



*THE* **O** **RESOURCE**  
**SCALE**

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**NEWS, REVIEWS, INFORMATION TO USE**

**Volume 7 No.3  
January/February 2020**

**Backshop Solutions  
Let's Make Some Coal Loads  
Building Realistic Stone Retaining Walls  
New Tracks - Entrepreneurs You Need To Know &  
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The Model Railroad Resource LLC  
407 East Chippewa Street  
Dwight, Illinois 60420  
815-584-1577

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**January/February 2020**  
Volume 7 No. 3

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Welcome to the online O Scale Resource magazine. The magazine is presented in an easy to use format. The blue bar above the magazine has commands for previewing all the pages, advancing the pages forward or back, searching to go to a specific page, enlarging pages, printing pages, enlarging the view to full screen, and downloading a copy to your computer.

Front Cover Photo

*Heavy coal train making it's way up the "widowmaker" hill on my Richmond, Danville & Southern Railroad. Check out how to make these coal loads in this issue.*

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The Model Railroad Resource, LLC publishes *The O Scale Resource* and *The S Scale Resource*. Be sure to look at both of our magazines. There are many articles in our magazines that are not scale specific and will be of interest to you. Click the magazine title in this announcement to see the magazine.

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# From the Publisher's Desk



Well it's almost a new year, and yes, we are a bit late with this issue, but we made it before the 31st. Waiting for last minute articles and proofing, plus making merry over the holidays, well, time got away from us. A new year supposedly means a "fresh start". Gym memberships go up and people all have good intentions, but if they are like me, not so much. I've blown through more new year's resolutions than a Munchkin in a tornado. As Popeye, said "I yam what I yam and dats all what I yam". OK, so much for self improvement.

This issue is another biggy! New Tracks has a fascinating article on starting a model railroad business and has featured some great entrepreneurs. Also, three great new giveaway drawings from Loyet Model Works, Lambert Locomotive Works and Shenzhen Fantasy 3D Technology Co., Ltd. There is definitely something for everyone.

Be sure to read Part 3 in Serge Lebel's fantastic signaling series: "Model Railroad Signals and CTC Operations Part 3: Scratchbuilding Your Signals. This time, he goes into etching brass for his signals. There are also many downloadable files to go along with this article to save you some drawing time.

George Paxon is back with an article on building realistic stone retaining walls. There is a lot of good information and pictures to help you with your scenery. I may have to try my hand at this.

One thing I want to remind you all about is Ross Dando's "Backshop Solutions" column. Ross puts himself out there so you can ask questions on almost anything model related. He is a man of many talents, and a legend in his own mind. Make use of that knowledge in your modeling and building. If you get stuck, shoot Ross an Email.

I got a real bug up by butt after the last show we attended and spent some quality time in the railroad room painting, decaling and weathering my collection of US Hobbies/Max Gray hoppers. Seventeen (17) in total with four different types. I needed coal loads and was not finding any like I had purchased in the past. So, I made my own. To be honest, they look better than the ones I had. It's easy and cheap, so check that article out.

A note to show promoters – we would love to promote your scale O shows. If we cannot be there, please send us some pictures with descriptions. Not only models, but the people attending and enjoying your show. We did receive a few pictures from the Southwest O Scale and Oklahoma Narrow Gauge Group Combined Meet, but we never received captions for the photos. We still thought it was worthwhile to show you the pictures.

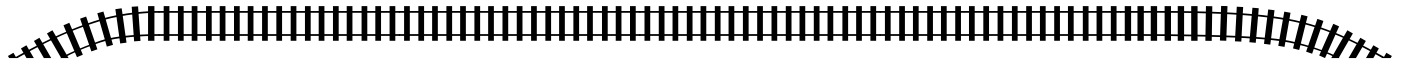
There are also forms for the March Meet model contest in this issue. Remember, the more information you can supply to the judges, the better the scores. Download and print these and fill them out before the show and save yourself a lot of time.

There will be some changes here at the Model Railroad Resource, LLC for both The O Scale Resource and The S Scale Resource Magazines. We will be moving to a more user friendly platform for reading online, as well as, maintaining the download feature so many of you like. Adobe Flash will be going away, and the new HTML5 will allow us to embed more information into the on-line versions of the magazines. So keep reading, and we'll let you know when we migrate to the new platform.

Happy Reading & Happy Modeling,

*Dan Dawdy*

# NEWS YOU CAN USE



Woodland is proud to present our new Peel 'n' Place Tufts, which are coming soon.



Peel 'n' Place Tufts allow you to model a variety of grassy plants often found in fields, meadows and pastures. These tufts are ready-made and can be used right out of the package. Simply peel the tufts from the tray and place them where desired. There are five types of Tufts (12 SKUs) available: Grass Tufts, Flowering Tufts, Seeding Tufts, Prairie Grass and Edging Strips.

[See their Website for more details.](#)



Model Tech Studios LLC has some new items for you. Fire Call Boxes. These emergency pull handle boxes hang near doors either exterior or interior. 2 pack of PRE FINISHED "Red" safety call boxes you see on every building for emergency.

Sprinkler Alarms with warning signs for your Building Wall Detailing. Detail your O Scale Buildings realistically for Fire Safety. Often seen on



Factories, Mills, Industrial Structures and Retail Buildings as warning alarms for Fire Safety. Includes 2 sets of alarms and the warning signs.

[See their Website for more great details.](#)



Chooch Enterprises has a limited supply of the following detail parts.

Flush laser cut windows for Golden Gate Models P-70 coach.



Atlas SW-8 replacement plexiglass windows. Makes the windows flush with the outer side.



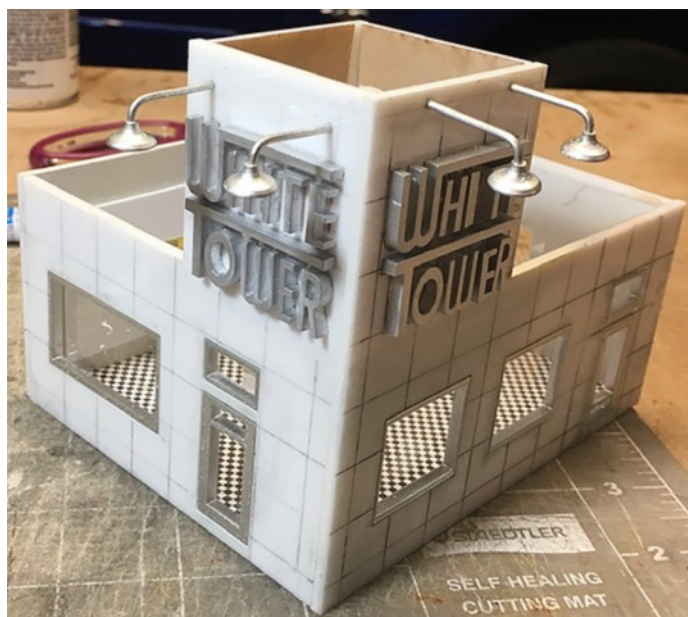
Wood Roof Walks for Intermountain Boxcars and Reefers. Laser cut Strathmore with peel and stick backing.



See all their products on their Website.

David Vaughn now has a blog set up at <https://tworailoscaleblog.wordpress.com/>. This blog's purpose is to develop a plan to revitalize and improve Two-Rail O Scale ("2ROS"). We here at *The O Scale Resource Magazine* have been a big proponent of this venture, and hope all of you look at and add to this endeavor.

Keith Wiseman of [Wiseman Model Services Inc.](#) Sent us a note that his Email has changed. The new Email is [kwiseman9961@gmail.com](mailto:kwiseman9961@gmail.com).



[Twin Whistle Sign & Kit Co.](#) has a cool offering. The White Tower Kit available for O scale.

For the moderately-skilled builder! One of our new classics. There is an interior Styrene flooring, a large selection of graphics, and many accessories. The model is made of high-quality lasered acrylic and has several laser cut and cast accessories. This is a great addition to your collection, and makes an excellent gift.

See their Website for more information.

The Old Town Model Railroad Depot is remaining open under new ownership.

*Editor's Note: Although this is a three rail attraction, we thought the history of it, and the fact that it will not close. would be of interest to many.*

San Diego, CA - December 2, 2019: The Old Town Model Railroad Depot, a model railroad museum based in San Diego's historic Old Town district, will remain open under new ownership. The Depot, which was founded in 2014 by Gary Hickok, was scheduled to close on November 30, 2019. One month prior to the anticipated closing, David Lizerbram and Mana Monzavi, a married couple based in North Park, San Diego, acquired the Depot, renewed the lease, and are keeping the Depot open. Hickok will remain actively involved in the Depot, as

will the many model railroad enthusiasts who operate their collectible trains on the O-gauge (Lionel size) tracks.

“We are thrilled to have the opportunity to help this wonderful museum live on for years to come,” said Lizerbram. “My father and I spent many hours working on our train layout when I was growing up in North County, San Diego, and it’s an honor and a pleasure to share this hobby with our visitors from San Diego and around the world.”

In September 2019, Lizerbram and Monzavi visited the Depot for the first time with their two-year-old son, Miles. They fell in love with the museum and were upset to find out that it was soon to close. They couldn’t bear to see it disappear. A few weeks later, they found themselves in possession of the keys to one of San Diego’s hidden gems, with big plans for the Depot’s future.

A visit to the Old Town Model Railroad Depot will take you back in time to the 1950's, where various trains travel over a 2,000 sq. ft. custom-built layout. The highlight is a city at night including over 100 buildings with lights and flashing neon signs, a ballpark, zoo, depot, industrial district, and even a working drive-in movie theater. Continuing on your journey, you will pass a large farm, a quaint country town, a beautiful mountain range, a large lake (complete with sharks), and a dam with trestles traversing over a large gorge.

The Old Town Model Railroad Depot, located at 2415 San Diego Avenue, Suite 107, San Diego, CA 92110, is open to the public daily (except Tuesdays) from 11am-5pm. Admission is free, and donations are encouraged. The Depot also includes a retail store featuring train-themed gifts, books, and apparel. More information can be found at [oldtowntrains.com](http://oldtowntrains.com) and upcoming events and special themed train runs will be announced on their social media sites, [facebook.com/oldtowntrains](https://facebook.com/oldtowntrains) The Depot’s phone number is (619) 299-9015.



[Richard Rands of Berkshire Valley Models](#) has a lot of cool new items, including:

#209 1934 Tow Truck - Comprised of white metal the kit is loaded with details. This is loosely based on a fantastic model built by Chuck Doan a number of years ago.

#469 Tow hoist - We are selling the hoist separately for those who would like to kitbash.

#659 Box Camera - White metal and laser cut wood.

#660 Produce Scale - White metal.

#661 Crates of Produce - 5 per pkg. - white metal.

#662 Coal Shovels - 4 per pkg. - white metal.





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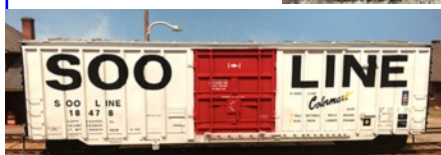
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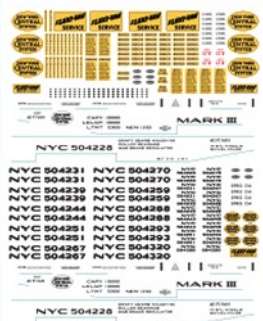


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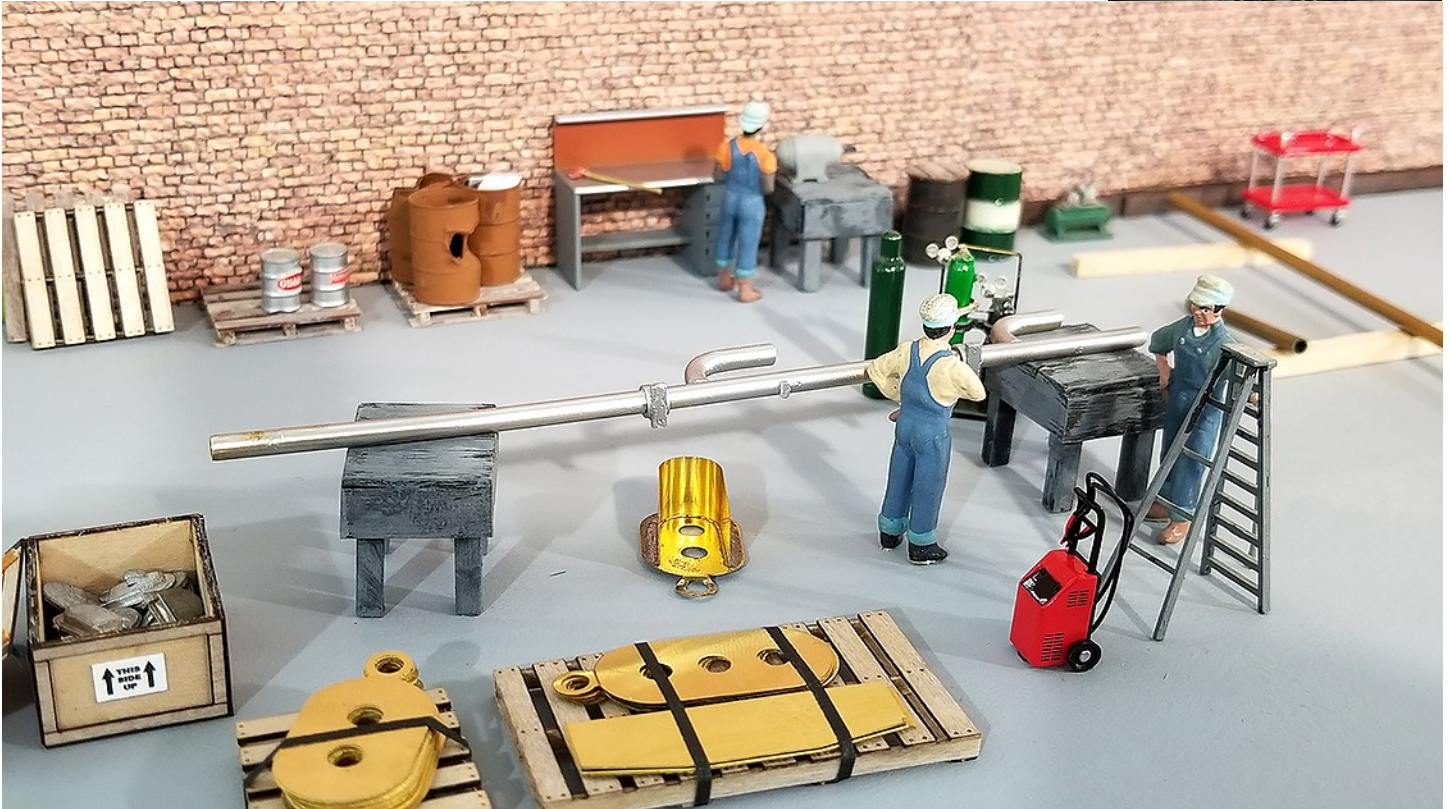
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## Model railroad signals and CTC operations

### Part 3 : Scratchbuilding Your Signals

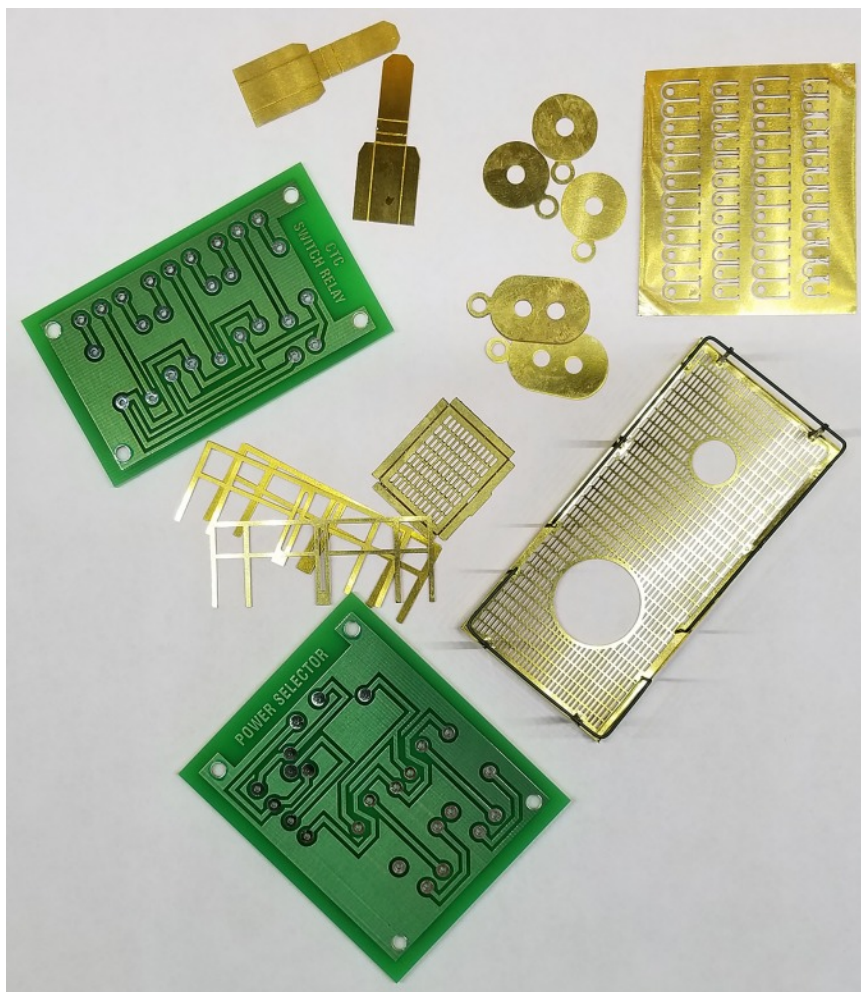
By **Serge Lebel**



For those of you who have decided to follow my articles and build your own CTC machine, I hope you had fun and that your project was a success. It is now time to get to the creative part of the process; scratchbuilding signals out of brass. For this, you will need to build a couple of tools, and I will show you how I have been producing brass signals and parts for the past 20 years. These tools and skills will serve you well beyond just making these signals.

Brass is a very good medium to work with. You can fold it, mill it, cut it, weld it and paint it to make just about any part you can think of. This is why I chose to use brass as a base material to scratchbuild my signals. In addition to the brass parts, I use a few commercial plastic parts like ladders and mast bases to save time.

The brass parts need to be cut out of brass sheeting. The best way to do this is to use a liquid etchant to dissolve the brass where you want to create a cut or an opening. This is called brass etching. The task is not very complicated; a part is designed on the computer, then printed on a film material which I call a negative. It is then transferred on a photo-sensitive film that is laminated on brass sheeting. The sheeting is then placed in the etchant solution which dissolves the exposed brass, leaving the finished part with nice clean cut edges.



*Etching can be used to create a lot of parts, as well as components.*

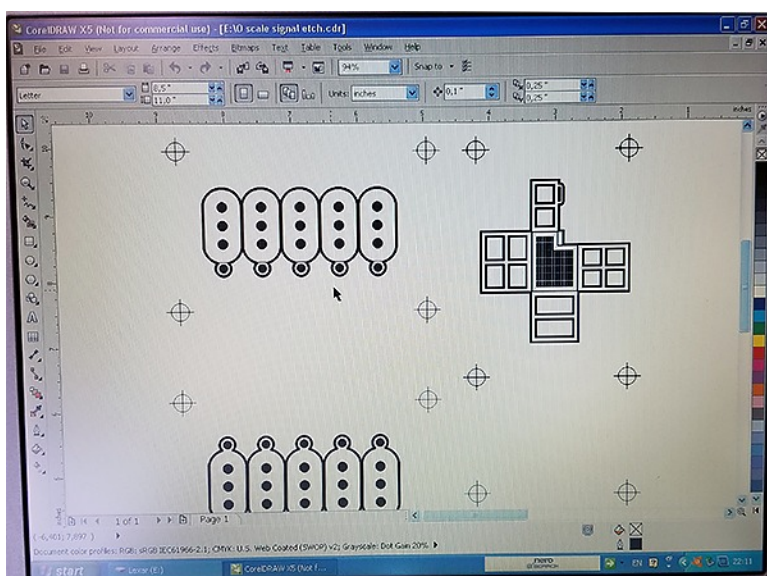
In order to make these parts, you will need the following tools:

Computer to design the parts on, and a design software of your choice (you can also use my design files attached to this article if you do not wish to design your own).

- Inkjet printer
- Laminator
- U.V. Exposure unit
- A small benchtop vise and a couple of small clamps (clothespin size)
- Two pieces of 6 inch by 6 inch clear acrylic
- Heated bath and container for the etchant

As for materials, you will need:

- 0.005" brass sheeting (I use K&S brass sheeting)
- Photo-sensitive U.V. film like the one used to produce home-made P.C. boards
- Pro-Etch inkjet film (Micro Mark Tools, part no. 83128) and laminating cardboard.
- Etchant (I use Sodium persulfate, but you can also use ferric chloride)
- Developer



This might seem like a lot, but there is a source for all these tools and products. To begin with the computer software... I use an old version of Corel Draw that I purchased used on-line for \$15.00

Any software that allows you to draw lines and curves, and create contours and fills will work. I have even seen some modelers create their artwork on Windows paint and other free software. The advantage with a design software is that if you are designing parts from measures taken on a prototype or plans, you can draw in full scale then scale down to the size/scale you want. In the case of the signals in this article, I am attaching all the design files that you will be needing, so you can skip this step for now, and return to it later if you decide to make parts for a different project.

As for the inkjet printer, today's printers can be set to a very high resolution. I suggest using the best resolution and the best print quality setting. Also, use the manufacturer's ink instead of some unbranded ink. The ink from the manufacturer will be darker, which is what is needed here. I have not done any research on this, but I think you could also use a laser printer, or better yet, an Alps printer if you have access to one.



I purchased a used laminator in a garage sale, again, for just a few dollars. You can find these on-line too. Don't spend the money on a new one, all you need is to have the rolls working. The film laminates cold, so no need for a fancy laminator unless you want to use it for the office.

Heated etchant bath... Here I am using an old kitchen electric pan, which I fill with water and insert a pyrex glass container. The

etchant goes in the glass container, and the hot water all around it keeps it warm.

### **Making your exposure unit:**

The one tool that you could buy, but I suggest building yourself, is the U.V. exposure unit. This is simply a set of mercury vapor 175 watts lights placed on each side of the brass sheeting to expose the film. Here is a photo of the one I built:





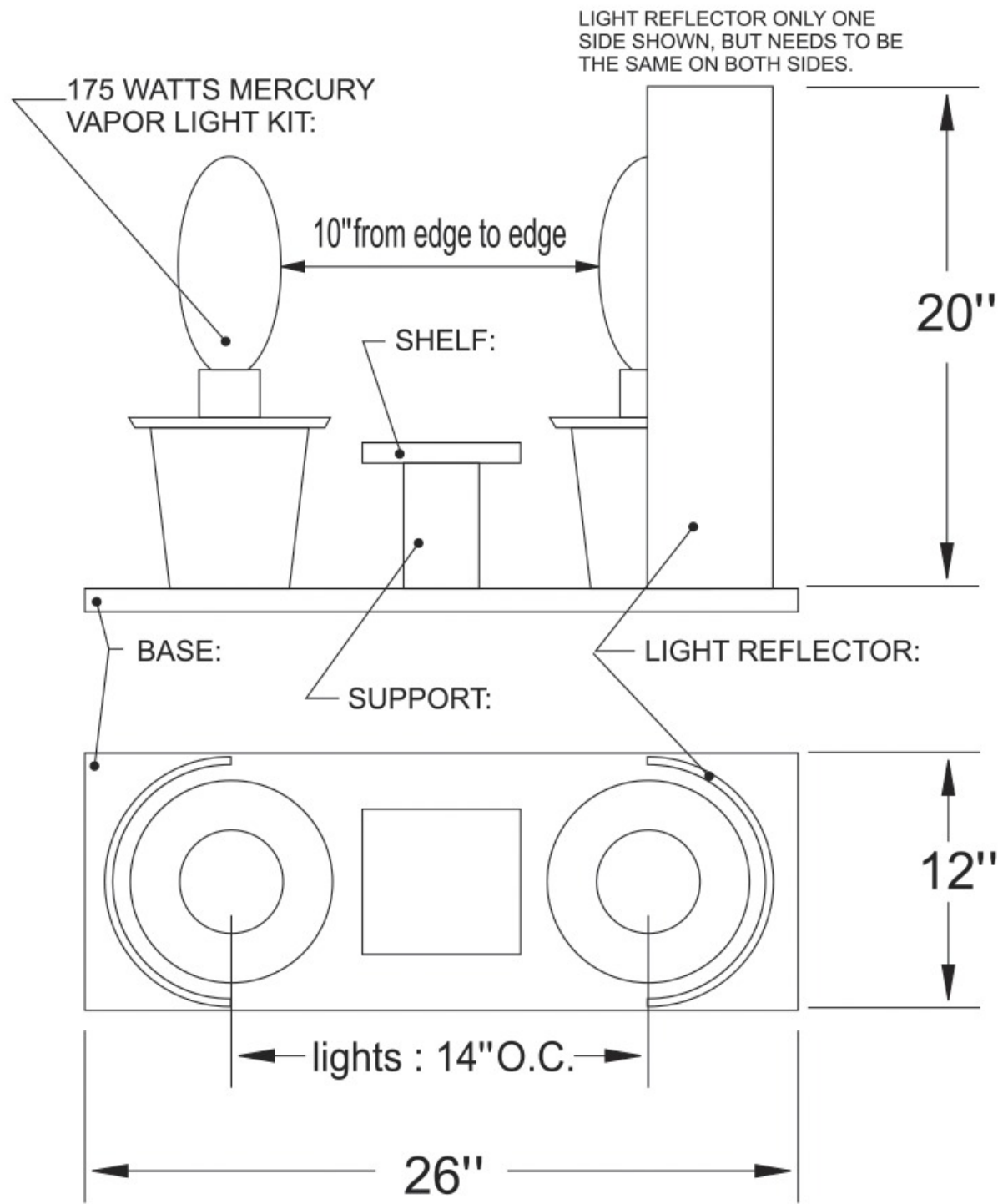
Now I built this unit 20 years ago, so I don't have photos of the building steps. But if you look at the photos, you will see it is quite simple.

Start by cutting the base and the shelf parts out of 5/8 inch plywood. Refer to the sketch for the measures I used, but they do not need to be exact. For the shelf support, I used a small block of pine. To calculate the height at which the shelf needs to be, you will need to have your workbench vise on hand, along with the 6 inch by 6 inch acrylic sheets. Place the sheets in the vise so that at least 5 inches of the acrylic extends over the vise jaws. The center of that 5 inch space should align horizontally with the center of the light source. This will determine where the shelf under the vise needs to be, therefore giving you the size of the support block underneath. If you want to be fancy, you can make that support block so that it is adjustable in height... But if you are always using the same vise, there is no need. Place this shelf right in the center of the base.

Next comes the mercury vapor lights. These can be purchased at any hardware store. Because the size and the way the fixture can vary between manufacturers, it is simpler for me to give you the measure I used between the two bulbs. See sketch. These measures are important if you want to use the exposure times I have determined by testing. Place the fixtures so that you get the correct distance and be sure that everything is aligned with the center of the base when looking from the top.

In order to maximize the light intensity, I made some reflectors which I placed at both ends of the exposure unit. To make these, I simply used a piece of sonotube cardboard tubing used for construction of support posts. I cut one piece just high

## U.V. exposure unit design



enough to extend over the top of the light bulb, and then cut it in two halves lengthwise. I then covered the interior with a white cardboard so that I get the most reflection from the lights. Be careful if you plan on using foil instead of cardboard, as the light rays might be projected in all different directions, making the point of having the reflector useless. I glued these deflectors with a hot glue gun.

Make the necessary electrical connections. Here again, I should have taken the time to install a light switch but I did not. I simply wired the fixtures to an extension cord so I have to plug and unplug every time. This was okay at first because I did not have a dedicated spot for the unit, but now that I attached it permanently in place, I might do the modification.

### **Acquiring the materials for the brass etching.**

Once you have these tools, you will need to get the materials. Brass sheeting can be found on-line and in hobby shops. I use the 0.005" because it etches faster than the thicker material. Besides, all the brass parts are folded and welded, making them strong once they are formed.

I usually purchase my photo-sensitive film from sellers on ebay. The best prices are from sources in China, but it takes forever to get here. If you can find a source in the U.S., it is worth spending a little more and get it on time. If you want to save the frustration of laminating your own brass sheets, you can buy U.V. sensitive brass sheeting from my current supplier, Circuits Imprimées de la Capitale in Quebec ([www.pcbcic.com](http://www.pcbcic.com) or 1-418-877-9047 and talk to Pierre DuBois, he speaks English)

The Pro-etch inkjet film is available only from Micro Mark Tools. If you have access to an Alps printer, you can use clear acetate. Be careful if you plan on printing on acetate printed with a laser printer. The black toner may look black, but it is not opaque enough and the 175 watt light will work its way through the toner and will cause your photo-sensitive film to cure, which is the total opposite to what you want.

The etchant I use is sodium persulfate. I know some modelers use ferric chloride also. It works, but it is very messy and will corrode anything made of metal for yards around. Sodium persulfate is what P.C. board manufacturers use, and it works well. It does not smell, and does not corrode. It can ruin clothes however, so it is best to work with an overcoat.

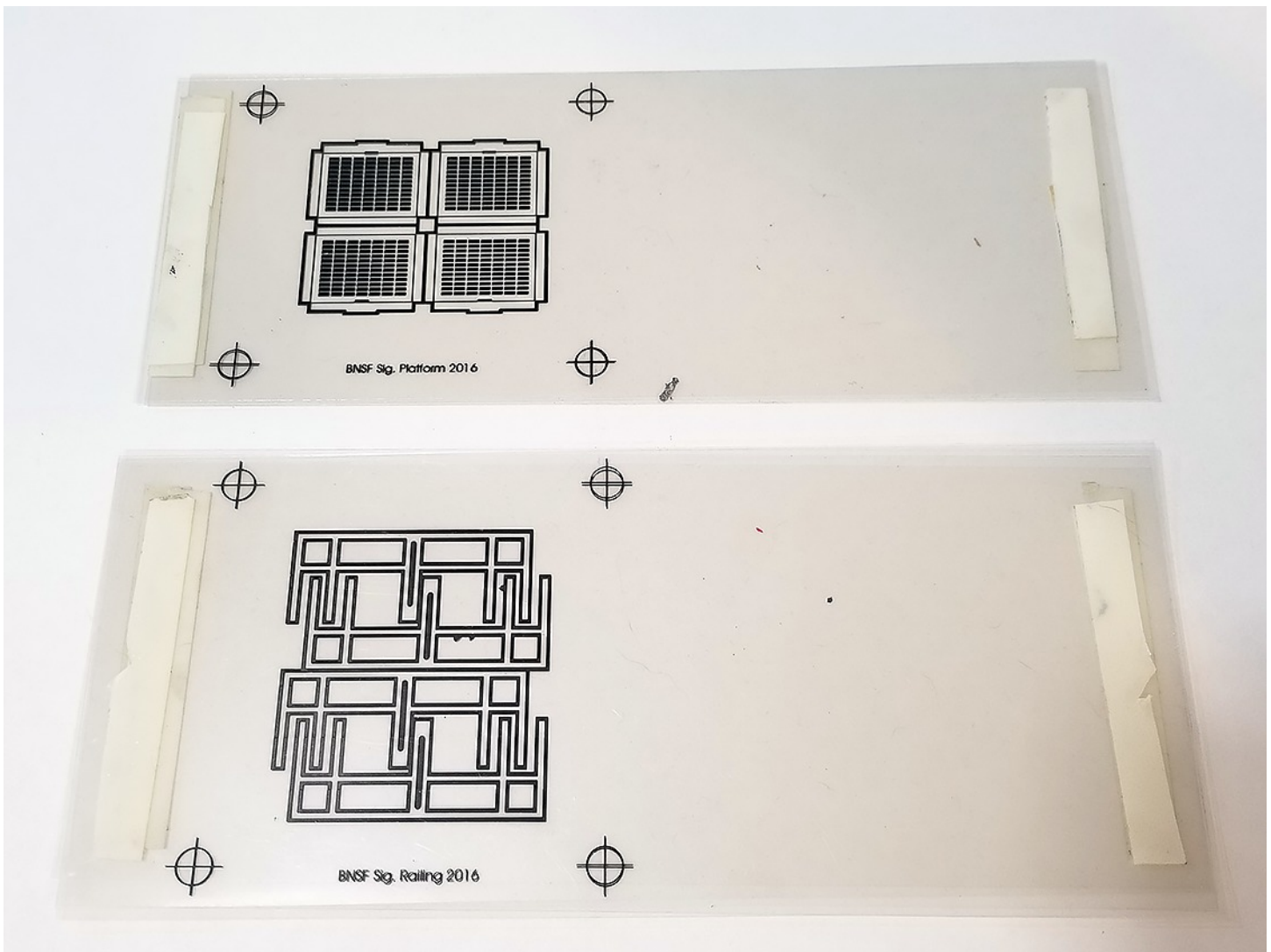
The developer is used to remove the un-exposed film from the brass. It is part of the process which I will explain in this article. Again, I heard some modelers use baking soda with great results. This remains to be tested. I get both products from a manufacturer out of Quebec (Canada) named Circuits Imprimées de la Capitale ([www.pcbcic.com](http://www.pcbcic.com)). You can reach their sales department and mention my name and this article, and they will sell you the products. If you live in the States, I would suggest looking up P.C. board manufacturers in your area. I never looked on-line for this because I had my source, but I am guessing it must be available.

Now that you have all the tools and supplies, let's get started...

### **Making the signal parts**

I have been a signal manufacturer since 2001. Over the years, I have designed and corrected my designs several times. As my gift to you, I am including my etched brass design files attached to this article, for those of you who do not want to make their own design parts. If your signal type is different than mine, you can still download my files as a reference, or perhaps to use some of the components. The first step here is to print the design files on the inkjet film in order to have a two-part negative that will be transferred to the brass by exposure to the light source. Trim each design, leaving some excess clear film around it in order to have sufficient space to place a scotch tape to hold both sides, but still be able to open it to insert the brass sheet between the films. The point here is to have the design transferred to both sides of the brass sheet, as the brass will be etched from both sides.

Next, prep the brass sheets for laminating. There are plenty of videos on YouTube explaining this process in detail. It is the same method used for P.C. boards.



I usually clean the brass sheets with soap and water by scrubbing both sides with a soft pad used for washing dishes. Some folks use steel wool. You can do that too, but it is very messy. Dry the brass sheets and check so that there are no residues, grit or towel fibres.

At this point, I like to measure and cut my brass sheets to fit the various frets that will be exposed to make the parts. These smaller sheets are easier to laminate. Laminating is best done in a dark room. I installed a red light in my paint booth area and closed the door. This ensures that the photo sensitive film does not get exposed prematurely. Again, cut the film to fit the brass sheets you just prepared. Remember that you need two sheets of film for every sheet of brass as both sides need exposure. The U.V. film is protected by a thin clear protector on both sides. You will need to remove one side, so you can laminate it to the brass. This is best done if you use two small pieces of masking tape placed on each side of the film in one corner, then pull back on the tape. One of the protectors will start peeling off.

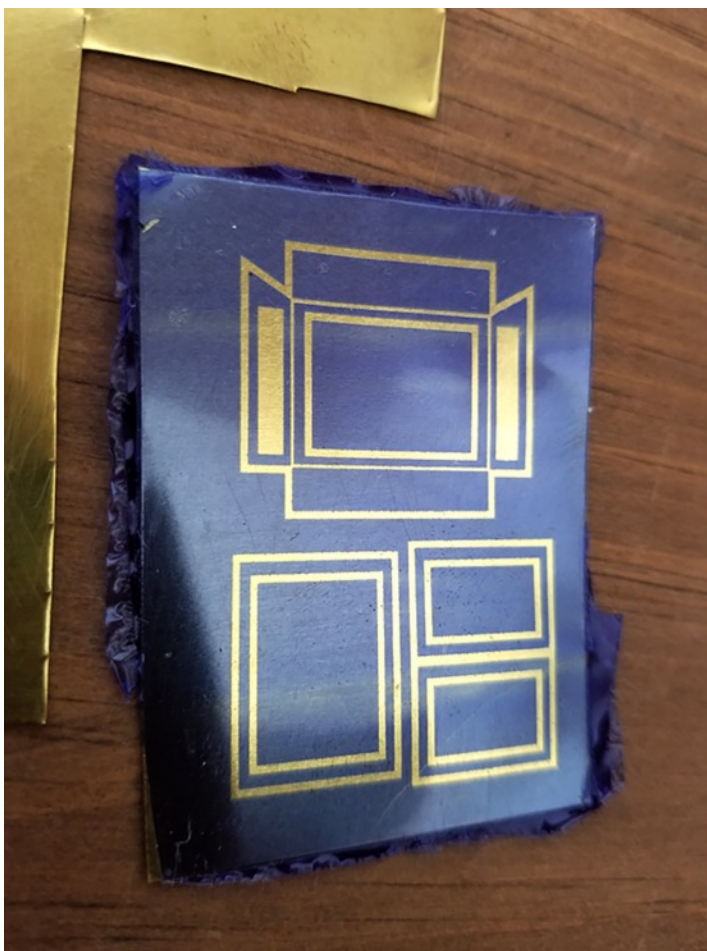
Wet the brass sheet with mild water and apply the film face down to the brass, starting at one edge and pressing the water out. Don't worry if you can't get it all out, the laminator will take care of the rest. Place your brass sheet between two sheets of laminating cardboard (I use plain white thin cardboard and throw it away when it gets too wet, but you can use laminating cardboard which is waxy and cleans off) and run a couple of times through the laminator. Do not use the heat on the laminator... Heat will destroy the film. Laminate with pressure only. Do the same for both sides and set these sheets to dry for at least 48 hours, in a dark, dry place.

It is now time to do the light exposure. Turn on the mercury vapor lights ahead of time. These take a while to reach maximum luminosity as they need to run hot. Take one sheet of brass and insert it in between the film



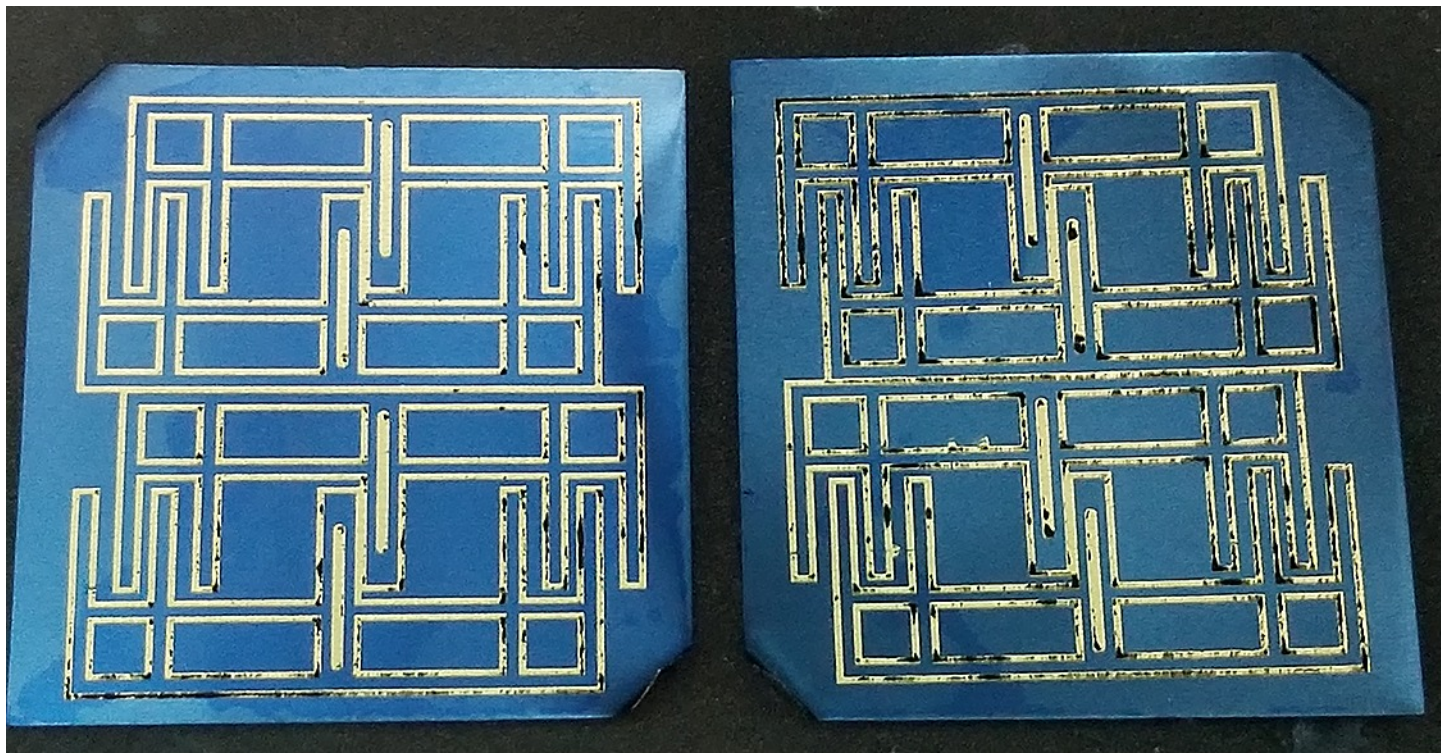
negative. It is very important that the film is in full contact with the brass sheet if you want a crisp, clear cut line. To do this, insert the brass sheet/negative between two pieces of clear acrylic pieces, then hold this entire assembly in a clamping device. I use my shop vise for the bottom hold, and a couple of small clamps for the top hold. This is now ready to place in your light source exposure unit. Be sure to be centered on each side so they both get the same amount of light exposure. I normally expose about 4 minutes, but then again it depends on the film I get, and how fresh it is. This is where you will need to do a few tests. Don't worry if you don't get it right the first time, you can simply remove the film from the brass by dipping it in acetone, and start over. There is a learning curve to this type of work. Once the exposure time is done, remove from the light source and, using a small piece of masking tape again, remove the remaining top protector that is on the U.V. film. Be careful not to pull the U.V. film off the brass when you do this.

Now, submerge the exposed brass sheet in the developer. I use the developer from my printed circuit manufacturer, which is a white powder. I use one teaspoon of developer for 500 ml of water. If done right, the developer will dissolve the unexposed film (the part that did not turn blue under the light) but will not affect the hardened, exposed film. I use a soft artist paint brush to help the process by brushing it gently while it is in the solution. Within 4-5 minutes, the film should dissolve, leaving the shiny brass clearly visible. Rinse under water to stop the developing process and set to dry for about 30 minutes. You can leave it out in full day light too, as this will finish the curing of the now exposed film. A well exposed film should turn a nice deep blue color.



The next step is to prepare your etchant solution. Since this solution is more active when it is heated, I am using an old electric pan half filled with water, in which I place a pyrex glass container which will hold my etchant. Set the heat to the lowest setting (etchant should not be hot to the point of evaporation, but still feel quite hot to the touch) Etchant mix is 500 ml of water for 125 ml of sodium persulfate. Pre-heat the water and add the sodium persulfate gradually, stirring it gently to dissolve it. You will see it dissolves like salt, and will be clear as water at first. As you etch parts, the brass particles will make the solution turn light blue.

Once the temperature is set and the etchant is dissolved, insert your brass sheets (one or two at the most) in the etchant, and, using plastic tweezers, keep the brass sheets moving around in the solution. Inert parts do not etch as fast and have a tendency to turn to oxidation instead of etching away. Turn the sheets over frequently. After about 15 minutes, you should start to see some edging and small holes poking through the bare brass. The brass will eventually all etch away and the parts will fall at the bottom of your container.



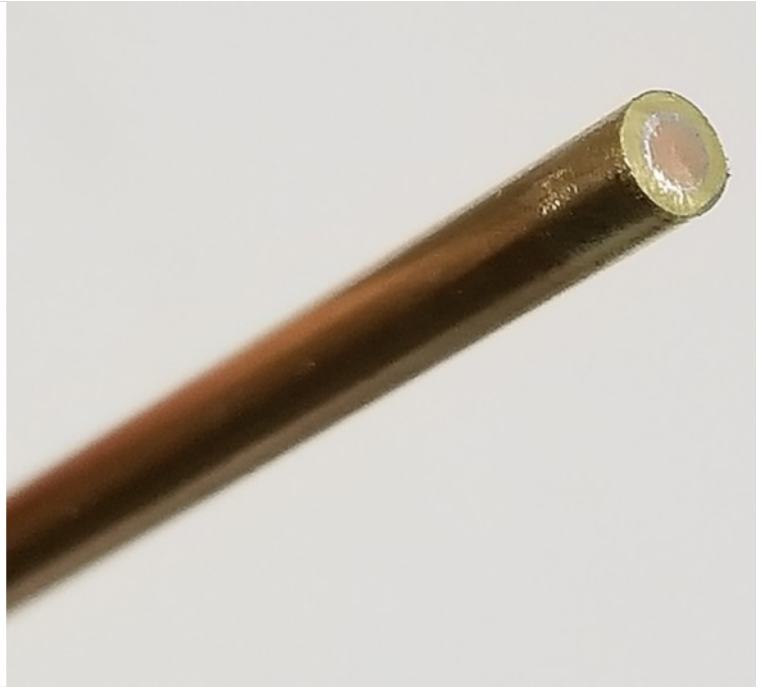
Remove any part that looks like it shows no more brass around the edges as soon as possible. Over etching will result in rough cut lines around your parts. Remove all the fret parts too as soon as possible in order to limit the amount of contamination to your etchant. A solution of etchant will usually do about 4-6 brass sheets like the ones in my signal designs (3"x3" sheets). If you notice that after 30 minutes the parts have not etched fully, the solution is probably blue and it is time to change the etchant solution for a fresh one.

Remove the cured U.V. film from the now finished parts and dip them in acetone for a few minutes. The acetone will dissolve the film and you will have a clean brass part. You now have the brass parts needed to build your signals!

### **Assembling the signals**

First of all, my advice to you here is to start with making only one signal. Don't start off with the goal of making all your signals at once; this is impossible. There are too many variants in each signal. The goal here is to make one perfect signal which will motivate you to get the ball rolling, then take it one controlled location at a time (meaning you will be assembling the 3 signals at the turnout plus the approach signal), working your way across your layout. I have to admit that even with my 20 years experience in making these, I was happy I took it one section at a time, as I was always finding little things I could modify or do better for the next batch of signals.

The steps you follow in assembling the signals is a matter of personal preference. I will show you the steps I have been following for years now, but after you have assembled a couple of signals, you will be able to come to your own conclusions on how to proceed. If you are making a different type of signal than the ones in my designs, read through these steps as a reference. Here is how I go about assembling mine:



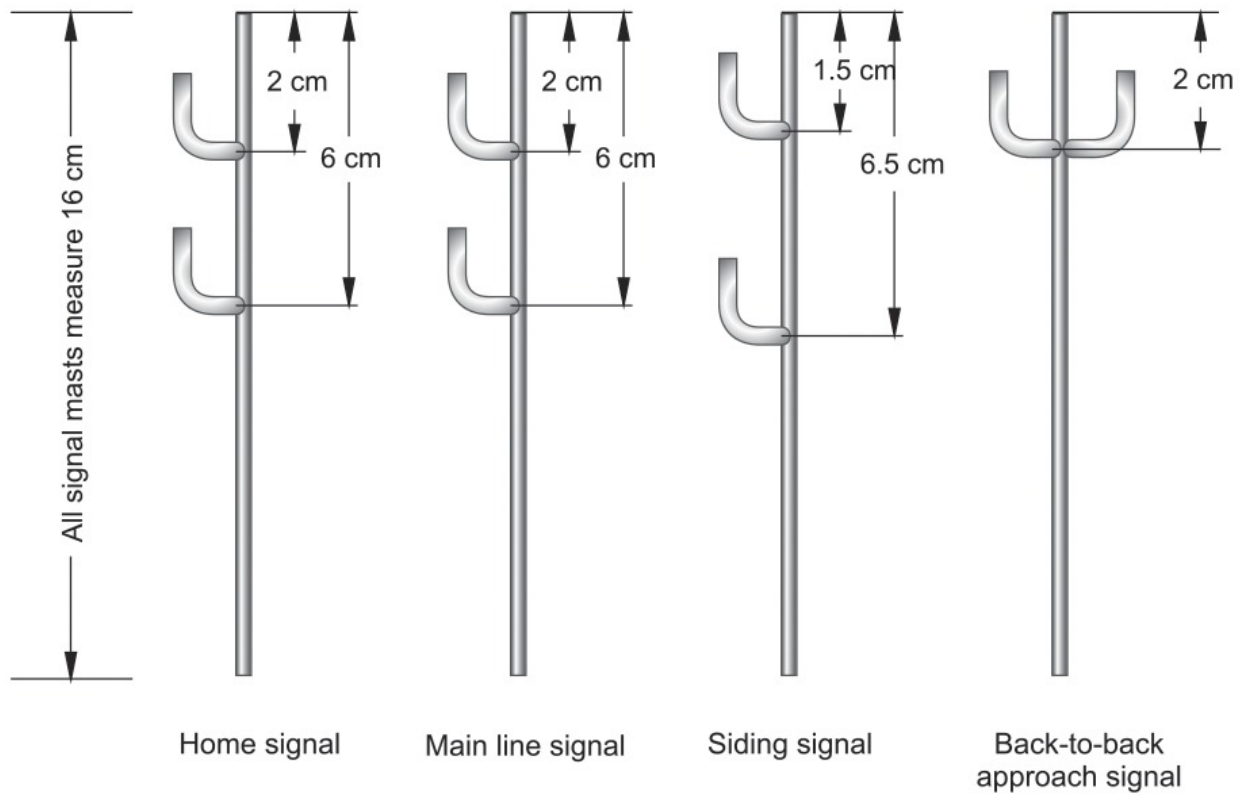
**1. Preparing the signal mast:** Cut a piece of 1/8" brass tubing 16 cm long, using a small tube cutter. File one end flush and clean, this will be the bottom end. The top end of the mast must be closed off. To do this, use a large diameter solid electrical copper wire (I believe mine is a 12 gauge solid copper wire) and insert it in the tube about 1/8 inch deep, and solder it with tin. Using wire cutters, cut the excess wire and file to a nice, flat finish.



Using a small round file (sometimes called a rat's tail) file a notch in the mast where the target support arm will extend, for each target of your desired signal. (See target arm placement chart on the next page). File only deep enough so you can create a small hole to run the wires through, about 1/3 of the tubing. Using a sharp object or a knife point, clear out the brass to have a good round opening.

Using some soft bendable brass tubing (K&S part number 8121), insert the tubing in the fold tool, and bend it 90 degrees. Take the folded tube out of the folding tool and cut the folded section. Refer to my photos for the proper proportions, you will have to eyeball it so it looks right. Using the round file, file one end of the tube so that it wraps about half way around the mast and hides the notched hole in the mast. Repeat for each target support arm needed. Do not solder in place just yet.

## Target arm placement chart



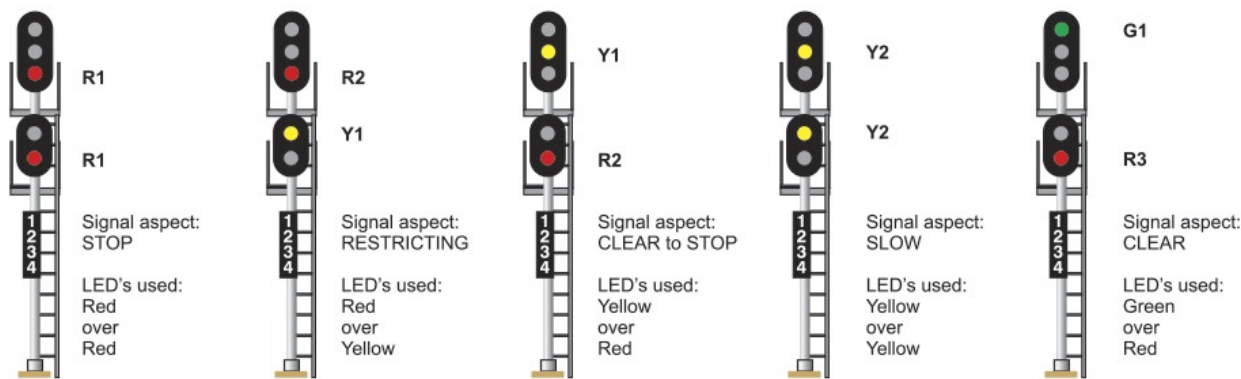
Before going any further, you will need to prepare the wires for the LED's in each target. This is where a lot of careful planning is needed. Remember when I mentioned in my first part of this article series that signals had to be wired in a special way in order to work with this system? Well, there is still some truth to that, but while working on my own layout, I discovered a fabulous component called a diode. (Yeah, this article series is evolving as I am writing it!)

Diodes act as flow valves. They will allow current to flow in one direction only. This has changed the way I wire my signals. At first, I was wiring my signals by running an individual set of wires for each LED color... So if I needed the red aspect on a target to light up from 3 different sources, I ran 3 sets of 2 wires (one for anode, one for cathode, for each of the 3 red aspects on the same LED). This meant using LED's that had 3 separate connections for each colored aspect. This was done so that the current could not flow back from one source to the other, which made other LED's come on when they were not wanted. But by wiring a single set of wires to the LED and adding diodes to the sources, this problem is eliminated. The only place where you will have to have separate wires to the same LED is when the same LED has the function of lighting constant in one aspect, but blinking for another aspect. Since the blinking circuit requires that both the anode and cathode be wired into it, this LED can not be shared. Connecting two sets of wires to two separate connections on the LED will treat the LED as two individual LED's, even if they are in the same housing.

This case of “doubling the wires on the LED's” will, at least in my case, only happen on the approach signals. Refer to your signal placement chart that you prepared earlier (remember when I said this would be important later on?) and determine exactly the signals that will require such aspects. As for the other signals, the only thing that will need to be noted is the number of “feeds” going to the same colored aspect (such as red 1, red 2 and red 3) to determine the number of diodes you will install for each LED. Refer to my chart to see how I determined the number of diodes I placed on each wire.

### SKETCH NO. 3

#### SIGNAL ASPECTS CONFIGURATION EXAMPLE FOR THE HOME SIGNAL NO. 1234



Sketch shows the number of sources that will feed each LED. For each feed, you need to install one diode. While some LED's will require up to 3 diodes, only one resistor is required per LED.

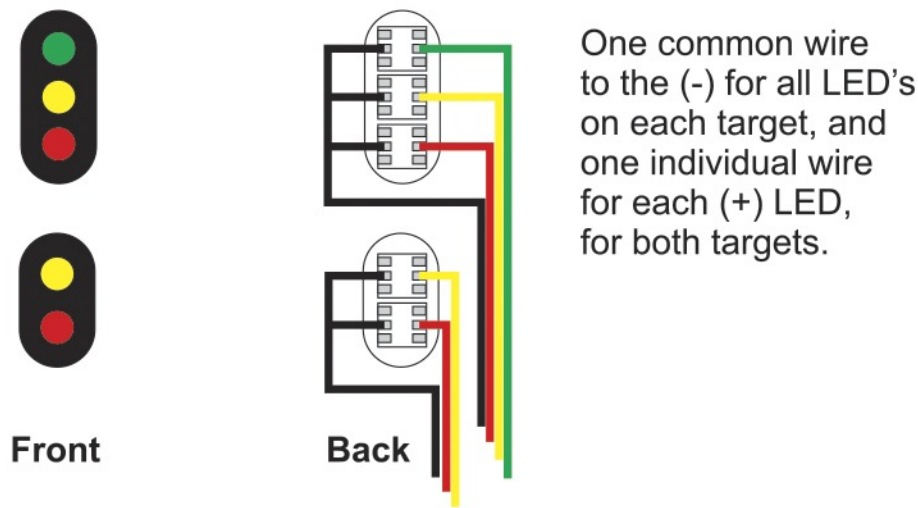
Now the LED's I used have 3 individual connections on each unit (see sketch). This means there are 3 individual LED's of the same color in one unit. So your maximum number of separate source feeds for each is 3 if wired normally. But using diodes, you can have as many individual source feeds as you like. This is why you will only need to connect one out of the three. In order to simplify the wiring, you can use a single wire to connect all the common side of the LED's in a same target. So for example, on the home signal, where the upper target has green, yellow and red LED's, I would use a single black wire for the common wired to all 3 LED's, and one colored wire for each colored LED (four wires in total for this target).

Signals that have a flashing aspect are wired the same way, but I then add a separate set of one black (for common) and one colored wire twisted together to connect to the second terminal of the led I want blinking.

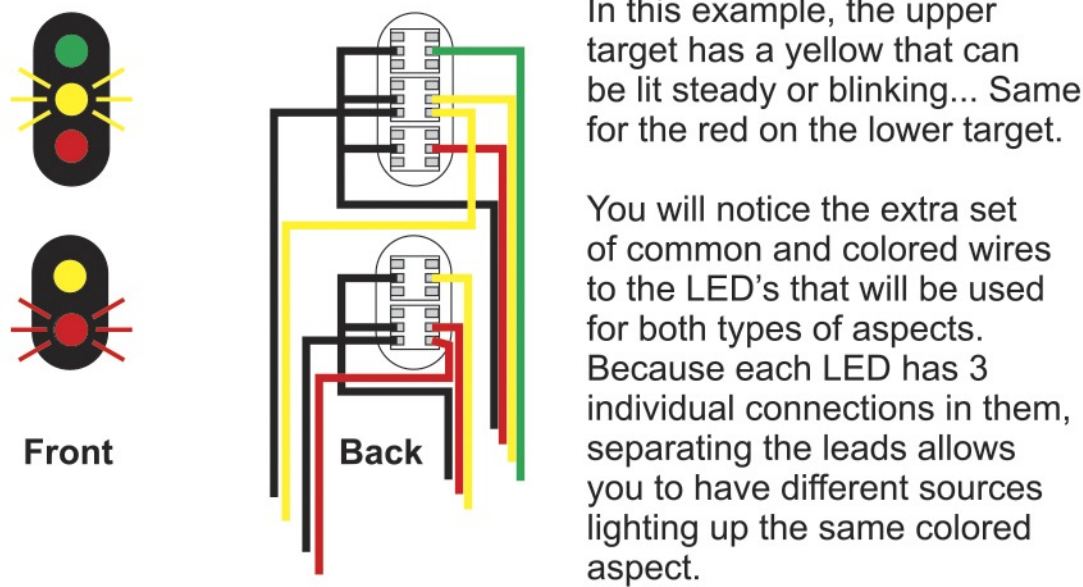
## SKETCH NO. 4

### Wiring of the LED's on home signal 1234

For non-blinking signal aspects:



For **blinking** signal aspects:



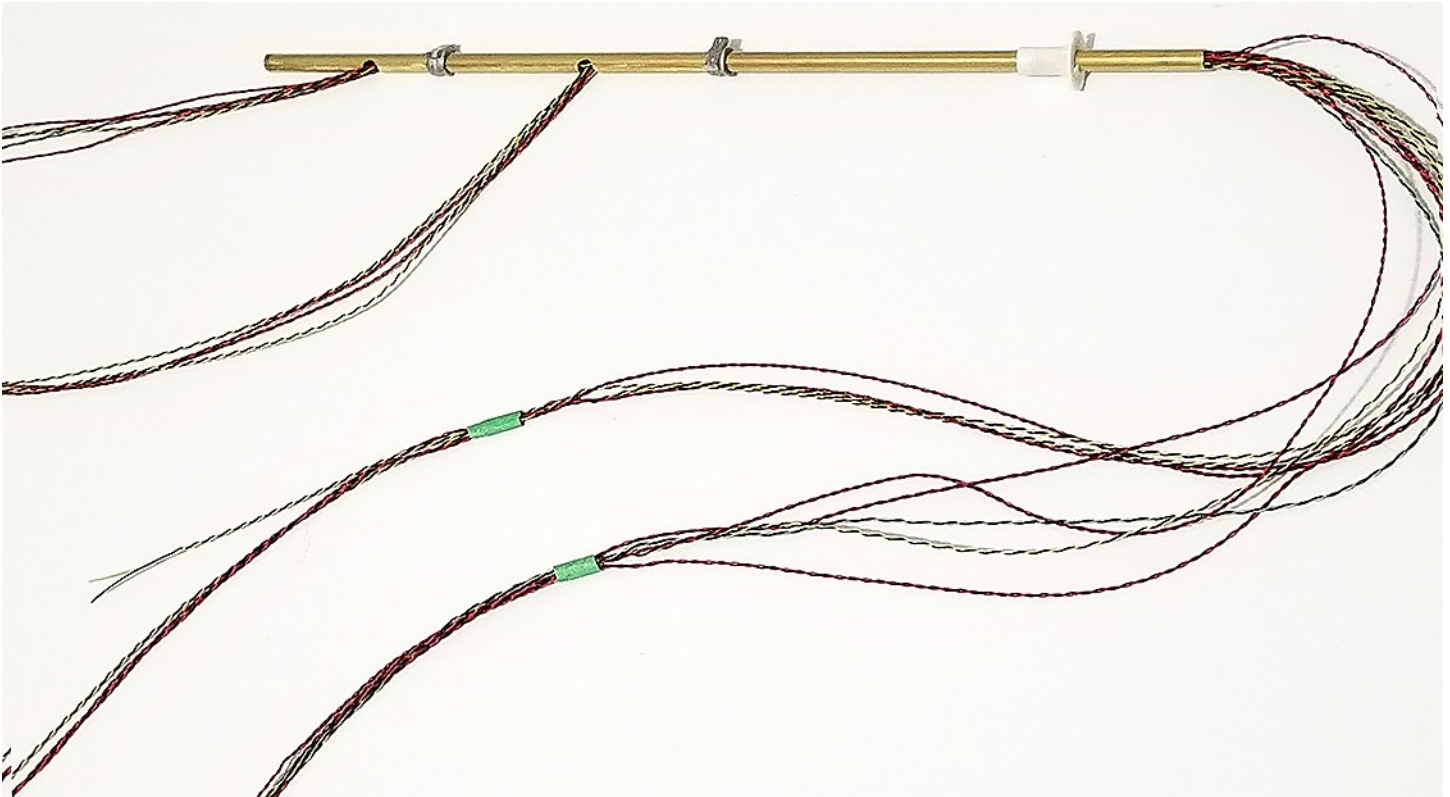
In order to keep things manageable, I twist these wires together by inserting one end of the wires in my vise, and the other is attached with a masking tape to a hand drill. I make the wires about 24 inches long, so I have enough wire to reach my terminals under the layout. Prepare all your wires and set them aside.



This is a good time to insert the signal base mount and the platform support brackets. When I first started making these signals, a friend of mine gave me a small bag of metal signal base mounts and brackets. As it turns out, these were old castings from Keil Line. I tried to reach Keil Line (now Scale City Designs) but I was not able to get the parts made. You can call Marty at Scale City

Designs, perhaps you will have better luck than I had. It is not that he did not want to make the parts, it just never came to fruition. So in my case, I ordered some casting resin and made my own parts from the ones I had. Since these are for personal use and not for sale, I saw no harm in copying the parts (it's not like I had a choice). With the availability of 3D printers now for hobbyists (I actually have two in my shop now!) you can make your own parts without any fuss.

In any case, **AND THIS IS VERY IMPORTANT**, this step must be done now before the wires are in place: Insert the platform support first (one for each platform) and then the base. Refer to the photo below for the placement of the platform supports:



Once this is done, you can run the wires for each target. I group all the wires for one target and twist them together for about 1 inch long, and insert this from the bottom of the mast. Start with the lower target, as you will be able to see the wires as they get close to the lower notch in the mast. Using some pointy tweezers, pull the wire out the notch. Using a small piece of masking tape, tape the group of wires together at about 6 inches from the bottom end in order to know that these are the lower target wires. Do the same for the upper target, running the wires through the mast and through the notch, taping them together at the bottom. Pull out the wires long enough so that they can run through the support arm and have enough wire left to reach the LED's on the target (about 3 inches of wire should do).

In order to protect the fragile wires' outer sleeve from melting when soldering the support arms in place and causing a short, install a short piece of heat shrink tubing over the wires, making sure to extend this protective sleeve to cover the area where the most heat will occur when making the solder joint. This is shown in the photo



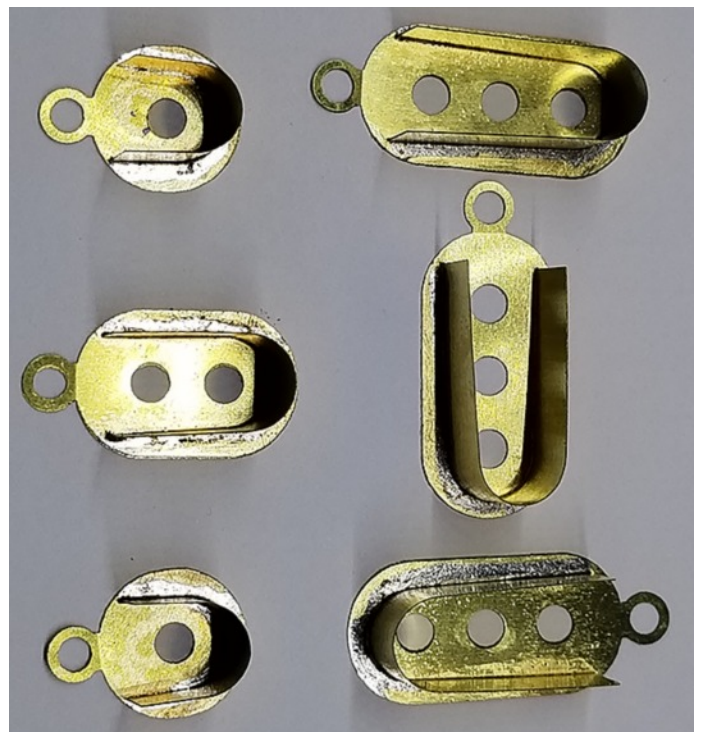
As you can see, I forgot to insert the platform supports and I had to start over again after taking this photo on the left.

You can now insert the target support arms in place and solder them. I use small pins on a cork surface to hold all the parts in place while I solder them. File away any undesired solder from the joints and set aside.

**2.- Prepare the targets:** In my designs, there are three target configurations... 1 light, 2 lights and 3 lights. Target hoods are a match with the targets. Match the hoods with the targets, and, using a round object like small tool handle, fold the hoods as shown in the photo below.



Using the cork board and pins, hold the parts in place and solder together.

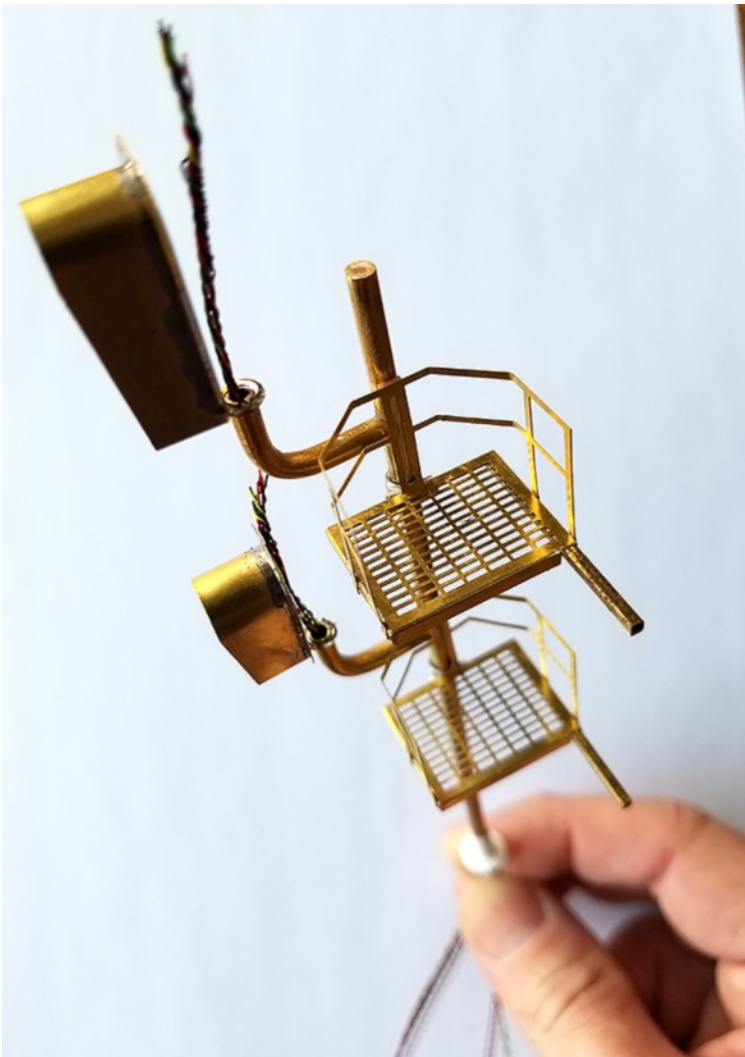




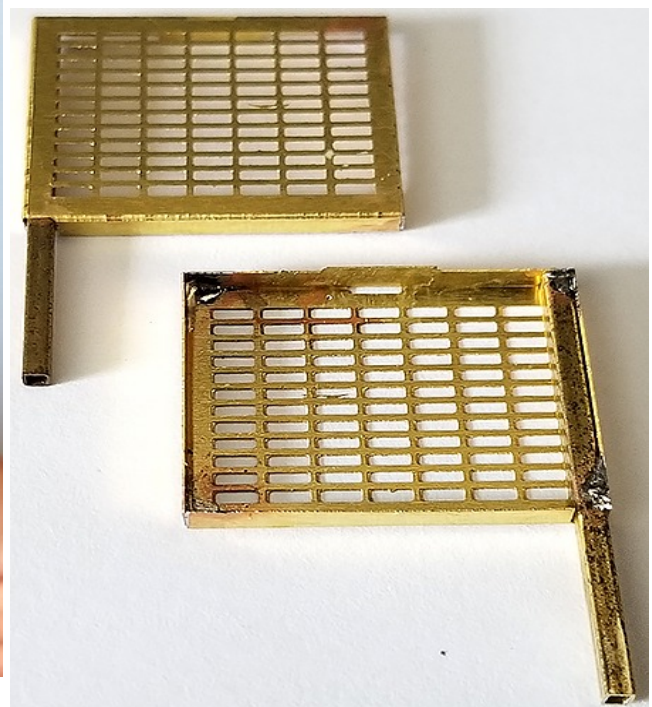
Now solder the target assemblies to their proper place on the signal mast.

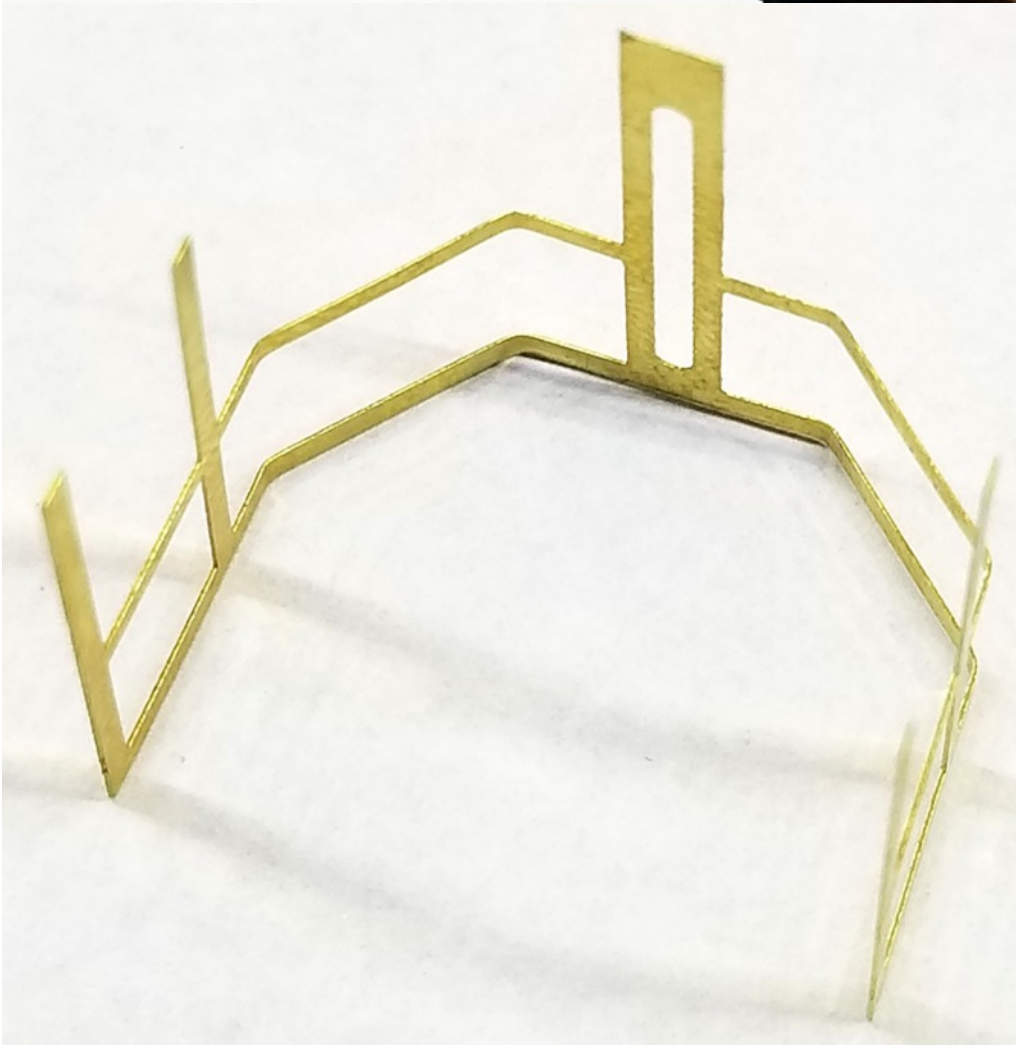
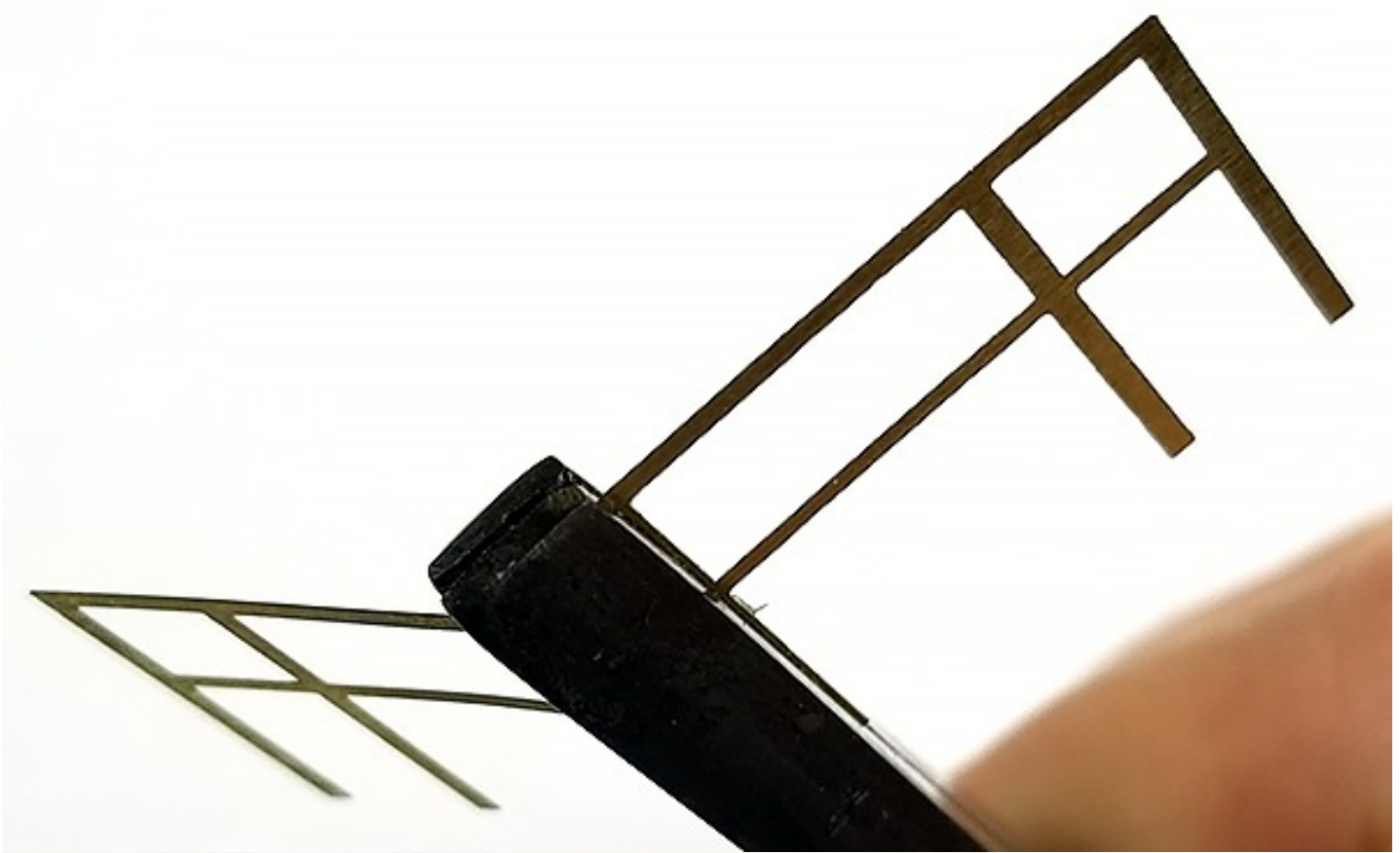
**3.- Preparing the platforms:** If you look closely at the platforms, you will see they have fold lines on one side. Again, this is where good planning pays off, as you now have to determine on which side of the track your signal is going to be, so you can place the ladder at the correct side of the platform. A signal place at the right of the track will have the platforms and ladder at the far right of the mast. This means the ladder support goes to the top right edge of the platform. See photo lower left.

With this information in hand, cut a small piece of square brass tubing and notch the platform edge where this brass tubing will be extending through.

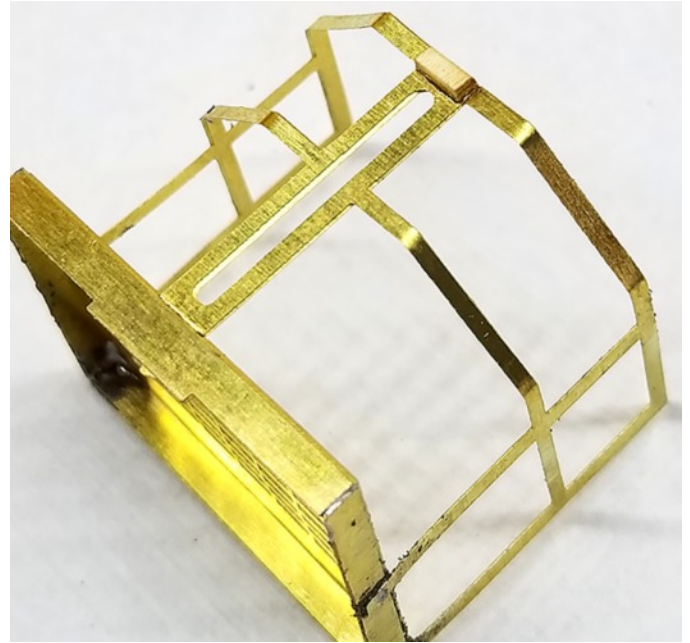
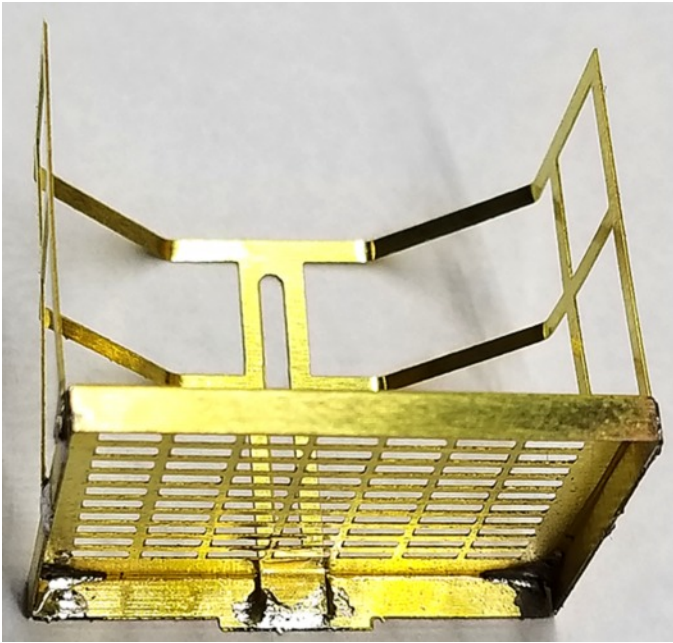


Fold the edges of the platforms at 90 degrees and solder all four corners. Place the small brass tubing and solder in place. To measure just how long the brass tubing needs to be and how long it must extend beyond the platform, cut a small piece of the Plastruct ladder to use as a guide. Always refer to your signal placement chart, identify each signal and double check to be sure of the platform and ladder position. For the ladder, I use Plastruct O scale ladder no. 90673.



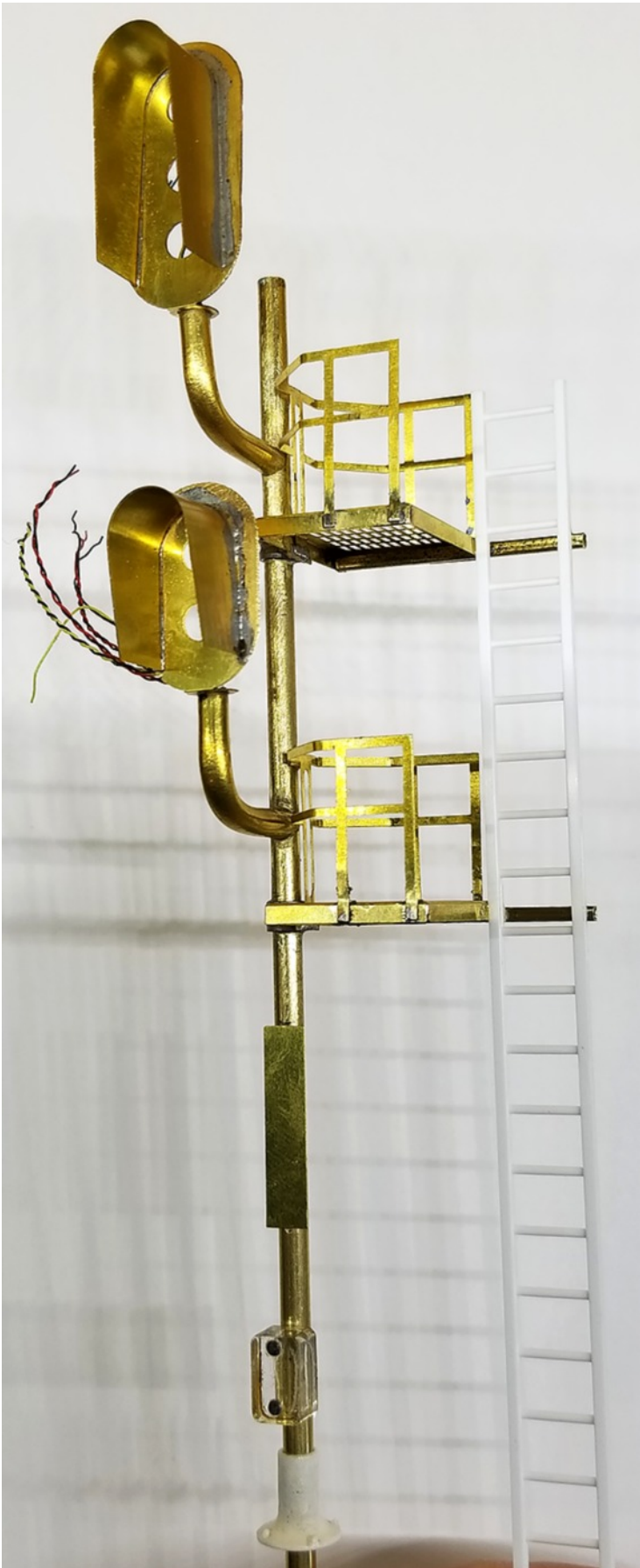


The railing around the platform is something that needs a bit of practice. I fold these by eyeballing approximately where I think the railing fits. I use flat pliers. See photos for reference.



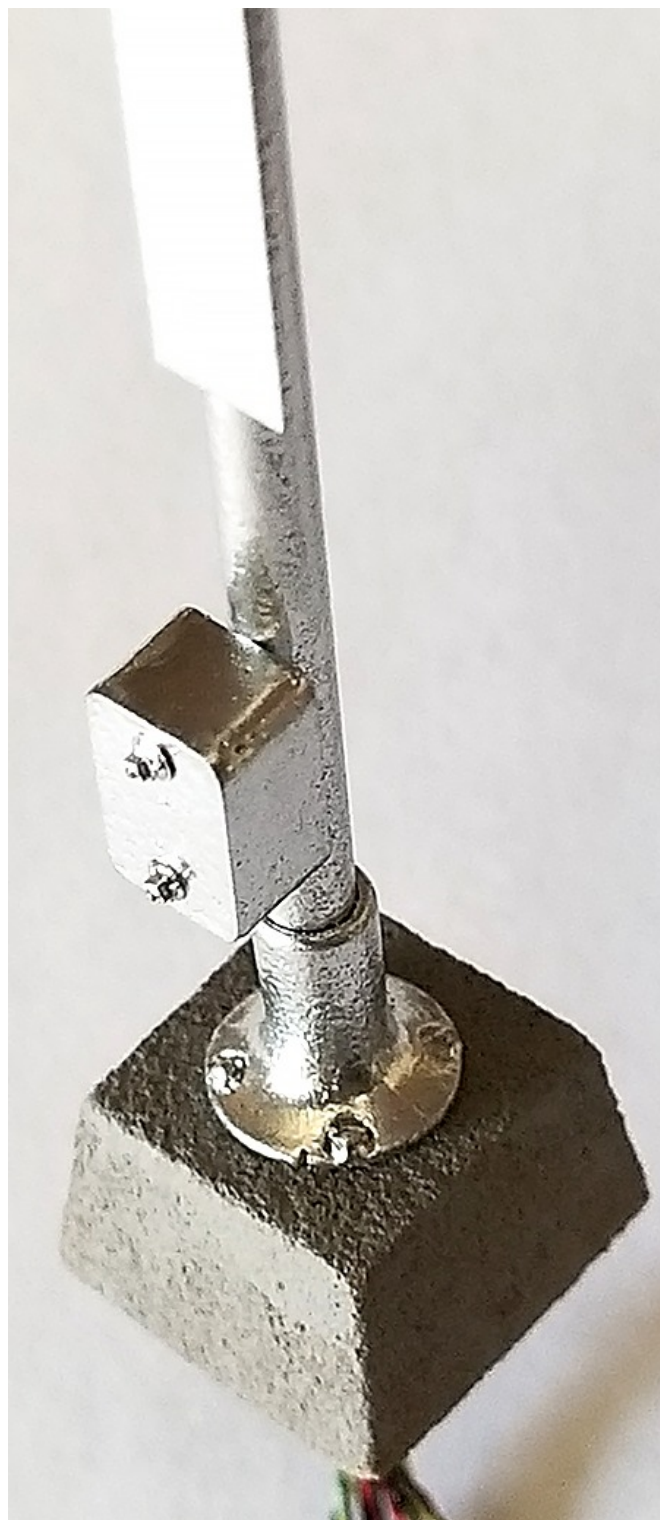
Once these are fitted, insert the center post of the railing in the small groove in the platform and solder. Solder both sides from the outside edge of the platform and file any excess solder.

Using C.A. cement or epoxy, glue the platforms to the platform supports on the mast, making sure they align properly so the ladder is not at an angle. Glue the ladder in place. This is also a good time to glue the number board. You can make a small junction box to place at the bottom of the mast, but this is optional. I made mine out of acrylic and glued a couple of nut castings to them for added detail. See pictures on next page.



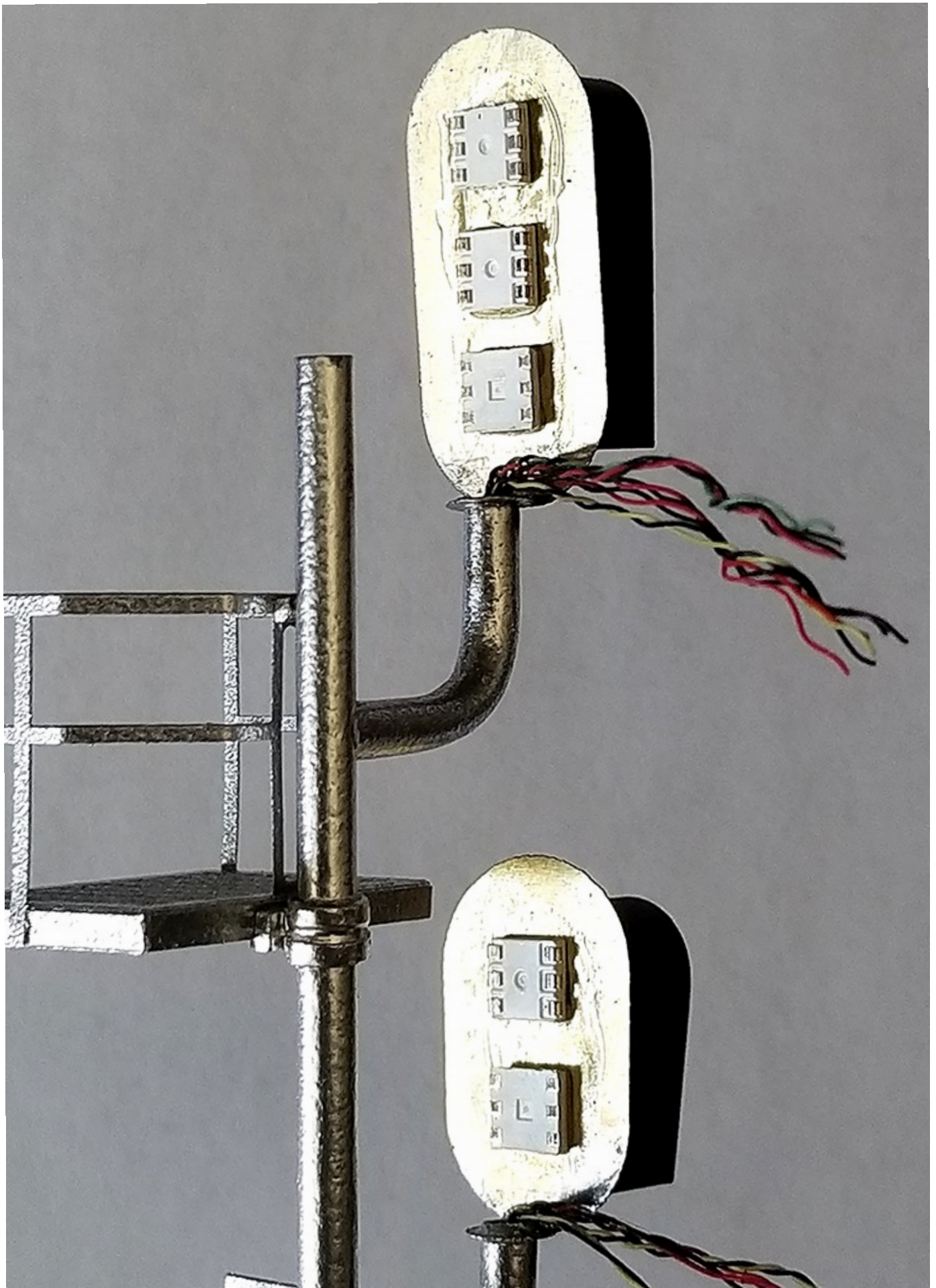


The signal is now ready to be painted. In an effort to avoid painting the colored wires, I inserted a small heat shrink tubing on them during the painting process. I first prime the entire assembly, then paint it silver. I then finish it with Testor's aluminum buffing metalizer which I buff with a small brush. The targets are painted with Tru-Color weathered black. I then make a small block to simulate the concrete base and paint it gray.



Next comes the installation of the LED's. I glue them with C.A. cement. One important step here is to check the polarity of each color of LED as some have the cathode marked while others (often from the same brand!) have the anode marked. Mark your own and place them so all the cathodes are on the same side. Then the hardest part of the job... Wiring the LED's.

There are no secrets to this, so if you placed the LED's correctly, solder the wires to the pads. These are small, so do not use too much heat for too long or you will damage the LED's. Trim off any excess wire, and then test each individual LED. On the next page is a sketch showing how the LED's will be connected to a terminal in a further step. This is only to give you an understanding of where the wires will go. See picture on next pages.

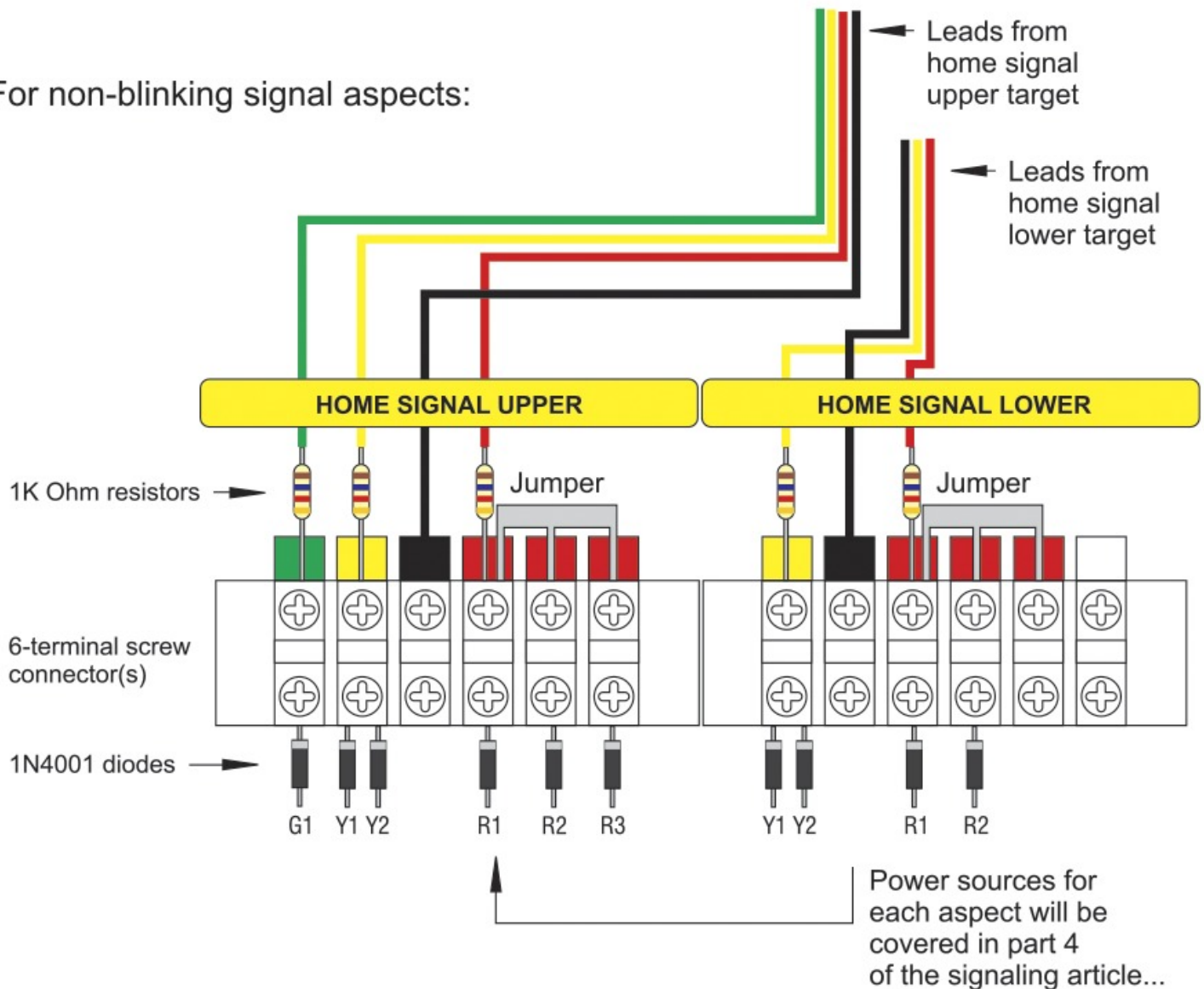


Once you are certain everything works, paint the back of the targets black, as well as the face of the number board. Install your signal number ID, which you can make out of old locomotive or car decals that have a bunch of extra numbers, or use a sheet of number decals available from various decal manufacturers.

## SKETCH NO. 5

### Connections of LED's of home signal 1234

For non-blinking signal aspects:



For blinking signal aspects, the additional leads will be wired directly to the flashing device's common and + voltage outputs.

#### Adding to the scene...

Signals on the prototype are usually accompanied by a signal bungalow. This is where all the electronic components of the signals are placed. Bungalows are usually temperature-controlled, keeping the heat out in

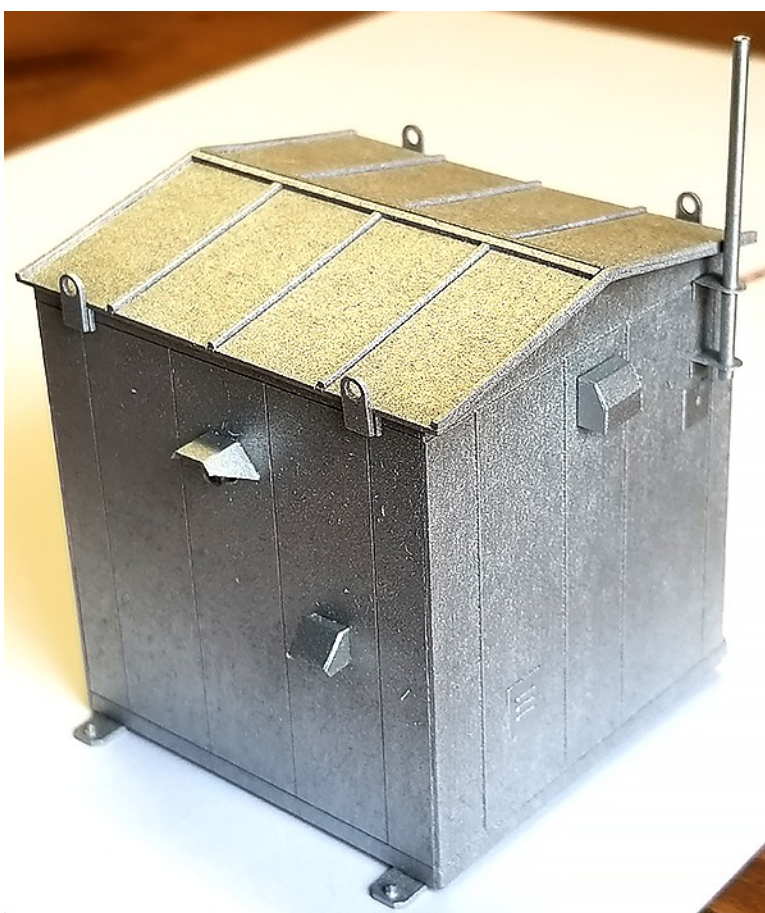


the summer, and keeping the components warm during the winter. These bungalows are locked and only accessed by the signal maintainer.

I built my bungalows out of styrene (or laserboard for later units) and added some brass details to them (this is where that brass etching system you just built start to come in handy!). I have attached all the design files below. Other parts include the door handles, which are locomotive door handles purchased from P&D, while the hinges are simply small pieces of brass rod glued in place. The electrical mast is 1/16" brass tubing. I also used some Archer decals for the louvers, and some bolts castings on the base plates. Various prototypes will have different designs, and some models have hip roofs also.



Each bungalow is usually identified by the controlled location it serves, by means of a label on the door or the side that faces the tracks. I added a white exterior light to mine, trackside. This light is on when the dispatcher locks the controlled location switches and signals, so a switching crew can easily see what is going on if the signals are dropped to red. In prototype operations however, this light is the "maintainer call" light, telling the signal maintainer to call the dispatcher. I was sure this feature had been phased out with the coming of radio communications, but a signal maintainer on the railroad where I work told me this was still the correct use for the light. Sometimes, when working outside, the signal maintainer might not hear his radio call, and could be placed in a position of danger. Turning on this light catches his attention and he will know the dispatcher is trying to reach him. Everything in the rule book makes perfect sense when you see the reason behind it! This is why I think the signal bungalow is an important item in the signaling system, and it adds another element to operations in addition to being a nice scenic feature.



You have now scratchbuilt your own signal. You can look at my signal photos for inspiration and general ideas for the different types of signal that I used for my layout. Now repeat for each signal on your list... Kinda makes you want to revise that list, doesn't it? Don't sweat it. It took me close to two years to build my complete signaling system including all the signals. (Now you know why I do not offer these commercially anymore!). This is a long process that can be a lot of fun if you take it one step at a time. The tools and skills you have developed with this experience will serve you well beyond making your signals. Now that you know how to etch brass parts, you will look differently at the possibilities of detailing that next car, loco, or structure! Since writing this article, I purchased a couple of SLA resin 3D printers and started learning how to design parts in 3D. I think this will open up a lot of possibilities for signal parts in order to make even better looking signals... but that is all too new to me to have any useful information to give you at this time.

In the next and final part of this series, we will be making some printed circuit boards for all the various components of the system and will be wiring everything up. Better get them signals built!!!

**The following files are available for downloading  
to aid in building and etching parts:**

[Bungalow brass parts.pdf](#)

[Bungalow structure.pdf](#)

[Signal parts - large target hoods.pdf](#)

[Signal parts - large target.pdf](#)

[Signal parts - platforms.pdf](#)

[Signal parts - railings.pdf](#)

[Signal parts - small targets.pdf](#)

[Signal parts - small targets hoods.pdf](#)

[Signal parts - large target hoods AI.ai](#)

[Signal parts - large targets AI.ai](#)

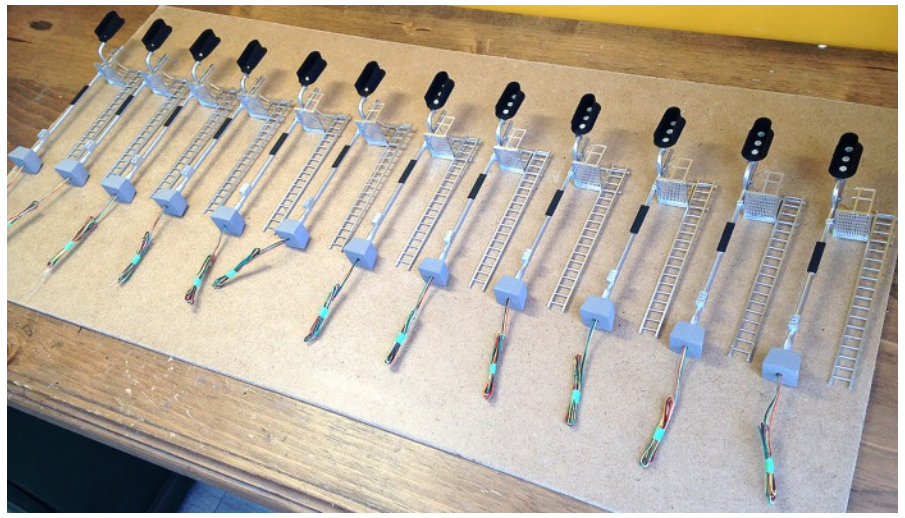
[Signal parts - platforms AI.ai](#)

[Signal parts - railings AI.ai](#)

[Signal parts - small targets AI.ai](#)

[Signal parts - small targets hoods AI.ai](#)







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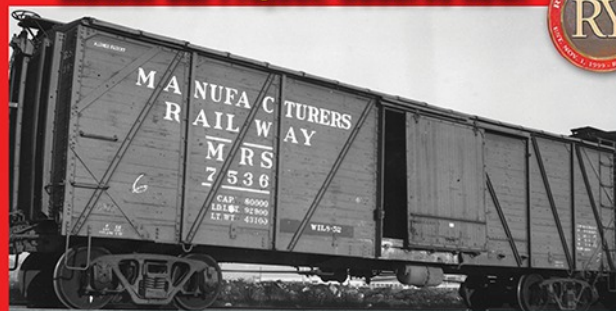
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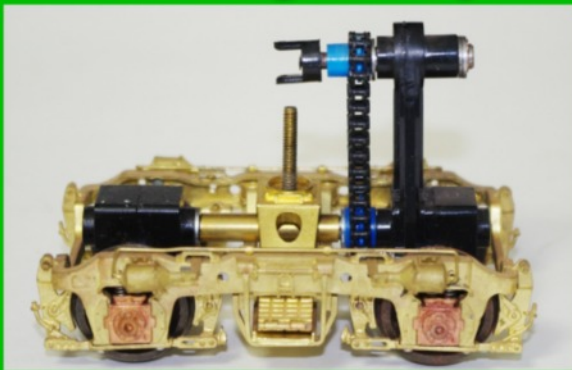


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# Notes On Building More Realistic Stone Retaining Walls

By George Paxon

I have a thing for stone walls. Over the years, I have built many of them on several layouts and tried many techniques for making them. I have rarely been happy with the results until recent times.

Where do you find stone walls? Well, just about everywhere in the “good ol’ days”. There’s still many of them around, too. At one time, most all building foundations were made of stone. Even brick buildings often had stone foundations under them. Farm fences were regularly made of stone that was removed from the fields following the spring thaw. Railroads, and highways, used a lot of stone walls to construct fills over which they operated. Railroads, and highways, had stone retaining walls above the tracks and roads as well in many locations to keep the rocks and mud from sliding down from the hillsides above and fouling the rail lines and roads. Bridge abutments, and even piers in the middle of rivers, were made of stone. It was one of the first, and probably most common building material, in past times. Concrete has surpassed it in modern times.

Stone was popular for many thousands of years as a building material because it was readily available, it was cheap, and it was extremely durable. Limestone, sandstone, granite, basalt, etc., were all used depending on what prevailed in the local area. A large force of expert artisans learned to work the stone into any required form. These stone masons were excellent craftsman and much of their handiwork survives to this day. When I was living in Turkey, I found Roman retaining walls along their ancient roads that were as functional then as they would have been 2,000 years ago.

And there are several kinds of stone walls. Some are made of cut stone. These are carefully shaped blocks, usually all of the same size, that were used in very up-market building projects for several centuries. Many fine buildings and retaining walls were made this way. Railroads, such as the wealthy Pennsy, built massive and enduring structures such as the multi arch bridge at Rockville, Pennsylvania from cut stone. Many retaining walls along the main line of the Pennsy in the mountainous Pittsburgh area were carefully crafted of cut stone. The famous Starrucca Viaduct on the Erie was another example of superb cut stone workmanship.

Rough stone – stone roughly cut to size, but not finished – was probably the most common of stonework. Many of the railroad retaining walls were of this construction. Driving along Highway 6, I think it is, in Clear Creek Canyon west of Denver, Colorado, between Golden and Idaho Springs, you can see many of the stone retaining walls used to keep the Colorado Central (which eventually became the Colorado & Southern) out of the creek. Another great bit of stonework was the Ohio Pass extension on the Denver Leadville & Pacific constructed while trying to build its still-born westward extension. Both these examples of stonework date to the 1880s and are still standing today.

Some stonework was laid with mortar and some was dry laid. Dry laid stonework is just fitted and stacked without the use of mortar. This was a common approach for retaining walls both below and above tracks. The Colorado examples I mentioned above were both dry stonework.

Generally, cut stone was laid with mortar. The ancient pyramids in Egypt were an exception, I believe. I think they were constructed of many carefully cut and fitted stones, but were dry laid. Rough stone could be either laid with mortar or dry laid.



Photo 1 is a nice example of a dry laid stone wall that exhibits many of the features we shall talk about shortly.

And have a look at Photo 2 (next page) of a mortared rough stone viaduct built along the Monongahela Railroad near Brownsville, Pennsylvania. Note the use of brick for the arches which provides great contrast to the stonework. I definitely need to model this very nice structure somewhere on my Mountain Electric. I am currently trying to work out where to put it. This will provide a project to allow me to try my hand at some improved mortared stonework.

### **Modelling Stone Walls**

Carved walls, as far as I know, was the earliest modelling technique. John Allen did many by carving joints between stones in plaster. Another method was by carving in linoleum. You could find some of these walls in *Model Railroader* in the 40s and 50s. Some modellers have made individual stones of card or styrene and glued them to a flat panel for their walls.

I have tried carving in plaster and it is a messy and laborious job.

A common problem with all these techniques above is that the stones usually all have a flat face. Some walls were built of smooth faced stone, but most such walls had stones with a rough face- either naturally rough or tooled. Some modellers with an artistic bent spent many hours adding apparent depth and texture to the faces of these flat stones with paint. The result looked fair in photos, but not all that good when viewed up close and personal.



**Photo 2**

Another problem was that the stones were usually too large using these techniques.

By the 60s, the stone wall modelling methods had evolved to casting them. Various suppliers over the years of cast plaster wall section have come and gone. Some products were good and some were bad. Some had interlocking edges, which was a nice feature, to avoid the rather un-prototypical vertical joint.

The current Chooch flexible wall sections are a recent innovation and allow a modeller to have nice curved stone walls.



**Photo 3**

Some of the cast wall products did a good job or representing mortared stone walls. I was never happy with the cast walls for dry stone walls as they still did not look realistic.

Photo 3 is of a cast dry stone wall on my old narrow gauge layout. It just did not look the part to me.

Finally, I decided to have a go and try building a dry stone wall the same way a prototype wall was built—stone by stone. It sounded like a lot of work at first, and I had some initial

misgivings about taking on the project. But with a bit of thinking, and being the lazy bugger I am, I managed to make the process more efficient. I eventually worked out that the biggest trick is to control the size of the stones, particularly the thickness. A prototype stone wall has relatively level rows of stones. Not all stones are the same thickness in a rough stone wall but the rows are still reasonably parallel to each other.

My first few attempts were based on pouring some plaster onto a sheet of wax paper, letting it dry in a thin sheet, then breaking it up into small pieces. The resulting stones were not appealing. They were all sorts of shapes and building a wall with them was a terrible chore. It required an awful lot of work and it was difficult to get a large percentage of very small stones this way. And, at first, I built walls with the stones of raw plaster and attempted to color the wall later. This resulted in a wall with an unsatisfactory and unrealistic look. Did I mention that I ain't an artist?

After much thought and trial and error, the following technique has evolved.

I pinched a round aluminium cake tin that my domestic manager had once used to make layer cakes. She had a very nice square pan that would probably have worked even better, but I got my hand smacked when I got caught scrounging around in her kitchen for that one.

The next step is to pour runny plaster into the shallow pan. But the secret here is to pour to a controlled thickness. I pour my plaster 1/16 inch thick, 1/8 inch thick, 3/16 inch thick, and 1/4 inch thick. The control of the thickness is important to making the wall building task easier later as we shall see. The plaster needs to be runny enough so that it will self-level in the pan with just a little help. Gently shaking the pan from side to side will level the runny plaster quite nicely. Put a little piece of masking tape in about three places around the inside of the pan to mark the thickness and pour plaster to the tape. Using three bits of tape also help you to keep the pan level, as if you don't, your plaster thickness will vary all over the place.

After pouring, I monitor the drying process for about five minutes or so, and when the plaster has set but is still soft, I scribe parallel lines in the top surface of the plaster. This can be done when the plaster is still in the pan. But to get the lines straight and even, I find it best to turn the pan over and tap the bottom a bit to let the sheet of plaster fall out of the pan onto a soft surface. A few thicknesses of old rags work well here to give the still fragile plaster a soft landing. You then can do the scribing without having the interference from the sides of the pan.

I scribe my lines about 1/2 inch apart. If these lines are too close together, the next step will be much more difficult. Make the scribe lines fairly deep by making several light passes.

I then snap each row off the sheet. This will be increasing more difficult as the plaster gets drier and harder, so some trial and error tinkering is required to work out the correct time to do this. I find I can usually begin this as soon as I have finished the scribing. Quite a few of the rows break clean along the scribe lines. Sometimes they do not, but the material is still useful. If a chunk breaks off with multiple rows, just break it up along the scribe lines as well. By letting the plaster dry somewhat the breaking will produce a nice rough edge where the break has occurred. This rough surface will provide the needed rough face on the stone.

When all the rows are separated, I then snap along each row to produce individual stones. These I break in pieces from 1/16 inch long to 1/2 inch long. The thicker the plaster, the harder it is to make very short stones. I sometimes use heavy tweezers or even long nose pliers to grip the end for this stone making step. You do not need to squeeze the pliers, as if you do, you will convert a potential stone into plaster dust. Just use the pliers and/or heavy tweezers as a lever to break off the plaster. Using the tools creates a fracture line in the correct place and makes breaking the smaller pieces easier. The risk for this step is in making too many large stones. You need a high proportion of small ones. It is tempting to make them large as the larger the stones, the sooner you get through this rather monotonous part of the work. But, persevere, and get a high proportion of small stones if you want a good looking dry stone wall.

When all the stones are broken, I color them. To do this I make up a solution of my basic earth color using latex or acrylic paint thinned about 6:1 with water. I put some of the thinned paint in a jar, pour in as many of the stones as will fit, put on the lid, and swirl and shake the jar to ensure the paint has completely covered all faces of all the stones.

Then strain out any remaining paint to be used for the next batch of stones and dump the resulting mess out onto some newspaper and let dry. I have an old slotted cooking spoon – again liberated from the kitchen when wife was not looking – and use it to stir the stones as they dry to keep them from sticking to the paper. After a bit of drying, I start the weathering process by spraying the stones while still on the newspaper with some black shoe dye thinned in metho-alcohol. Stir the stones and spray, stir the stones and spray, etc. Then let them dry again.

When freshly painted using the thinned earth color paint, the stones are all the same shade and look flat, dead, and uninteresting. Once the thinned shoe dye is added the stones begin to acquire some individuality. They do not all appear to be the same color and some have dark areas where the dye had run into crevices and dried. Any white spots or lightly painted areas soak up more dye and are darker when dry.

And, for a few batches you can vary the basic earth color by adding some tube type artist's paint to the jar of earth color paint. Brown, dark red, and yellow added to the earth paint will provide a bit of variety in the basic color of the stones.

I do the above in batches until I have a good quantity of stones. It is not all that laborious, and only takes a few hours to produce a substantial supply of stones. The longest step is waiting for the painted stones to dry. Hard to do much else then because I find it good to give them a stir now and then to keep the smaller stones in particular from sticking fast to the newspaper.

When all dry, I store the stones in a large, gallon sized, plastic jar.

Now we need to prepare footings for our stone wall. The footing is important. No stone mason worth his salt would build a wall without a proper footing and neither should you. The footing provides a level starting point for your wall. You should rough out the shape of the wall using a marking pen and then add some horizontal strips of wood to provide the footing. Just keep the footing below the areas where the wall will be exposed. Where the bottom of the wall is sloped, step up the footings as would be done in the real world. Step up the wall in multiples of the 1/16 inch stone height increment, i.e., make the step up 1/8, 1/4, 1/2, 3/4 inch, etc. This will make stone laying easier later. I just rip some strips from an old board lying around, cut it to lengths as required, and glue and clamp them in place for my footings.

Now we can become stone masons. I get out my gallon jar of stones, pour some out into the lid of the jar, get a bottle of white glue and tweezers, pour myself a glass of red wine, and start laying stones. You would be surprised how fast the work goes. Select stones to provide a varying width placing them on the wood strip footings such that the 1/2 inch dimension (this was the width of the scribe lines on the plaster sheet) is the depth of the wall. This will mean a broken edge becomes the face of the stone. I start with a few 1/4 inch high stones, then put a 1/8 inch high stone one on top of another here and there in the row. A 1/8 inch high stone with two 1/16 inch high stones on top somewhere in the wall will really add variety, as does a 3/16 high one with a 1/16 high on top. Do just a short run of wall to start with. Then, do the next row on top of the first. Select stones with a width sufficient to overlap the joint between the stones on the first row. Keep raising the wall. Make some rows with mostly 3/16 and 1/8 inch high stones using a 1/8 and 1/16 inch high and two 1/16 inch high ones here and there. Play with it at first to get the correct look. Occasionally, I lay a stone sort of on end with the height being then greater than the width. And once you get into the swing, the wall will go up at an amazing rate. Having the stones of a discreet number of thicknesses makes it simple to keep each course level. If the stones are all random thicknesses, it would require quite a bit of trial and error stone selection and placing to get one of the correct height to keep the row level. And if you place the wrong stone and decide to change it, the

stone will probably have glue on it which needs to be wiped off before putting the stone back into the pile in the jar lid. Having only the four different heights makes it easy to select the correct one for the next position.

I tend to run a line of white glue at the very top back of the previously laid row of stones and set each top stone down in place with the tweezers in the glue. Sometimes a stone will be stubborn and it will be necessary to put some glue on the stone itself before placing it in position. But take care to keep the glue from the faces of the stones and your dry laid wall will look very natural. One other advantage of having the wall 1/2 inch deep is that there is sufficient room for gluing and it is easier to keep the glue toward the back of the stones and avoid much of it oozing out onto the face.

I am mostly into dry stone walls. But, I do not see why you could not use a grey contact cement for glue and lay the wall as if it were mortared. In this case, you want the “mortar” to be a bit further toward the front of the wall and be seen. One issue is that most of the grey tube contact cement I know of is a builder’s adhesive and it very sticky and probably difficult to control. But I might have a go at it one of these days and see how it works. I would use a water based adhesive and try diluting it with some water to make it more manageable. Where stone walls were used for building foundations they would almost always be laid with mortar, so having a try at using the grey adhesive and having the adhesive show as mortar would be a good way to model such stonework. Same goes for a bridge pier as it would require mortar.

I find it best to run about five or so rows of stone and then take a break. You need to get away from such an intense project once in a while to keep it from driving you bonkers. And, it gives the glue some time to dry. If you build the wall too high in one session, it may collapse. Letting the glue dry a bit solves that problem. If you are building against a solid backing you can go quite a bit higher without much danger of the wall failing before the glue has time to set. Taking a break also gives me a chance to recharge my wine glass so all is good.

Top capping. Sometimes a stone wall had the top row formed of largish and often similar sized stones to form a bit of a decorative capping. Often, this row of stones was set out just a little from the wall as a feature. To do this, I go through my stone jar and select special stones for this top row.

After laying the stones and letting the glue dry, weather the wall with washes and chalk. Such stone walls were usually built from stone gathered locally. As a result, it should have a similar color to any surrounding stone. An exception to this would be if the stonework was very new it would be much brighter in color as the surrounding stone would be weathered and the newly constructed stonework would not. Look at a recent cut when driving along a highway and you will see what I mean. After a few years the stonework will weather as will and look pretty much the same as the surrounding stone.

I make washes by diluting some artists tube paints with water and brushing them over the stonework and any surrounding stone to get the color about the same. Sometimes I spray more of my black shoe dye in metho-alcohol on the face of the stone work, pointing the nozzle in an upward direction to get some of the black dye on the underside of stones as it helps give a shadow look.

I have used a small paint brush and added some color to random stones. I used dark red, brown, and yellow artist tube paint well diluted with water for this.

Finally I work some powdered chalk into the stones here and there. Green chalk can give the impression of moss in wet areas or where the shade is heavy. Brushing black chalk vertically below bridge ends, or where water might have run add a lot of realism. If the bridge is rusty steel, you could use brown or even a little orange to indicate rust running down from the bridge steel above.

When happy with the color, spray the wall with a flat finish after weathering and this will seal the chalk and kill any shine should there be any errant glue.

Drainage behind a retaining wall is very important. If water is trapped there it can develop hydraulic pressure sufficient to push over the wall. It also saturates the soil behind the wall making the soil unstable and placing much greater strain on the wall. A dry stone wall provided a good bit of opportunity for any water behind the wall to escape through the wall and move to lower ground. Any mortared wall definitely must have provision for drainage either by leaving holes along the base of the wall or by providing a culvert to take the water away. Sometimes the drain is behind the wall and exits parallel to the wall at the downhill end of the wall. But where there is a chance of significant water runoff, a culvert is installed through the wall to channel this water and avoid it saturating the soil behind the wall or washing the wall away. Such a culvert is an easy and neat bit of detail. I use a bit of a plastic tube such as water pipe or electrical conduit for this. I ream one end to make the culvert as thin looking as possible, paint it black inside and out, and build it into the wall. If the stone wall is against a solid backing just drill a hole through the backing about the size of your culvert, glue the culvert in place allowing it to protrude out past the outside face of the wall, and build the stonework around it. You can let the open end of the culvert fall a bit to help it take away the water.

Nice arched culverts can be made in O scale using HO tunnel portals and wing walls. But they are better models of mortared walls as they lack the air space between stones that a dry wall should have.

I have included a few photos of stone work I am doing using this technique so you can be the judge of how closely it resembles prototype dry stone retaining walls. The first, Photo 4, shows a large wall that serves as a combination retaining wall and bridge abutment. This photo was taken just after the scenery plaster and rockwork was installed under the wall to cover the stripwood footings and with some of the vegetation added. More vegetation and trees will soon be added. The second, Photo 5, shows a small retaining wall above the tracks to prevent rock and mud from sliding down onto the right-of-way. And the third, Photo 6, is a small below track retaining wall, located just below the wall in Photo 5, that includes a drainage culvert. You might notice that the wall in the second photo was built into the surrounding rock ledges and uses the existing ledge as the footing. All these walls will get more vegetation and probably more weathering.



An extra bit of nice detail is to have some water running out of a drainage culvert. To do this, I cut a tapered piece of scotch tape or very thin clear plastic. Glue the wide end of the tape or plastic to the inside bottom of the culvert. Then bend the tape down and glue the thin end to the scenery directly below the culvert. When dry, carefully drip just a little clear gloss on the wide end of the tape or plastic and the culvert and let it run down to the scenery below. Let this dry well.



**Photo 5**



**Photo 6**

You can then add a little more clear gloss if needed to give the water some shape and get away from the flat tape look. You can't rely on the stickiness of the tape to hold it to the culvert. I have had it come lose when applying the gloss so I glue the ends with ACC when installing it.

Such rock walls are not difficult to make, and I believe they look better than those using other available methods. You might give the process a try on your layout.

If you come up with a good approach for doing a mortared rough stone wall, share it with us. I certainly am interested in knowing more before I tackle my model of the Monongahela Railways stone viaduct (Photo 2) that I would like to build for my Mountain Electric. And I am sure other readers of *The O Scale Resource* would be interested as well.

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# LET'S MAKE SOME COAL LOADS

By Dan Dawdy

Over the past few months I have gotten rather ambitious and started painting a lot of older KTM/Max Gray hoppers that I have accumulated over the years. There are five types in all, and all will be in my own road name. I did some research in an old "Car Builders' Cyclopedia" for the proper, or close enough, data and dates as I was going to have decals made along with a different number series for each car type. If there is any interest, I can do a write up on getting these cars ready, painted and decaled later, but for now, let's make some coal loads.

First off, I did not invent this idea. I saw some videos and added a few of my own ideas. If you have a different way, please share with us. The picture below shows what I used: scrap 1 inch foam insulation (you can buy smaller sheets of this in most big box stores, and 1/2" will also work depending on the car); ruler, cheap paint brush, tooth picks, paint and coal. Not shown is a box cutter that makes the cutting of the board less messy as well as a Stanley Surform Shaver you will see later in the article.

Do not try to use regular styrofoam as it's too soft and a total mess to work with.



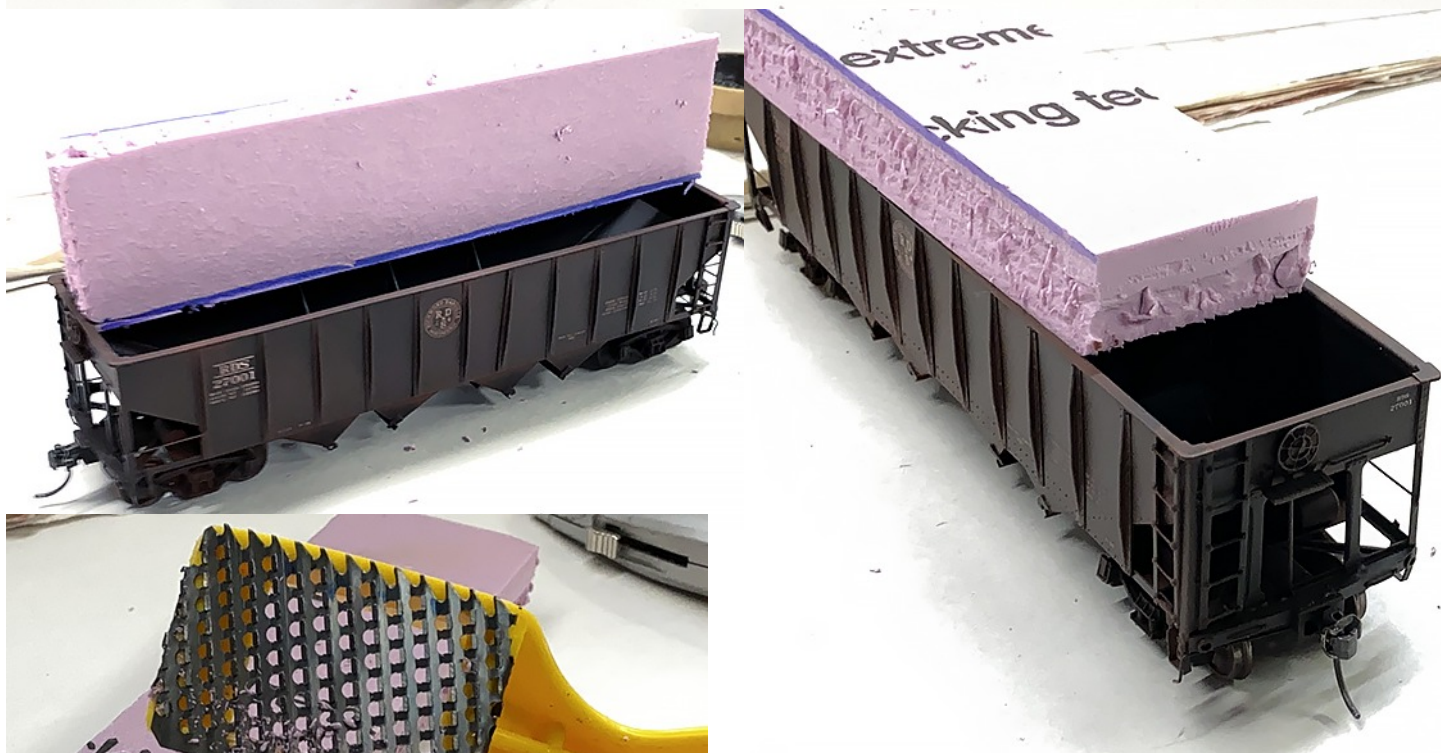
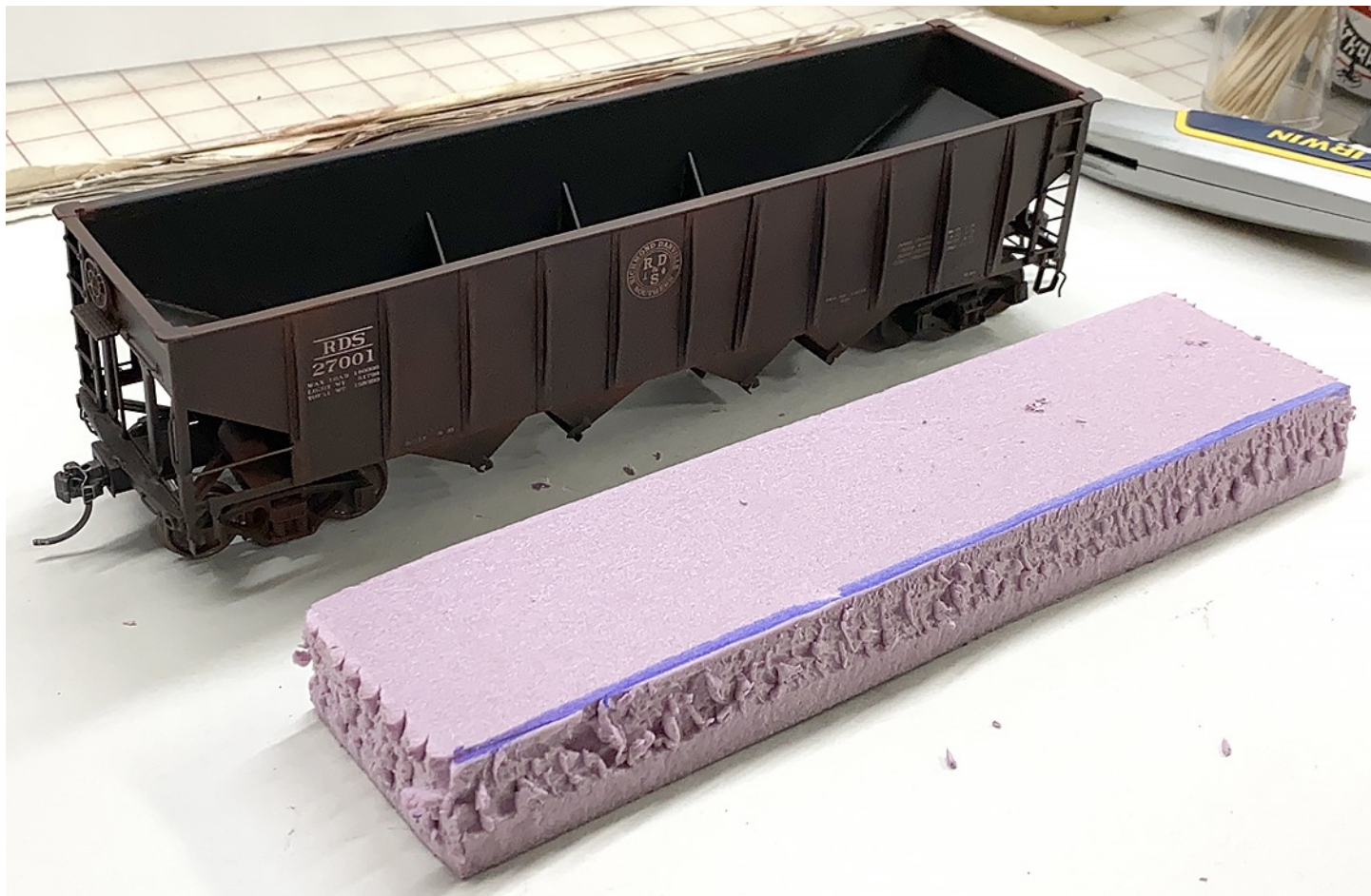
The paint I like is artistic acrylic that comes in a tube. Not oil, but acrylic. Hobby Lobby and Michaels all have coupons so it's really inexpensive. Also shown is a basic acrylic like you can buy for under a buck at Walmart and other outlets. I prefer the artistic acrylics as they are thicker and not as runny.

As for coal, I went with Brennan's "Famous Reading Anthracite Coal" since I wanted, well, real coal. I bought extra large to simulate mine run coal. Some large mines had breakers on site to load different sizes of coal depending on its intended use. Many did not, and the coal was sent off for farther processing.

Step one is to roughly measure the inside of the car. Go just a bit larger as it's easy to shave down.



Next, draw the size on to the foam board, and using a box cutter, cut to size. My box cutter did not go all the way through, but enough that I could snap my piece off. You can buy special saw for this, but it's messy.

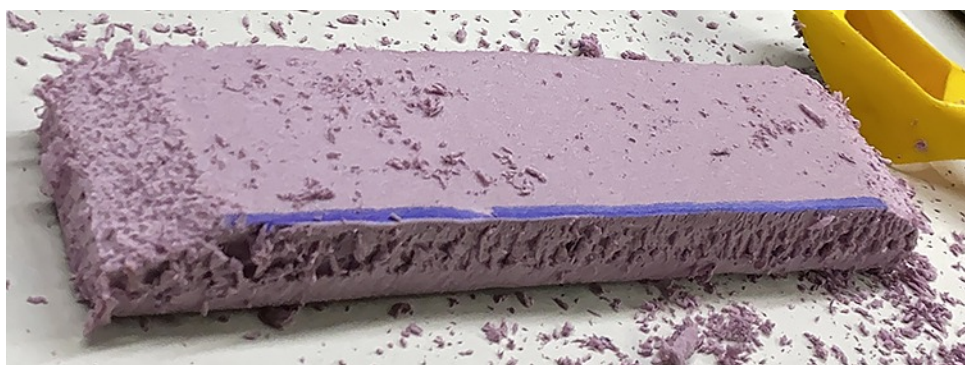


Once cut, you can see I'm a bit too long and wide. That's fine as now I'll stat the shaving. I found the

Stanley Surform Shaver on Amazon and it works very well. A rasp file will also work. Here is where the mess begins.



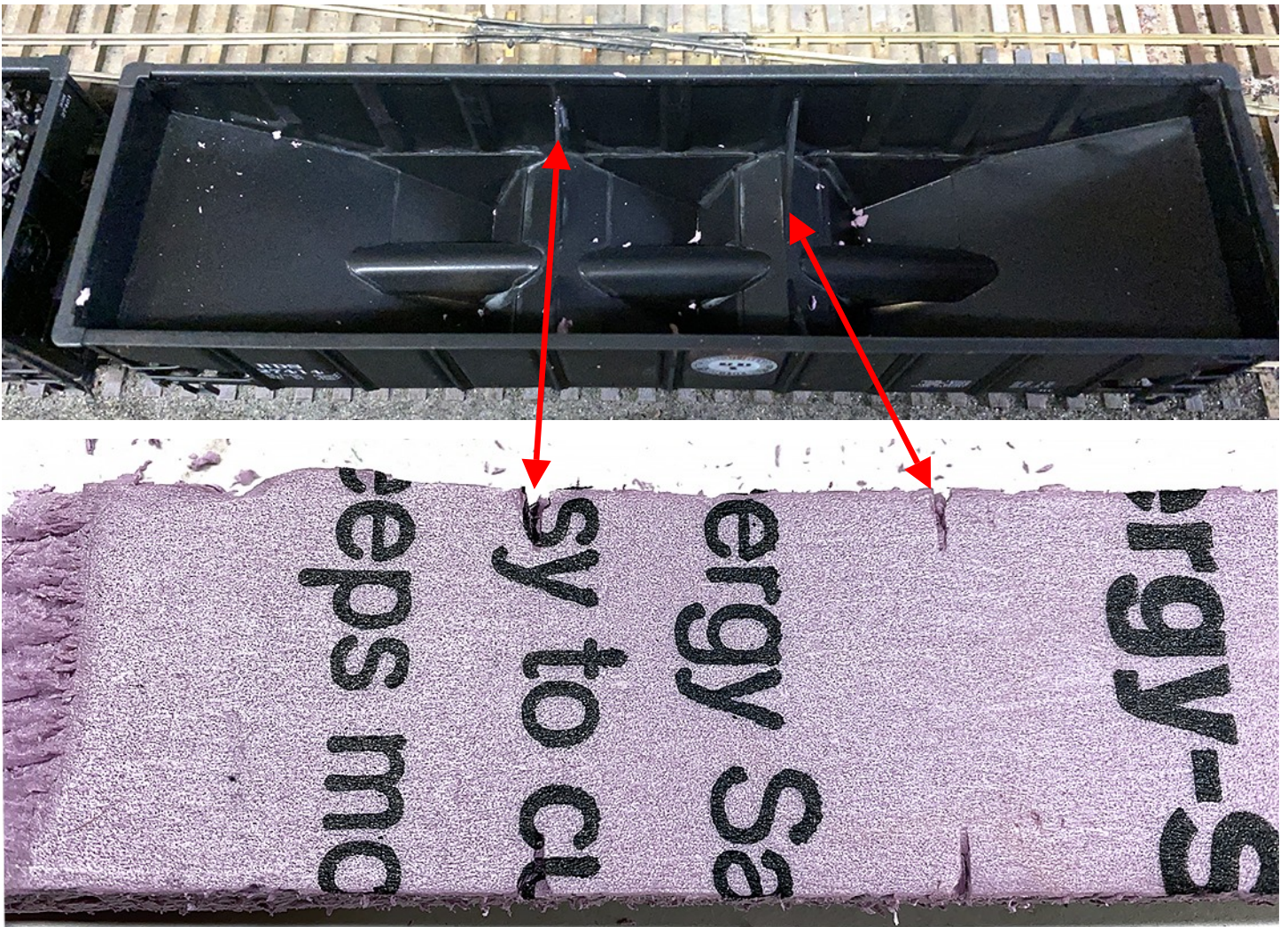
Trim the ends to fit. If you are going to want to remove these as part of your operations, you don't want a tight fit. I'm not going to remove these, so a snug fit is what I went for.



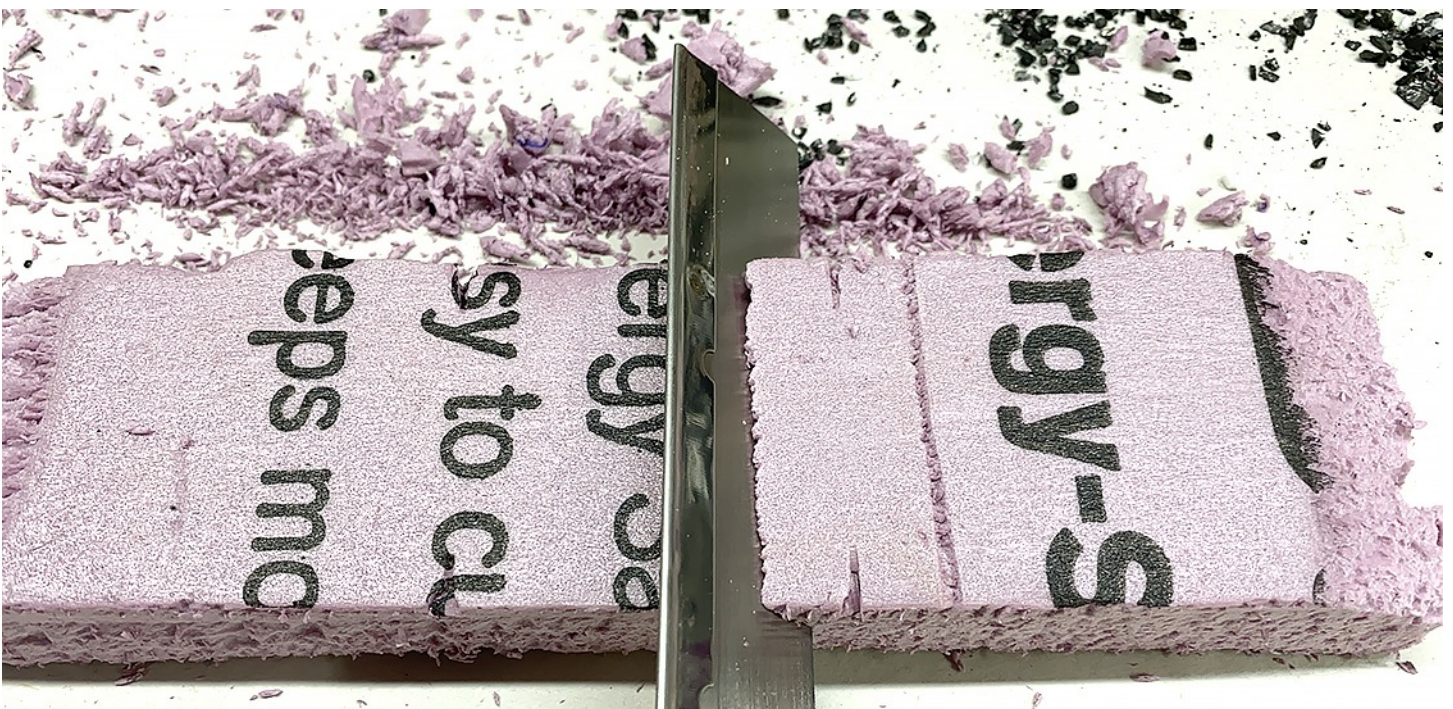
Depending on the type of car, you may have to angle the bottoms to fit the slope on the inside of the hopper. No one will see this part, so just remove the material. It's not going to be pretty.

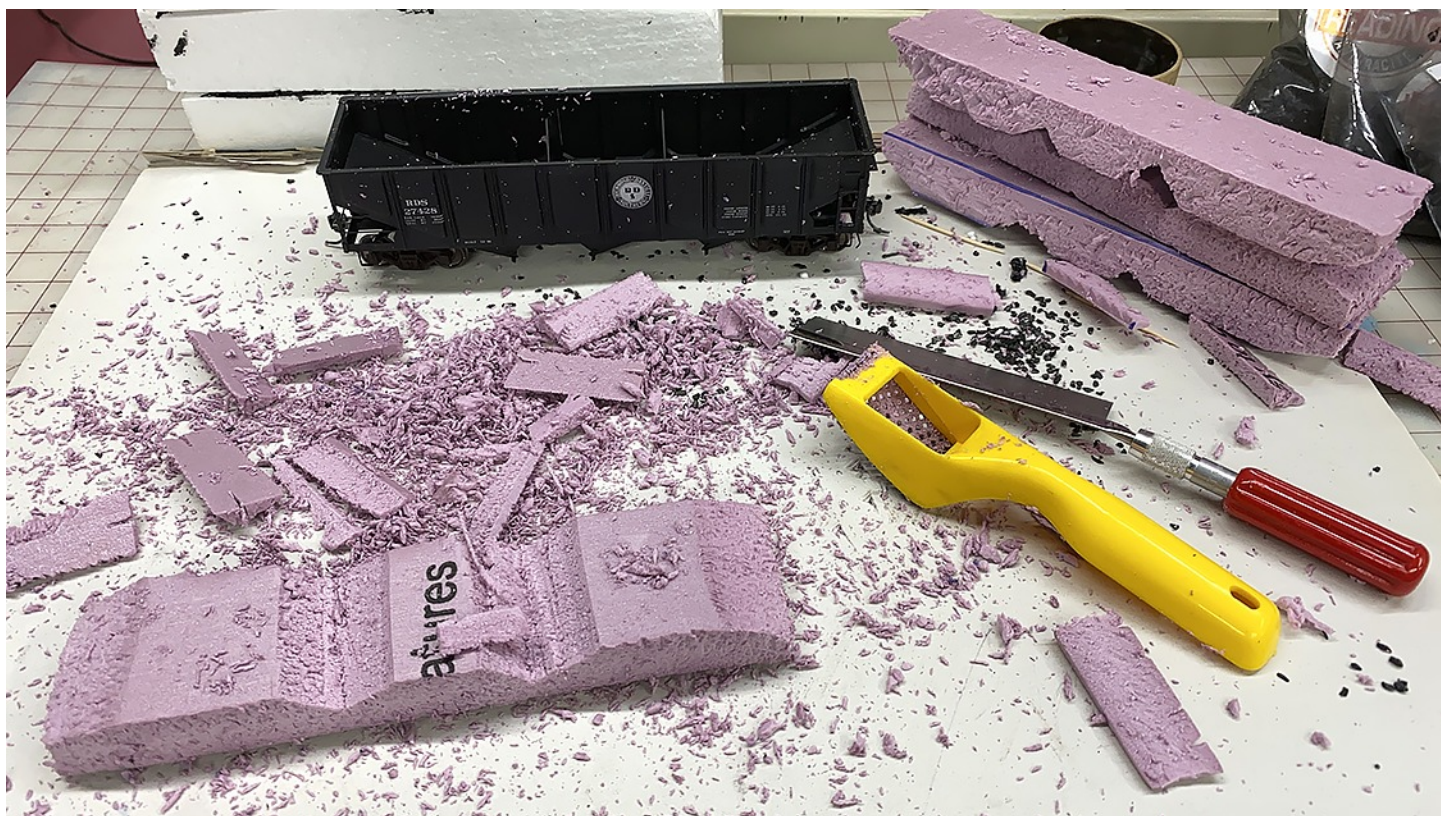


Next, push the foam into the car to test the fit. Some cars have a gusset that will hit the foam stopping it from going down far enough. See picture on next page.



By pressing down the gussets will leave a mark on the foam. I just do a quick angle cut to remove material and clear the gusset. There is no precision involved here as no one will ever see it.

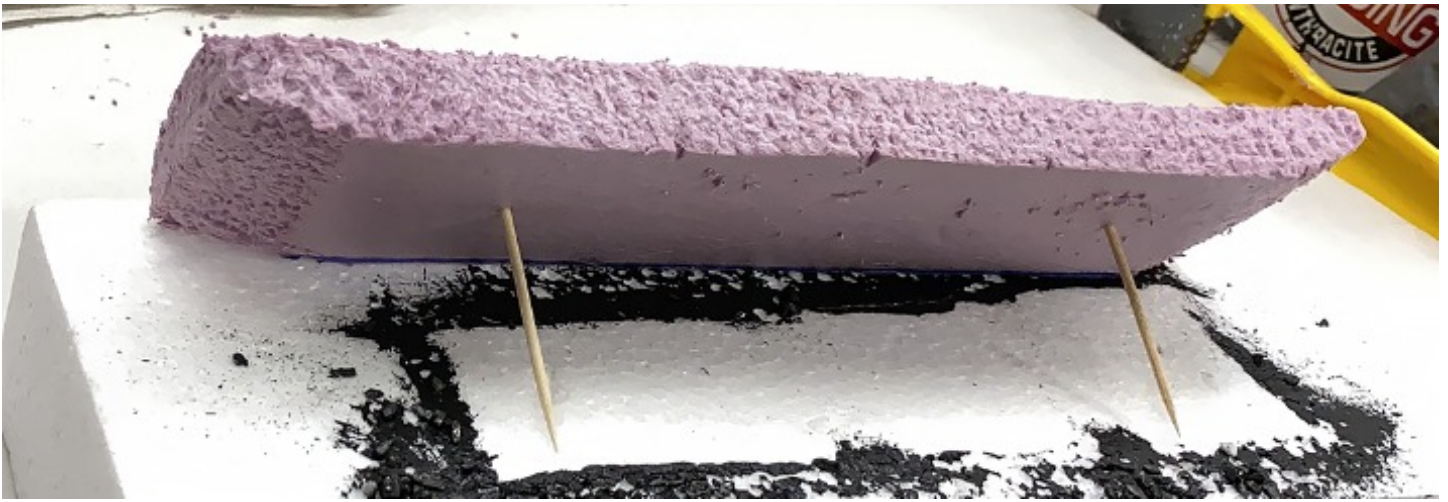




OK, the picture above shows the mess and four boards almost ready. The last thing we need to do is round off the top to look like a load and not simply a flat surface. Again, don't get too worried about the look.

The last step is to shape the foam board to give it a contour to look like the coal was dumped into the car. This will vary based on location and time period. Again, it's what looks good to you and if you're not sure, head to the the Internet and search for pictures from the era and location you are modeling.





Now do a quick vacuum of your work area as well as vacuuming the final piece before moving on to the next step.

The picture above shows the board ready for painting. I used tooth picks stuck into the foam board and then stuck it on to Styrofoam blocks. This just allows me to paint and add the coal without getting my hands full of “stuff”.

Below are four sets ready for painting. Note the picture below was shot after the painting pictures on the next page. I found out that by mounting the foam directly on to another piece of foam the paint would seep



under and not fully dry. It also acted as a glue of sorts so you would have to pry the two parts from each other. So, for the next batch, I used wax paper between the coal load and the foam mounting board. The following painting pictures don't show the wax paper, but it was so much easier with it.



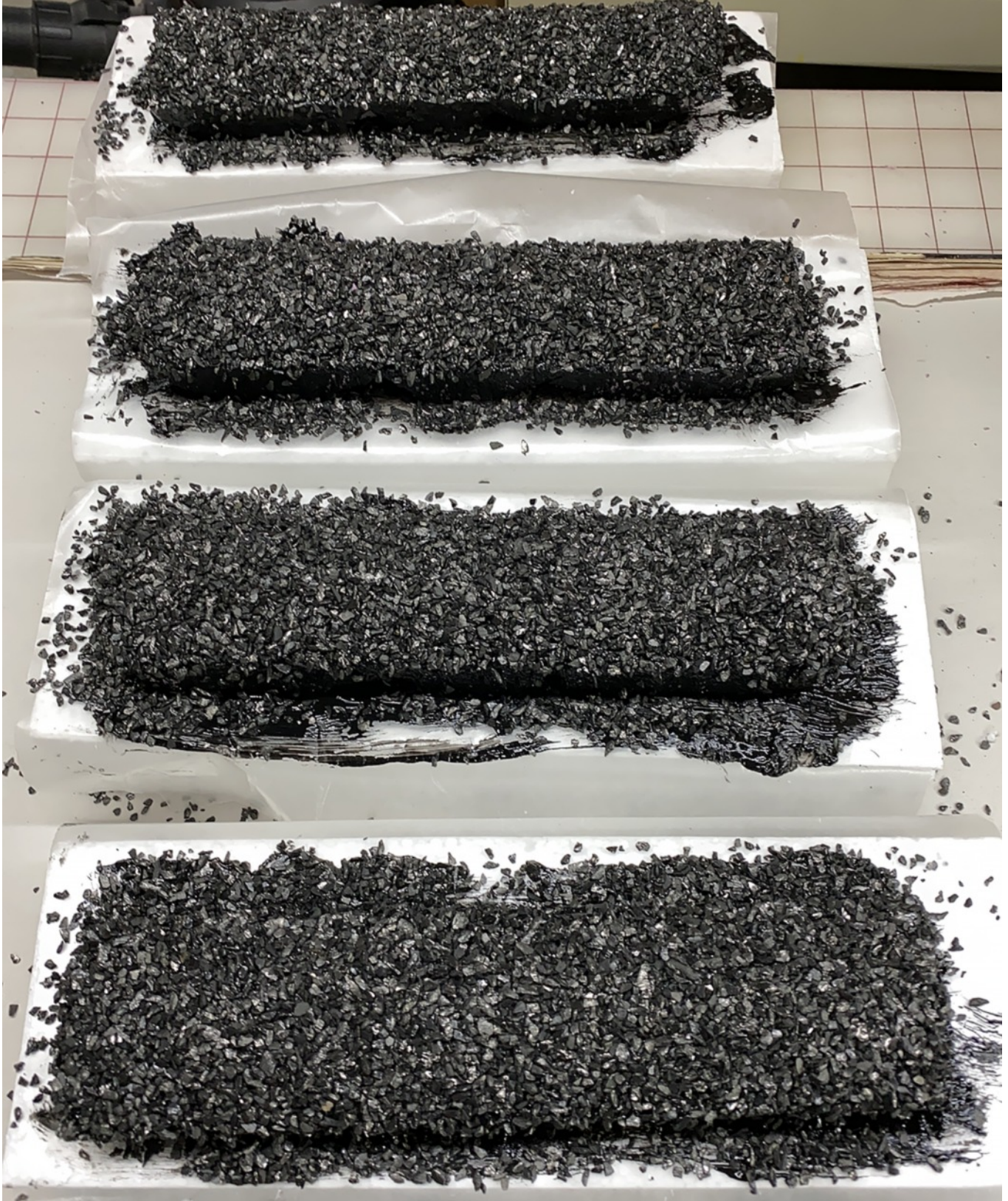
Slop on the paint making sure you dab it into the cracks and crevices, and paint the side and ends as well. You're not painting a masterpiece here so, just slop the paint on so it's nice and wet like the picture on the next page. Now just sprinkle out the coal in a back and forth motion getting all the paint covered. Don't worry about using too much. I recover more spillage than actually sticks.

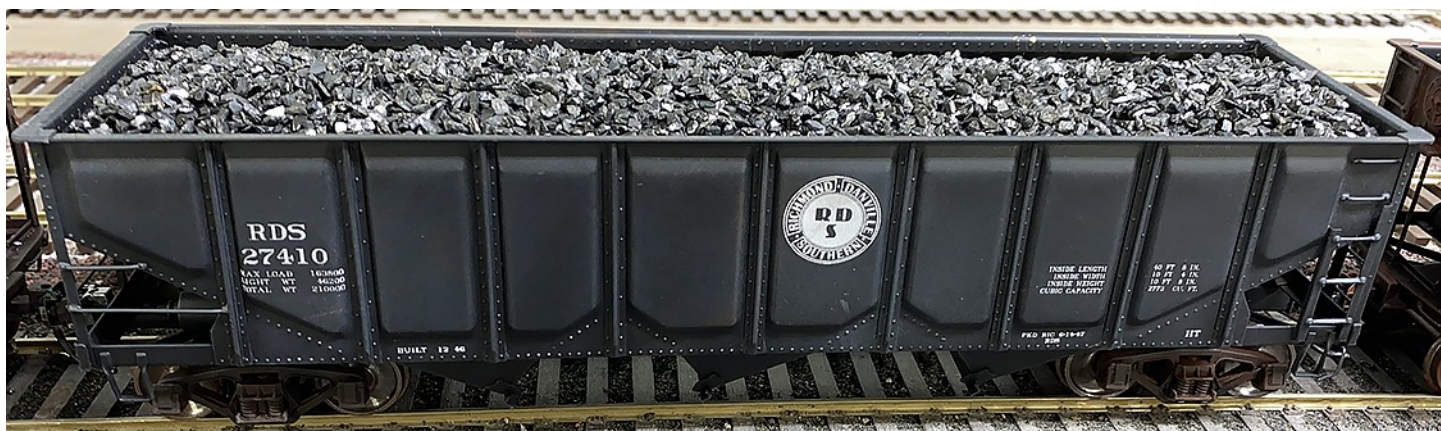
One coating of coal is all I needed. Once you are through with the sprinkling of the coal, set it aside for a day to fully dry. After it's dried, I dump off the excess and reclaim it. Then, with my thumb, I rub off any coal that stuck to the sides.



Below are four loads drying. From sizing to painting and adding the coal was about 25 minutes for all four. It's not hard or time consuming, and you will save a lot of money doing it yourself. You will also have a better selection of the size of coal you can use.

I made loads for two, three and four bay hoppers as well as gondolas. Over 14 loads of assorted lengths and I only went through a bag and a half of Brennan's coal.







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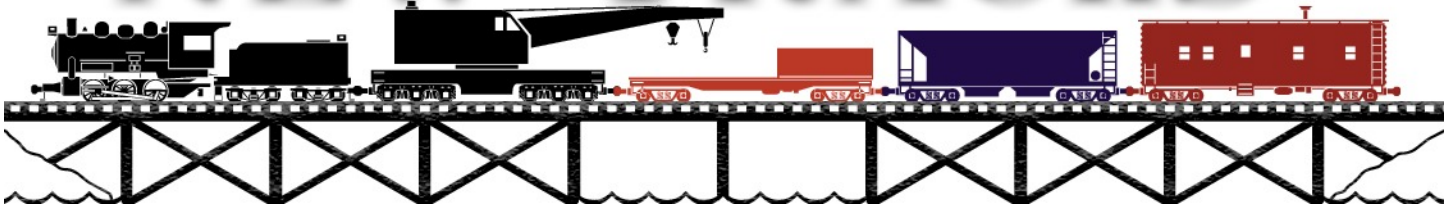
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# NEW TRACKS



**Mentor Definition: A Trusted Counselor or Guide**

**By Contributing Editor Jim Kellow MMR**

## **Have you ever wanted to start a Model Railroad Business? I bet many of us have! Help is here!**

**Do you want to start a Model Railroad Business that makes money? Read on to learn more.**

Hear what it takes from a successful Model Business manufacturer, who may become your mentor. Also hear from two of the companies he is currently working with, and read about possible business opportunities to help you start your own business!

But before I start this article, I want to bring you up to date on the building success of the Rail-Scale-Models winner of their Tobacco Barn Kit back in December, 2018. Dennis Stanczak, the contest winner, just provided me the following information about building the kit.



**Dennis Stanczak**

Hi Jim, It's completed,.I'm even working on a module that will include it in the scene. I still need to make a Mail Pouch sign like one on the tobacco barns in Dane County, WI. Let me know what you think about the build?

Dennis Congratulations, I think it looks great. I look forward to seeing the sign.



Now let's get down to starting a model railroad business.

I bet there are a lot of modelers who have wished they could make a business out of their hobby! I bet these modelers would love to take a chance and start a company. But they don't, either from fear of either losing money, or because they feel they lack the required business experience or knowledge to create and manage a business venture.

Hiring a business consultant is probably not in the cards financially, at least not at start up time, so in many cases, the business is not started and only remains a dream for the future. This is really a problem in our hobby for two reasons.

First, the people who started modeling companies in the past are retiring and trying to sell their companies, but some cannot find a buyer, so they just shut the company down. Therefore, we lose some great kit manufacturers. New entrepreneurs are needed to take over these companies.

The second reason is that new products or services that many of us could use are not brought to the market. Here is an area where market research and product pricing are critical to developing a successful business plan. How to do this market research and write a business plan is a mystery to many of us, so nothing happens. In both cases, our hobby is the loser.

Well, I have great news for you budding entrepreneurs. I found an individual who is responsible for bringing new products to market for a Fortune 500 Company. It is uncommon to have a person with this experience coming into the hobby, starting his own model company, and offering his expertise for free to help you start a business. He has started one of the most successful and profitable O Scale Model companies currently in the market.

This person has agreed to mentor other modelers to help them develop their business or product idea, determine pricing, and develop a successful business plan for their company's product/service. FOR FREE. All he asks is that you ask for his help and listen to his advice.

I am honored to introduce Kevin Macomber. I also am profiling two of the modelers he is currently working with to develop their new companies, Dylan Lambert, and Aaron Loyet.

If any of you take Kevin up on his offer, I look forward to seeing your new products/services in the market, or hearing that you are taking over a company from a retiring owner. Please contact me via email at

[JimKellow@oscaleresource.com](mailto:JimKellow@oscaleresource.com) so I can profile you in a future article. Best of luck. Please meet Kevin.

### **Kevin Macomber**

It was several years ago that I came back to the hobby, specifically On30, as I was looking for a new creative outlet. As an accomplished woodworker, I simply became bored with it and had all of the wood projects I wanted. Model railroading included that of course, but also other areas that interested me to include design, architecture, painting, creating and electrical. The latter has been my profession in the last 20 years, along with mechanical designs, of



*I'm standing (white shirt) and my wife aka Mrs. M is sitting, taking orders. She is a big part of the business and my son who is going into engineering college is often involved as school permits.*

which I have about two dozen inventions and designs credited to me. This is a side of me that most are not aware of.

Like many modelers, and I use that word in its pure definition, the confusion of the supplier base by their retiring or closing, has made the hobby far more difficult than it needs to be. So it was about four years ago, as I was building a structure, that I became fairly frustrated finding parts and pieces to complete it. It was also then that I saw a tremendous opportunity to start a business using my past experience.

My professional career started about 25 years ago as a product manager for a Fortune 500 company whose focus was industrial tooling, with sales over \$500M. It was there I began my knowledge of bringing new products to market and commercializing them. It was this, and the subsequent roles I held, to include running engineering teams and then heading up sales engineering, that you really become groomed to see product opportunities. Coming into model railroading, the rules and principles should have been similar, but they were not. This is due to the fact that some people solely make products for the hobby rather than operate as a formal business. There is nothing wrong with that of course, but at some point, a profit needs to be made to either rationalize your investments or keep you motivated.

So four years ago NGMC ([Narrow Gauge Modeling Co.](#)) was started and has grown into over 1,000 products. While we started out as a typical buy-resell business, we have expanded to 50+ brands, some of which we acquired. We have also moved into our own manufacturing, typically contract, or OEM. That said, all of these require different approaches and skill sets to make it profitable. And, it was from here, that I saw my intimate knowledge of running a start-up business would help the hobby as well.

That is where Dylan and his company, Lambert Locomotive Works, comes into the mix. Dylan, a 25 year old wiz-kid, had a dream to start his business. But like most of his age, did not have the business acumen to pull it off. And as I got to know him, he reminded me of myself at his age, and also made me reflect upon those who groomed me.

I fondly recall, and often, one humbling story of a guy, Don, who was near retirement. Just a year out of college, I went to his office and asked to talk to him about a new product idea that I had. He cordially invited me into his office where I proceeded to elaborate on this new design. When I was done he kindly said “well Kevin, that is a great idea, but it failed the first four times we tried it, but maybe you can make it work.” And it was at that point, I learned the wisdom of ‘snow on the roof.’

Though Dylan is young, his dreams or ideas, are probably no different than others trying to start. But, like most, there is not a knowledge of concepts like product life cycle or product development in terms of what is known as ‘stage gate model.’ But with most companies failing, this is imperative knowledge to have. As a side note, there is a great book “Winning at New Products” (Cooper) which is the easiest and quickest to absorb.

Working with Dylan has been fun and, of course every time I talk to him, the Don story is going through the back of my head. But this is part of being young and having endless energy that most of us can only faintly remember. It reminds me as well of saying I heard many years ago “it is a shame that wisdom is wasted on the old and good looks on the youth.”

Mentoring Dylan has clearly been a fun effort. We of course started with a business plan and product road map. This framework has been crucial to keeping him focused and paced. It has also given me the opportunity to use my favorite word ‘no’ to keep him going in the right direction. But, the most important thing is to see him relish in his even most minor successes, though now I see very big successes for him in the future.

I would argue maybe one of the most important successful things businesses can do is help new businesses succeed. Jeff Grove of Carolina Craftsman Kits has been doing the same, and you can see his impact on the next generation of laser kit cutters evolve. But, this at the same time requires new businesses to listen and to embrace solid business practices and procedures. It also requires long hours every day, not just a couple days a week. It is said “plan the work, work the plan.” Thanks, Kevin Macomber

After reading Kevin's comments I asked him several questions.

**What was the reason for the start up of your model railroad On30 hobby, and how did it cause you to start your company? Where is your company now, and what is your goal for the company in the future?**

KM: My segue into the hobby happened by coincidence more than anything. Firstly, from a personal angle, I had been looking for a business for my retirement which is still many years out. As an engineer, I realize I can continue working a long time in my professional career, but really don't want to do that. However, as an On30 modeler, it is more common than not that we build or modify existing products to create our scenes. During a build, I was looking for several items and simply could not find them. After searching intensely, I found some, but was surprised how few options there were and how spread out the parts were across multiple suppliers and the subsequent shipping costs involved. Having managed multiple product lines simultaneously in the past, I quickly realized there was a business opportunity here.

After the first couple of years, what started as a commercial opportunity, also became a mission to save or recreate many of the detail parts and accessories of the past. One can simply see how much has been lost if you read a 1970s/80s Walther's catalog. And, while it is a sad thing to look at in context to what has been lost and despite what people have mythically believed about the demise of O Scale, all of our research showed the opposite. So despite the questioning of our sanity by many, each product we introduced showed success. It was from there that we have grown to over 1000 parts for the 1/4" scale hobbyist with no slowing in the future. I actually see us becoming more like the Walther's of old, but for a broader hobby base than they had.

**When I talked to Kevin, I asked him about his interest in mentoring and helping other model hobbyists start or expand a company. He immediately told me he would love to mentor any modelers who want to start a company. However, he quickly added that the modeler must be willing to put in the time and work involved in starting and managing the company based on proven business practices regarding research, cost controls, product pricing, and basic entrepreneurship. So, if you are interested in having some mentoring help from Kevin, for free, all you have to do is email him and ask. His email is: [Kevin.Macomber@oscaleresource.com](mailto:Kevin.Macomber@oscaleresource.com) I wish you the best of luck and look forward to seeing your products in the market.**

**Next, I asked Kevin to give modelers three or so best tips for starting a model railroad company and bringing a product to market so they will understand what he believes is important to their success. His reply:**

KM: Very early in my professional career, a senior manager taught me the phrase "plan the work, work the plan." This of course is the fundamental step of product development. Without a solid business plan that is focused and defined, a product is more likely than not to fail. And, as you move into a company like NGMC, there are so many product opportunities it is easy to get distracted. This is so true when dealing with a young and enthusiastic business owner who wants to please all customers with all products. It can't be done.

The next important step is to outline the product roadmap in six (6) month increments. Not only does this outline the products you will develop and commercialize, but it will help roll out a portfolio that looks unified and connected. I also do this in context to competition to some degree so they can't anticipate my next move or launch. I keep all of this very close to my chest as well as other data about the business.

The last issue with starting a business is learning who you can trust for advice. And by trust, I am not talking trustworthy, but one who gives you unbiased counsel. While it seems logical to use only people from within the railroad hobby, it is not a good practice. People within the railroad hobby can best help you by telling you what failed, which is very useful information so you can avoid it. However, I have used a variety of resources outside of the hobby or other hobbies to bounce ideas against. And, almost always, it comes down to good research. On any item that requires capital, I ask dozens of people for input. Sometimes this is formal

and other times, I listen to or read comments and add it to my product notes. I do this regularly with Dylan. I ask him “is it his idea or the customer's idea?” and then send him off to do more research. And, I have pounded into him the phrase “no pay, no pay attention.”

In the above comments, you heard Kevin talk about Dylan Lambert who he is mentoring at this time. Kevin is obviously very proud of what Dylan has been able to accomplish and his future. After meeting Dylan in writing this article, I believe we will be hearing a lot about him in the future. Please meet Dylan and hear his story and journey with Kevin. I also hope you enter his Contest drawing.

### Dylan Lambert



I model in On30, and it was really an accident that I fell into it. A friend of mine gave me a Bachmann Consolidation and a Gas Mechanical for my birthday, and I have just stuck with On30 ever since. At that point, I wasn't doing much modeling. After meeting Kevin Macomber though, I ended up getting to work, that happened about a year later. You see, I did a poll in the On30 group because I was curious as to what people were looking for in locomotives. Within something close to an hour I had about five hundred individual data points. That got me doing some hard thinking. At the time, I was basically a nobody. Dylan Lambert? Never heard of him. So I figured that if me, a nobody, got that type of response, then maybe there's something to this whole locomotive thing. And then I realized that we used to have a lot more suppliers in the hobby. Backwoods Miniatures, Boulder Valley, OzSteam, the list goes on. A lot of them either were no longer doing On30 stuff, had retired, or had more pressing concerns to deal with. So I went back to the On30 Railroading

group on Facebook and asked people to break down their reasoning for me. And boy, did the people break down their rationale. The final straw was as I was fiddling with a shorty tender, it hit me something like a sack of bricks. I can do this casting stuff!



*This first example of some of my work was a rather easy conversion as pioneered by Allan Carroll. It's a simple matter of turning the motor 90 degrees so the Bachmann ten wheeler boiler will fit on the 2-8-0 chassis. Once that's done, you can simply place the boiler on the chassis and screw into place through the same smokebox screw hole from the original boiler, as they line up nicely.*



*This second experimental kitbash is one of two works-in-progress at the moment. It started as an idea to make an On30 decapod, but as I'm sure many have come to know, 'mission creep' is a thing to deal with. In this case,*

*I had a spare boiler from a 2-4-4-2 boiler floating around, and noticed that it was the same size as the Bachmann HO scale decapod's boiler. So, consulting with Allan Carroll for some assistance, he ground out the sides of the motor block just enough for the boiler to clear the sides of the boiler (the motor mount only being a few thousandths too thick) and grinding out four small nubs on the inside of the 2-4-4-2 boiler. Then, looking at the pile of stuff that's calling my layout home presently, I remembered I had a conversion kit to turn the 2-4-4-2 into a tank engine just sitting there. So some fitting later, and we come to where the build presently stands. It'll need some paint work and a short on the chassis fixed, but when done, it'll create a very unique 2-10-2 tank engine.*

At that point I did not have the foggiest idea of what I was doing. How do you design a locomotive? I didn't know CAD yet, so I enlisted the help of Calvin Witt to get started on a mockup. I threw together a model using a bunch of parts I had lying around. After doing a bit of reflection, I realized I can't scratchbuild to save my life. Once I started seeing what Calvin was doing, I started thinking AGAIN. You know, why can't I just design something on the computer and then make a 3D print of it to make molds of? So I got my hands on Fusion 360 and started experimenting. Then I got the first printer, a simple filament job, and started messing around with it. All of this gave me experience that I didn't yet have. But by April, my first kits ended up being laser cut cab kits. How exactly did that happen? Well, Kevin started pushing me. I think at that point it was clear that I was doing more floundering than good, but with all of my ideas and clear desire to do SOMETHING, I think Kevin realized that I had some potential so he might as well throw in and try to help steer me in those early days. He directed me to Stephen Milley at Rail Scale Models, who he had been working with on some building kits and told me to start with something unique for a Porter, as at the time I had been going through the Porter Light Locomotive Catalog from the early 1900s looking for inspiration. So Stephen designed a cab kit for the 0-4-0 Porter in the style of some of the round roof steel cabs that Porter used on plantation and mining engines. That got my foot in the door and people at least started learning who I was, and that I was serious about giving this whole supplier thing a go. So, along comes the Lycoming Summer Meet in July 2018, which I ended up going to. I had some early prototypes I had done up on the filament printer with me, and one of them caught just about everyone's eye; a slope-back tender.

Now I'm far from stupid, and know how to take a hint. There was clearly something to this tender thing too... So I brought it up with Kevin. He just looked at me and asked what I was wasting time for. So I got home



*This is the other kitbash on my bench at present, some attention from some black paint and wiring of the headlights still to do before calling the build 'done'. This one was entirely by accident, as I realized that by taking an HO scale ten wheeler from (you guessed it) Bachmann, you could cut the front of the motor mount off as it wasn't entirely necessary to be there. Once that's done you could fit a boiler off of a small On30 4-4-0 on that chassis and make a micro-ten wheeler. Then just get an eight pin plug from Bachmann, identify which wires go where, and you can wire the plug up to a 2-4-4-2 tender quite easily, as the wires connect via insulators as opposed to solder joints. While ordering all the parts from Bachmann can prove expensive, it's an incredibly straightforward build, the only part contributed from myself being a newly printed 3D smokebox saddle.*

On30 modelers are starting to look at me as an authority in locomotives. That alone makes this worth it, but I'm far from done. Eventually I want to launch a limited run of Ready to Run locomotives. Ideally, it would be small to start out, and I do have one in mind. But that is easily a year or two down the road before I'll be ready to start tackling that, although I have the plans and just need to figure out the scale to it and mark them up with the requisite scale dimensions. All of this progress has one common denominator, Kevin Macomber. He's been pushing me to constantly move the envelope forward with what I'm doing. Whether it be to try to better understand the electronics that makes the model work or to pouncing on the ideas that people are putting out there that prove popular in the On30 community.

As for the design work, which is primarily what I do these days, learning the CAD software that I use was mostly trial and error. As such, I'm of the belief that some of my growing experience with CAD software could help future designers learn how to better use the technology we have at our disposal. It's also true that during my extensive research into mechanisms to use for different On30 locomotives that I've identified quite a number of well-running ones that can produce any range of locomotive sizes. So on that front, I can use what I know of good running mechanisms to help a modeler identify how to best power one of their projects.

and finished off the design. By this point, I had met Les Davis, and he would print off the first two masters for the slope-back for me. After some trials and admitted failures with the first two molds, (which drove me rather nuts, I must add), I finally got the first mold done. All while this is happening I'm taking down the names for people that wanted one of these tenders. I ended up with about twenty during that time. So for about two weeks, I was doing a tender day, as it took some time for the resin to set properly so I didn't warp the tender body when I took it out of the mold. Then the second improved master came along (as with the first one I had issues with rivets catching bubbles, so I added a spacer to that master and redid the second half of the mold) and I got another mold made. Fantastic, but the orders had stacked up to about thirty if I remember correctly. That's when I probably got bit with the designer's itch. And, more importantly, I had to get the lead out.

Since that point a year ago, I've launched a line of detail parts that is slowly growing, have a number of projects reaching critical mass, and have noticed that more and more



After reading about Dylan's journey I asked him what he considers to be Kevin's value to his efforts and what he believes is the best advice Kevin has given him so far? He replied:

"So far as what Kevin brings, I think there's safely a few points he covers on a regular basis. He's constantly drumming it into my head that this is a business. He's not wrong either, as the goal of any business is to make money. As for what his best advice has been, there's one line he uses with me constantly; no pay, no pay attention. Basically if the idea doesn't look like it'll earn its keep, don't bother with it and move onto something that stands to make some revenue to pay itself back. It's that philosophy that I'm putting into the three kits I've got on the front burner right now. He's also pushing me to research things like locomotive electronics and gearing and get a grasp on them so

I might one day be able to pull it all together into a ready to run locomotive, which I've previously mentioned."

During our conversation I suggested to Dylan he offer a drawing contest. He agreed immediately and suggested the Prize for the winner by one of his Type W kits. Dylan will also provide mentoring to the winner to help make sure he builds the best model possible. The winner will receive the Upgraded Type W locomotive shown above. The gray parts are all 3D printed detail components.

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**To enter the Lambert  
Locomotive Works contest  
each modeler must complete  
the form here.**

Modelers fill out form, agree to build model and write article on their experience that I will include in one of my future "New Tracks" articles. Good luck to all of you!

If you believe Dylan can help you in your modeling, or want to say hello and order a product from him, please contact him at: [Dylan.Lambert@oscaleresource.com](mailto:Dylan.Lambert@oscaleresource.com).

After talking to Kevin and Dylan, and having Kevin tell me he believes in a relatively short time Dylan can become "the person to go to for information and models of On30 Locomotives", I decided I wanted to check back with both of them in a year or so and see where they are with their companies and what they see in their futures. I am sure their futures will be exciting and profitable.

As I was about to send this to be published, I got information that Kevin had just started mentoring another company, Loyet Model Works. Again talking to Aaron, I think this company is one to watch for its growth and development so I decided to include it here.

## Loyet Model Works

Loyet Model Works is involved in diecast model modifications and weathering for the On30 modeling community. Aaron Loyet's, "Loyet Model Works", is a relatively new company that I am pleased to have found and be able to introduce to you. Since Kevin is also mentoring this company I feel confident that we will hear great things about Aaron's company in the future. Aaron is also offering a Contest Drawing, so please enter it to show your appreciation.



**Aaron Loyet**

I first got into the hobby at a very young age with some old HO stuff given to me by my grandfather. Once in my teens, my grandpa got into G scale. I was fascinated by the detail and size, however the costs were very large compared to what I was used to (no more \$1-2 train cars like I grew up with). Interested in the hobby, but with no funding to do so, I looked to going from scratch. I built my first car in G scale at 15 out of craft sticks and leftover metal scraps from the barn. Three years later, it went on to win best of show in an all G scale contest. Over time, I got some help from online forums and talking with people at

shows, helping me to learn more on the craft and fun of building from scratch.

In 2015, I moved to Honduras to be a missionary full time, selling most of my G scale collection before going, but the fun of researching prototypes and planning was still strong. After moving back, I decided to start back up, but after lurking around for a couple years, I decided to settle into On30. Giving me the fun of combining the HO I was into as a kid, but with the fun of kit bashing and scratch building I enjoyed in G scale.

With my company, Loyet Model Works, I plan to take what I have



## Loyet Model Works



### Build. Paint. Weather.

learned from scratch building and weathering from almost 20 years in the hobby, and bringing custom offerings to the market, with products ranging from custom die cast vehicles, to weathering locomotives and rolling stock. Here are photos of some of my models and a photo of my shop area.

To place a custom order, or to view what I have for sale, visit my page at [www.facebook.com/loyetmodelworks](https://www.facebook.com/loyetmodelworks), or contact me by email at [Aaron.Loyet@oscaleresource.com](mailto:Aaron.Loyet@oscaleresource.com).

I asked Aaron if he would offer a contest drawing for one of his models. He immediately said yes and suggested one of his modified and weathered 1/50 models as the prize.



Here is the contest winner's prize, a 1:50 scale excavator all muddied up.

He is also offering his help in weathering other vehicles the modeler may want to work on himself. Great mentoring from an expert. Fantastic, thanks so much Aaron for your interest and help.



**ENTER HERE TO WIN OUR  
LOYET MODEL WORKS  
DRAWING**

**To enter the Loyet Model Works contest, each modeler must complete the form [here](#).**

Modelers fill out form, agree to build model and write article on their experience that I will include in one of my future “New Tracks” articles. Good luck to all of you!

I look forward to seeing how the winner plans to use the model in his modeling. I also hope the winner will share some of his weathered models so we can see his talents. Thank you Aaron for all your help with this project. Please show your appreciation to Aaron by entering his contest.

Now I want to introduce you to a Chinese 3D printing Company and some information about starting your modeling in 3D printing. I hope this also stimulates your interest in trying 3D printing and maybe even using it to start your own company.

### **Chinese 3D Printing Co**

I recently did an article which included my first entry into 3D Printing. As a result I heard from several modelers with information on 3D printing that I believe can help our modeling. This information may also be of interest to some of you who are considering starting a model railroad business using 3D products. Please read on.

A modeler in India, Jeremiah Bunyan of Pegasus Designs & JBM, wrote me about a Chinese company he uses for his 3D Printing and highly recommends. He suggested I contact them for an article I was working on. I have profiled Jeremiah and his company, in one of my [previous articles](#), and also had him design an interior trolley light fixture for me. I originally had Shapeways print the part. It came out great, but frankly I was surprised at Shapeways total cost, including shipping, and because of my inexperience, I had trouble getting the print made. In fact, Jeremiah had to guide me through the Shapeways online process to get the part printed.

So I took Jeremiah’s suggestion and contacted the Chinese company and asked them to print the same light fixture for price, quality and ease of communication comparison purposes for this article. I was very pleased with both the communications and the printed light fixture.

### **Shenzhen Fantasy 3D Technology Co., Ltd**

#### **I first asked about the Company owner.**

The founder of the company is Goffy Zheng. After graduating from college, because of interest in 3D printing, Goffy joined a FDM printer company in Shenzhen. Goffy found that many customers need 3D printing services, so he founded the company to do 3D printing services. Yes our company does business in the United States. Shenzhen Fantasy 3D Technology Co., Ltd. Is located in Shenzhen, China.

We provide professional 3D printing services for on-demand production of prototypes, individual products as well as short-run manufacturing. The 3D printing processes we offer include SLS,SLM,FDM,SLA,MJF. We provide access to a wide range of materials including PLA, Resin, Nylon, Copper, Iron, Aluminum.

The maximum size we can print is 1400\*700\*500mm. SLA printing has high detail. Our services are recognized by a large number of customers. At the same time, we provide laser cutting services (acrylic board, aluminum sheet, wood board), Silica Gel Compound Mould, spray paint, STL file repair and other services.

Our company does not have a modeler who does designs, customers give us their 3D files, and we print them to the customer's specifications. Please send me the model you need to be printed, I will give you a quotation for printing and shipping.

In order to see for myself how difficult it would be to get a design printed, I sent Ivan an email of the 3D design for my interior trolley light fixtures I had designed by (Peggy Sue) in India and printed By Shapeways. I wanted to compare price and quality as well as ease of doing business.

### Comparison - Price

Shapeways was more expensive to print my model, but the shipping cost was naturally more expensive from China. The total cost was basically the same. I did not try to compare volume pricing or for on demand pricing for either company. The total delivered cost either way was about \$20.00.

Note: In my conversations with Ivan, I learned that based on his experience with other modelers who asked for quotes from him, these modelers had experienced the same result I had. That is, Ivan's printing cost was less than Shapeways. Therefore I suggest you may also want to get a quote from Ivan for your project and judge for yourself his delivered pricing for your project.

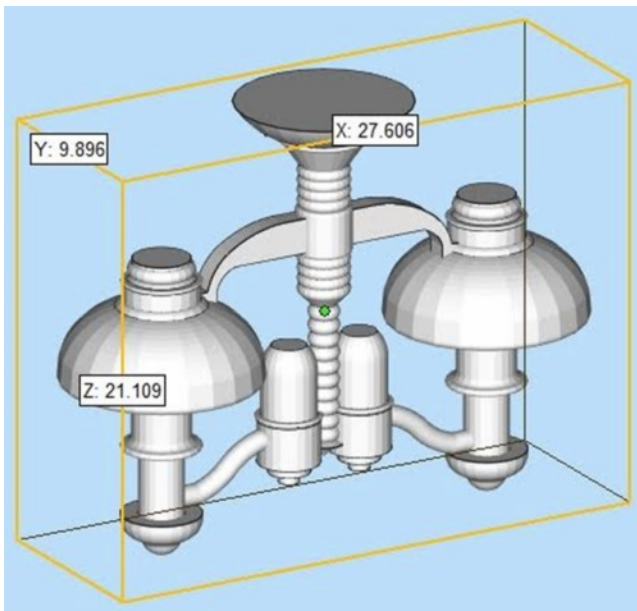
### Quality

For me both parts look great and I would be extremely pleased to use either one. Quality for me was not an issue. [Here is a video of the Chinese printed same part](#) and a photo I took of both parts together. I have also included is a dimensional photo for your reference.

### Ease of Communication

I had no problem in communicating with Ivan in working on my project. I really like being able to talk directly with a representative of the company. As a first time user, I would not hesitate to ask for quotes from Ivan for any future project I may want to print. As soon as I sent my part design, I received an email from Ivan





with dimensions of the light fixture for me to approve before printing. I really liked this. I sent this email to the modeler who had designed the part for me and he immediately told me it was accurate and to approve the part for printing. I did and I could not be happier.

#### **Please meet Ivan:**

I am Ivan Mao, I am the salesman for the company. Please contact me at [Ivan.Mao@oscaleresource.com](mailto:Ivan.Mao@oscaleresource.com) with any questions or inquiries.

I asked Ivan about communication problems customers may have in using their service. Ivan said:

“On 3D printing services, cooperating with Chinese companies will not be too difficult. So far, I have not

encountered any major problems. If we take the order, we will reprint it if we have caused a problem with the original printing.” He offered these suggestions for customer designs:

1. The thickness of the printed model should not be too small, The thickness should above 0.8 mm. The probability of printing failure of the model with too small thickness is greatly increased.
2. For the resin model, the thickness is too small to be easily deformed. Of course, the materials can be printed are more than resin.
3. 3D printing use STL file, and the file is preferably in STL or STP format.
4. We recommend sending 3D files to us after completing the 3D design work.

Lastly, I asked Ivan to offer a Drawing Contest where readers would enter by sending in an email and a winner would be drawn from the entry's. Ivan agreed and offered a winner's prize of \$100.00 USD off the total delivered cost for the 3D printed item. Thank you Ivan for your interest and help. I really appreciate it. If any of you are interested in getting into 3D modeling this could be your starting point. I hope you will enter the contest. Good luck to you all.

[To enter the Shenzhen Fantasy 3D Technology Co., Ltd contest each modeler must complete the form here.](#)

Please show your appreciation to the company by entering their contest. Good luck to all of you!

**ENTER HERE TO WIN OUR  
SHENZHEN FANTASY 3D  
TECHNOLOGY Co., LTD  
DRAWING**

I also heard from a modeler about how he got started with 3D printing. I believe these comments may open up the 3D printing experience for many modelers.

Peeyush Garg, a modeler from California, wrote about his journey into 3D printing.

I'm relatively new to 3D printing but here's what I have learnt. If you want to get started, visit this website [www.tinkercad.com](http://www.tinkercad.com). This is built for 7th grade students in mind. It takes you through a short hands on tutorial on how to work with 3D printing, and in a matter of minutes, you'll be doing some simple designs. Once you're hooked, there's no stopping. There's many YouTube channels that provide lots of information about 3D printing. A couple of my favorite ones are Maker's Muse and 3D Printing Nerd.

Once you have a design ready, I usually go to [3dcompare.com](http://3dcompare.com). Once you upload your design, you can see a list of manufacturers who will be able to print it for you in your choice of color/material. And I don't think you can beat the price that is quoted there. Most of them are US companies. They are either smaller individuals / businesses or probably doing it for fun. Do choose wisely as the quality can vary. You can probably ask what printers they use to make your call.

Also try thingiverse, if you haven't already, where you can find some nice publicly available designs to start with. 3D printing is no longer limited to a few big manufacturing houses. It's become community based where people share designs with each other and also share their printers to print for others! It's amazing.

Thanks Peeyush for sharing your journey into 3D printing. Maybe I will get there yet! Seems like more help is out there than I thought, but there is no question that for me to really benefit from what the 3D technology can bring to my modeling, I am going to need a lot of help. Good luck to all of you in your 3D Printing "New Tracks" journeys.

Thanks to the companies and individuals in this article for sharing their journeys, and offering their knowledge and help to aspiring entrepreneurs. After all, helping each other to learn skills and develop confidence in our abilities, is a major part of modeling success for all of us. That's the point of my "New Tracks" series.

Thanks also to all of you for reading this far. Time for me to get back to my workbench to continue building a model for one of my upcoming articles. Good luck with your modeling and have fun with your modeling going down your "New Tracks".

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# BACKSHOP SOLUTIONS

Have a modeling question for our experts? Please send a description of your modeling problem to

By Ross Dando

[backshopsolutions@oscaleresource.com](mailto:backshopsolutions@oscaleresource.com).

## END OF YEAR PROJECTS AND MORE RAMBLINGS



*Above: Work table with my tool tote so I have the basics. The rest just finds its way from the tool cabinet.*

*Below: The work bench used to be the main station, but has turned into a weathering area.*



As December rolled around this year, I was just thankful to be here. I have my energy back after a heart procedure, quit drinking so much, and made a resolution to get more models finished. Dan sent me a message and asked what my article was about this month. I should have given him a hard time and asked where are all those questions you promised me from the readers were. The Back Shop Solutions column is really about helping each other. Heaven knows I have lots of questions, many have gone unasked and therefore unanswered. But I do have a great hobby network of experts who have helped me learn new skills and take new risks to learn new ways of building models. A recent thread on Facebook focused on work bench clean up on Christmas Day. That is what got me thinking about this month's article. Don't try to find the common thread too fast, it will all come together, or maybe it won't, but you will learn about what's going on in my hobby room.

My work bench, and now work table, are both a mess. I have a hobby room that does not have to be packed away for anyone, so yup, it's a wreck most of the time. There is always a project in progress, research materials pulled out to find that information for my project; or, the next project I started because while looking for information, I found a picture of another model that I knew I was going to do, was stacked in the pile in the other room, so I had to go get that out. But if you look at the modeling table, you will see one model that just can't seem to find its way to the finish line.

The GP7 is a fine scale work in progress. I made strides this year and created some new cool parts that may find their way into a package for others to use as parts for their projects. Terry Van Winkle also helped me create a very accurate coupler cut bar lever that we then sent to Jay Criswell to help get them to David at VB&B to be cast in white bronze. They turned out awesome, and now if you want them, they are available for purchase. I can't wait to finally permanently attach them to the model. Stay tuned, it will get closer to the finish line this coming year.



*Handrails built and ready for paint.*



*Coils built and installed.*



*The new lift bar brackets turned out great.*



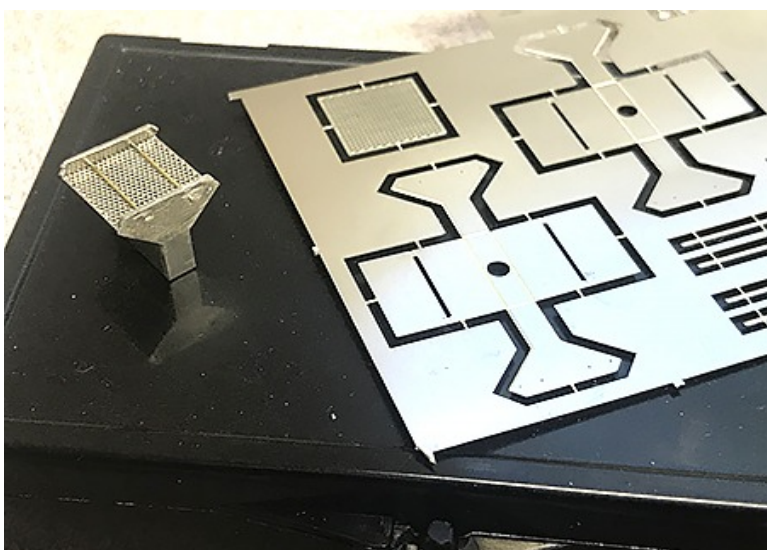
*Getting the details located.*



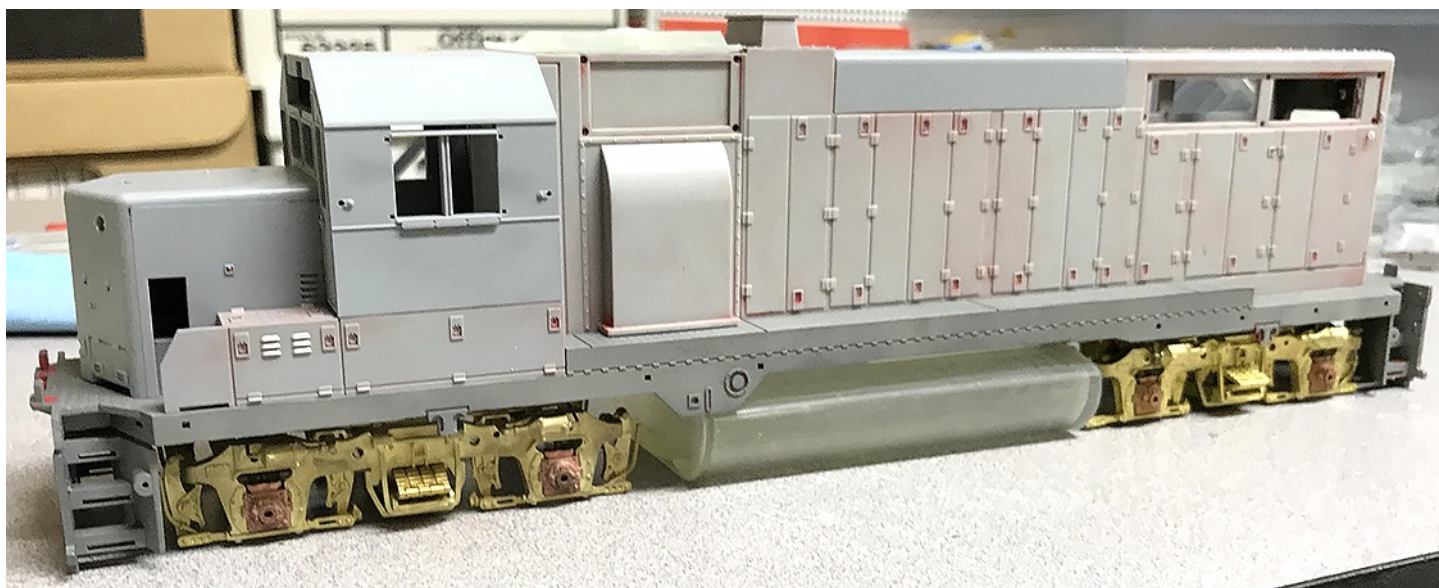
*Headlight prints turned out great.*



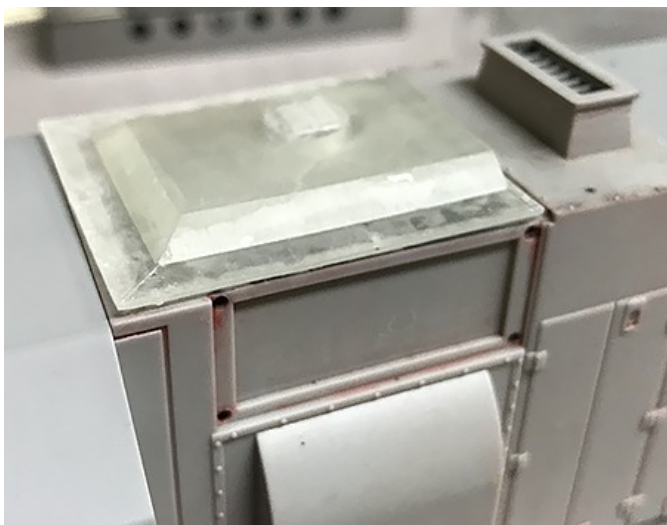
*Lifting horn installed on the frame.*



*Spark arrestors designed and built.*

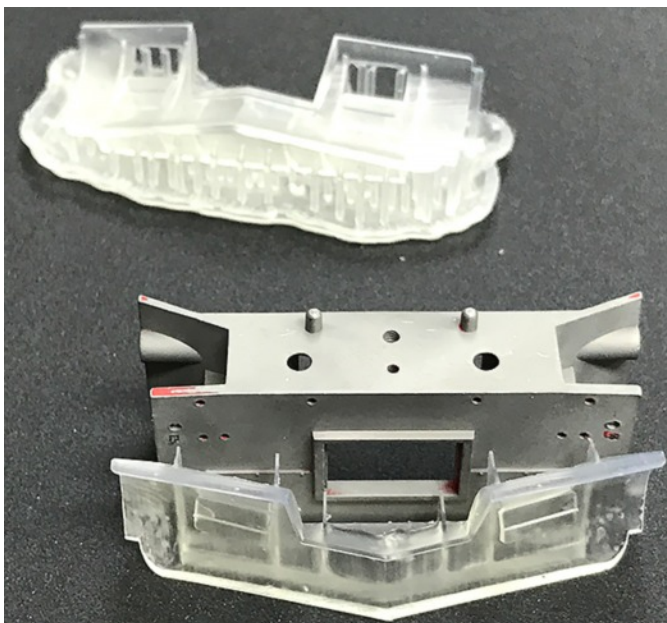


*GP35 mock up, lots left to do.*



*Above: Filter hatch print test for the GP35.*

*Below: Snow plow for GP35.*

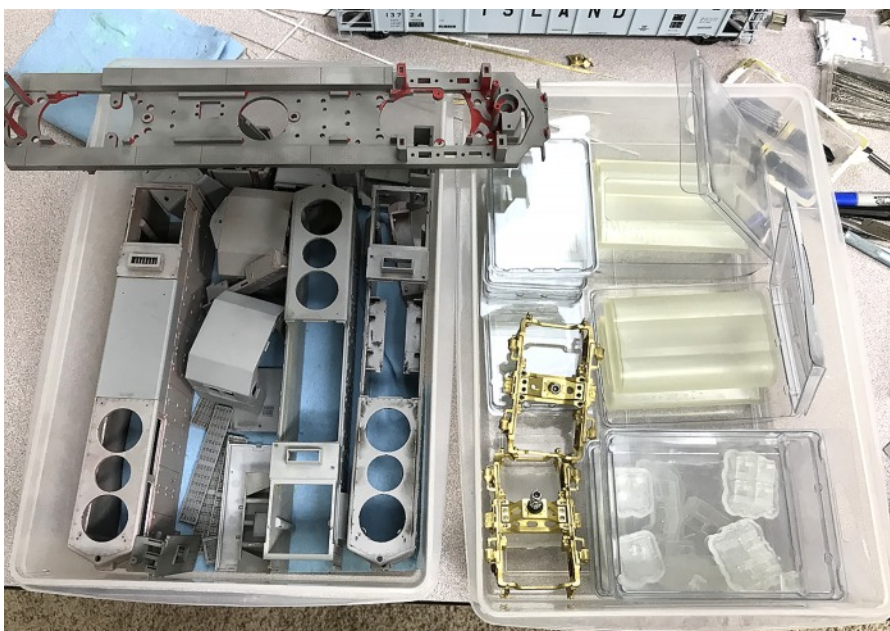


*Above: Details for GP35 project.*

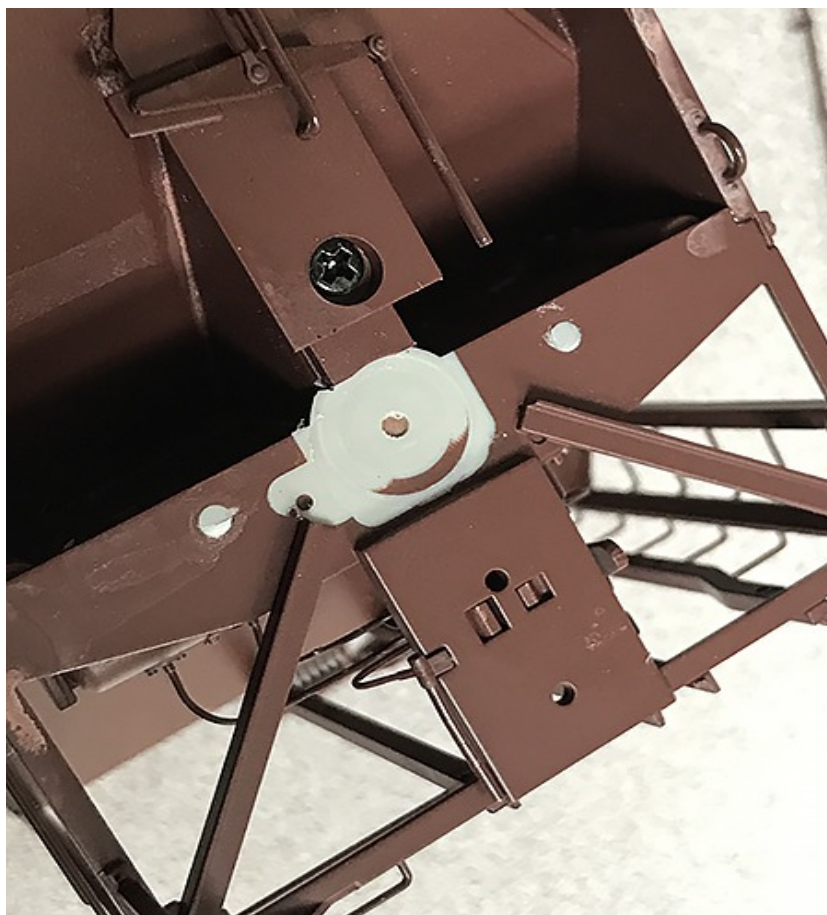
*Below: GP35 fuel tank print.*



Look at the picture on the lower left of my project box. How do you store your projects? My method comes from a machine building background where you boxed up and sorted out all the parts by subs assembly. I have a number of clear plastic totes and I sort out what needs to go to a project. When I am looking for one thing, I generally run across something that should be in a tote so the hunt begins for the right tote so I can add to that specific project.



My modeling time is limited, so when I get runs of time where I can focus, I like to get as much bench/table time as possible. So while everyone was cleaning their work benches for Christmas, I was filling mine up and getting a project done. What you ask? Besides being



*The bolster boss has been machined off.*



*Master for the bolster and coupler pocket.*

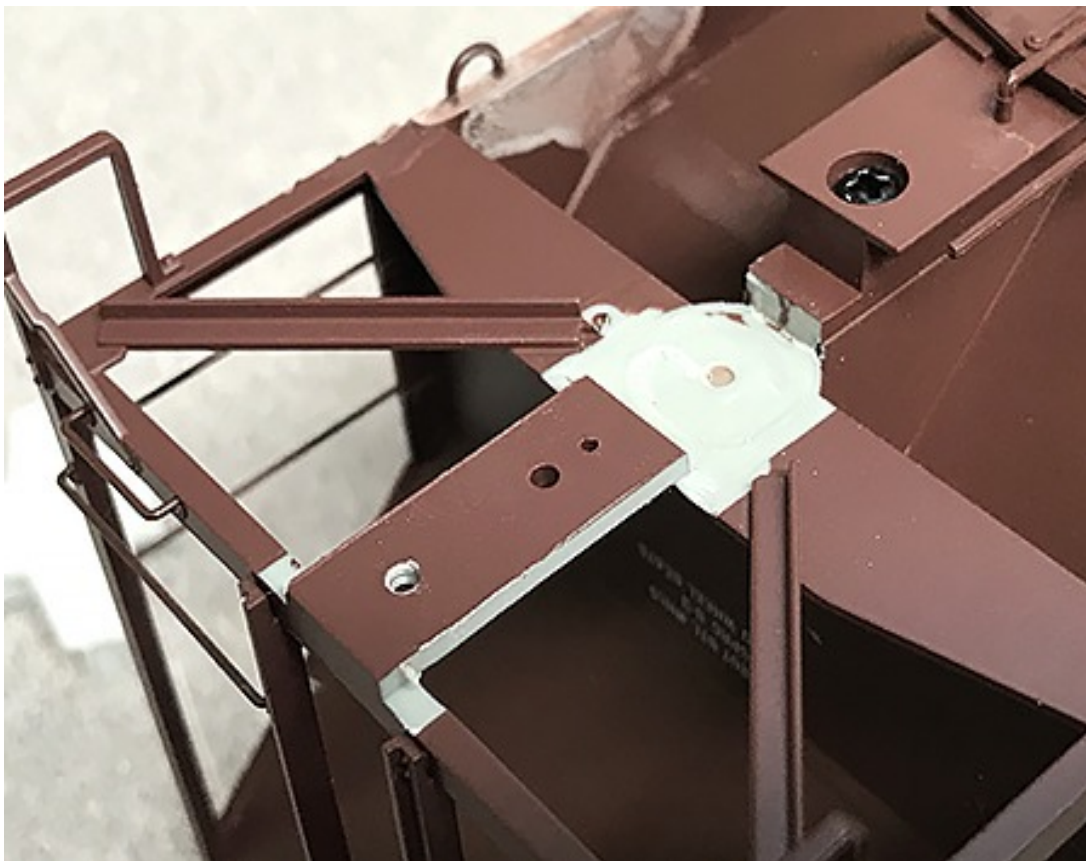
addicted to flat cars I have a weakness for grain hoppers.

The Rock Island moved a lot of grain so it makes sense that I would build some cars. My fine scale modeling focus has made it hard to go to the hobby shop shelf and just grab some cars to slap them on the track like I could in HO. Man, there are some amazing HO freight cars. But, I digress. Atlas has done a great job with their Masters Series of cars. They make a PS2CD 4472 car that is so well detailed, it only needs minor work to make some parts more fine scale as well as convert to proto48.

My first glaring omission on the car that needed to be fixed was the truck bolster. There really isn't one, just a round stud to screw the truck to and a couple pins to help create a triangulation to help the car track. Not prototypical. Now, before you shut off because I'm one of those P48 guys and I am talking prototypical and you happen to have the OW5 bug and are happy with it, the process here applies just the same, just use your OW5 trucks. I started by searching out previous publications on the PS2 4427 cars, then I dug out my HO model of the car and, finally, I surfed the Internet. In the end, the bolster and coupler pocket assemblies for the PS2 car family was pretty similar up until the high side 4427 cars were built. So, off I went to carve up a part that would work. The first step was to remove all the pieces I was never going to use. This was accomplished by just clamping the entire car body in my milling machine vise and using a 1/8" end mill to slowly go around and remove the unneeded parts.

Now, to make things bit easier on myself, I made the decision that I would not completely rebuild the coupler mounting area. This provided the baseline to go calculate the bolster height and needed materials to create the correct bolster shape. Now, if you think it's not right, I welcome constructive criticism

accompanied by scale drawings so I can correct the parts. With that disclaimer out of the way, let's look at the mess I came up with to create what I think is a pretty good alternative to an out of the box model. I glued up materials and carved on them until I had a part that fit in the machined space. Now one would generally just build it all in place, but no, I need several cars for my railroad that will someday be built. So off went the parts

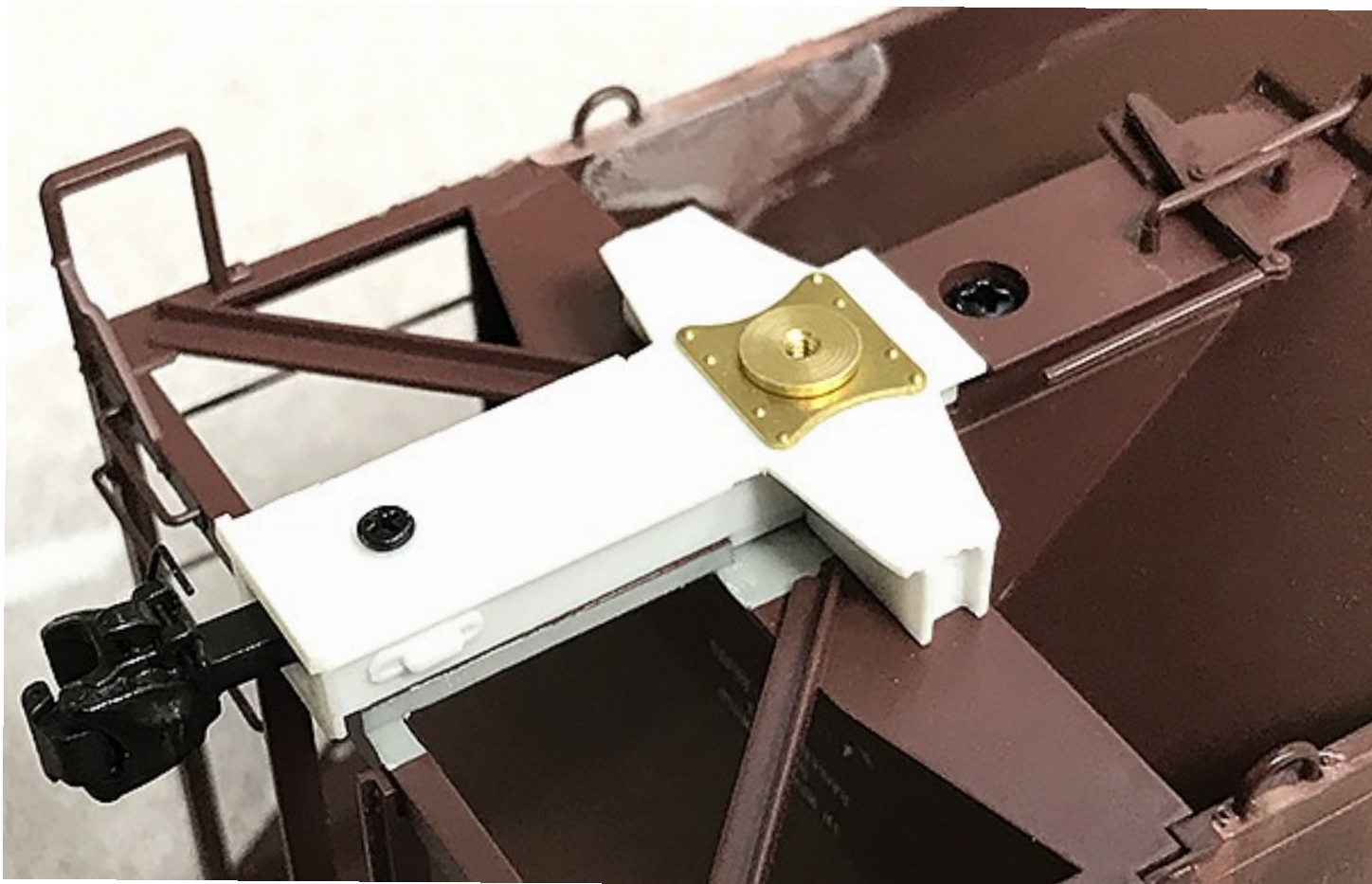


*Final sizing of the coupler mounting pad.*

to Jon Cagle, the master of silicone and resin, to create a mold and some castings. It just so happens, the casting came to me just in time for Christmas!

A quick clean up and test fit, and I was happy with what I had! Next was the drilling of the bolster and pressing in of the Protocraft bolster insert.

The coupler box had the Protocraft couplers fitted and then, yup you guessed it, Protocraft 100 Ton roller bearing trucks. Please note, I am not a paid Protocraft spokesman, but Norm, if



*Casting with the brass insert pressed in place.*





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# *Southwest O Scale and Oklahoma Narrow Gauge Group Combined Meet*

**Pictures by Joseph Grillo**

We were sent some pictures from Joseph Grillo who attended the Southwest O Scale and Oklahoma Narrow Gauge Group Combined Meet this past October. Unfortunately, there were no notes on the pictures.

I still thought we should show the pictures, and maybe next issue we'll get some descriptions. If you can help with descriptions, please send them to us at:  
[daniel@modelrailroadresource.com](mailto:daniel@modelrailroadresource.com).





*Merlyn Lauber from Caboose Stop Hobbies made the trip.*







# WHAT'S ON YOUR WORKBENCH?

This series shows our readers what other modelers are working on, and we need your help to make it successful. All that's needed is a simple snapshot of what your workbench looks like and the project on it. Send us a picture or two along with a short description of what you are working on so we can share it here. If it's a project under construction, send it in. Repair job, send it in. Completed project, send it in. Send your pictures and descriptions to [daniel@modelrailroadresource.com](mailto:daniel@modelrailroadresource.com)

Terry Nixon contacted me about my Atlas RS-1 conversions and decoder article that appeared in [our very first issue](#). The four units shown have been running since 2011 with no issues and three more were added to the roster. Following my lead, but with a different decoder, Terry made the changes.

Terry writes:

*"Just finished my conversion of the RS1 to DCC. Well worth the time and effort like you said. I installed an ESU Lokpilot 53611 (no sound) decoder and current draw is approx. 210 ma with light unit at medium speed, well within decoder specs. of 0.9 amp continuous.*

*I used the LED's that came in the engine for headlights and they draw only 0.61 ma with a 22k resistor. Headlights are wired in series so they are on all the time (not directional). Other changes include installing Kadee's and weathering powders to fade the paint down a bit. Now slow speed operation is pretty darn good when you consider that this drive mechanism was never designed with slow speed in mind. Overall, I'm 100% happy with the results of this project. Thanks for your help Dan."*

Terry sent us a few pictures of his unit. Beautiful weathering!





# AP Post Oak, Pennsylvania

By Brady McGuire

New business opens in downtown Post Oak. The proprietor of the Train Shop, needing to increase his revenue to combat competing sales at the new big box discount stores selling model trains, opens a Railfan Rooftop Bar-n- Grill. The instantly popular railfan spot received another shipment of adult beverages today. The venerable old FGRX wooden reefer is scheduled to make frequent deliveries to quench the patrons' thirst.

The only draw back currently is all the cases of beer have to be man-handled up four flights of stairs. The proprietor has been searching the local barn sales in hopes of finding a serviceable rope and pulley hay hoist to lift the cases directly to the rooftop cooler. At present, a free beer is awarded to anyone getting a case of beer up the steps to the rooftop.



Railfans have been coming from miles around to enjoy the railroad action on the double track railroad mainlines running through town. Usually averaging 24 trains a day. Four mail and passenger trains stop at the nearby station daily. Late morning, the local way freight arrives in view to switch the town's industries. The high perch of the Rooftop Bar-n-Grill provides a commanding view of all the daily railroad action. Check it out.



*Brady says: The building is an out of the box "The Train Shop" from MTH. Most of the folks and the rocking chairs are from Artista. The fireplace, figures and picnic table set up for lunch are unknown. Found them in my parts box. The red picnic table in the back and the stairs' roof shelter are scratch built. The "cooler" is kit bashed from a section of HO scale SD-40 hood.*

# ***SCENE AROUND THE LAYOUT***

Dan Beresford of Mansfield, UK sent us a fantastic picture of the following: Louisville & Nashville #100, the first Alco RS3 purchased by the railroad, brings a local freight underneath the abandoned pie factory on my work in progress layout "Piedmont Blues". (Weaver RS3, painted and weathered by myself.)



We are proud to feature readers work. So get those cameras and cell phones out and start shooting!  
High quality JPG or TIF files only.

Email photos to [daniel@modelrailroadresource.com](mailto:daniel@modelrailroadresource.com) along with a description of your pictures.

## March Meet Model Contest

March 14th, 2020 at the Chicago O Scale Meet

### Categories

- Diesel
- Steam
- Passenger Cars
- Single Structure
- Display/Diorama
- Traction/Trolley
- Freight Cars
- Heavy Electric
- Gas-powered
- Caboose
- Non-revenue

1. The model contest will be held Saturday March 14<sup>th</sup>, 2020 at the Chicago O Scale Meet. Models must be entered prior to 11:00 AM on that day. Once entered in the contest, the models must remain in the contest area until 4:00 PM on Saturday, March 14<sup>th</sup>, 2020. Awards will be presented at 3:30 PM on Saturday, March 14<sup>th</sup>, 2020, and models may be picked up at that time.

2. All models will be judged by a team of judges using nationally established judging guidelines. Categories that have only one model will not be judged, and no placement will be given. In these cases, The O Scale Resource gift certificate will be awarded to the sole entrant in that category. Best of show will be a popular vote.

3. Judging will start at the judge's discretion, and will be finished by 3:00 PM on Saturday March 14<sup>th</sup>, 2020.

4. All models must be put in the display position by the modeler, and only the modeler may handle the model.

5. Any descriptions, photos, or other information relevant to your model will be attached to this entry for the duration of the contest, and will be made available to the judges at their request. The material will be returned after the contest.

6. I hereby certify that the model entered is my work. I also hereby release *The O Scale Resource Magazine* (the contest sponsor), Hobby Hill Inc. (the show promoter), and all persons connected with the contest from any liability due to damage or loss of the model entered.

7. I hereby grant The Model Railroad Resource, LLC photo reproduction rights for publication of this entry in *The O Scale Resource Magazine*.

# Chicago O Scale Meet 2020

## Model Contest

Thanks for entering the model contest at the Chicago O Scale Show on Saturday, March 14<sup>th</sup>, 2020. The following pages are the Model Contest Entry Form and the Model Contest Judging Form. You may fill them out prior to coming to the show, and that is recommended to save you time at the show.

The Contest Entry Form identifies your model and is your receipt for your model. When you place your model in the contest, this form will acknowledge that you have a model in the contest. When you pick up your model, you will need to sign this form in the Claim Check area. This tells us that you have picked up your model, and it is no longer in the contest. The form also explains the rules for the contest. You will notice that there is a category for Single Structure and one for Display/Diorama. There needs to be a distinction between when a Structure model becomes a Diorama. For the purpose of this contest, a Single Structure is a stand alone building with no base. The building may have all the interior partitions and trim, but no other details. For example, a clock on a wall or a person on a platform will move your model into the Display/Diorama category. If the building is mounted on a base with scenery, that will move the building into the Display/Diorama category. This may seem awkward, but it is the simplest way to make the distinction. The other categories should be clear. If not, contact us for help.

The Contest Judging Form will be used by the judges when looking at your model. You need to fill this out in as much detail as you would like. **In addition, we would encourage you to supply more information on separate pages.** Title any additional pages with the title of the judging box they apply to. For example, titling the page Construction will tell the judges that the information applies to the first box of the judging form which is titled Construction. If you supply photos or drawings, they will be used by the judges and returned to you when you pick up your model. The first box titled Construction explains how you built your model. For example, if your model is more than 90% scratch built, you would check off that the model is scratch built. In the construction techniques section, you may check off more than one item. The last item in this box is the description of how you built the model. The space is short, and we would recommend more explanation on a separate page. Make a note on the line to see the attached pages. The next box titled Detail is where you will describe the detail and what it took to create it. Again, we would recommend a separate page for your explanation. Any photos or drawings you used would be a help to show how you replicated features in your model. The next box titled Conformity is where you will describe how your model matches a prototype. If your model is entirely free lance, that is OK. Just describe how your model would match a prototype construction. Again, we would recommend a separate page. The next box titled Finish and Lettering has some items that can be checked. Check as many as apply to your model. A separate page may be required to explain all your techniques. The last box that you will need to fill out is the Scratch Built box. Describe any parts of your model that you made from scratch, along with how you made them. A separate sheet will help here as well. Any information that you can give the judges will help them to understand your model and how you built it.

The two judges will each make their own observations and assessment of your model. They will then confer with each other to give you a total score. You will get the contest judging form back with your model, and your information when you pick up your model. All decisions by the judges are final.

If you have any questions, please do not hesitate to contact us.

Amy Dawdy [amy@oscaleresource.com](mailto:amy@oscaleresource.com)

Dan Dawdy [dan@oscaleresource.com](mailto:dan@oscaleresource.com)

# Chicago O Scale Meet 2020 Model Contest Entry Form

Entry No. \_\_\_\_\_

## ENTRANT / MODELER (please print legibly)

Name \_\_\_\_\_ Category \_\_\_\_\_  
 Address \_\_\_\_\_ City \_\_\_\_\_  
 State/Province \_\_\_\_\_ Zip Code \_\_\_\_\_ Country \_\_\_\_\_  
 Phone (\_\_\_\_) \_\_\_\_\_, \_\_\_\_\_ Email \_\_\_\_\_

## CONTEST EVENTS (please print legibly)

Enter your model description, number, or railroad name in the event you would like to enter.

Diesel \_\_\_\_\_  
 Passenger Car \_\_\_\_\_  
 Steam \_\_\_\_\_  
 Single Structure \_\_\_\_\_  
 Display/Diorama \_\_\_\_\_  
 Traction/Trolley \_\_\_\_\_  
 Freight Car \_\_\_\_\_  
 Heavy Electric \_\_\_\_\_  
 Gas-powered \_\_\_\_\_  
 Caboose \_\_\_\_\_  
 Non-revenue \_\_\_\_\_

## CONDITIONS OF ENTRY

1. The model contest will be held Saturday March 14th, 2020 at the Chicago O Scale Meet. Models must be entered prior to 11:00 AM on that day. Once entered in the contest, the models must remain in the contest area until 4:00 PM on Saturday, March 14th, 2020. Awards will be presented at 3:30 PM on Saturday, March 14th, 2020, and models may be picked up at that time.
2. All models will be judged by a team of judges using nationally established judging guidelines. Categories that have only one model will not be judged, and no placement will be given. In these cases, *The O Scale Resource* gift certificate will be awarded to the sole entrant in that category. Best of show will be a popular vote.
3. Judging will start at the judge's discretion, and will be finished by 3:30 PM on Saturday Saturday, March 14th, 2020.
4. All models must be put in the display position by the modeler, and only the modeler may handle the model.
5. Any descriptions, photos, or other information relevant to your model will be attached to this entry for the duration of the contest, and will be made available to the judges at their request. The material will be returned after the contest.
6. I hereby certify that the model entered is my work. I also hereby release *The O Scale Resource Magazine* (the contest sponsor), Hobby Hill Inc. (the show promoter), and all persons connected with the contest from any liability due to damage or loss of the model entered.
7. I hereby grant The Model Railroad Resource, LLC photo reproduction rights for publication of this entry in *The O Scale Resource* magazine and/or use on their Website.

Entrant Signature \_\_\_\_\_ Sponsor \_\_\_\_\_ Date \_\_\_\_\_

## CLAIM CHECK

I hereby certify that my entry # \_\_\_\_\_ entered in the model contest has been returned to me.

Entrant Signature \_\_\_\_\_ Sponsor \_\_\_\_\_ Date \_\_\_\_\_

# Chicago O Scale Meet 2020 Contest Judging Form

Entry No.

## 1. Construction (Maximum 40 points)

Points Awarded

Select the construction that best describes your model

- ☐ Scratch built complete model and details >90%     ☐ Kit bash commercial model not per the kit plan  
☐ Scratch built partial model and details <90%     ☐ Kit built per the kit plan >90% some modification  
☐ Modified commercial model >50% modified     ☐ RTR model with some modification <20%

Name of kit or commercial model used as basis if applicable \_\_\_\_\_

Construction techniques—Select the methods and materials that apply to your model

- ☐ Drew own plans     ☐ Followed construction article     ☐ Cut & fit wood     ☐ Soldered metal  
☐ Used proto/com plans     ☐ Cut & fit metal     ☐ Cut & fit cardstock     ☐ Made patterns  
☐ Used kit plans     ☐ Cut & fit plastic     ☐ Cut & fit glass     ☐ Made molds

Describe how model was built, complexity, and materials \_\_\_\_\_

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## 2. Detail (Maximum 20 points)

Points Awarded

Describe complexity, difficulty, & quantity of detail parts added by you. Identify commercial parts.

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## 3. Conformity (Maximum 25 points)

Points Awarded

Describe how your model conforms to a prototype. Include prototype documentation other than supplied with kit.

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## 4. Finish & Lettering (Maximum 25 points)

Points Awarded

- ☐ Weathered     ☐ Hand Lettered     ☐ Decals     ☐ Transfers     ☐ Spray     ☐ Airbrush     ☐ Dry brush     ☐ Stain  
☐ Non weathered     Describe methods and materials \_\_\_\_\_

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## 5. Scratch built (Maximum 15 points)

Points Awarded

List all parts scratch built and note special refinements. \_\_\_\_\_

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## 6. Total Points (Judges only here)

Total Points

Tabulated by \_\_\_\_\_ Verified by \_\_\_\_\_  
The O Scale Resource January/February 2020

# O SCALE SHOWS & MEETS

Have an upcoming O Scale event? We would like to help publicize it. Send us the information up to one year in advance, and we'll place it here along with a direct link to your Website and/or Email.

**[Click here to send us your information.](#)**

## **Atlanta - O Scale South 2020**

**Saturday February 22<sup>nd</sup>, 2020**

Cross of Life Lutheran Church, 1000 Hembree Rd, Roswell, GA  
Swap Meet and Modular Layout plus Layout Tours following  
Meet. Hours 9 AM until 2 PM. \$5 Admission (Spouses, Children  
Free). \$25 per 8-ft Table (Includes Admission). Call Dan Mason  
770-337-5139 to Reserve Tables.

Email: [daniel@southernoscalers.com](mailto:daniel@southernoscalers.com)

Web Address: [www.oscalesouth.com](http://www.oscalesouth.com)

## **Chicago March Meet**

**March, 13, 14 and 15th, 2020**

Westin Lombard Yorktown Center

Lombard, IL

The Chicago O Scale Meet is a 3 day gathering of vendors,  
customers, clinics, and fun held annually in March in the  
Chicagoland area. This is the Chicago O Scale train show you've  
heard of.

Website: <http://marchmeet.net/>

Email: [info@marchmeet.net](mailto:info@marchmeet.net)

## **O Scale West - S West and Narrow Gauge West**

May 21-23, 2020

Hyatt Regency Santa Clara (San Francisco area)

Website: [www.oscalewest.com](http://www.oscalewest.com)

## **Eastern PA 2 Rail O Scale Train Show and Swap Meet Strasburg, PA**

**April 18, 2020**

Strasburg Train Show: Two-rail swap meet at the Strasburg Fire  
Co, 203 W. Franklin St, Strasburg, Pennsylvania. 9 am-1 pm.

Admission \$5, wives/children/military w. ID free, tables \$25 for  
first table, additional \$20 per. Great food, modular layout,  
clinics. Contact John Dunn (609-432-2871) [Click here for map](#)

## **The SONC 2020 Convention**

**July 16-18, 2020: St. Louis, Missouri**

For more information contact John Wubbel: cell phone/text  
message (570-580-7406); e-mail [jwubbel@gmail.com](mailto:jwubbel@gmail.com)

Website: <http://sonc2020.com/>

## **Eastern PA 2 Rail O Scale Train Show and Swap Meet**

**Strasburg, PA**

**August 8, 2020**

Strasburg Train Show: Two-rail swap meet at the Strasburg Fire  
Co, 203 W. Franklin St, Strasburg, Pennsylvania. 9 am-1 pm.

Admission \$5, wives/children/military w. ID free, tables \$25 for  
first table, additional \$20 per. Great food, modular layout, clinics.

Contact John Dunn (609-432-2871) [Click here for map](#)

## **O & S Scale Midwest Show**

**Saturday and Sunday, September 18-20, 2020**

Formerly the Indianapolis O Scale Show / S Scale Midwest Show  
New name but the same great show! This is a dedicated 2 rail O  
Scale and S Scale show; however, we encourage and welcome  
the many modelers and collectors from the 3 rail and high rail  
side of the hobby to attend. There are many aspects of the hobby,  
including building, scenery and more that applies to any scale.

Moreover, this show is a great place to get inspired while meeting  
old friends and making new ones!

Website: [oscalemidwest.com/](http://oscalemidwest.com/)

Email: [info@oscalemidwest.com](mailto:info@oscalemidwest.com)

## **Eastern PA 2 Rail O Scale Train Show and Swap Meet**

**Strasburg, PA**

**October 17, 2020**

Strasburg Train Show: Two-rail swap meet at the Strasburg Fire  
Co, 203 W. Franklin St, Strasburg, Pennsylvania. 9 am-1 pm.

Admission \$5, wives/children/military w. ID free, tables \$25 for  
first table, additional \$20 per. Great food, modular layout, clinics.

Contact John Dunn (609-432-2871) [Click here for map](#)

## **The Cleveland 2 Rail O Scale Meet**

**Saturday, November 7, 2020**

Cleveland O Scale Meet our 37th annual show

9:00 AM to 2:00PM at the UAW Hall

5615 Chevrolet Blvd. Parma, OH 44130

Admission \$6, free parking, large facility

Please note show time changes

Dealer load in Friday Nov 1 1-4PM Saturday 7-9AM

440-248-3055 email [j3a5436@gmail.com](mailto:j3a5436@gmail.com)

Website: <http://www.cleveshows.com>

# READER CLASSIFIEDS

## BUY ~ SELL ~ TRADE

To submit a wanted to buy or sell non business classified ad please click the link below.

<https://ribbonrail.com/railroadresource/Classified/> 725 Characters \$10.00 less contact information.



**WANTED:** Vintage O Scale Older the Better! Outside 3rd rail, Acme, Alexander, Birch, Egolf, Exacta, Icken, Pomona, Mutiplex Track, Model Structures Buildings, Walthers Streamlined steamer, Baldwin Niagara, early diesels, Bascule or Lift bridge, World's Fair pieces, Museum and Santa Fe RR pieces, Scale Model Railway, old controllers, etc.

**Also looking for:** Voltamp, Carlisle & Finch, Knapp and Howard.

Carey Williams

Email: [wasp3245@aol.com](mailto:wasp3245@aol.com)

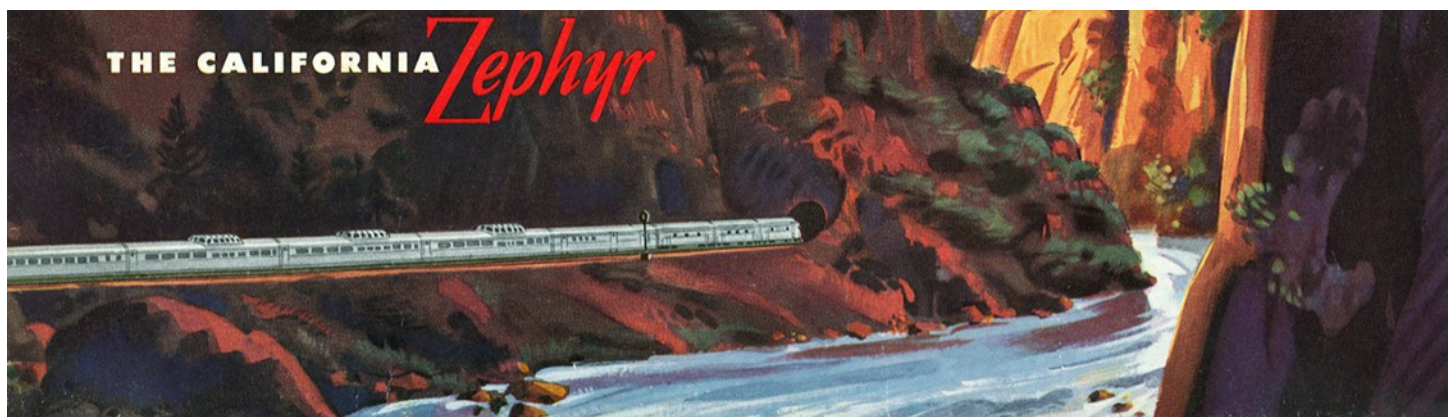
Phone: 773-332-6121



**FOR SALE:** Golden Gate Depot 10 car 1951 Super Chief in 2 Rail. Unused, set A opened to inspect dome car -good. Set B factory sealed. \$3,500.00 free shipping lower 48.

Scott Thurman

Email: [thurmanscott971@gmail.com](mailto:thurmanscott971@gmail.com)



keymodels.net

# Key Models

March/April 2019

## MANUFACTURERS

**RTS** Rail and Track Work  
Supplies, INC.

Your O-Scale source for prototypical Rail, Cast frogs, Guard  
Rails, Points and other track laying supplies.

Phone: 810-571-1616

Email: [info@railandtrackworksupplies.com](mailto:info@railandtrackworksupplies.com)

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Email: [orders@scalefigures.com](mailto:orders@scalefigures.com)

Web: [scalefigures.com](http://scalefigures.com)

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Cast resin items for your S & Sn layout.

Tunnel portals, bridge piers, abutments, culverts, and  
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## Save Our Scale

Join a blog dedicated to  
Revitalizing two-rail O Scale

Your Input Needed

[tworailoscaleblog.wordpress.com](http://tworailoscaleblog.wordpress.com)

## BOATS



*hulls & fittings for your layout or diorama*

[www.seaportmodelworks.com](http://www.seaportmodelworks.com)

603-498-3849 [sales@seaportmodelworks.com](mailto:sales@seaportmodelworks.com)

**Details, details,... more details**

**Berkshire Valley Models**

[berkshirevalleymodels.com/apps/webstore](http://berkshirevalleymodels.com/apps/webstore)

and a few other things

O scale!

## SHOWS & MEETS

**Chicago "O" Scale**

**March 13-15 2020**

[www.marchmeet.net](http://www.marchmeet.net)

Ph. 630-745-7600

## DEALERS

Caboose Stop



Hobbies

[Caboose Stop Hobbies](http://CabooseStopHobbies.com)

301 Main St.

Cedar Falls, IA 50613

Phone: 319-277-1754

[trainguy34@mchsi.com](mailto:trainguy34@mchsi.com)

Web: [www.caboosestophobbies.com](http://www.caboosestophobbies.com)



RGSRR Hobbies

1102 Dyer Rd

Whitewater, CO 81527

PH 970-245-5100

[www.rgsrrhobbies.com](http://www.rgsrrhobbies.com)

## PROTO 48

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18498 Half Moon Street, Unit 203

Sonoma, CA 95476-4835

Phone: 707-935-7011

Email: [norm@protocraft.com](mailto:norm@protocraft.com)

Web: [www.protocraft48.com](http://www.protocraft48.com)

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# O&S Scale Midwest Show



**It's September! Time to kick off your modeling season!**

**THE BEST OF O SCALE AND S SCALE IN ONE SHOW**  
**SEPTEMBER 18-20, 2020**

**WYNDHAM** INDIANAPOLIS WEST 2544 EXECUTIVE DR. INDIANAPOLIS, IN

**DEALER SETUP**

**SHOW TIMES**

**Friday 4pm - 9pm**

**Saturday 9am - 5pm**

**Saturday 7:30am - 9am**

**Sunday 9am - 2pm**

**Room Rate \$125.00\* per night (until 8/21/20) Reference O/S Scale Show when calling**

**\*Based on availability**

**317-248-2481 / 877-361-4511**

**MEET OLD FRIENDS AND MAKE NEW ONES**

Please print clearly – Detach and return lower portion with payment

Name: \_\_\_\_\_  
(Exactly as you would like badge printed)

Business: \_\_\_\_\_  
(Exactly as you would like badge printed - table holders only)

MAILING ADDRESS

CITY/STATE/ZIP

Phone: (\_\_\_\_) \_\_\_\_\_

Email: \_\_\_\_\_

Make checks payable to: Model Railroad Resource LLC  
Mail registration form to: 407 East Chippewa St  
Dwight, IL 60420

Or register and pay online at:

**Registration (Both days included) \$25.00 \$ 25.00**

(Table holders must pay the \$25.00 registration fee)

**# Of 8 ft. Tables \_\_\_\_\_ \$50.00 ea/\$60 after 8/1/20 \$ \_\_\_\_\_**

☐ O Scale vendor ☐ S Scale vendor ☐ No preference

Number of add'l registrants \_\_\_\_\_ @ \$25 each \$ \_\_\_\_\_

(Please list below/Use back if needed/Spouse/Children 15 and under free)

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

**TOTAL AMOUNT ENCLOSED: \$ \_\_\_\_\_**

(No refunds after 8/20/20)

**Electrical needed? Yes ☐**  
(Subject to availability)

**OSCALEMIDWEST.COM OR SCALEMIDWEST.COM**

**CONTACT INFO@OSCALEMIDWEST.COM OR CALL 815-584-1577 WITH ANY QUESTIONS**

The parties, whose names appear on this registration form, have agreed to hold harmless all of the organizers, sponsors, Model Railroad Resource, LLC, The Wyndham Indianapolis West, and others, single and collectively, for any injury, harm, loss, damage, misadventure, or other inconvenience suffered or sustained as a result of participating in the Indianapolis O Scale Show and S Scale Midwest Show 2019 or in connection with any activity related to this event, whether of negligence by agents under their employ or otherwise.