 6-wheel trucks could really be weighted down and the pads would not show.

A Closer Look at P48: After a few years as a professional hostler and brakeman, plus fifteen years with an operating RR museum, I’m all for thinner, more prototypical wheels, although RP25 specs were a quantum leap from tinplate wheels. The argument over gauge though is close to negligible. If O Scale had stayed with the 1930s 1:45 proportion, the track gauge would be 1.259”. A track gauge of 56.5” is not cast in stone. Pennsy used 57”, and, according to a pamphlet from the Federal Railroad Administration about their Automated Track Inspection Program, current track gauge is allowed to vary up to 58” with speed restrictions. This is 1.208” in 1:48 or a difference of 2 scale inches. Finally, why won’t Kadee make a long shank coupler for long cars? At least how about a dummy coupler for passenger cars?

Happy Rails

R. L. Scheuerman, Calif. via e-mail

Mike replies: Thanks Ted. I am aware of the House of Duddy track. The purpose of the column was to consider whether the options of ready-to-run track in P48 would be viable, not to identify sources. Most prototype modelers seem to prefer handlaid track for a variety of reasons. Until the market demand for correctly gauged flextrack and turnouts greatly expands, it will remain risky for anyone to invest the considerable resources needed to do it right.

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The goal of this article is to teach the O Scaler interested in handlaying track a different and practical method of ballasting track. Usually ballast is added last after spiking track on hand laid ties or installing flextrack. This can be a slow process while you pick out ballast from flangeways and points.

With this method the ties are glued down and the ballast is poured over the wet glue. The glue I use is a water soluble padding compound, a type of glue used by bookbinders and printers who make pads of paper. Ballast is added, leveled, and matte medium sprayed to bond it all together.

Photos 1 and 2 show the tools and materials needed. They are: padding cement, available from: [http://www.americanprintingequipment.com/], matte medium available from A.C. Moore and Michaels art supply houses. (Use the 40-50% coupons from the Sunday newspaper to buy, you will save $10 or so.) Ballast (medium gray Woodland Scenics’ bottle with shaker top) some paper towels, a spray bottle and a pen or marker. You’ll also need a 2” wide x 12” long pine scrap, a 1-1/2” wide foam brush from a good hardware store. (Do not use ones from major home improvement stores, as they are poorly made and too flexible.) Along with a 1-1/2” good quality sash brush and some pre-cut and stained ties.

To begin, draw two parallel lines the same distance apart as the length of your ties. Then apply the padding compound with a brush, running it outside the pencil/pen lines drawn by 3/8” (Photos 3-4).

Drop the ties in place into the padding compound using the guide lines. Align or re-space ties as necessary so they look good. Press into place with a finger (Photo 5). Turn the 2” x 12” pine scrap on its narrow edge and place it onto the center of the ties, and press down. This will ensure the tops of the ties are level and won’t require sanding (Photo 6). Photo 7 shows what a foot long stretch of track should look like with the ties in place.

Shake ballast onto and between ties, so that tops of ties are covered with ballast in the center. Distribute the ballast with a 1-1/2” width foam brush and work the ballast from the center of the ties outward to the ends (Photos 8-9). Tidy up the
edges by moving the loose ballast towards the ends of the ties making an edge to the ballast (Photo 10).

Roll a 24” long strip of paper towels around the pine block to make a blotter (Photo 11). Then, prepare a spray bottle by mixing 50% matte medium and water plus 2-3 drops dishwashing liquid. Test the spray bottle so it puts out a mist when used. Hold the sprayer at a 45 degree angle and thoroughly wet the ballast. The ties will get very wet and so should the ballast (Photo 12). Press the blotter onto ties, lift and move to the next wet area and press onto ties again. Do not rub the blotter from side to side or along the ties, only place it directly down on the ties (Photos 13-14). Then leave finished, ballasted ties to dry overnight or longer depending on humidity.

Spike rails to completed ballasted ties (use of safety glasses recommended). You can pre-paint the rail if desired (Photo 15). Track switches are built in the same manner, following all the same steps, except do not ballast where the throwbar is between the ties at the points. You can place a tie there when placing the loose ballast, but remove it before spraying with matte medium (Photo 16). Photo 16 shows switches on my railroad that are installed after all the ties were glued in place and ballasted. This method of building switches is exactly the same as building them on ties with no ballast. Note there is no ballast at the throwbar location.

◆
In 1975, the Southern Iron and Equipment Co. started building a 52'-6", 100-ton gondola. Evans took over SIECO and continued building the cars through December 1981. A total of 1,730 cars were built with three minor body variations. This model represents the second, and most common, version of the car.

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Replacing Atlas O Couplers

Bob Anthonyson

This is a simple process for replacing Atlas O couplers with Kadees. First, remove the single screw that holds the truck to the underside of the car. Working from the direction of the end of the car, insert a penknife blade under the vertical tab at the back of the coupler. Pry this tab back by raising the knife blade; the bottom of the coupler box can now be opened. Remove the coupler and spring and detach the coupler box from the underside by unscrewing two small screws (Photos 1 & 2).

Atlas O has two different methods of attaching 2-Rail couplers. In some cases, there will be two holes directly in the underside of the car. In these cases you will usually want to use two .4 x 8mm screws. In other cases, a special connector plate is attached to the underside and the coupler is attached to this plate. This is shown in Photo 3. In this case, you will need 2-56 x 5/16" screws to attach the coupler.

The Atlas O couplers have a deeper box than the Kadees, so shimming will be necessary if you want your coupler at the recommended NMRA height (Photo 4). Micro-Mark makes very inexpensive shims for this purpose (item #82582) or you can measure and make your own (Photos 5 & 6).

The spacing of the screw holes for the Atlas O couplers is slightly closer together than what is ideal for the Kadees. However, the spacing is close enough that you can still use the existing holes. Start by screwing one end of the Kadee box into a hole on the car or connector plate. Stop when the screw has just enough bite to stay in place. Start the second screw into the other hole and once it has taken hold, return to the first screw and give it a few turns. Keep alternating until the coupler box is snug against the underside of the car or the connector plate. Be careful not to overtighten the screws (Photo 4).

Reattach the truck and you are finished. As an optional step you can allow the truck to operate with equalization. There is a connecting bar that is screwed into both of the truck sideframes. This bar is designed to hold a 3-rail coupler. However, 2-railers have no need for this bar and if it is removed the truck’s springs will be able to function as on the prototype. You can now enjoy the use of your Atlas O car equipped with Kadee couplers.
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As a hobby, model railroading covers many areas. There's literally a lifetime of things to learn and skills to master. For some, the practice of scratchbuilding models seems to have fallen out of favor. There's a lot of opinions as to why such as increased work demands, a more hectic and mobile lifestyle; greater variety of recreational pursuits and so on.

In spite of these facts, scratchbuilding remains a treasured aspect of the hobby for many modelers. Taking a ready-to-run model out of a box may give instant gratification. But then what? In scratchbuilding, the sense of gratification is progressive; building on itself with the successful completion of each new challenge. The goal of this article is to cover some basic skills and introduce the joys of scratchbuilding to a new generation of model railroaders.

We were all beginners at one time, learning as we went, making lots of mistakes and false starts along the way. In reality, one never really stops being a beginner. One may become very accomplished, but there's always something new to learn.

That's the essence of scratchbuilding: learning new skills and improving or perfecting old ones. Practice does indeed make perfect and can be an essential skill in and of itself. It's also a mindset; characterized by the willingness to do something over until the results are pleasing and accurate. As you gain confidence in simple projects you'll naturally be drawn to more complex and challenging ones. This is as it should be and constitutes one of the true joys of learning: the sense that you're mastering something. Over time, you'll own your skills. Meaning, they will be a part of you forever.

In OST #41, Gene Deimling wrote an article on how to generate a scale drawing to work from using a software utility called Scale Print; that comes bundled with the CD-ROM version of the Car Builder's Cyclopedia from P.I. Engineering [http://www.raildriver.com/products/cyclopedias/scale.print.php] Gene's article would be a good one to review as an introductory primer.

**Parts layout**

Learning how to accurately layout a project is a basic scratchbuilding skill that everyone has to learn. It isn't as hard as it seems. With a bit of patience plus the proper tools and knowledge, you'll pick it up quickly. As Gene suggests in his article, what we're going to do is build a basic box for the carbody (in my case a boxcar) to which the appropriate details will be added.

Photo 1 shows the basic tools needed to do an accurate layout. They include a scale rule; ninety-degree squares for marking corners and squaring up the outside corner of the sheet stock; a caliper for measuring and a scriber, which in this case is a modified dental tool. You can also purchase scribes from Micro-Mark [www.micromark.com].

The basic techniques are the same whether you're working in styrene, wood or metal. Careful workmanship at this early stage of a work project will pay dividends many times over. A mental hurdle to get over is to not be afraid of doing something over. Think of this stage as the foundation of a house. Sloppiness here will haunt you all the way through the project.

To begin, always check the rough sheet stock you're using for squareness. For this project, I'm using 0.040” thick styrene. Don't assume that factory corners are square or that the edges are straight. Though they often are, there may be defects that could affect the accuracy of your layout. I used the large square to verify that one corner of the sheet is a true ninety degrees. I also check whether the edges are straight and true. Hold the sheet stock up to a light source and place the rule or your square on the edge. Any light that shows through means the edge isn't straight. You can true up an edge quickly with a few passes from a large mill file, checking your work against the light as just mentioned. If an edge is really jagged, scribe a straight line for reference and work from it, trimming the excess away. Once I have one corner square, I work from that reference point in laying out all the other measurements (Photo 2).

A mistake modelers often make is using the end of the scale rule to take readings from. I prefer a rule that has the zero mark one foot in from the end rather than on it. The end of your rule can get banged up or dented and the markings often wear away, leaving you guessing. By having the zero point away from the edge, the measurement is more precise than trying to line up the edge of the rule with the edge of the material (Photos 3-4, page 24).

For this wood sided single-sheathed car, I built a box that is sized to the interior dimensions of the prototype, which are 40'-6” long by 9'-0” wide and 10'-0” high. The wood siding on most cars of this type was 1” to 1-1/2” thick by five inches wide. I plan to laminate strips of 0.020” x 0.100” (1x 5 scale inches in O) styrene for the car siding to this core, which should equal the outer dimensions of the prototype car. Factors like this will affect how you size your car's substructure. Since the end pieces will fit between the side walls, they need to be...
0.080" (0.040" thickness of the sidewall x 2) narrower in order to have the dimension of the substructure equal nine feet.

Using the calipers for marking and measuring is more accurate than using the scale rule each time. Take a measurement from the rule with the calipers and line one of the blades up with the true edge on your material, and then bring the point of the scribe or an X-Acto knife blade up against the calipers’ opposite blade to mark the other end (Photo 5-6).

Using the rule to do this can introduce errors that will compound on themselves with each additional measurement. Run intersecting lines past each other to give a truer point of reference for corners (Photo 7). I always scribe my layout lines instead of using a pencil or pen. Drawn lines can be thick in nature and throw things off. They can also get smudged from handling, whereas a scribed line is very accurate.

Doing an accurate layout for your project takes time. Often no matter how careful you are mistakes will happen. However, they are often easy to fix. Photo 8 shows how the two sides for the boxcar had a rough edge where they were snapped free from the larger sheet of styrene. I actually made these a scale inch taller, so I could file down to the real line instead of relying on the snapped edge. Since the car sides had two edges that matched, I aligned those edges and taped the pieces together, then clamped them in a vice. I filed the mismatched edges with a large mill file, working slowly and carefully, checking my progress with the blade of the square (Photos 9-10). The end result was two car sides that matched...
perfectly. I did the same for the car ends. It may seem like a lot of work, but the car will be perfectly square.

Photo 11 shows the basic box all assembled with the interior bracing and flooring in place. I put lots of 0.125” x 0.250” styrene strip bracing on, especially in the corners, so there would be plenty of material to attach ladders and grabirons to later. I haven’t put the roof on at this point because I need to put some weight inside the car so it will track well. You’ll notice that I have the centerline of the car marked for both the length and width. This helps in placing the underframe and other details. The basic substructure of the car is now done and ready for the underframe, wood siding, the steel zee bracing and other finish detailing. The parts layout procedure is pretty much the same for most types of rolling stock or structures. As I progress along with this series, we’ll consider another area of mystery for many: the underframe.

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After several decades of crawling under layouts to attend to wiring additions and installing switch machines overhead, I decided to do something about the sore knees and banged head which always seemed to accompany that activity. This time around, once the benchwork and track base were in, it would be different. In addition, there would be no more need to disturb the under layout storage to make wiring changes. In this new (for me) scheme, the wiring cables and electronic devices would be located in a recess at the edge of the layout. Feeder wires to the track, signals, and accessories would come to screw terminals in the recess.

Moving the Circuitron Tortoise switch machines to the edge of the layout would require something a little different for the linkage to the throwbar. I had two requirements for the linkage design: The first, of course, was that the points had to be moved reliably and positively against the stock rail and held there with some pressure. Secondly, the linkage had to be installed without the need to crawl under the layout. Being able to completely build and assemble the linkage at the workbench was also a plus.

Photo 1 shows a completed crank and connecting rod assembly ready to be installed. The connection of the crank to the throwbar is shown in Photo 2. The curve in the steel wire pushing on the throw bar indicates the amount of holding pressure to the points. The installed crank and rod are shown in Photo 3 from under the plywood subroadbed. Photo 4 shows the Tortoise mounted to the benchwork and the rod connection.

Construction of the crank subassembly is shown in Figure 1. The steel wire is a section of the fulcrum wire included with the Tortoise. The length of the 5/32” brass tube for the bearing sleeve need only be long enough to extend from the top of the ties through the subroadbed plus an inch or so. The bearing sleeve is pressed into a 5/32” hole drilled through the roadbed. I usually drill the hole about 1/2” away from the throwbar. The hole can be drilled at a convenient location on either side of the track and throwbar. Check for clearance underneath the roadbed. The throwbar is drilled with a #63 drill for the steel wire from the crank assembly.

Figure 1

I like to make the 1/8” tube at least 1/2” longer than the bearing sleeve. The distance between the 1/8” hole and the #50 hole for the clevis pin in the flat brass bar is approximately 3/4”. After pressing the end of the tube into the hole in the bar, but before soldering them together, I will check the relative alignment of the bar and steel wire at the track switch and the switch machine’s location. When the wire is parallel to the track, the flat bar should be at a right angle to the con-
necting rod from the switch machine.

Construction of the connecting rod is shown in Figure 2. The clevis and stud are from the model airplane section of the hobby shop. The clevis is available with either 4-40 or 2-56 threads or soldered-on connections. The ring terminal is available in the electrical department of your local hardware. I have made the connecting rod with a soldered-on clevis, but prefer the threaded clevis to allow for fine tuning of the length upon installing. I try for an even deflection of the steel wire in both positions. I’m using connecting rods up to 30” in length made as shown. For rod lengths of 12” or less, I just use the 3/32” tubing as in Photo 1.

Figure 2

![Connecting Rod Diagram]

The Tortoise machine is fastened to the benchwork prior to making up the connecting rod to length. A couple small screws plus mounting tape or glue or even just the yellow carpenter’s glue are adequate to fasten the Tortoise machine in place. An approximate measurement from the bearing sleeve to the center of the Tortoise machine lets me solder the rod assembly together except for one joint. The last joint is soldered after a trial fit between the bearing sleeve and Tortoise.

The model airplane people also have a flexible nylon control rod in various lengths that will work for the connecting rod where the switch machine’s location is not in direct line with the crank. This is similar to using the old choke cable or (for the younger crowd) bicycle brake cable. I have used the nylon control rod for a situation that was five feet away and around a curve from the Tortoise. The down side for using this device is that the outer sleeve must be securely clamped down to the benchwork along its length to prevent excessive flexing.

To install the assembled linkage, the crank’s shaft is inserted into the sleeve from the bottom and the steel wire slipped into the two holes in the end of the tube and then the hole in the throwbar. The rod is screwed in or out of the clevis to bring the ring terminal to the center of the Tortoise movement when the switch points are midway. Attach the ring terminal to the Tortoise with the screw furnished with the machine, but leave the connection a little loose. Check the operation and readjust the rod length if necessary.

Photo 5 is of one end of a staging and fiddle yard with a section of the fascia removed to show the wiring recess. The Tortoise machines operating the ladder turnouts are behind the fascia panel to the left of the turnout control’s toggle switches and indicator LEDs. The toggle switches are recessed to avoid “belt-buckle” operation. And lastly, I can report that my aging knees really appreciate being able to do the layout’s wiring from an office chair.
STEEL RAILS to the Sunset

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Registration: $35, $40 after May 31, registration includes spouse and children under 18
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A free newsletter with registration information will be available on the website for download after February 1, 2010. To receive a hardcopy, send an LSSAE with 2oz. of postage to: 2010 O Scale National, 876 Boyce Avenue, Palo Alto, CA 94301-3003.
Finding myself in need of a lightweight loading dock at Vindex on the Chaffee Branch, and only having about 12’ by 30’ of available scale space, I started looking around for what was available on the market. There are some nice kits out there, and if they fit your scene by all means buy one and support your fellow craftsmen. If, however, you need a special size or shape, it’s not too difficult to build one yourself. If you have been into model railroading and kit building for any length of time, you more than likely have most, if not all the stuff you need lying around in your scrap box. If you don’t, it’s not that expensive to get the materials.

Doing the research, can be almost as much fun as building the dock itself. The places I looked for information were: Railway Engineering & Maintenance Cyclopedia, historic association guides like; The Blue Mountain Express, The Log Train, in addition to the local library, and the Internet. Getting pictures is by far the best way to tell what the loading dock looked like. If you don’t have a photograph, researching how a particular line ran their railroad can give you an insight on how it would be built. In addition you get a sense of the people; how they thought, and how they worked. So with that information in hand let’s get started.

To do this we will need one piece of basswood 1/16” x 3” x 24” which costs about $1.50; two bags of Kappler 7” x 9” x 24” standard profile ties (they’re expensive at about $22 a bag). If you handlay track you probably have a boat load somewhere in your stock. Or you can use two pieces of 8” x 8” scale timber stock 12” long for the front, back and sides. One piece of 12” x 12” scale timber stock 12” long. The strip wood cost about $4 a bag from Kappler. So for under $20, not counting the ties, you will get enough material to do several loading docks as well as other projects that may come to mind.

Cut the 1/16” basswood to 12” x 30’ scale feet. Mark off 8” or 12” scale increments along the width (Photos 1-2) and scribe with back end of an X-Acto knife and ruler along the marks. One or two light passes should be enough to simulate the planks in the deck (Photo 3).

Now mark off 16’ and 14’ on every other plank along the width to simulate the ends of boards. Scribe with square and X-Acto knife (Photo 4).

Take a file card or wire brush and distress the basswood to give it grain. Several passes should do nicely (Photo 5).

Cut two pieces of the 7” x 9” or 8” x 8” stripwood 30 scale feet and four pieces 11 scale feet. Lightly apply white glue to the stripwood pieces and attach them around the perimeter.
of the deck and glue two pieces one third of the way in from the ends. Clamp and wipe off the excess glue with damp rag (Photo 6). Note: If you are using the 7” x 9” profile ties, apply the nine inch side facing out from the deck.

Scribe a vertical line at the middle of the deck on the front and rear timber face to simulate the cut line between two 15 foot timbers. This line will center the middle posts when we attach them to the deck.

The reason for using tie material is the real railroad would no doubt have many switch ties lying around. Most branch and shortlines would use whatever was on hand since money for new material was always in short supply. If you have 10” x 10” or 10” x 12” stripwood you could substitute that for the 7” x 9” or 8” x 8” material. This would be bridge timber material and that would be getting into a heavyweight loading dock.

The posts are 12” x 12” scale stripwood. You will need to cut six of them 5-1/4 scale feet long. When attached to the loading dock, the floor will be 5-1/2 scale feet above ground, or about level with door openings on your box cars. Of course you can adjust this measurement to fit your terrain.

Attach one post at each corner and one post front and back at the centerline of the loading dock with white glue. Level and plumb the posts and allow enough time for the glue to set up (Photo 7). Turn right side up and gently place weights on top of the loading dock, again allowing time for the glue to cure (a couple of hours (Photo 8).

Stain with Minwax brush on wipe off Dark Walnut. This stain is a good match for tie color but you can choose your own color to fit your taste. If you have them, install some one inch nut/bolt and washer castings to front and side beams where posts attach to the deck. Place loads on the deck and weather with coal soot and dust. Allow to dry thoroughly and install on your layout where appropriate.

This is a one or two evening project, that's fun to put together and inexpensive to do. Little items like this make your railroad seem bigger than it is, and at the very least slows time down if not stopping it, if only for a little while.
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From The Beginning... Options, Opportunities & Oddities

Due to a momentary lapse of reason, your regular columnist has been replaced by yours truly as it seems that I have become a sort of traction modeler or enthusiast. This might have occurred since I have graced these pages in the past with a few scratchbuilt trolley articles and hope to continue doing so. I never had intentions of being a traction and trolley modeler --- I just stumbled into an area of O Scale modeling that struck me as being seriously entertaining!!

So, it was totally by chance that I built my first trolley. Note the use of the word built. It was not bought, bright and shiny in a box, ready to put on the track and chased around the room. Nothing wrong with RTR, but the options for buying a RTR trolley was actually quite limited. That may still be true or not depending on one’s perspective. I had just completed building two LaBelle passenger cars and feeling rather accomplished, I ran out and got kits for a Lake Shore Electric combine and the matching freight motor. Curious thing about these kits; they build multiple configurations of cars dependent on what details are used and their placement. You can actually build specific prototype cars. Shocking! After several conversations with the late Tom O’Toole and the writing of checks, detail parts arrived along with some under-the-floor drive units from this company called, Q-Car. At the time, I thought these power trucks were just the neatest things I’d ever seen. I still do! That they could be arranged for either 2-Rail power collection or for overhead wire was yet another revelation. So, I assembled both kits, and installed details accordingly for specific cars. I even succumbed to putting an interior in one. I painted them up, and then promptly lettered both for the Chambersburg, Greencastle & Waynesboro since the LSE goes nowhere near the Cumberland Valley RR and that’s what I model. This was all found to be good, and more importantly, fun! So, early on I managed to exercise several options that were readily available to a novice traction modeler. I tracked down a handful of purveyors of supplies and information, e.g., issues of Traction & Models were opportunistically acquired and ravenously devoured. Thus, I was able to put my first two trolleys on the track, sans overhead wire which will be a future exercise pending the completion of something quaintly referred to as “scenery”. Shortly thereafter I managed to acquire three more LaBelle kits and procured all of the necessary accoutrements to complete them. Yes, I was completely bitten by the traction bug and now after close to a decade these same kits rest uneasily on the shelf...

In parallel to this grand adventure I discovered the joys of scratchbuilding, maintenance-of-way equipment, and the freedoms of building freelance. And, these interests completely intersected with traction modeling. Perusing traction publications or 6’ of library shelf dedicated to trolley and traction lines revealed a near endless array of model building opportunities of some of the most interesting oddities ever to grace two rails. Line cars and snowplows and work trolleys, Oh my! My efforts of building the former two have been seen in these pages, so let’s look at the work trolley (Photo 1). Looks suspiciously like the venerable Pittman 4-wheel work trolley, but this is a chimera. Resin cast ends and a scratch-built wooden body with added on details, but look what’s under it – a readily available and modestly modified modern off-the-shelf Bowser mechanism. Here’s a budget drive option that opens up all kinds of fun opportunities!! And, if you have resin ends, well, why not resin sides, too (Photo 2).

I’m advocating having fun and being adventurous with traction and trolley modeling; build whatever you really like. Yes, there are RTR trolley offerings out now from Atlas, MTH, Lionel, St Petersburg, etc and some brass floating around (see your loan officer). A selection of venerable items from names like Pittman, Walthers, Ashland Car Co., Franklin Models, Locomotive Workshop, and others can be had at swap meets, shows and eBay. Q-Car still sells drives, kits and details. NorthWest Short Line still sells Magic Carpet drives and still has a few kits available. LaBelle still produces a selection of wooden trolley cars. Maybe we can discuss traction freight trailer kits and moving freight under the wire in some future installment. ✤
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This project came to life at the suggestion of my two O Scale buddies, Charlie and Jerry. The three of us have been building O Scale layouts, bashing kits, and scratchbuilding for a long time. Charlie and Jerry are Duluth, South Shore and Atlantic fans and all three of us are Soo Line fans.

While brainstorming over coffee one day, someone mentioned the notable lack of DSS&A O Scale rolling stock, especially cabooses. The conversation drifted to the possibility of creating a pair of DSS&A cabooses from Atlas/Roco extended vision caboose underframes. These were imported in the 1970s and they are still in abundance (Photo 1). Many are hiding in basements. Others can be found at shows, swap meets, eBay, and Yahoo O Scale Groups. They are very nice cars with well detailed bodies and underframes. Unfortunately, they are way too modern for the three of us. We collectively model the 1950s into the '60s. We pooled our cabooses and easily came up with three underframes. We needed three because I decided to build the two DSS&A cabooses, along with a Soo caboose.

The project is based on a comprehensive article in the Soo Line Historical Society’s spring 2002 issue of The Soo magazine. The article included a history of these wood cabooses with their steel underframes, drawings for both roads, and some very good photographs. The Atlas/Roco underframes are steel and a pretty close match to those we were modeling. I enlarged the HO drawings in the article to O Scale (187% enlargement) and determined the project was feasible. I would also be able to use the end sills, platforms and steps if I shortened the frames. Except for the window arrangements, tool box dimensions, cupola railings and truss rod details, the Soo and DSS&A cabooses are virtually identical.

Having a couple of very good modelers looking over my shoulder has made a big difference in how I develop and build my models. Good enough isn’t good enough any more. There’s a synergy at work that seems to be more that the sum of the three of us. We’re all motivated do better work than if we weren’t critiquing each other’s efforts. I want to emphasize this article is less about how to build a Soo or DSS&A caboose than it is about adapting the Atlas underframe to any number of scratchbuilt caboose bodies. Let’s get started.

Underframe

I began by removing the three bodies from their underframes. They are easily released by pressing on the four tabs that hold the body to the underframe. I didn’t save the end railings and ladders. They will be replaced with brass 0.020” wire handrails and Taurus/Trout Creek brass ladder kits. I also unplugged and removed the underbody air tanks, brake rigging, tool boxes, trucks, and couplers. Set these aside as you can use at least some of them on the new car.

I already knew the underframe would have to be shortened and, with some modifications, I could use the end platforms, sills, and steps. I began construction by measuring the distance between the platform steps, which was 7-25/32”, and compared that to the same dimension on the Soo/DSS&A drawing.
I’d have to remove a total of 1-5/16” (Photo 2). The two existing cross members are spaced further apart than the Soo/DSS&A’s, but they are very similar in construction. To shorten the frame by 1-5/16” and achieve the prototype’s cross member spacing, I laid out three cuts on the Atlas underframes. I removed 7/16” from the center and another 7/16” at each end of the frame at the bolster faces. This allowed me to keep the end platforms, steps, and truck bolster intact. I made the cuts with a Zona saw and then squared them up. The frames were reglued on a sheet of glass to ensure they were aligned. I used CA glue and added 0.030” x 1/2” styrene strips on top of the frames to reinforce the joints (Photo 4).

I had to carefully saw away the frame’s four 1/16” x 1-3/16” sill extensions at the steps because they would have hung below the new car sides. You can see these unwanted extensions in Photo 2. Chances are, no matter what caboose body you’re building, you’ll have to remove these extensions (Photo 4).

Using an X-Acto knife with a #11 blade, and some small files, I carefully reshaped the platform steps from straight lines to the Soo/DSS&A’s S-curved step profile as seen in the car end view. Next, I filled in the platform deck recesses with five-minute epoxy and added a bit of 0.040” square styrene filler. I overlaid the steel grill platform decking with 0.020” x 0.100” scribed styrene decking.

The Soo/DSS&A cabooses have steel end sill channels that are 7/32” tall and commercially unavailable. I made up new channels that were 1-5/16” long from 0.030” x 0.156” strips for the web with 0.030” x 0.080” strips for the flanges. I laid out the end sill grab iron locations and drilled them out with a #74 bit, then glued in Tichy #2002 straight wire grabs. I also reinstalled an air reservoir and cut down Atlas tool boxes for the two DSS&A cabooses.

At that time I also drilled and tapped the Kadee® coupler mountings 2-56 and drilled the bolsters 0.060” for the truck mounting screws. The Atlas/Roco truck bolsters are the correct height for Athearn or Weaver trucks and 33” wheelsets. To allow the caboose body’s 0.040” thick end walls to clear the modified end platforms, I had to trim the platform ends. This completed the underframe assembly. The platform railings, brake staffs and wheels, and the ladders were added after the bodies were built up and the roof height verified.

**Carbody**

The carbody’s sides and ends are cut from Evergreen #4067 car siding. This material is 0.040” thick with a scale 3-1/4” board spacing. I began construction by laying out the ends, cutting them with a new #11 blade and a cork-backed steel rule. Scoring and snapping is great but it tends to leave small ridges along the edges, so I filed them off before assembly.

These ends were pretty simple, door openings only and no windows. On this project the car ends fit between the 0.040” thick car sides. Consequently, I reduced the end’s width by 0.080” to allow for the combined thickness of the two car sides. I used Grandt Line #52 doors. These D&RGW style doors were only a scale 5’ 9” high. To achieve the correct door height, I had to add filler strips to the tops and bottoms of the doors (Photo 5). When they were glued in place, I added 0.030” x 0.060” trim and then added the sills, a sandwich of 0.030” x 0.080” and 0.040” x 0.060” strips (Photo 6). I glued 0.020” sheet trim across the tops of the ends. The ends are capped at the roof line with 0.030” square strip.

To complete the ends, I laid out the grab iron locations and drilled #74 holes for Tichy #2002 straight grabs and hand formed 0.020” brass curved wire railings (Photos 7-8). Forming these railings is pretty easy if you bend the wire over a ¾” dia dowel pinned in a vice. Don’t have a ¾” dowel? You can also form the wire into a smooth natural arc over your thumb.

To simulate the door knobs, I drilled out the locations and thrusted steel pins through the doors. The pins were cut off and secured with CA on the inside. As shown in Photo 7, to ensure a snug fit between the ends and the underframe platforms, I test fitted each end and filed and filled as required.
I laid out the car sides and at this point, depending on which caboose you're building, it's a good idea to verify the window arrangement on both sides of your car. In my case, the DSS&A window arrangement was the same on both sides (Photo 9), whereas the Soo caboose has three windows on one side and only one window on the opposite side. On one hand, I'm a stickler for prototype accuracy. On the other, I hate scratchbuilding windows. Luckily, the O Scale gods were smiling favorably on my efforts as I was able to find Grandt Line windows that were a close match; so that's what I used.

After cutting the openings, I installed the windows and added 0.020” x 0.188” letterboards to the top of the car sides (Photo 10). These letterboards extended beyond the ends of the sides and I trimmed them to the correct profile after the glue dried. After checking that the sides and ends were squared up, I assembled them into a four-sided body by joining a side to an end and then repeating the process with the opposite side and end, using a dead flat surface. A small sheet of glass is perfect for this operation. I used my five inch square to ensure I was getting 90-degree joints. After I verified the joint was square, I flowed plastic cement into the inside faces of the joint with a brush, then I set each of the L-shaped assemblies aside for a day to allow the joints to thoroughly cure. Then I assembled the two halves, checking again for squareness, and set it aside to dry.

After the plastic solvent cured for a day, I added 0.100” x 0.375” styrene strips to the inside of the car to reinforce it. These strips were located so they wouldn't interfere with the underframe. I also added a 0.200” x 0.375” cross members at the center of the car. I test fitted the bodies to the underframes and they fit perfectly. Geez, I must have been doing something right.

With the cabodies still fitted to their respective underframes, I drilled a 2-56 clearance hole in the center of the underframe and marked this hole's location on the 0.200” x 0.375” cross members. I then drilled and tapped the cross member to accept a 2-56 x 5/8” RH screw that retains the body to the underframe and allows removal to service the battery-powered interior and marker lighting.

**Cupolas**

With the carbody assembly done, I decided to build up the cupolas. On these cabooses, I did something I've never done before. I'd decided to make the cupolas removable. The thought was if the cupolas were stand alone assemblies, it would be a lot easier to paint their interiors, glaze the windows, and add a brakey in the cupola seat. Completely finishing the cupolas made it pretty easy to frame out the roof openings to match their dimensions. There was only one problem and I created it. I inadvertently framed and installed the cupolas on the wrong ends of the cabooses. You'll note in the assembly photos, the cupolas are above the windows and in the painted and decaled car photos they have magically migrated to the correct location between the windows. Now I really knew why I'd made the cupolas removable. I removed the cupolas, the stanchions and roof railings, and sanded off the roof's primer coat. A bit of framing surgery was required, plus re-skinning the roofs but in the end it all worked out. This is what I call a character-building experience.

I cut my cupola sides and ends from the same Evergreen scribed siding I used on the carbody. I extended the sides and ends by 5/32”. These extensions are hidden beneath the roof line. I could not find any commercial windows to match the DSS&A and Soo windows, so I scratchbuilt them. It was a relatively simple task as window building goes. I cut out the window openings first and then cut the sides and ends to size. All of the interior window sashes were cut from 0.020” styrene sheet (Photo 11, page 40). The end window's sills are 0.020” x 0.040” strip. The side windows do not have sills. These cupolas were a bit unique in that the sides rise vertically and then cant inward. It's a bit...
When the windows were completely built up, I assembled one of the 0.040” x 0.375” side walls to one of the ends, then joined the other side to its end and let them cure for a few hours before assembling both into a single cupola (using a small square to ensure 90 degree joints, Photo 13). As shown in Photo 14, I installed the canted sides next. The cupola roofs are 0.030” sheet styrene (Photo 15).

Both the DSS&A and Soo cupolas have roof stanchions and U-shaped railings. Initially I used Precision Scale Company’s #32041 plastic queen posts. They were the correct 5” height but were extremely fragile and didn’t have the through eyes for threading 0.020” brass wire, making it nearly impossible to attach the rails. While I was reworking the roofs and cupola openings, the gang went to work searching for a better stanchion, preferably one made of brass. Jerry scored big time. He found a few packs of PSC’s #372 stanchions at Walthers. These were gorgeous lost wax castings that were the correct 5” height and had the requisite brass eyes for the 0.020” wire. Unfortunately three packs just weren’t enough. There are 12 stanchions per pack and for the three cabooses we needed a total of 62. It took awhile to get three more packs, but it was worth the wait.

In Photo 16 you can see how I cut 0.040” cross members with roof peaks that matched the peaked ends of the car. I added 0.080” square support strips to the bottoms of these cross members and then glued them into the carbody, spaced to match the length of the cupola. To center the cupola in the roof and provide a gluing surface for the roof sheets, I added a pair of 0.060” x 0.100” styrene strips between the cross members. After checking for a “snick-fit” (Photo 17) and verifying each cupola height was correct, I cut two roof panels per car from 0.040” sheet with cutouts to clear the cupolas. I added edge-glued 0.020” x 0.040” trim boards flush with the underside ends of the roof panels.

**Roof details**

As shown in Photos 18-19, I used Grandt Line #144 running board supports. After the supports were glued in place on ½” centers, I flat-filed them all to a uniform height. For the running boards proper, I used 0.020” x 0.125” styrene strips.
To ensure consistent board spacing, I inserted short lengths of 0.030” strip between them. Before I glued the strips to the supports, I ran a piece of 50 grit sandpaper the length of each strip for a wood-grain effect. The overall effect is quite nice. I left the boards approximately 1/32” short where they meet the cupola. This allows easy removal of the cupolas.

To support the smoke jack, I glued a 0.060” x 0.375” square plate to the underside of the roof where the smoke jack is attached. The smoke jacks on these cars are quite tall. I didn’t have any commercial stacks that were the correct height and since I had Keil-Line’s #48-249 short smoke jacks on hand, I used them with modifications. I reduced the severe roof angle on the stack base, then cut the stack pipe and spliced in a 5/32” x 1” length of brass tubing (Photo 20-21). The two white metal pieces were coated with CA and shoved into the ends of the brass tubing. Make sure your smoke deflector (draft inducer?) is set at a right angle to the angled base. I also drilled through the smoke deflector for a better looking smoke jack.

My cabeese have wire braces that run from the smoke jacks to the ends of the cupolas. I replicated this interesting feature with 0.020” brass wire that I formed into a radius to match the diameter of the smoke jacks. I extended the braces approximately 3/32” to run into the cupola ends, drilling #67 holes in two places to accept the wire ends. I soldered the wire braces to the stacks with Tix low-melt solder sticks and flux. I located the stack’s attachment point on each roof, and then drilled a #67 pilot hole. I then drilled out the holes to accept the smoke jacks. To enable removing the cupolas, the stack’s wire braces are not glued. The trick is to make them look like they are (Photo 22).
With the cabodies and the underframes completed, it was time to address the coupler attachments, end railings, brake staffs, and ladders. I began final assembly by drilling and tapping the end platforms 2-56 for the Kadee® coupler boxes. I used Walthers’ 2-56 x 5/8” RH nylon screws, which extended through the platform decking and were trimmed flush to the deck with a #11 blade. Primed and painted, the screw ends weren’t visible.

I selected Taurus Products/Trout Creek Engineering’s P6002 brass ladder kits for my end ladders. This kit is very delicate and scale looking and it also allowed me to run the caboose railing right through one of the ladder’s rung holes. This was a prominent feature on the prototype and I wanted to replicate it on the model.

As shown in Photo 23, these kits are etched from 0.020” brass sheet and have the rung holes etched in the ladder stiles. The kit is flat, but it is cleverly designed to be formed into a neat ladder assembly. Once the brass sheet is bent 90 degrees and the ladder sides are held parallel to each other with the provided jigs, it’s pretty easy to solder in each 0.020” brass wire rung. I recommend using Tix low melt solder sticks and flux. A 30-35 watt soldering iron will provide plenty of heat and ensure nice clean joints with a minimum of solder build up. The ladder’s hooks are not needed on these cars and were cut off.

In Photo 24, I laid out the end railings and posts on a scrap piece of ½” plywood. My railings were 0.020” brass wire. The RH horizontal railing was threaded through the ladder rung holes and became the final rung in the ladder. After bending up the railings, I used masking tape to hold them in place on the plywood. The handrails were soldered together just like the ladders. To beef up these solder joints, I formed 1/16” right angle bends on the tops of the posts where they joined the horizontal railings. Photo 24 shows the railing, posts, and ladder assembly. The 0.020” brake staff has not yet been added. This will be done after the railings are attached to the ends. I left the bottom ends of the posts long to facilitate attachment to the end sills.

Next, I laid out the railing post locations on the end sills and drilled #74 holes to clear the railing posts. After slipping each railing assembly into place on its end sill, I cut a piece of styrene sheet to the correct railing height to hold it in place while the glue dried. The excess wire post material was then snipped off and carefully filed flush with the bottoms of the end sills.

As shown in Photo 25, I added a brake staff at both end sills and capped off each staff with a PSC #4670 brass brake wheel. I had initially installed Intermountain plastic dished brake wheels that were not correct for this caboose. The triumvirate met and voted to change out the Intermountain brake wheels and replace them with the correct PSC flat-spoked brake wheels. The upper end of the brake wheel staff was CA glued to the railing. The end ladders on these cars attach directly to the roof ends. I cut the ladders to fit the trim. But I did not attach them to the roof. To allow body removal, the ladder ends simply rest against the roof.

Before priming and painting, I washed the cars in a mild solution of laundry detergent and water. I brushed everything with a soft brush, rinsed, and let the cars air dry for a couple of days. Jerry airbrushed the cars with Floquil #110009 primer. The decals were custom made by Bob Anson in Jacksonville, FL. If anyone’s looking for custom decals, you can contact Bob at [e2picasso@yahoo.com]. Photo 26 shows the finished cars fresh from the paint shop.
Bill of Materials

Evergreen Scale Models Styrene
- #34067 car siding
- #9040 0.040” sheet
- #9030 0.030” sheet
- #124 0.020” x 0.080” strip
- #137 0.030” x 0.156” strip
- #361 0.060” x 0.375” strip

Taurus Products/TROUT Creek Engineering
- #P6002 Caboose ladder kit

Atlas/Roco
- Extended vision caboose underframe

Tichy/CMA
- #2002 straight grab irons

Kadee
- #804 couplers

Keil-Line
- #48-249 smoke jack

Walthers
- 2-56 x ¾” nylon screws

Grandt Line
- #52 end door
- #21 windows
- #144 roof walk supports
- #33 brake pawl and ratchets

K & S
- 0.020” brass wire
- 5/32” brass tubing

Precision Scale
- #372 brass stanchions
- #4670 brass brake wheels

Floquil
- #110009 Primer

Polly Scale
- #414354 Special Oxide Red (Soo)
- #414281 Box Car Red (DSS&A)

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WWW.MARCHMEET.NET
### Steam

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<tr>
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<td>PSC 17347-1, SP GS-4 4-8-4, FP, New, Black, Road No. 4436</td>
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<td>PSC, SP AC-9 2-8-8-4, FP, New, Coal Version, Road No. 3800</td>
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**News: Dremel® Brand Detail Abrasive Brush; MSRP: $7.99**

The Dremel® brand is expanding its line-up of EZ Lock™-compatible rotary tool accessories with the introduction of the Detail Abrasive Brush in three different grit strengths. The brush's unique, flexible bristles are designed to improve users' sanding capabilities by helping them get into tight, intricate spaces and contoured shapes without damaging their work piece. Detail Abrasive Brushes can be used on materials such as wood, aluminum, plastic, metal, steel and vinyl; and smoothing or de-burring wood after carving or routing.

The Detail Abrasive Brush is compatible with all multi-speed Dremel rotary tools and fits on both the 402 and EZ402 mandrels. It is recommended that users apply only light pressure when using the accessory and work at speeds of 15,000 rotations per minute or below for best performance and results.

Each bristle on the brush is impregnated with sanding abrasive that wears down as the accessory is used to expose new grit, extending the accessory's life and eliminating the need for abrasive compound. Each sanding brush is color coded by grit strength for easy identification. The brown brush (EZ471SA) contains 36 grit and is best used to remove light rust from metal or steel. The white brush (EZ472SA) contains 120 grit and works well to remove light paint from wood. The red brush (EZ473SA) contains 220 grit and is ideal for removing tarnish from brass.

The Detail Abrasive Brush is available now at most hardware stores and home improvement centers nationwide. Brushes retail in packages of one, for a suggested retail price of $7.99.

**News: #84518 Digital Pull Meter; MSRP: $19.95**

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The digital drawbar meter displays the pulling force developed by your locomotive in ounces. Add weight to your loco and see how the pull increases.

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**News: DSL Shops O Scale Structures**

DSL Shops announces their latest O Scale releases: #O215A Model Shop and #O215B Drug Store. These urethane buildings come with paper signs and awning, a card stock roof, clear plastic for windows, chimney and instructions. Priced at $29.95 each, these very simple to assemble and paint structures are copies of the HO cardboard kits sold by Ayres in the mid 1950s.

See your dealer first or check [www.dslshops.com] for more info.

**News: Hex Frog Juicer; MSRP: $69.95 & BullFrog Turnout Control; MSRP: $6.00 kit, $9.00 ready to use.**

**Fast Tracks-Quadica Developments Inc., 47 6th Concession Rd. Brantford, Ontario, Canada N3T 5L7**

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Fast Tracks is pleased to announce that they have been appointed by Tam Valley Depot as the exclusive Internet retailer for the Hex Frog Juicer automatic frog polarity reverser.

**Hex Frog Juicer**

The Hex Frog Juicer is an easy to use, electronic controlled switch that automatically and instantly switches the polarity of the frog as the engine passes over a switch. It eliminates the need for complicated wiring or electro-mechanical switches, replacing them with a single device connected to the frog with one wire. Polarity switching is seamless with no interruption to engine motion or loss of sound.

Each Hex Frog Juicer can control the polarity of DCC power for up to six frogs on all types of switches including turnouts, wyes, 3-ways, single and double slips. Using a Hex Frog Juicer is especially helpful for double crossovers and crossings as it dramatically simplifies the wiring for these types of switches. The Hex Frog Juicer is priced at $69.95 each, is in stock and available to order now from the Fast Tracks website at [www.fast-tracks.net/frogjuicer]

**Manual Turnout Control**

Fast Tracks announces the release of the new BullFrog under mount manual turnout control with a complete line of supporting accessories.

Complete with integrated control rod mounting, the BullFrog turnout control is priced at $6.00 each for a kit version, and $9.00 each for a ready to use model, making it one of the lowest cost manual turnout control solutions available today. The BullFrog features a small mounting footprint, automatic power routing with an integrated SPDT switch (with the option to add a second switch), and a high torque, long throw wire, making it easy to mount the control under the layout with minimal alignment problems.

The BullFrog product line also includes a number of accessories including the TadPole remote control rod mount for very tight locations, hangers for supporting the control rod under the layout, joiners for creating control rods of any length, and complete kits that include the control rod, mounting hardware and panel knob. The BullFrog turnout control is laser cut from 2mm plywood and has been endurance tested for over 100,000 cycles. The BullFrog turnout control and accessories are compatible for all scales from Z to O and can be ordered now from Fast Tracks at [www.fast-tracks.net] or by calling their toll free line at 888-252-3895.
Irish Tracklayer has developed some innovative new products that could make handlaid track a reality for many more modelers. Their new turnout tie strips are laser cut from sugar pine with the ties themselves measuring a scale nine inches thick by ten inches wide (Photo 1). They are available in NMRA and P48 versions with the only difference being in how the connecting webs between the ties, which are designed to fit under the rails, are spaced.

A preproduction sample I saw was cut from thin plywood, but John Houlihan of Irish Tracklayer said he switched to sugar pine so that the spike holes wouldn’t have to be pre-drilled. Although I didn’t drive any spikes in my sample, which had to be returned, past experience tells me that modelers shouldn’t have any issues driving spikes in these strips. The turnout tie strips come in three sections no longer than 11 inches in order to fit IT’s standard shipping box.

The wood was very clean and free of fuzz. The laser cuts were as crisp as could be, although as we’ve come to expect with laser cut wooden parts, the edges were burnt and very dark which, depending on how you want to color your ties, could impact the staining and weathering processes. All a modeler has to do is glue the strips down, stain or weather, then add rail.

My initial thought was that the tie strips could simply be flipped over for use as a right or left hand turnout, since the pine has a good face on either side however the laser cut tie plates also provided are of one sided orientation only.

Made from Strathmore® one or two ply paperboard, the tieplates are a testament to what modern laser cutting technology is capable of (Photo 2). These also come in precut strips to match the ties. The spike holes are pre-drilled by the laser along with separation lines in the tieplates under the frog. It’s these separation lines that give the tieplates their one-sided orientation. As shown in Photo 3, the tieplates match perfectly with a number 5 frog casting from Right-O-Way.

I’m not certain how I would handle working with these plates as to whether I would leave the connecting web or cut it away before laying the rails. Further, since they are made of paper, I’d have some reservations about using the traditional method of diluted white glue and water for bonding the ballast. Once again, since I had to return my samples, I wasn’t able to determine how they would hold up.

John reports that he will do custom turnouts and tie plates based on a railroad’s common standards for a set up fee of $50.00 for each numbered turnout. The customer must provide the common standards for the railroad of their choice. John has standards UP, SP, B&M, PRR, N&W and Frisco however these do not cover all eras. Also in development is a US Steel Taylor adjustable rail brace. When ordering, modelers must specify whether they want NMRA or P48 tie strips along with any frog castings such as ROW’s or American Switch and Signal’s.

Having a variety of choices about how to do something is always a good thing. These products may well take some of the drudgery out of handlaying track for those modelers who are on the fence about whether they want to go the route or not. Contact Irish Tracklayer for further information.
Voyageur Press, 400 First Ave North, Ste 300, Minneapolis MN 55401
www.voyageurpress.com

Reviewed by Joe Giannovario

In The Beginning...
Railroading and coal go hand in hand like bread and butter. It’s hard to imagine the development of U.S. railroads without the simultaneous development of the coal industry. Author Brian Solomon and photographer Patrick Yough have joined together to produce this book tracing the history and development of coal railroading in the U.S.

They start this journey, interesting enough, not in the coal fields of Virginia and West Virginia but in the anthracite fields of Pennsylvania where Josiah White and Erskine Hazard developed methods for the commercial mining of anthracite and effective ways to burn it. This set off the first coal boom in the U.S. White and Hazard also created two companies which were consolidated into the Lehigh Coal And Navigation Company to mine and distribute the coal.

And so it began. Chapter One tells the coal-related histories of the Reading, Lehigh Valley, DL&W, Erie, NYO&W, and CNJ. Chapter Two takes us to the Appalachian coal fields for a history lesson about the B&O, C&O, N&W, VGN, and PRR. Chapter Three tells about modern, contemporary coal operations in the Appalachians. But I found Chapters Four, Five and Six to be most enlightening as they deal with modern coal operations in the mid-west and western states. For example, I did not know that the largest source of North American coal today comes from Wyoming and eastern Montana hauled in enormous unit trains primarily by BNSF or UP. The statistics are astounding. One mine alone in Wyoming can produced more coal than the top 50 mines of 1958 combined.

Admittedly, coal unit trains are best modeled in smaller scales but if you want to know the what, where and how of modern coal railroading, this book is the place to start. And don’t be fooled by the 125 color and 47 B&W photographs; this is not just a pretty picture book but a well researched trove of information with an extensive bibliography.

Coal Trains is available now. Check out the other railroad related titles at the Voyageur Press website.

Johns Hopkins University Press, 2715 N Charles St., Baltimore MD 21218
www.press.jhu.edu

Reviewed by Joe Giannovario

Tracing Forgotten Trails
In 1990 Richard Carpenter was driving across northern Indiana when he noticed a visibly high fill that could only have once been railroad roadbed. As he drove on toward his home in Connecticut he noticed other tell-tale traces of our railroad history. It occurred to him that this history should not be lost or forgotten and he embarked on a project to document the state of American Railroads at the height of its achievements in 1946.

Why 1946? Between 1920 and 1946 only four national and significant railroad mergers occurred. Therefore, a snapshot of 1946 railroading would actually be a pretty good picture of railroading for the preceding quarter-century. In 1946 steam was still King and people still rode trains to get to other parts of the country. Nearly everything moved by rail in 1946 so it’s a historically significant period. And so was born the Railroad Atlas of the United States in 1946.

I purchased Volume 1 because it covers the area served by the N&W, the road I model, and, in particular, the Abingdon Branch. Unfortunately, I did not learn anything new about the branch but the wealth of information contained in this one volume is amazing. Carpenter has hand drawn the maps and keyed them with symbols and colors which he explains in the preface to the book.

In addition to the maps are some 22 track plans at various locations, and indices for coal stations, interlocking stations, passenger and non-passenger stations, tunnels and viaducts totaling 297 pages of information. I’ve copied a portion of the map from my local area so you can see the sort of detail included but you really do need the author’s key to understand all of the information here.

Carpenter has produced a total of three volumes so far. Volume 2 covers New York and New England. Volume 3, just released, covers Indiana, Lower Michigan, and Ohio. I bought my copy directly from Johns Hopkins University and so paid full list but used copies are available from several sources on the net.
Along with the Andrews and Vulcan, Bettendorf trucks were introduced prior to 1920s and until being phased out in the 1970s, they were the most popular replacement for the once common archbar freight trucks. The archbar design was banned from interchange service in 1937, since it was prone to metal fatigue failure of the flat bar stock used in the truck's main frame members. The Bettendorf design along with others of that time featured a one piece cast sideframe with integral cast journal housings as opposed to the separate housing more common to the archbar and some earlier designs.

Protocraft is a great resource for 1/4" scale prototype modelers, and these P48 brass truck kits are a very accurate representation of the prototype. The masters for these kits were made by Oscar Neubert and even the tiniest lettering is legible and three dimensional! The 64 piece kit is very complete and features all the components one would expect to find on a prototype truck such as complete brake gear and a proper bearing for mounting to the carbody (Photo 1).

I'll admit up front, that the kit intimidated me at first glance. There are many small parts to the brake gear and lots of holes to drill. Although my experience with brass or metal is limited (very limited), I was able to work my way through the assembly with a minimum of problems. The first step recommended in the instructions was to clean up the flash on the castings. The amount of flash will vary somewhat from kit to kit and my cleanup took about forty-five minutes of work with a needle file. It is recommended that you carefully check the fit of the sideframes to the truck bolster to make certain there is freedom of movement between them. Be careful not to file too much here as a sloppy fit is not what you want. The sideframes should be able to slide up and down freely on the bolster as this provides part of the truck's equalization with a properly weighted car.

Once the parts are cleaned up, you plunge right in with assembling the brake gear. A number of pre-located and dimpled holes in the dead lever brackets, the Schaeffer levers and the connecting rods have to be cleaned out with a #70 drill bit. I did this by hand using a pin vise and hair clipper oil as a drilling lubricant. This part isn't as bad as it sounds and only took a few minutes of careful work. Now comes the fun part. The brake components are held together with microscopically tiny brass pins. I found it relatively easy to insert the pins using a pair of pointed tweezers and a Magni-visor. Once inserted, the pins can be squeezed with a pair of pliers which peens them over nicely. The brake levers are to be mounted at a forty degree angle to the bolsters. The brake beams that hold the plastic brake shoes have an angled slot in them that fits over the levers. Due to my own ignorance, it took me three tries before I got the brake beams oriented properly on the levers (Wrong angles twice and backwards once). Thank goodness for extra pins. To fix my mistakes, I simply filed off the peened end of the pin in question and it came right out. The instructions indicate to drill out a #61 hole in the bolster for mounting the dead lever bracket, and I think this is where I got confused, as the diagram showed the bracket mounted to the opposite side of the body bolster from where the hole was located. I finally wound up cutting the pin off the bracket and I just soldered it in place.

The rest of the assembly is simple from here. I soldered the spring platforms to the sideframes so they would stay put when slipping the sideframes and bolster together. The 33" P48 metal wheelsets are lightly coated with wax to prevent rust before painting. I cleaned them with hot water and dish detergent. The instructions clearly say not to use any heat source to dry the wheels since the plastic insulators are heat sensitive, so I dried them off by hand with a paper towel, then inserted them into the sideframes. The final step for me was to insert the springs. I compressed them in my long nosed tweezers, and they went in place without any fuss (I only lost one). The finished trucks have a nice rolling quality to them and the springs are soft enough to give good tracking and equalization.

It took me several hours over a couple of days to actually complete the assembly. I spent a lot of time staring at things and undoing my own mistakes. Now that I have my feet wet, the second truck should go more smoothly than the first. While these trucks are not designed for beginners, they're not impossibly hard to work with. Anyone who has assembled a pair of San Juan Car Co. trucks will do fine with these. Take your time and get familiar with the parts and you'll be rewarded with a fine set of trucks for that showcase freight car.
A few months ago I happened to be in Lincoln, Illinois. While there I was wandering around the closed RR station and freight house downtown. Suddenly the grade crossing bells and lights went on. It turned out to be the daily Chicago/St. Louis Amtrak train, several hours late. I love grade crossing signals because they are so in-your-face that they demand attention. In the same way they make a model RR interesting to visitors because they are surprised and startled and it is about the only new thing I have to show visitors since 2009 was a no-growth year on my layout.

I would like to hear your comments about grade crossings. I had always used the simplest arrangement: one gapped rail running from, say, four feet to the left to four feet to the right as in Figure 1.

The power to the gapped rail goes through an occupancy detector circuit and that circuit’s output controls the grade crossing circuits. You do need to make the last car on a train draw electrical power, usually by having lights. But this has two problems: (1) when the train stops at the station next to the grade crossing and the DC track power goes to zero the grade crossing circuit also stops. DCC solves that as the track power never goes off; and (2) it is not realistic because, on the prototype, the grade crossing activates when the oncoming train is a mile away and deactivates when the receding caboose is a few hundred feet away.

If the trains only go in one direction on your track then the rail gap positions can be changed to be more realistic, say 5 feet before to 6 inches after. And if the layout is powered by DC then the voltage polarity on the rails can be used to select between two gapped rails, one for eastbound trains and one for westbound trains. But what about DCC where you don’t know the train direction?

This was the subject of a recent email dialogue with OST’s publisher Joe Giannovario. I rashly told Joe that it was difficult to design a realistic grade crossing for a DCC-powered layout because you could not deduce from the voltage polarity which direction the train was going. He, of course, called me out and said “Why?” So I had to figure out a way to do it and came up with the following.

In Figure 2 (next page) both rails have overlapped gaps as shown to make two isolated sections of track and there are two occupancy detectors. The gaps are at positions 1, 2, 3 and 4. Gaps 1 and 4 are say, four feet away and gaps 2 and 3 say, six inches away. A two relay controller receives the voltage from the two occupancy detector outputs and feeds the grade crossing power. The circuit is shown in Figure 3 on the next page.

This is how it works. Say a train is moving left to right. When the loco enters the left isolated track (at point 1) current from the left occupancy detector output flows through the right relay’s B contacts and energizes the left relay coil. Then the left relay closes and the A contacts energize the grade crossing circuitry and B contacts open the circuit to the right relay coil; to prevent it from operating, and also to connect the right track detector also to the left relay coil. The diode in the circuit prevents a sneak path back to the output. When the last car on the train passes point 3, the left detector opens and current no longer flows to the grade crossing circuitry. But the left relay is still energized until the last car passes point 4. Then the left relay opens and both relays are now reset and the circuit is ready for another train. Note how symmetric the circuit is. It works the same way for trains in either direction.
direction. Note also that, if the left relay opened after the train end passed point 3, then the circuit would reset and immediately detect the end of the train, between points 3 and 4, as a new train and cause the grade crossing to energize again.

This sounds complicated but the two relays do all the work. I put them on a perfboard and then soldered wires directly to the pins. The top of the relay unit (right) is shown in the Photo 1 alongside the detector unit. The wiring diagram is seen in Figure 4, while Photo 2 shows the actual underside of the unit.

Note that the relay unit does not attach to a power source. It gets its power through the contacts on the occupancy detector boards. My Walthers crossing gate used 12 volts DC so I used 12 volt relays and a small 12 volt DC power supply.

Let me know your experience with grade crossings. Are you satisfied with the simple arrangement? Do you have a controller that is better than mine? I’d like to hear from you.

**Parts list:**
- 2 12 volt DC DPDT relays, Shack (Radio Shack) 275-249
- 2 Rectifier diodes, 1 ampere is plenty, Shack 276-1103
- 2 Block Occupancy detectors. Dallee TRAK-DT

![Figure 2](image2)

![Figure 3](image3)

![Figure 4](image4)
Rutland Railroad Ice House, Chatham, N.Y.

Harold Russell

Rutland Railroad Milk Train Operations

At one time Chatham, New York, was a major railroad center being the intersection of the Boston and Albany’s east-west line (the northern extent of the New York Central’s Harlem Division), and the southern tip of the Rutland out of Bennington, VT. Besides a small passenger depot, the Rutland had an enginehouse, turntable, coaling station, and water tower among other small buildings.

We know that the Rutland had very brisk milk traffic into Chatham until the late 1950s. There is a good chance that the ice from the ice house drawn here was used to top off the milk cans before they traveled further to New York City. This was especially so during hot weather. Let us briefly examine the Rutland’s milk operations.

Milk trains were a major revenue source for the Rutland Railroad that at its peak ran daily milk trains from Ogdensburg, New York south. Early in the morning milk train No. 8 would leave Ogdensburg making pickups at ten stations on the way to Alburgh, VT. The train then became No. 88 and it continued on to Rutland where it was split, one portion, No. 156, went east through Bellows Falls to Boston and the remaining portion, still No. 88, headed south through Bennington to Chatham, NY. At this point the milk cars were taken by the New York Central to New York City over its Harlem Branch.

The empty cars would return by a reverse route stopping at Alburgh where they would be backed into the ice house there and thoroughly iced for the next day’s return trip.

The milk trains also carried passengers in a coach or combine which also accommodated the crew. Between Alburgh and Rutland they also carried a baggage car.

R. W. Nimke’s book, The Rutland 60 Years of Trying, has a photograph and a Rutland Railroad Valuation Department drawing of the small ice house located at Chatham, NY. We can only speculate its use. Possibly it was used to top off the ice in the cars waiting for the Central’s pickup. This may have been especially true during hot summer days. Chances are it was also used to fill the Rutland’s crews’ ice boxes. Jim Shaughnessy verified that the Rutland did not run ice cooled air conditioned passenger equipment so that possibility is eliminated.

Ice House Construction and Use

Typical ice house construction involved wood studded walls and shingled roof. The inside of the walls was lined to the top with wood, chestnut being the preferred material. Double sided and insulated doors located at multiple levels were hinged to swing outward. The roof had a ventilation cupola and/or an end vent. There was no insulation in the walls as its cavity allowed the circulation of air letting the warmer air rise to the top and out the cupola. The buildings had a stone foundation and a gravel floor that sloped toward the center where a small trench allowed the water from melted ice to flow outward.

Ice blocks were packed one on top of the other as solidly as possible between the walls - the layers being separated by straw or sawdust. Any gap between the ice and the walls was similarly filled. The bottom layer of sawdust was sloped toward the center of the ice house so that the ice blocks would lean toward the middle thus keeping the force of their weight off the walls.

Ice houses were typically painted a light color to reflect as much heat as possible. Ice houses were typically loaded and unloaded using a system of conveyors and slotted wood ramps. Specially designed picks and tongs were used to aid the process. The blocks of ice typically weighed about 100-150 pounds.

Modeling the Rutland’s Ice House

The data in Nimke’s book allowed me to make the drawing of this small ice house. A small building such as this would be a good addition to your model railroad. As such, it occupies little space and can serve your layout’s milk cars and ice-cooled passenger equipment. Of course, the ice house would have to be periodically restocked so it would be necessary to move a box car to it. You can use basswood or styrene siding and roofing materials. The hinges and door handles can be cut from strips of thin brass. I suggest you paint the building a light gray color.

After placing the building on the layout, surround it with wet, muddy ground with a small stream of water coming from its rear. Lush green grass could surround the stream. The front of the ice house might have gravel up to track side. Most ice house doors faced north or east to avoid the prevailing winds.

Possibly a bench could be placed up against the building with some ice handling tools nearby.

More Information

Copyright restrictions do not allow us to publish photographs of the ice house. However, you can see photographs of this ice house by visiting:

NEB&W Guide to Structures
http://railroad.union.rpi.edu/article.php?article=5567

Information for this article came from various Internet sources:

3. Foxborough’s Last Ice House
4. Harry Gottlieb: Filling the Ice House 1934
http://www.flickr.com/photos/americanartmuseum/3313921947/
5. The Rutland 60 Years of Trying by R.W. Nimke.
Rutland Railroad Ice House
Drawing is full size for O Scale
Drawn by Harold Russell
Plan view is not to scale.
For reference only.
John Dunn sent this photo of a Golden Gate Depot PRR BM-70 postal-baggage car. Dunn weathered the car with Conti Crayons. He also added Precision Scale Co. air hoses and diaphragm face plate. The mail door ladder was located in the wrong place on the mail end of the car as-delivered because of interference with the truck swing. John relocated the ladder under the door as per the prototype but the ladder is attached to the truck frame.

A hot steamy day in NE Tenn. in August, at the Hampton Stone Works finishing shop. The fire in the tank engine is banked for the weekend.

The factory building is 1652, by actual count, individual pieces of 'stone' CA'd to each other with no backing. The interior has actual compression beams working with functioning tension rods to help reinforce the walls.

The whole scene was created by Ed Reutling.
Above: At twilight, a variety of Central Ontario Rwy (CORY) and CNR equipment slumbers at the Lilleyburg engine facility on the Model Railroad Club of Toronto layout. Lilleyburg is the southern terminus of the CORY, and is the regular host to CN equipment due to long standing trackage rights. David Maclean sent the photo.

Even though we are going to run a series by Tom Mix beginning next issue, we never get tired of looking at his work. Tom scratchbuilds his own locomotives to P48 standards. At left is another example of his fine handiwork.
The 2010 O Scale National Convention will be held June 30 - July 3, Wednesday - Saturday, at the Hyatt Regency Santa Clara, Santa Clara, California, near San Francisco. June 30 is set up day and July 1 - 3 are days of buy/sell, clinics, contests, and layout visits. Registration is $35, tables are $45 each (electricity is free), hotel rooms are $109 plus tax for 1-4 occupancy. Registration and table fees increase by $5 after May 31.

2010 will also be the 20th anniversary of O Scale West (OSW). The OSW organizing committee has moved the 2010 OSW from its usual early February time frame to the summer, and has added convention-level activities. In 2011 OSW will return to its normal February schedule and format.

Thus, the 2010 National includes and is sponsored by the 20th Annual OSW. Since the organization and management of the National will be by the normal OSW committee, attendees can expect to experience the easy going atmosphere, well-organized activities, excellent host hotel and friendly staff, and large number of layouts open for visiting that are typical of OSW meets.

Since we have lots of experience organizing and managing buy/sell, clinics, contests, and layout visits activities, we are able to put extra effort into the activities that were added for the convention.

Banquet

The Hyatt Regency folks have been superb by working closely with us to come up with a quality banquet meal priced at $50. There will be a no-host bar before the hotel’s patio, and we’ll start a little later so it will be dark enough for any projected presentations to be seen easily. Our banquet speaker is Art Lloyd, whose railroading experience spans being a Train Master for the Western Pacific, to Amtrak, to his present day work on regional rail transit systems.

Museum Tour

This tour is to the world-class California State Railroad Museum in Sacramento on June 30. The cost will be $30 including transportation and museum admission. The group will travel to/from Sacramento on Amtrak Capitol Corridor trains. The Museum is a short walk from the station.

For the Long Distance Traveler

We’ve created what we call the Grand Tour for those who want to take time before and/or after the convention to visit the many railroad-related attractions (museums, preserved railroads, layouts, model displays), national parks, and other attractions that exist in the greater western U.S. One can start the tour at Las Vegas, Seattle, Portland, San Diego, or Los Angeles. From any of those points one can drive to the convention, visiting layouts and attractions along the way. After the convention one can drive a different tour route to their departure airport. We are making arrangements with layout owners who are located on tour routes to be available for contact by phone to set up a visit. Some of these layouts are world class and have never been open to the public before. Our web site, www.2010oscalenational.com, has more information and will be updated as new information becomes available.

Counting the many layouts on the Grand Tour, there will be more than 40 layouts open for visiting. The visitation schedule for the approximately 30 local layouts spans Sunday, June 27, through Sunday, July 4, which will allow dedicated folks to see all of them.

Contests

The 2010 convention contests will be a departure from the normal OSW popular vote contests in that in that we are adding a judged (NMRA rules) contest. It will be possible to enter a model in both the judged and popular vote contests and a model could win its category in both contests.

Convention Car

We are close to signing a contract for the convention car which will be the Lionel scale proportioned milk car decorated for Château Martin winery. These cars were used to transport wine in bulk from California to New York City where it was bottled. Watch for an article about this car and wine transport by rail.

I hope this information has you interested in attending the convention. Please contact me if you have any questions or suggestions. See the convention ad in this issue for contact information.

-Rod Miller, Convention Chairman
Buy-Sell-Trade ads are $5 for 30 words plus your address information. Additional words are $0.25 each. Subscribers are permitted one free ad per subscription cycle. All B-S-T ads are prepaid. You may send ads by postal service with a check or money order. Ads sent by email or called in must use a credit card. See our contact info on page 2.

FREE O SCALE LIST: List of O Scale shows for 2009. Send LSAS to Bob Retallack, Dept OST09, 2224 Adner Cl, Columbus, OH 43220.

WANTED: Small N&W custom-built or scratchbuilt steam, 4-8-0, 2-8-0, 4-6-0. Also looking for N&W brass parts, e.g., pilots, cylinders, domes, tenders, etc. Contact Joe Giannovario, jag@oscalemag.com or call 610-363-7117.

WANTED: American special run 50' Milk, boxcars, Hallmark comp gons, Sunset WWII emergency boxcars, PRB WWII comp gons, Lobaugh 30' reefers, WWII era boxcars what have you! Mail only. Jim Seacrest, PO Box 6397, Lincoln, NE 68506-0397.

FOR SALE: Two USH UP 2-10-2s, Cab#s 5071 & 5080; USH UP 4-8-4 #7004; OLV UP 4-6-2 #3211; Key C&O Allegheny; WSM C&O T1 2-10-4. All models custom painted, lightly weathered and lighted by Harry Hieke, Jr. Call Harry Bender before 8PM EST, 410-316-1889.

WANTED: CN, CV, GT, GTW, D&W steam/diesel era freight, passenger, MoW and caboose (vans). What have you? Mail only. Jim Seacrest, PO Box 6397, Lincoln, NE 68506.

FOR SALE: Brass and die-cast parts for All Nation/ Babbitt steam locomotives, frames, drivers, rods, valve gear, boilers, cabs, tenders, and details. Also restoration and repairs available. Some complete kits available on metal and plastic detail parts, backdrops. Free catalog. Pioneer Valley Models, 35 Yale St, South Hadley, MA 01075-2636.

WANTED: The O-Scale 2 Rail Club is a modular train club looking for members or those to follow this standard and start a club. We are using a portable 2' x 4' table format. Follow the modular standards for placement of the two track mainline, wiring, and table height. Visit the web site at: www.oscale-2rail.com. Request a free PDF of the O-Scale 2 rail club standards guide from: oscale2rail@live.com.

FOR SALE: New Sunset 2-Rail engines: 2-Rail UP Big Boy, $1500; 2-Rail Challenger $1500; 2-Rail B&O EM1 2-8-4, $1500. Email: woodbymaruss@msn.com, or call 505-898-6956.

FOR SALE: O SCALE ENGINES and freight cars from the 1970s in good to excellent condition. AHM 0-8-0 yard switcher and freight cars; Two Atlas F9s, industrial switcher and freight cars. Contact Chet Thomas at 904-220-0593 or at cttrainz@aol.com.


PAINTING, WEATHERING, minor repair on brass only. Will build resin kits depending on time period. Also will paint backdrops. Call or write Phil Ginkus, 508-832-6942, 7 Mt. View Ave, Auburn MA 01501.

FOR SALE: O Scale cardstock buildings, quality metal and plastic detail parts, backdrops. Free catalog. The O-Scale 2 Rail Club is a modular train club looking for members or those to follow this standard and start a club. We are using a portable 2' x 4' table format. Follow the modular standards for placement of the two track mainline, wiring, and table height. Visit the web site at: www.oscale-2rail.com. Request a free PDF of the O-Scale 2 rail club standards guide from: oscale2rail@live.com.

WANTED: LTD AMT Steam/Diesel era GN, NP, C&NW, CM&O engines, passenger cars, freight cars, MoW, cabooses, What have you! Mail only please. Jim Seacrest, PO Box 6397, Lincoln NE 68506.

FOR SALE: All engines EFP & TRO. SP AC-12 4294 PSC, $4950; SP 2-8-0 Glacier Park Models #2811, $2200; SP MT-4 and MT-5 PSC (latest run) $950; SP P-10 PSC (Skyline cast/ges) loco $120 C-8 tender and Solute drive $2500; P-8 PSC W/120 c_8 tender, Cockerham drive, $2500; SP 60' Shopped coaches PSC UP new (3) $300; SP 72' Diner PSC UP new $350. Reasonable offers considered. Call Office 650-347-4402 or email hantell@pacbell.net. Bruce Antell, 50 San Mateo Dr, Ste 105, San Mateo, CA 94401-3857.

WANTED: AHM C-Liners, powered, non-powered, body shells. Also want brass C-Liners. Call Harvey Merz 701-523-5557.

FOR SALE: 2 Rail Sunset/3rd Rail PRR N1s 2-10-2 LN boxed, $900; 2 rail Sunset PRR Q1 #9860 4-4-6-4 LN boxed $1000; 2004 set of 3rd Rail Pullman cars in original boxes: 1x combine, 1x baggage, 3x Pullmans, $1000 for the set. Buyers to pay shipping. Contact: 626-791-5300, Dennis Bagby, 2233 N. Sureau Ellen Ln, Altadena, CA 91001.

FOR SALE: FELD,M.L.&S.S. decal sets. Will do 2 locos and several cars; $18.50 per set. Contact Mike at 515-353-4292 or email bluffcreektrains@wccta.net.

To ensure your event listing makes it into the proper issue, please note the following deadlines for publication:


November 2009

7: Stamford CT


Weekends starting the 27th: North Haledon NJ

Model Engineers Railroad Club of North Jersey, 75th Anniversary - Annual Open House. Club is located at 569 High Mountain Road, North Haleden, New Jersey 07508. Open weekends: Fridays 7:00 - 10:00 P.M., Saturdays & Sundays 1:00 - 5:00 P.M. Admission: $5.00, children free with adult. For more info contact, Paul Harbord 973-427-4905 before 9:00 pm EST, or email pharbord@optonline.net.

December 2009

Weekends through the 13th: North Haledon NJ

Model Engineers Railroad Club of North Jersey, 75th Anniversary - Annual Open House. Club is located at 569 High Mountain Road, North Haleden, New Jersey 07508. Open weekends: Fridays 7:00 - 10:00 P.M., Saturdays & Sundays 1:00 - 5:00 P.M. Admission: $5.00, children free with adult. For more info contact, Paul Harbord 973-427-4905 before 9:00 pm EST, or email pharbord@optonline.net.

March 2010

12-14: Lombard IL

Midwest March Meet 2010. New location! Westin Lombard Yorktown Center, 70 Yorktown Center, Lombard IL 60148. Call 800-937-8461 and ask for the Chicago O Scale room rate. Show registration write to March Meet. 2636 Hallweg Ave, Red Wing MN 55066 or call 630-745-7600. By email contact meetinfo@aol.com.

June 2010

30th to July 3rd: Santa Clara CA

The 2010 O Scale National is being held in lieu of the 2010 O Scale West. The hotel room rate is $109/night plus 10% room tax, for up to 4 people in the room. Registration is $35, $40 After April 30, 2010. Vendor tables (72") are $45, $50 after April 30, 2010. A banquet will be held at 7:30 PM Friday outside the hotel. For more details, contact the O Scale National Convention, c/o 876 Boyce Ave., Palo Alto, CA 94301-3003 or call Rod Miller at 650-329-0424 between 9:00 AM Pacific Time and 9:00 PM Pacific Time. Email: rod@rodmiller.com.

July 2010

11-18: Milwaukee WI

NMRA National Convention & 75th Anniv. The National Model Railroad Association (NMRA) will be celebrating its 75th birthday in 2010. As part of the festivities the National Convention will be held in Milwaukee Wisconsin, the birthplace of the NMRA. We are planning a rip-roaring Midwestern, good time for all, both model railroader and general interest attendee alike. Dates for the convention are Sunday July 11th to Sunday July 18th. On Sunday the 11th, we are going to kick off the week with a Beer and Brat Fest (a Milwaukee Favorite) at Zeidler Union Square Park, just a stone’s throw away from the convention site and hotel. Contact Ken Jaglinski, Vice-Chair. Contact mjaglinski@wi.rr.com.
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An OST Reader Poll

I’ve been participating in some interesting discussions online and one particular thread generated a series of questions about what is important to O Scalers when it comes to a commercially manufactured model, especially locomotives since they generally are the most expensive items on a model railroad.

I promised my online conferees to post an edited version of these questions as a survey both here in the magazine and online. I’d appreciate it if you, our readers, would answer the survey either by writing to me or by going to the OST website and click on the link to the survey.

O Scale Modeler’s Poll: Answer each question with (A) important or (B) not important:
1. Model is dimensionally accurate
2. Accurate castings and details
3. All wheel sets gauged to current NMRA standards
4. Drive wheels sprung
5. Drive wheels equalized
6. Drive wheels both sprung and equalized
7. Ease of maintenance/disassembly
8. Factory painted and lettered
9. Constant intensity lighting
10. Directional lighting
11. LED lamps
12. On steam engines, lighted class lamps
13. Factory Command Control (DCS/TMCC/DCC) system
14. If Command Control equipped, CC with sound
15. If not Command Control equipped, sound cabs on drive wheels
16. Command Control ready
17. Smoke units, steam or diesel
18. Low current, high torque motor
19. Slow speed operation for switching
20. Dual motors in articulateds
21. Dual motors in diesels
22. Written Warranty
23. Minimum radius stated on box
24. Minimum radius no greater than 60°
25. Limited quantity

The blog will keep a real-time tabulation of responses. I’ll collect written responses and try to give you an update in this space in the January 2010 issue.

Gift Suggestions

It’s that time of year when people start asking “What would you like for [insert your preferred ethnic holiday season]?!?”

Supplying an answer is always a risky proposition because our tastes as O Scalers are pretty specific and unique. So, OST is here to help you this holiday season. I’ve asked a variety of O Scale modelers 3 questions:
1) If you could buy one book, which one would it be?
   Cost limit $100
2) If you could buy one tool, which one would it be?
   Cost limit $50
3) If you could buy one model - kit or RTR, what would it be?
   Cost limit $150

Here are some of the answers I received:

Mike Cougill, Managing Editor OST — Book: Pullman-Standard Freight Cars 1900-1960 by Edward S. Kaminski from Signature Press or copies of the Gregg Train Shed Cyclopedia reprints. “The more info I have for a given project, the more I enjoy modeling it.”

Gene Deimling, P48 Master Modeler — Book: Steam at Allandale, 1998, Canadian Branchline Miniatures (Orillia, ON) by Ian Wilson; Tool: 7-piece Wiha screw driver set from MicroMark; Model: Southern Car & Foundry 60’ Harriman Baggage car kit (Due out before Christmas according to Jon Cagle).

Tom Thorpe, Benchwork Guru (CurvedBenchwork.com) — Book: John Armstrong’s Track Planning for Realistic Operation, Kalmbach; Tool: Dremel flex-shaft and the new quick-change mandrels; Model: Any caboose. You can never have too many cabeeses!

Brian Scace, Former Editor OST — Book: A Guide to Modern O Scale, 2nd Ed. or a subscription to your favorite railroad historical society’s newsletter; Tool: As many straight and bent forceps as you can get for $50; Model: Any of Mullet River’s freight car or caboose kits.

Frank Verrico, DCC Guru at Model Rectifier Corp. — Tool: A pin vise and a set of 61-80 number drills, or a Kadee O Scale coupler height gage; Model: Any MTH Premier Rolling stock and MTH 2-Rail trucks for converting the rolling stock.

Ted Byrne, PowerUp columnist for OST — Book: The Story of the Baltimore and Ohio Railroad 1827-1927 in two volumes and published to celebrate the 100th birthday of the railroad in 1928; Tool: Resistance Soldering unit; Model: Old Pullman curved turnouts 48’/59” or 63’/83”.

Joe Giannovario, Publisher OST — Book: A Railroad Atlas of the United States in 1946, Vol. 1 Mid-Atlantic States., by Richard C. Carpenter (see the review in this issue); Tool: A digital caliper (about $20 online); Model: Any caboose. You can never have too many cabeeses!

And Finally...

This was a tough year on everyone: modelers, retailers, and manufacturers, but we seem to have weathered the worst of the economy. OST has actually increased its subscription base and we’ve held onto most of our advertisers. Thank you both for helping us keep this endeavor alive and growing.

For the coming year, we wish all of you good health, good friends and good times.

Keep Highballin’
ANATOMY OF A DIESEL
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Less than 50 Engines and sets of cars will be produced in 2 Rail. Many sets have already been reserved, so don’t delay, 1-800-3RD-RAIL Today. This beautiful GG-1 model will be produced in LIFE-TIME brass, with two motors and “Quiet Drive” mechanism, directional constant voltage lighting and fully detailed cab interior with crew figures. $999.95 MSRP.

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