The Keystone Modeler

Pennsylvania Railroad Technical & Historical Society

No. 103 Winter 2018

Inside:

The Keystone Modeler
Pennsylvania Railroad Technical & Historical Society

Published Quarterly by
The PENNSYLVANIA RAILROAD
TECHNICAL and HISTORICAL SOCIETY
A non-profit organization

THE KEYSTONE MODELER STAFF

EDITOR
Jim Hunter
Jhthistle@gmail.com

ASSOCIATE EDITOR
Jack Consoli
jjaconsoli@gmail.com

NEWSWIRE EDITOR
Steve Hoxie
stevehprr@cox.net

EDITOR EMERITUS
Al Buchan
abbuchan1@comcast.net

CHAIRMAN MODELING COMMITTEE
Elden Gatwood
Elden.J.Gatwood@usace.army.mil

ART DIRECTOR
Tim Garner
t.a.garner@verizon.net

Send comments and corrections to the Editor at:
Jhthistle@gmail.com

MEMBERSHIP INFORMATION
PRRT&HS, PO Box 54, Bryn Mawr, PA 19010-0054

PRRT&HS MONTHLY E-NEWS
Keystone-e-news-request@lists.keystone-pubs.org?Subject=subscribe

NUMBER 103 **WINTER 2018**

CONTENTS

FRONT COVER

(Top) A brass N5e cabin car detailed and finished by Jack Consoli. Jack explains his methods starting on page 6. *(Jack Consoli)*

(Bottom) GG1 #4905 rolls along under the wires on Ed Swain's layout. Learn how he strung the wires starting on page 25. *(Ed Swain)*

The Keystone Modeler

Manuscripts and photographs submitted for publication are welcome. Materials submitted are considered to be gratis and no reimbursement will be made to the author(s) or the photographer(s) or his/her representative(s). The Society reserves the right to reject, for any reason, any material submitted for publication.

Please contact the editor for information and guidelines for submission. Photo files 800x600 pixels or larger in JPG format are preferred. Statements and opinions made are those of the authors and do not necessarily represent those of the Society.

The Keystone Modeler on CD-ROM

Disc 1	August 2003 to July 2004	*TKM* Nos. 1 – 12
Disc 2	August 2004 to July 2005	*TKM* Nos. 13 – 24
Disc 3	August 2005 to July 2006	*TKM* Nos. 25 – 36
Disc 4	August 2006 to July 2007	*TKM* Nos. 37 – 48
Disc 5	August 2007 to July 2008	*TKM* Nos. 49 – 60
Disc 6	August 2008 to Autumn 2009	*TKM* Nos. 61 – 71
Disc 7	Winter 2010 to Autumn 2010	*TKM* Nos. 72 – 75
Disc 8	Spring 2011 to Winter 2012	*TKM* Nos. 76 – 79

Each disc is $15.00. There is also a disc containing all issues from 1 to 48 for $60. If you are a resident of Pennsylvania, please include PA sales tax. Include an additional $15 for shipments outside the US. Send a check or money order in US dollars payable to PRRT&HS to:

Jim Hunter
4306 North Victoria Way
Harrisburg, PA 17112-8641

To **subscribe** to **The Keystone Modeler**, click on the link below and send:
mailto:the-keystone-modeler-request@lists.keystone-pubs.org?Subject-subscribe

To **unsubscribe**, click on the link below and send:
mailto:the-keystone-modeler-request@lists.keystone-pubs.org?Subject-unsubscribe

In this issue, you will find something different at the top of Steve Hoxie's column. It is a link to a survey which Dave Wilson is conducting. Steve wanted to help Dave, and I agreed because I felt doing this was a way to reach as many PRR modelers as possible.

A survey such as this is done in the hope/expectation that it will influence manufacturers to produce the models most desired by Pennsy mavens. Personally, I have my doubts that it has that effect. Manufacturers have to be concerned about demand, and whether they will sell enough units to make it worth their while. What I do believe is that some of the members of the Modeling Committee have good contacts with the manufacturers and are able to at least influence what the producers do in terms of colors and details. If the Modeling Committee is aware of the results of the survey, perhaps they could use that as evidence to support their proposals. At any rate, I think the survey can be fun to take and to discuss among modelers.

Doug Nelson won the RMC/Dremel Kitbashing Award for his N scale X42. In the February *Craftsman* he shows how he built his car from two Intermountain kits.

Our winter *TKM* includes an article by Jack Consoli which demonstrates how soldering transformed an old brass model into a much-improved N5E. Soldering was also employed by Ed Swain in constructing the catenary on his layout.

Jim Hunter, Editor

Pennsylvania Railroad Technical & Historical Society

The purpose of the Pennsylvania Railroad Technical & Historical Society is to bring together persons interested in the history and modeling of the Pennsylvania Railroad, its subsidiaries and its acquired companies. Our goals are to promote the preservation and recording of all information regarding the organization, operation, facilities, and equipment of the PRR.

The Society's quarterly illustrated journal, *The Keystone*, has been published continuously since 1968. Each issue of 64 or more pages contains illustrated original authoritative articles about locomotives, cars, other equipment, facilities, and operating practices of the PRR. The Society also publishes its own thoroughly researched books and other materials concerning PRR history. *The Keystone Modeler* is also a quarterly special 30-plus page online publication of the Society.

The Society meets annually, usually during a weekend in early May, providing an opportunity for its members to get together and learn more about the PRR. Local chapters around the country also provide members and guests with regular meetings that feature PRR related programs.

Information about our Society may be found on our website – www.prrths.com. To join the Society, send $40.00 to:

PRRT&HS
PO Box 54
Bryn Mawr, PA 19010-0054

All memberships are for a calendar year, back issues of The Keystone for the current year are sent upon joining. Overseas membership has added postage fees.

PRRT&HS Interchange

Selected Society Merchandise of Interest to Modelers

PRR Equipment Drawings on Microfilm

Copies of PRR equipment drawings are available from the Society's microfilm collection. To order drawings, you must know the drawing number and title. Ordering information and lists of arrangement drawings are available on the Society's website. Go to www.prrths.com, select National Society, and then The Interchange. If you require a printed copy of this information, please send your address and a check for $2.00 made out to PRRT&HS to:

Richard C. Price
779 Irvin Hill Road
McVeytown, PA 17051

The Keystone Modeler
NEWSWIRE
With Steve Hoxie

Annual Model Survey

For a number of years Jerry Britton, Keystone Crossings creator http://pennsyrr.com/ , conducted a survey of Pennsy modelers to determine what products we wanted the most. This information was then presented to various manufacturers. Although we can't know what has gone on behind closed meeting doors, we believe this effort has been done to good effect. We do, indeed, have a wonderful array of PRR specific models available. This year Dave Wilson has stepped up and created the 2018 HO Survey. Your participation is invited at:

https://goo.gl/forms/BBVCK1JUUnbFIkvJ3

The survey will close mid-March.

PRR Product News

ATHEARN
http://www.athearn.com/
PRR EMD SD40 Diesel Locomotive RTR—HO Scale

(Athearn)

Athearn has announced an SD40 to be available in both DCC-ready and DCC/Sound versions as part of their Ready-To-Roll line. The sound decoder will be the Soundtraxx Econami. These models will be equipped with LED's, actual rubber hoses, and have several road numbers. It is expected to be available in January 2019.

ATLAS MODEL RAILROAD CO.
https://shop.atlasrr.com
PRR Pullman 10-1-1 Heavyweight Sleeper RTR—HO Scale

(Atlas)

Atlas has released a 10 section/1 Drawing Room/1 Compartment model based on the former Branchline cars. The car is currently available.

ATLAS O
https://shop.atlasrr.com
PRR H21A Hopper—O Scale

(Atlas)

Atlas is making this very common car available for O scalers. You can never have enough H21's. Coming the second quarter of 2018.

BOWSER MFG. CO.
http://www.bowser-trains.com/
PRR AS-16m Alco RS3 Phase III Road Switcher—HO Scale

Discussions with Bowser indicate that this much anticipated model will be available in the fourth quarter of 2018.

PRR F30A Flat Car RTR—HO Scale

(Bowser)

Bowser is making another run of the F30A flat car. Availability is expected in December 2018.

PRR GS Gondola RTR—HO Scale

(Bowser)

Bowser is also planning the popular GS for a rerun due for arrival in December 2018.

BROADWAY LIMITED IMPORTS
http://www.broadway-limited.com/
PRR T1 Steam Locomotive—N Scale

Work on this popular engine for N scale is progressing. It is now expected in April 2018.

PRR P5A Electric Locomotive—HO Scale

Development is proceeding. It is now expected to arrive in July 2018.

WALTHERS
https://www.walthers.com/
PRR EMD E8 Passenger Diesel—HO Scale

(Walthers)

Walthers is providing an E8 model with the side skirts removed and in the single large stripe scheme, representing engines as they operated about 1960 and later. Models are currently in transit and expected February 28, 2018.

PRR Alco PA1 and PB1 Passenger Diesel—HO Scale

The Alco PA/PB are now anticipated to be available in February 2018.

PRR EMD F7 Freight Diesel—HO Scale

EMD F7 A and B unit models are in production by **Walthers**. Both DC and Sound/DCC versions will be available. Check the website for availability of photos of the model to determine if these models fit your era. Expected by the end of March 2018.

Upcoming Events

February 3-4, 2018 - Timonium, Maryland
Great Scale Model Train Show
http://www.gsmts.com/

February 10, 2018 – Portland, Oregon
Bridgetown Railroad Prototype Modelers Meet
http://alwlines.com/

March 23-25, 2018 Malvern, Pennsylvania
Railroad Prototype Modelers Valley Forge
http://www.rpmvalleyforge.com/

April 13-14, 2018 Savannah, Georgia
Savannah RPM Meet
Contact Denis Blake, seaboard_1966@yahoo.com

April 21-22, 2018 Roanoke, Virginia
Coalfield Railroads RPM Meet and Scale Train Show
https://www.facebook.com/TheCoalfieldRailroadsRPMMeetAndScaleTrainShow/

April 26-28, 2018 Marion, Ohio
Central Ohio RPM Meet
Contact dblake7@columbus.rr.com for more details

April 28, 2018 San Bernardino, California
Western Prototype Modelers Meet
https://ppw-aline.com/pages/rpm-so-cal-meet

May 6, 2018 Staunton/Waynesboro, Virginia
32nd Annual Shenandoah Valley Train & Railroading Show
http://www.acmrrc.org/annual-model-train-show/

May 9 –12, 2018 Altoona, Pennsylvania
50th Anniversary PRR&THS Annual Meeting
http://www.prrths.com/conventions/PRR_Annual.html

Advance Planning

June 1-2, 2018 Enfield, Connecticut
New England/Northeast RPM Meet
http://www.neprototypemeet.com/Welcome.html

June 16, 2018 Richmond, California
Bay Area Prototype Modelers Meet
http://www.bayareaprototypemodelers.org/

July 20-21, 2018 Collinsville, Illinois
St. Louis RPM Meet
http://icg.home.mindspring.com/rpm/stlrpm.htm

August 5-12, 2018 Kansas City, Missouri
NMRA National Convention and National Train Show
http://www.kc2018.org/

October 18-20, 2018 Lisle, Illinois
RPM Chicagoland
http://www.rpmconference.com/

The N5E: Upgrading a Brass Cabin Car

by Jack Consoli – photos by the author unless specified

Completed N5E model.

Although this article describes work I did on a specific PRR cabin car, the techniques can be applied similarly to most any other brass cabin car model in need of upgrading. Brass manufacturers and importers have produced PRR prototype cabin car models since the 1960's or earlier, and as with most other railroad scale models, the level of detailing and accuracy to the prototype has steadily increased over the intervening years. Many of these older models have good "bones," as the house-fixer-upper crowd likes to say, but need some work to get on par with the level of current models being produced in brass, plastic resin, etc. The subject cabin car of this article is an unpainted version of a class N5E imported by Alco Models as their model #X-135, built by KSM in Korea in the late 1960's to 1970's. Precision Scale and Alpha Models also produced versions of the N5E as well, somewhat more recently.

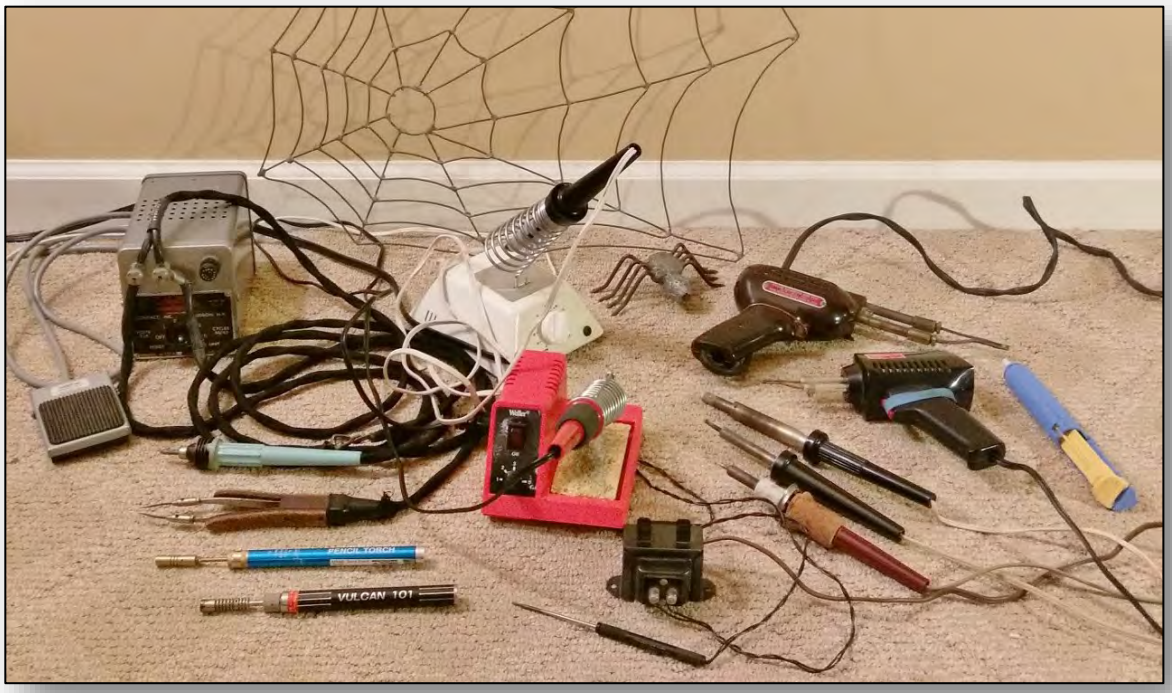
Unlike some other projects, the work required here is not as much about adding commercially available detail parts as it is fabrication and soldering. Soldering. Soldering is a mandatory skill to even consider undertaking a project like this. A friend (who should know, as he scratch-builds brass steam locomotives) noted, some of the work here is "not for the faint of heart". If you can't solder, that's too bad, as it is a great skill to have in your modeling toolbox. You should learn. It is an art that has an almost magical quality when it goes well and you watch metal – normally hard and solid as any material you deal with – melt and flow into the joint between separate parts, then solidify, making them one. Conversely, when it doesn't go well, it can be as frustrating as anything in modeling. I learned this as a kid when I decided it would be a "fun" project to build a 2' tall spider web out of 12-gauge bare copper wire with my Dad's soldering pistol, woefully underpowered for that task. It graphically illustrated one of the three big issues in soldering. You need the right tools, and for a project like this, that means more than one soldering device. The tool must be fitted to the situation for things to work well. In addition to size, space and accessibility in making a joint, tool selection is about thermal mass. You must be able to get the solder and the parts up above the melt temperature of the solder. The "just use a bigger hammer" philosophy could be applied here except that the tricky part is that while making one joint you don't want to unsolder any other joints that may be nearby. So, the real skill is not only being able to get the area needed up to sufficient temperature, but to do it quickly and/or selectively enough to avoid unsoldering other joints.

Good electrical conductors are typical also good thermal conductors so the pure copper and its alloys, including brass, that comprise many of our models are great at wicking away the heat you are trying to apply to a given area, not only thwarting your ability to create the joint you want, but also threatening to destroy neighboring joints in the process. Small irons/guns/torches are good for small parts, but parts with large thermal mass such as car roofs, floors and bodies as well as steam locomotive boilers, frames and tenders need something different. These situations are where a resistance soldering unit can become your best friend. Don't get me wrong, you can do most any, and everything, with a medium to large iron or torch if you've developed the expertise to do so. You can also cheat a bit by using different melting point solders that are available. With this approach, you solder the first joint with the highest melting point solder and on subsequent nearby joints you use lower melting point solders. In this approach, you then carefully apply only enough heat to melt the next lower melting point solder to create the current joint you are working on and not re-melt the earlier joints. You can also make use of heat sinks to help protect parts or areas you don't want to heat. These can be of the metal, mechanical clamp-type or simply a wad of wet paper towel placed on the model to block the heat from reaching an undesirable area. Better yet, learn to use all these techniques where they are best suited to the task at hand. I will attempt to describe *how* to do the work to upgrade the car below.

THE PROTOTYPE

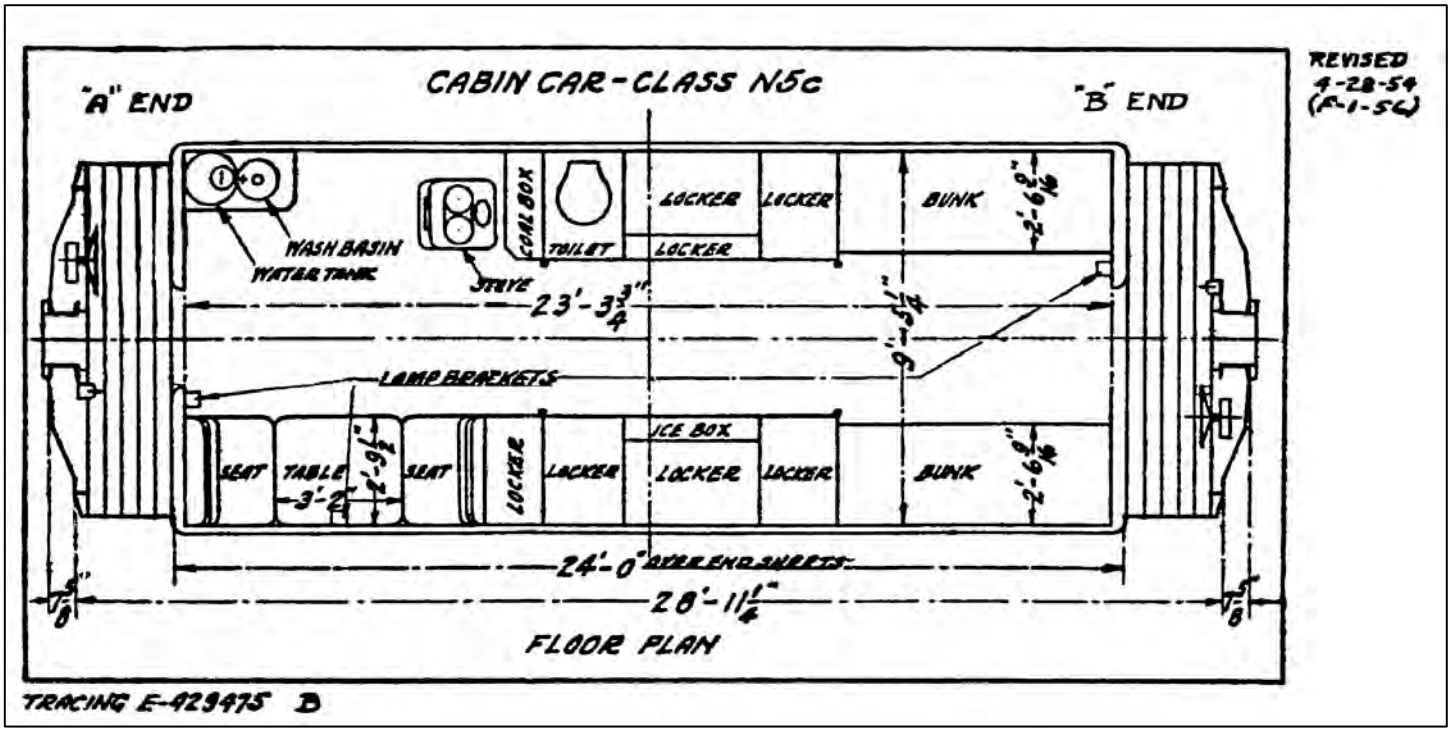
On the PRR, *the* class N5E cabin car was distinctive, not only because of the physical features of the car, but also because it was a single car class in amongst their massive fleet. The 1957 cabin car roster shows the roster to consist of 2112 cars in 12 other classes, plus N5E, #477594. The car's appearance was a combination of mostly typical Pennsy steel cabin car features: relatively short all steel body, streamline cupola (albeit placed slightly off-center), curved-eave roof and end platform collision post structures. It was most noticeably unique in having four rectangular windows on each side.

The short history is that it was rebuilt at Pitcairn in October 1945 from a wrecked N5 class cabin. Understandably, when the railroad rebuilt this 16-year-old N5 (built October 1929), it incorporated some features like those used in their most recently constructed class, the N5C of 1941. The result was that it was generally similar to an N5c, with the steel body, streamline cupola and four windows per side, however, rectangular windows were substituted for all the round porthole windows. This may have been an indication that the porthole windows inaugurated with the N5C design had already been determined not to be worth repeating and were a preview of the return to rectangular windows on the later N8 class cars to follow in 1951. Also, unlike the N5C, its shorter length cupola was offset 12.5" from the centerline of the car, a holdover from the N5 from which it was rebuilt. On the N5, there are structural members in the carbody under the ends of the cupola to support it, which in turn, were supported by off-center crossbearers below them in the underframe. Apparently, this part of the original car survived and thus the streamlined cupola was constructed to fit the spacing and location of these supports. The air brake reservoir also appears to be mounted in a manner not typical on N5 or N5C class cars. The car was never Trainphone equipped. PRR correspondence shows that in 1947 at least one other wrecked N5 was proposed to be converted to an N5E, but the plan was changed to make it an N5C after protracted attempts to get drawings of the original conversion failed.

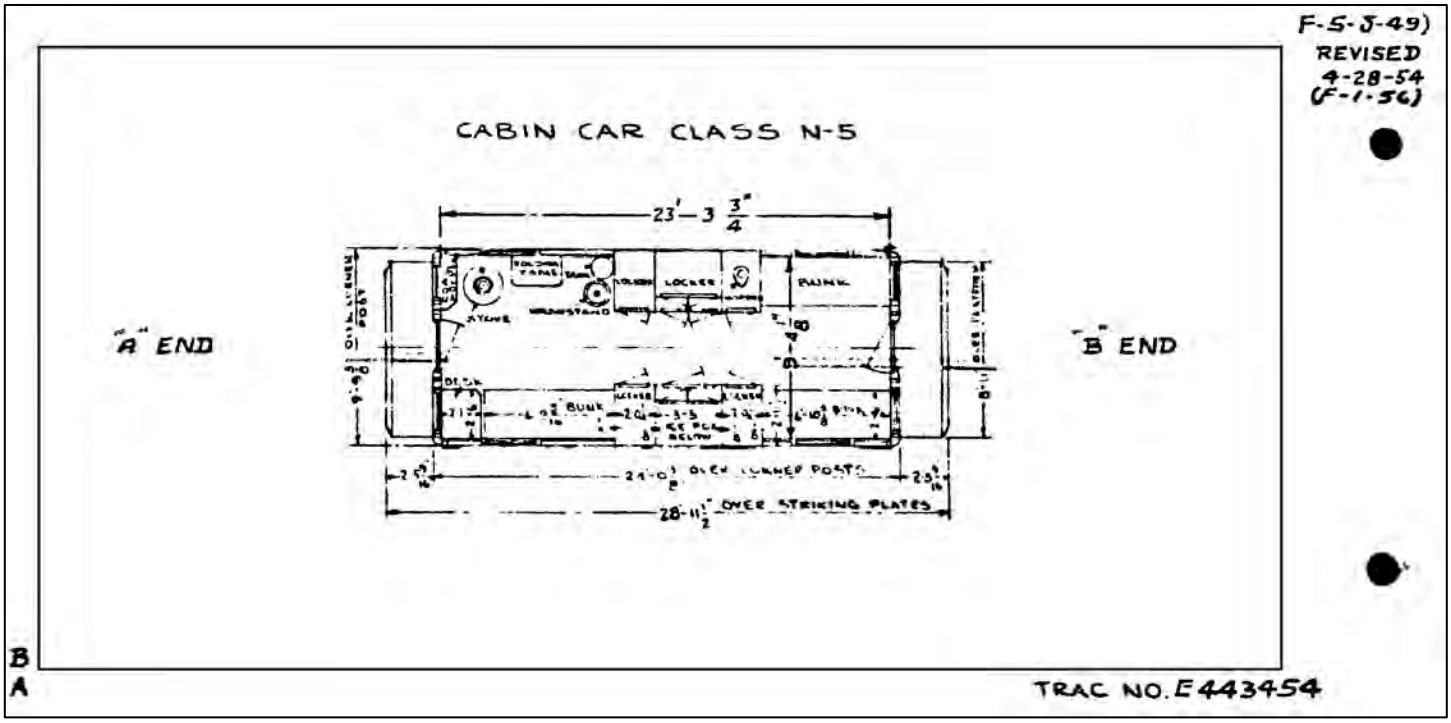


My array of soldering tools: various size and wattage pencils and irons, butane torches and a resistance soldering unit.

Following its construction, the only major visible change over its lifespan was the interior rearrangement of the stove location. Externally this resulted in the smoke jack moving from a location near the end of the car to a position near the cupola. It appears that concurrent with the move, the smoke jack was changed from the "T" style to the "H" style. This relocation was apparently implemented on a number of cabin cars, but I do not know the history of this. The PRR's "builder's photos" show the interior arrangement of the car was very similar to the N5c plan shown below, except that the plan has the later stove/coal box/sink/water tank locations. The toilet location matches the vent visible on the exterior of the car. The N5E was built with the stove/coal box/sink/water tank arrangement similar to the N5 floor plan below.



▲N5c Cabin Car floor plan, revised to 4-28-54. *(Courtesy Robert Schoenberg)* ▼N5 Cabin Car floor plan, revised to 4-28-54. *(Courtesy Robert Schoenberg)*



Westbound N5E in front of pushers EF-15 9660A, EH-15 9518B, and EFP-15 9843A at Lily, 12/19/60. *(Fred R. Kern)*

The N5E was also unusual in that, unlike the other N5-classes, the car was originally painted with circle Keystone herald on each side in addition to the widely-spaced, spelled out roadname. A similar scheme was then later applied to the N8, although the roadname was repositioned between the windows, rather than above them, due to the longer space available. The PRR's "builder" side view appears in *Pennsy Power III*, a later photo of the car in PC Railroader magazine shows the car with a shadow Keystone scheme applied and with fully black cupola and roof. September 1965 and May 1967 photos in *Prophet's Pennsy* and *PRR Color Guide Volume 2* respectively, show the car in focal orange with black roofs and orange cupola sides with plain keystone lettering. The same very late PRR-era photo in the *Caboose Data Book No.2: Cabin Cars of the Pennsylvania and Long Island Railroads*, *Prophet's Pennsy* and *PRR Color Guide Volume 1* shows the car in the same focal orange with plain Keystone scheme but with a yellow pool service cupola.

Although never duplicated, the lone N5E survived through the PRR era and on into Penn Central and Conrail. It is in fact, still in existence and is on display outside the Children's Museum in Utica, NY.

http://www.hebners.net/CR/crn5AEF.html

So why model this one-of-a-kind car from amongst a cast of thousands? The 1957 cabin car roster lists it as being assigned to the Pittsburgh Region with the service assignment of "W. Brownsville Jct. - Altoona", one of five such N5/N5B/N5C cabins. West Brownsville Junction on the Monongahela Branch (former Division) was the marshalling point for coal coming off the PRR's Ten Mile Run Branch plus the PRR's share of the coal output of the Monongahela Railway. Several locomotives and cabins were assigned to this direct service for coal headed eastward via Altoona. These trains traversed the more northern section of the Monongahela Division (which I model) before diverting across the Port Perry Branch to join the mainline at Pitcairn. It would appear to be operating in this service in the 1960 photo of the car returning from Altoona at Lily, trailing a P&LE hopper: typical of cars in the consists of coal trains originating on the MRy. (Since they owned no freight cars, they primarily loaded cars from their three parents; the PRR, P&LE and B&O.) A searchable version of the 1957 cabin car roster is available on the Keystone Crossings website at:

http://pennsyrr.com/data/1957-cabin-car-roster

Alco Models N5E as purchased. A nice model, but with opportunities for improvement.

THE MODEL

I purchased an unpainted version of the model (the late yellow-cupola version was also produced). "Unpainted" typically does not mean the model is bare brass, but rather has been painted with a clear cover coat to retard tarnishing of the brass while retaining the pretty, shiny brass appearance. Soldering over, through or around paint, whether it is a color or clear, usually doesn't go well. Paint in the joint prevents the desired metal to metal interaction and paint near the joint will usually discolor, roughen, char and/or become difficult to remove. So, unless you plan to only solder at a few selected spots, it is a good idea to just strip the whole model to start with. The nice thing here is that you really can't damage the underlying brass model like you can a plastic model with this process. I disassembled the model, put all the brass parts in an old tall peanut butter jar of my favorite stripping agent, put on the lid and walked away for several days. Once the finish is removed, scrub the model with soap, cleaner or cleanser and set aside to dry.

The subsequent modifications fall into three categories: missing details, incorrect details and poorly executed details. I like to do the steps involving the most handling or abuse to the model first, then work down through the finer details as the work nears completion. I deal with the trucks, wheels and couplers first. I filed the excess solder from the coupler mounting pads on the ends and test-mounted a set of Kadee #58 couplers in #5 coupler boxes using the screws provided with the car. I tossed the model's brass trucks into my parts box as they fit the "poor execution" category. I put some Reboxx 1045 .088" wheelsets into a set of Bowser plastic single coil spring caboose trucks #1-74012 to simulate the PRR class 2A-5F trucks on the prototype and added washers to get the couplers to the correct height. Using plastic trucks on brass models also helps to avoid shorting issues and the loss of weight on these otherwise relatively heavy models is not an issue. Use the brass trucks on some other plastic or resin project where the added weight is a bonus and shorting isn't a potential issue. I removed the couplers and set the underframe aside until later.

BODY

The first steps on the body modifications were to remove the parts requiring "correction". I grasped the base of the smoke jack close to the roof with the resistance soldering unit tweezers (see sidebar). If you think ahead about how the current and heat will flow you can help get the desired results without unpleasant consequences. By grabbing the base of the smoke jack, it will heat up first and then the heat will spread out to the surrounding roof, causing the joint to reach melt temperature before any other part of the car does. So simply grasp the part, depress the footswitch and wrestle the part out with the tweezers once the solder melts (which is usually visible as the solder turns very shiny). You generally want to try to use as high a setting as you can since that makes the joint heat up most rapidly, reducing the potential for melting nearby joints. Two exceptions are when either the part in question is very small and can be melted/destroyed outright or when the parts being joined have small thermal mass and just don't require high heat to get them up to soldering temperature. Regardless of the parts and/or heat settings, you also want to only apply the heat for as short a time as necessary to melt the solder in the joint being worked.

RESISTANCE SOLDERING

A resistance soldering unit is basically a power supply. The tweezers are one of the attachments of the unit. The tweezer's two tips are the two isolated electrodes meant to grasp an electrical conductor between them to complete the circuit and thus generate heat due to the resistive heating of that part. The insulative cork handles are to prevent you from becoming part of the circuit, albeit only 5 volts, but more importantly, to insulate you from the potentially high heat generated. On my Hotip unit the control has five power settings which simply increase the amount of current available to flow to the tips. The parts (and interfaces between parts) you are soldering or unsoldering act as resistors in the circuit. When current flows through a resistor, the resulting voltage drop is due to the electrical energy being converted to heat: the more current dissipated, the more heat (power) generated. In a resistor, power consumed = the *square of* the current times the resistance, so increasing current is very effective in generating heat. The high temperature alloy tips of the tweezers often glow bright red when the higher current is applied. This kind of power is a wonderful thing but be aware that you can literally vaporize small parts like grab irons on the higher power settings. The small tips allow you to apply heat in very localized areas in several different ways, detailed in the car modifications described below.

My unit has a footswitch to energize the circuit which is extremely helpful in two ways. The first, obviously, is that it leaves your hands free to hold the tweezers, the model, parts, solder, etc. The second is that it aids greatly in another way regarding the second big issue in soldering: how to hold the parts in the desired position/location while making the joint. Since the tweezers are a clamp, you can prep the joint and then hold the part you are soldering in proper position and get everything ready, prior to applying any heat. Once the heat is applied and the joint is made, the parts need to remain fixed in place until the solder cools enough to freeze back to the solid state. The beauty of the tweezers and the other tool, the straight electrode, is that once the joint is made, you let off the footswitch and continue to hold the parts undisturbed for a couple seconds while the tool and parts cool and the joint freezes, undisturbed. This is unlike the situation with a soldering iron, with which, although it can be used to hold parts in place when melting the solder, you can't complete the joint by removing the heat (the iron) without also letting go of the parts.

Another key ingredient for soldering to work well is the cleanliness of the parts. The cleaner the surfaces, the easier the solder flows and bonds to them. Always clean the surfaces to be soldered even if they don't look "bad". An oxidation layer forms on bare brass stock and parts on the models very rapidly under even normal room conditions and this layer inhibits soldering. Yes, applying more flux and more heat for a longer period will sometimes help to break through this layer, but those are all things counterproductive to making good, clean minimal joints without affecting neighboring parts. Before attempting to apply any part to the model I make sure to clean it and the area to which it is to be applied. You can do this easily mechanically by sanding with fine emery cloth, scraping with the edge of a knife blade, sand blasting, chemically with various liquids or scrubbing with copper/brass-specific cleanser. During the soldering process, the molten solder will tend to wick or travel towards the higher heat areas and follow the cleaner path of least resistance. You can use this behavior conversely to help confine where the solder flows by not cleaning areas where you don't want the solder to go. This is not a foolproof mask but is somewhat effective with minimal effort. There are brush-on mask materials available that will prevent solder from flowing more absolutely, if needed.

Also on the list of parts to remove were the rain gutters over the cupola side windows, the drip edge over the paired side windows, the curved body side grab irons and the horizontal end railings. These are all straight forward to remove, just grasp with the tweezers, set the power level to high, depress the footswitch and pull off the parts as soon as the solder melts. Potentially damaging these parts using the high setting here is not a problem as I planned to discard all these parts being removed. Clean up any excess solder left on the model after removal of the parts. I then cut out the vertical dividers in the cupola side windows, as these windows were not divided. On the real car, at some point in time, there were wind deflectors mounted outside these windows, which I guess is what those verticals are intended to represent on the model. I also cut off the protruding trapezoidal tabs along the bottom of the body sides at the bolsters with a cut-off wheel in a motor tool and then filed them flush. N8's had these, but none of the N5 classes did.

With these parts removed, rebuilding can begin. The rain gutters over the cupola windows were removed since they were placed way too far above the tops of the windows and were a bit oversized at .020" diameter and made the model look wrong. The original gutters on the model were simply a bent piece of wire, so I made no effort to salvage them as it was easier to just make new, properly shaped, clean ones from .015" brass wire.

The first step is making any of the parts from brass wire, thus is to lightly sand the wire with 400-600 grit emery cloth while still in the raw wire state. The cupola area had already been cleaned while sanding and scraping to clean off the remnants of the solder from the original rain gutter after it was removed. Once cut and bent to shape, I applied a thin layer of rosin paste flux along the location for the gutter. I placed the new wire gutter on the model in the flux and clamped one end with a small heat sink. The other end was held in proper location with the tweezers: the open windows here provide easy access to both inside and outside surfaces of the cupola. You could at this point turn on the heat and feed solder directly into the joint from the end of a length of small-diameter rosin-core wire solder like you might when making an electrical connection. With this method however, it is difficult to limit the amount of solder pulled into the joint. Since many of these joints only really require a very small volume of solder, and any excess ends up being material you need to remove afterwards as cleanup, I use other methods. With a soldering iron you can melt some solder onto the tip before touching the joint and carry it to the joint, controlling the volume reasonably well that way. But you can't do that with the tweezers since they aren't hot before making the joint and solder generally will not adhere to the tweezer tip material anyway. I cut short lengths of the rosin core solder wire off the spool with a knife and placed those little "logs" into the corner where the joint is desired: the flux holds them in place. For reference, I used lengths of about 0.150" long here. I applied the first one about at the middle of the window side on the upward side of the rain gutter. If all is right, when you apply the heat with the footswitch, the flux will start to boil and then the solder log will melt and wick along some length of the gutter mostly disappearing underneath it, forming fillets between the bottom curvature of the wire and the cupola side. Once you see the solder flow, let off the footswitch to cut the heat, but continue to hold the part tight with the tweezers. After a few seconds the joint will solidify and "freeze" and you can let go with tweezers. With one end now soldered, move to one or two spots along the top of the gutter depending on how far the solder is wicking, and repeat. Finally remove the clamp and solder the other end. You should have solder fillets the length of the gutter with hopefully minimally excess solder about. To clean off the excess solder I find scraping techniques with the edge of various knife blades to be very effective as it removes the solder before removing brass as it is softer. On the gutters, final cleanup can be done with a chisel-type knife blade held perpendicular to the model, using its tip's square corners to scrape out a square corner between the wire and the cupola. This also helps makes it look more like a rectangular piece like the real gutter, rather than a round wire. You could even lightly file the top of the wire to make it fully rectangular.

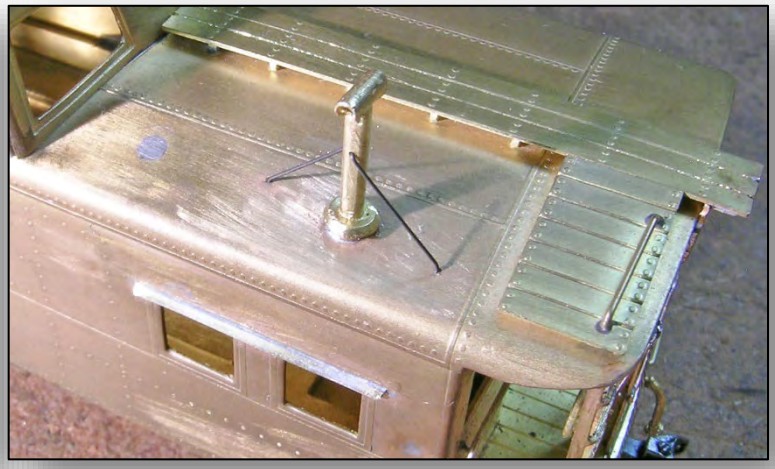
Method of attaching cupola rain gutter. Clamp is at left, tweezers are holding the part in place at right, ready to solder. Remnants of removed side window watershed and cupola rain gutter parts are visible above model.

Soldering technique where the tweezers cannot reach inside the area desired. Tweezers are held against the base surface straddling the area to be heated. Short length of solder wire is stuck in place at spot desired with flux, ready for heat to be applied.

The model comes with passable grab irons on the cupola roof, albeit with the standard oversize diameter wire and without any semblance of the rivet connections to the roof at the ends. Additionally, they didn't bother to put anything in the corner to represent the third support leg and this omission is in a particularly visible area of the model. You could replace the whole thing or unsolder one or both ends of the grab, drill a hole in the roof, slide an etched or wire eye onto the grab and solder it back in position. I do not have a fondness for moving grabs however, as the soldering is a bit touchy. You can't hold the grab with the tweezers and ever hope to heat the surrounding body material up sufficiently: you will usually melt the grab first. If you apply heat to the body on the outside, then the solder fillet and any excess forms on the outside at the joint and requires cleanup. They are most easy to solder in or out from the inside of the body, but here in the cupola, space is very cramped. So instead I left the grabs as is and drilled the holes under the corners of the grabs, angling in a bit from one side, then the other. I took about an inch of roughly .007" diameter wire - a single strand from a scrap of larger gauge stranded electronics wire, formed it into a "U", straddled the grab and shoved the ends into the hole under the grab, pulled them through and squeezed them together under the grab. Inside the cupola I scraped clean an area where each wire leg would be bent down, trimmed the strands and bent them apart like a cotter pin up against the underside of the cupola roof. I applied some flux to these tails and the cleaned area of the roof behind them, placed a bit of solder wire in the joint and then straddled the wire with the tips of the tweezers, poking down perpendicular to the inside of the cupola roof. Applying high heat for a quick joint is recommended to avoid other nearby pieces from being unsoldered. The heat is generated primarily in the area between the tips so you can make a spot joint easily and safely this way.

Moving to the main roof, there were a couple items to fix. I drilled a new hole for the smoke jack, about 32" in from the end of the body in line with the original hole. I took a piece of brass rod a bit larger than the original hole and turned it down in a drill press to have a little step that would fit into the hole as it is a bit large to fill just with solder. I soldered this into place in the hole from the inside making sure to apply enough solder outside to overfill the joint a bit so it would be smooth and flush once filled and cleaned up. The original smoke jack was a "T" shape rather than the later "H" style on the model. I trimmed off the outer legs of the "H" to form a "T" and drilled out the horizontal piece with increasing size bits up to .040" and then filed rounds on the lower corners. I drilled a small hole crosswise through the vertical section for the support rods. I fed an excess length piece of .010" wire through this hole, bent both ends down parallel to the vertical tube and outward to form a "V". I marked where these would pass through the roof, drilled holes for them and then set the part aside until later so as not to damage it.

Cupola detail showing replaced side rain gutters and added third legs to original grab irons.



Completed roof view showing recontoured corner, moved and modified smoke jack and original hole filled. Compare to original corner contour shown below.

I scraped the roofwalk parts with the teeth on the edge of a razor saw to give then a bit of graining since they were still wood on the N5E at this comparatively late date. The corners of the roof are poorly executed on the model. The roof overhang should extend horizontally from the body and then smoothly curve up and around to the ends in typical PRR practice. On the model it sort of slopes upward and then has a very sharp corner as it meets the end. To improve this area as much as possible without heroics, I simply filed the contours to be smooth and look as much like the prototype as I could with the material available. Although not perfect, I think it makes a huge improvement in mimicking the feel of the prototype.

Moving to the ends of the car, there are also several areas for improvement. There are missing end details and three end railings instead of two, which are in the wrong locations and pass through the collision posts instead attaching to the outside of them. Since the end railings are wrong, I first unsoldered and removed them, affording better access to the ends of the body. Like the cupola corner grab irons, the "L" shaped grabs on the ends of the body are also missing their third, center supports. On the prototype the center support was a piece of rod extending inward from the corner, parallel to the face of the end for a short distance and then turning inward to the body.

End views of as-purchased model illustrate problems: three end handrails running through the collision posts, sharp roof corners and missing details.

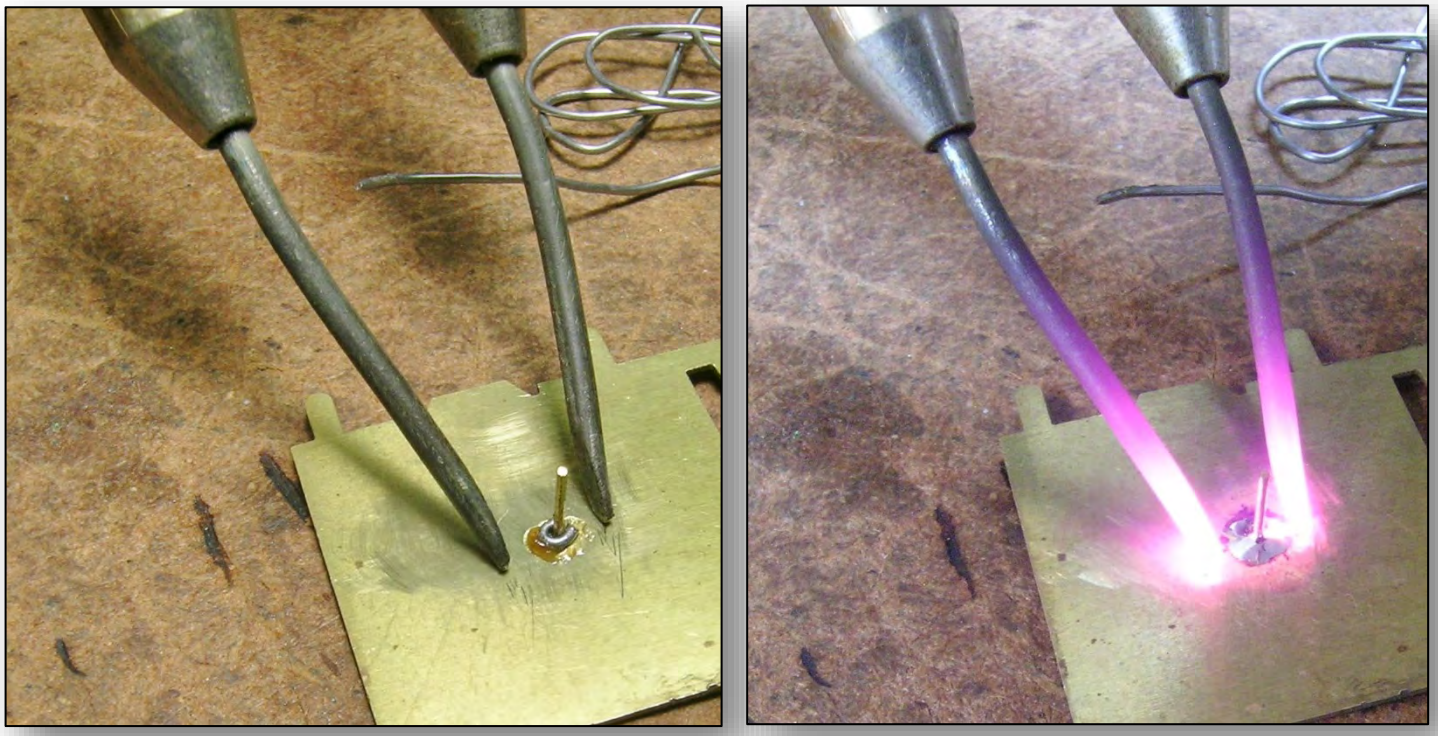


Illustration of a method of soldering wires or small details to large thermal mass of the body. (the inside of the model was too cramped to hold and photograph, so I set up this simulation on the workbench.) At left, cleaned wire (grab iron) is inserted from outside through hole. Flux has been applied to small cleaned area around hole on body inside surface and a ring of solder wire has been dropped onto grab end (this helps keep it where it is needed at the joint without requiring a third hand). Tweezers are in position, pressed against the body straddling the joint area, ready to solder. Photo at right, a couple seconds later after depressing the footswitch on high heat setting, shows red-hot tweezer tips and solder that has just melted and formed the desired joint. Once this smooth, silvery joint forms, maintain pressure and release the footswitch and allow to cool.

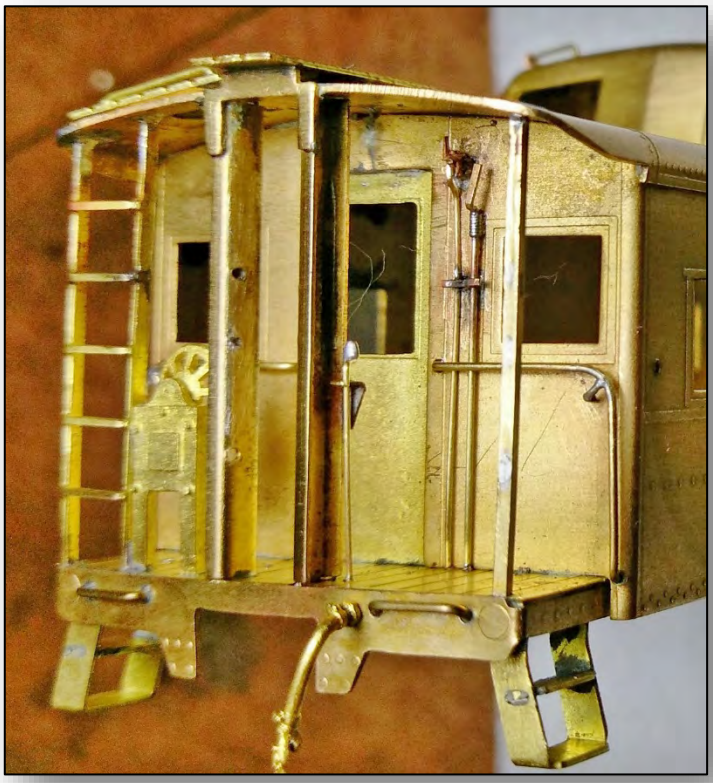
First, I marked and drilled holes through the end walls at the proper locations for these legs. I then cleaned and bent a long piece of .015" brass wire 90 degrees at the end. I slipped it through the hole in one end and then out the mirror image hole in the other end of the car. Held in place in this way, I marked it to the proper length to just touch the "L" grab inside the corner and trimmed it. I scraped clean the area around the hole inside the body, reinserted the piece, applied flux and a length of solder bent into a "U" around the wire. I positioned the tweezers against the body inside surface straddling the grab wire, and with my free hand grasped the far end of the wire and moved and twisted it until the bent end lined up properly with the "L" grab. Depress the footswitch until the solder flows, then release. Once the joint has frozen trim the grab to length on the inside of the body and repeat for the others. On the second end of the car I ran the extra wire length out a nearby end window, since the holes already had the grabs installed. Once joints have frozen, I sometimes cool down the whole or part of the car by dunking it in a cup of water I keep nearby. This can eliminate discomfort in handling and/or the possibility of unintended unsoldering with the accumulation of heat in the model after making multiple joints. After scraping clean the center of the "L" grab and applying a small bit of flux, I made the joint with the third leg. Here a 25W soldering pencil works better than the tweezers. Simply melt a small amount of solder onto the clean, hot, fine tip and touch the joint: the solder on the tip will wick into the joint quickly, forming a nice fillet. This low wattage iron is sufficient to make this wire-to-wire joint quickly yet can't readily supply enough heat down through the small grab iron to soften the joint just made to the body with its large thermal mass.

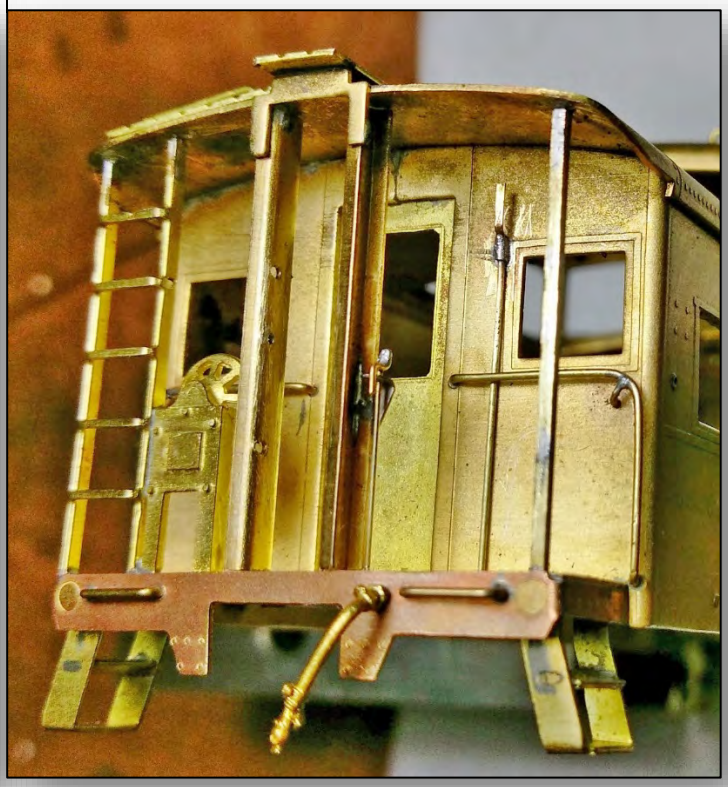
There are various air brake-related appliances on the ends of the car, none of which came on the as-purchased model. I fabricated these out of bits of wire and small strips of thin sheet stock, as well as using a commercial brass retainer valve casting. High on the rear (I call the stove end the rear) wall of end sheet are the brake retainer valve and the air whistle valve. The front wall has only a whistle valve. I fabricated the details onto the ends of pieces of wire and then fed them down through the holes that were drilled up through the end platforms from the bottom. I soldered the ends under the platforms as I did the grab irons described above and tack soldered the upper ends to the face of the end sheets. I also fabricated small, thin stock brackets and soldered them to the side of the collision posts with the tweezers to hold the back-up brake valves, which were fabricated from wire. Soldering the small wire to the small bracket can be done with the soldering pencil without loosening their connections to the collision posts, whereas the bottom of the wire needs the tweezer method to solder them under the platforms. The brakewheels should be a Klasing style, but I am unaware the availability of these complicated wheels in brass, so I left them as-is.

The vertical grab irons on the corner posts are also missing on the model. Rather than making the usual simple right-angle bends on the ends of these grabs and trying to drill holes through the dangerously thin corner posts to mount them in, I formed a z-bend on each end of .015" wire, and flattened the ends a bit, which more accurately simulates the prototype. In addition, this allows for using a different method to make these solder attachments. Clean the areas to be soldered and "tin" them individually first. Simply, this entails applying a bit of flux and then depositing a thin layer of solder over the desired area while the parts are separate.

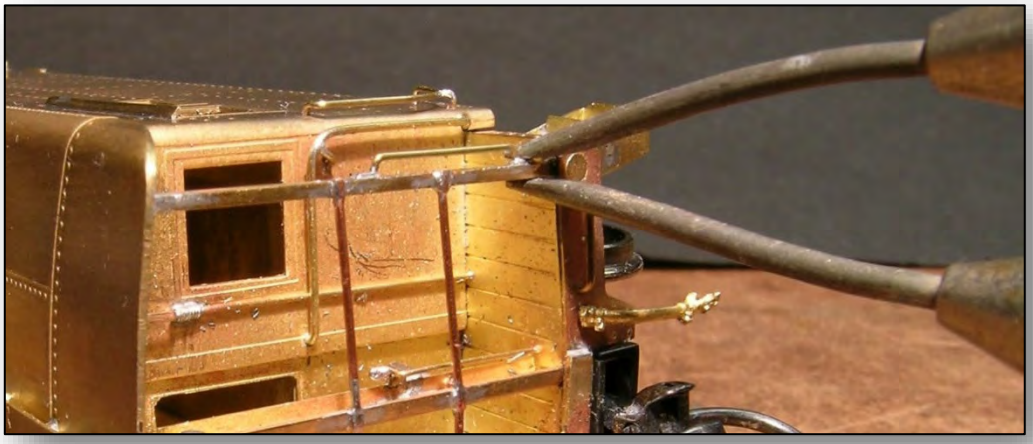
[This term technically seems to be a bit of a misnomer but is understandable how it came into common usage. Real "tinning" or tin dipping was the manufacturing process of coating or plating metallic tin onto iron or steel sheets to make tinplate – the stuff that model trains used to be made from which we all grew up with or wished we had grown up with. This tin coating protected the iron or steel from rusting and was used in many things including making "tin" cans (which are predominantly steel, not tin). Another manufacturing process, Terne coating, involves similarly coating steel sheets, but with a mixture of tin with some lead added. This coating was popular for roofing material and gas tanks. So, since solder historically employed various tin-lead alloys when this term came into being, rather than pure tin, maybe we should have said we needed to terne the parts before soldering? This term is also used commonly in the electrical field where pre-coating the bare ends of wire with solder before making a joint is equally misleading being called tinning. Now with eco-friendlier lead-free solders, the term has become more correct.]

Tinning is a bit tricky to do with the resistance soldering unit, but trivial here on these small parts using the 25-watt pencil iron. Basically, apply some flux, get a small amount of solder onto the tip and touch the tip to the area needed: it should flow and coat the area immediately. You can use the tip of the iron to help wipe or spread it over the desired surface area. If you get too much on, file or scrape off the excess before making the joint. This accomplishes two things: first it allows you to regulate the amount of solder getting into the joint, potentially to the minimum actually required to make the joint and thus reduce or eliminate cleanup later; and second, it eliminates you having to handle the solder and feed it into the joint with your third hand while making the joint. Once the parts are both tinned, clamp them together in proper alignment and heat the joint to reflow the solder on both surfaces together between them. This is another situation where the resistance soldering unit is a big help. Sometimes, and especially with small parts, it is difficult to find room for both a clamp and the heating tool especially when most clamps that can withstand the heat, also act as heat sinks, and thus thwart your ability to make the joint. The beauty of the resistance soldering unit is that you can use it as both the clamp and the heating element. You simply hold the parts together and get them in the proper position with the tweezers or the probe, then turn on the power, and once the solder flows, turn off the power, maintaining the clamping until the joint freezes. Hold these corner grabs to the corner posts on the flats on the "Z" ends and solder one end, then the other.





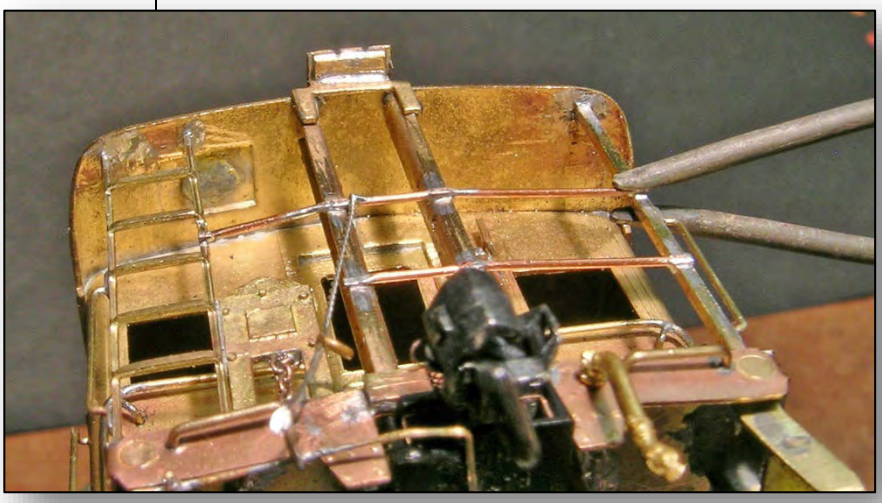
Rear end of car at left, front end at right. Added details include: retainer and whistle valves with air lines on end sheets; third (center) support legs on end "L" grabs; brake valves and lines attached to right hand collision posts with small brackets.



Soldering the pre-tinned corner grabs to the corner posts, using the tweezers to simultaneously heat and clamp the joint.

I also added a couple pieces of strip stock to help improve the end appearance. I soldered a .015" thick strip under the overhanging ends of the wood roofwalks to replicate the horizontal supports that are missing on the simulated support parts on the model. I also soldered a .020" thick strip on the end sill above the coupler pocket to better represent the buffer block. With all this work completed, I replaced the end railings removed previously. On the prototype, the railings are attached to the outer flanges of the corner posts, the collision posts and the ladder stile and are flattened at these points of contact for the rivets that attach them. I stripped and straightened some .020" copper electrical wire and marked the points where the flattened spots needed to be to line up with the vertical posts. Standing a thin steel freight car floor weight on edge at each spot along the wire, I coined those areas with a light hammer tap. I tried it first with some stiff brass wire, but the coining made the wire unmanageably brittle at those spots (you increase the temper of copper alloys via work-hardening/mechanical reduction rather than heating/quenching) so I switched to the soft copper wire as my starting point. Since they are in a fairly protected spot, I figured they shouldn't get bent in handling and usage even though the wire is soft. I bent them at the flat spots to match the locations of the verticals and soldered the spots one at a time using the same tweezer clamping technique as with the corner grabs. I then filed off the bit of extra length I left at each end.

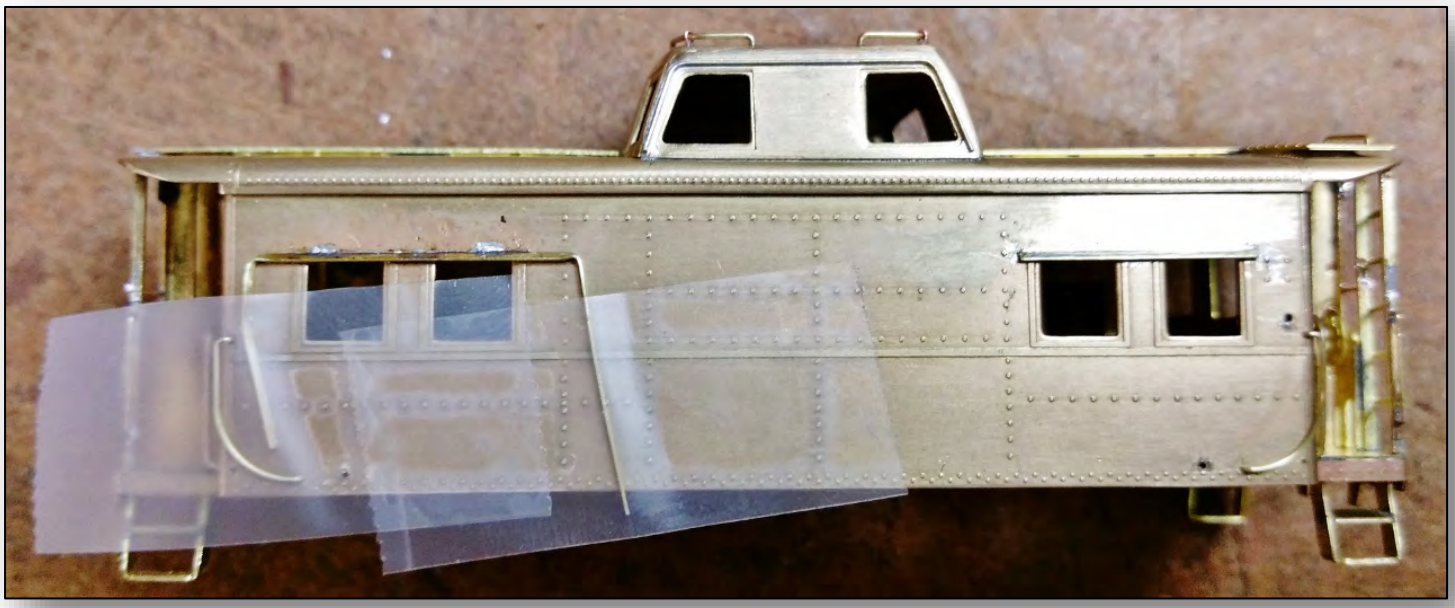
Moving to the sides of the car, there were only a couple items to rectify, although these were a couple of the most taxing parts of the project. My impression of the model upon first seeing photos of it was that there were five things that jumped out as detracting from the car looking correct and absolutely needing to be fixed. Changing out the crappy trucks and cutting off the extraneous side sill tabs were trivial. Correcting the rain gutters over the cupola windows was a bit challenging. That left the curved side grab irons and the angled rain "watershed" or drip edges over the side windows. I felt that the horrific side window watersheds were enough to singlehandedly ruin the appearance of the model. Instead of these parts being a piece of thin sheet steel attached above the windows on the frame that angled downward, the model has massively thick pieces of brass with tabs that are inserted *into* each of the window openings. They are soldered to the inside top edge of the window openings and protrude horizontally, not at an angle. If all this wasn't bad enough, the solder joints were only made at a couple small points leaving gaps large enough to let light show through from the other side of the car. I understand why the manufacturer did what they did: it was a more manageable manufacturing solution, and thus cheaper. If I could only fix one thing on the car, these would be it.



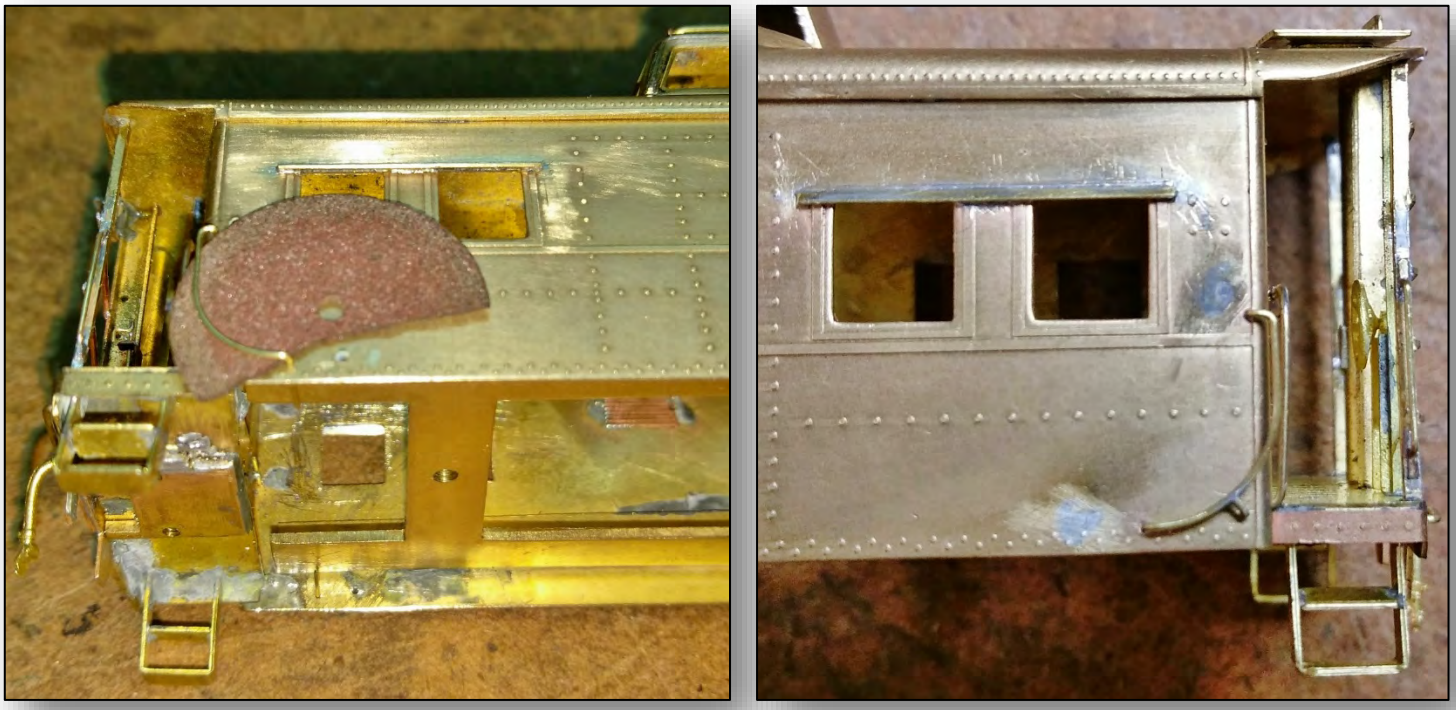
View showing the method of soldering the end railings to the verticals at the flat spots. The horizontal support piece added under the roofwalk end is visible here.

How to do it well was the biggest challenge. So, like Cortés destroying his ships upon reaching the New World, the first parts I removed from the model were these watersheds, forcing myself to have to fix them later. One approach could have been to make the full watersheds – a thin strip, bent at an angle along its length with rivets embossed along the vertical part that fastens to the frame above the window. These would have been straight forward to hold against the model and solder. However, I didn't feel I could bend these parts and so I opted to add only the downward angled portions. I selected some .010" x .030" brass strip to give the desired appearance. Here, the third important consideration in soldering came into play significantly. It is about holding the parts in the proper position during soldering, which I have discussed how to address in different ways above. This situation, however, concerned me most. I could see no way to hold these finished parts by hand at the proper angle, aligned horizontally and vertically and get a nice smooth joint along their full length or with a clamp, pliers or the soldering tweezers. The solution I came up with is shown below. I bent an oversize length of the strip into a "U" shape and then twisted the straight center part that would become the watershed to the proper angle. I cleaned the strip and only the top section of the window frame and applied a small amount of flux to both. Here is a case where selective cleaning and restrictive application of the flux can help direct the solder flow to where you want it for the joint and keep it away from the car side where you don't as you will have to clean it off later. Once I got the strip aligned properly over a window, I taped the ends to the car to help hold it during soldering. Just as I did previously with the cupola drip strip I placed small sections of solder wire at the base of the watershed, straddled the area with the tweezer tips and heated it until the solder was sucked into, and wicked along the joint. Meanwhile, with my free hand I pressed down on the edge of the watershed away from where I was soldering with the flat side of a popsicle stick to keep it from moving and hold it tight to the body. I found doing this in three spots allowed the full length of the joint to be filled with minimal excess to clean up. The excess length of the strip beyond the window was then snipped off with fine pointed shears sold for working with etched parts.

The other glaring problem on the sides was the corner grabs. They are the wrong shape, are located in the wrong places and don't have the third support legs: but at least the wire used is oversized. I removed the originals with the tweezers and scaled the correct shape from the builder's side view photograph making a drawing in the corner of a piece of cardstock like it was the corner of the car. I then laid this template on the car body and marked the three new hole locations through the card with a scribe. I drilled the holes in the car and formed the grabs from .015" wire using the template as a guide. I inserted the grabs and soldered the legs protruding inside the car as described above with the end grabs. Once again holding things in the proper location is critical to successful soldering. I found a broken piece of a motor tool cut-off wheel made an appropriate non-conductive high temperature-resistant spacer of the proper thickness under the grab. I laid the car down on top of the grab to hold it at the proper depth while soldering. I then added the third support legs with more wire just as I did on the end "L" grabs. Lastly, I filled the holes from the original grabs with solder in a manner similar to soldering the grabs to the body. I added flux and a placed a small ball of solder onto the hole and heated with the tweezers straddling the hole. When the solder flows and fills the hole, turn off the heat. File and sand off any excess flush with the car side.



Arrangement of holding watershed strip in place during soldering utilizing the excess length on each end. The three soldering spots and minimal excess solder are visible here, prior to clean up. Windows at right have a finished watershed. New corner grab irons are also in place and their relative distant position to the factory mounting holes can be seen. The third support legs have not yet been added.

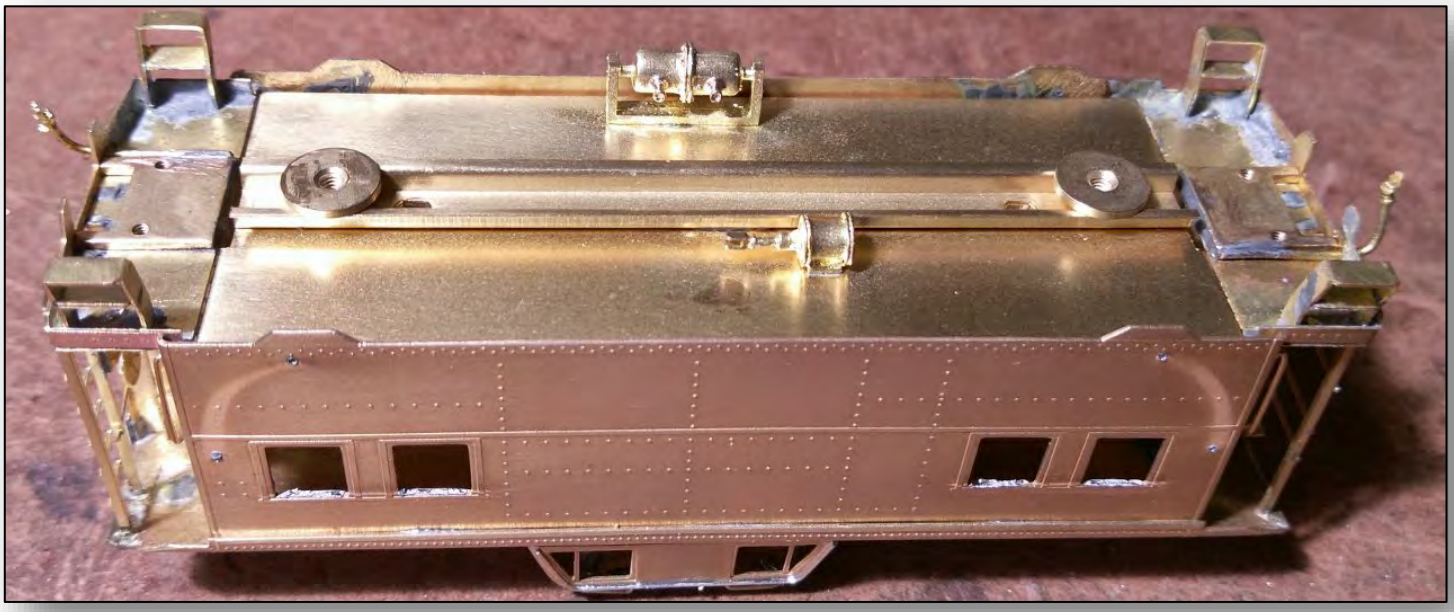


Left photo shows corner grab in place with temporary spacer, ready to solder. Backing piece for lavatory vent can be seen inside car at right center. Right photo shows finished corner grab with third support and original holes filled.

Finally, there is a small rectangular opening on one side of the car which was supposed to be the vent for the lavatory, not an open hole or window. To close it off, I soldered an oversize piece to the inside of the car side. I used a thin piece of copper foil, a scrap of copper peeled off a circuit board I believe, for this. I laid the piece on a single cut file with fine tooth spacing and burnished "louvers" into the foil with the end of a wood toothpick before soldering it to the inside of the body. The body work is complete at this point and all joints should be inspected and final cleanup of excess solder finished. Remember to make sure to file the insides of all the window frames smooth at this point to have a flat surface for the glazing to lie against when applied later, after painting and weathering.

UNDERBODY

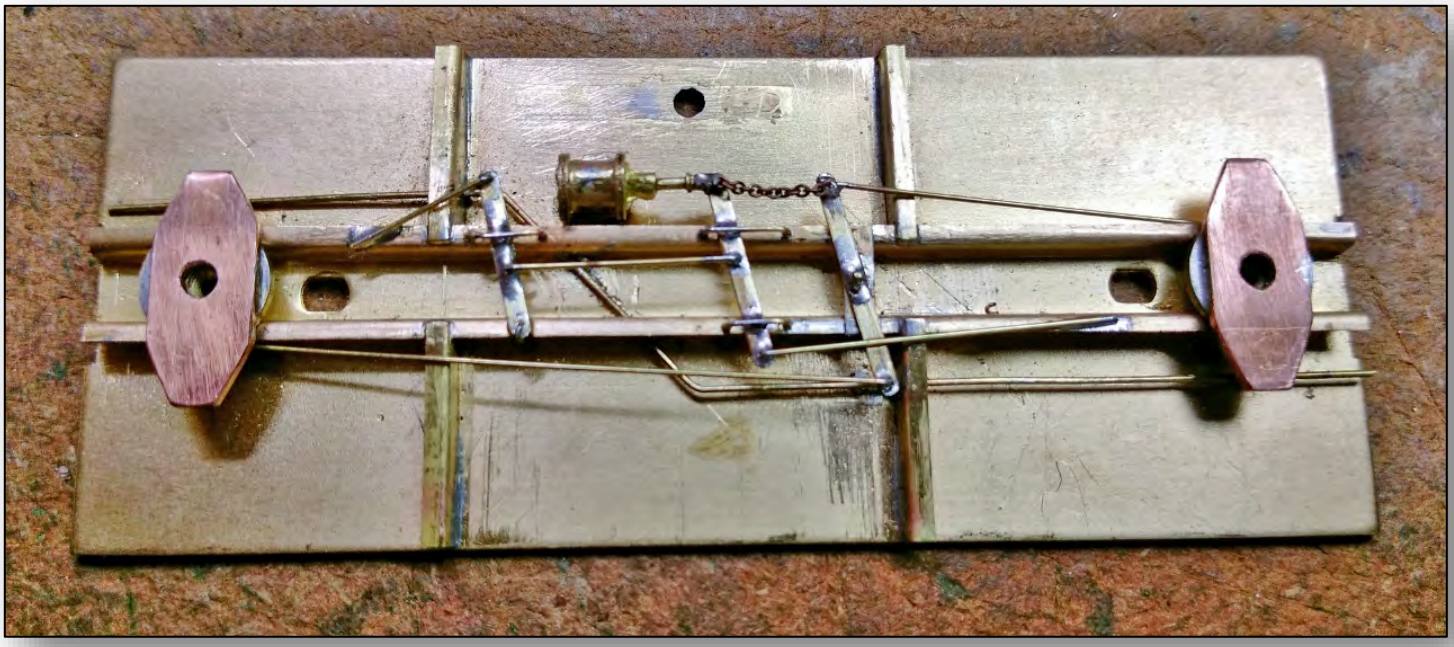
To be generous, underbody detail on brass caboose models of this era is "sparse". I wanted to add enough detail that a side view would look at least roughly prototypical.



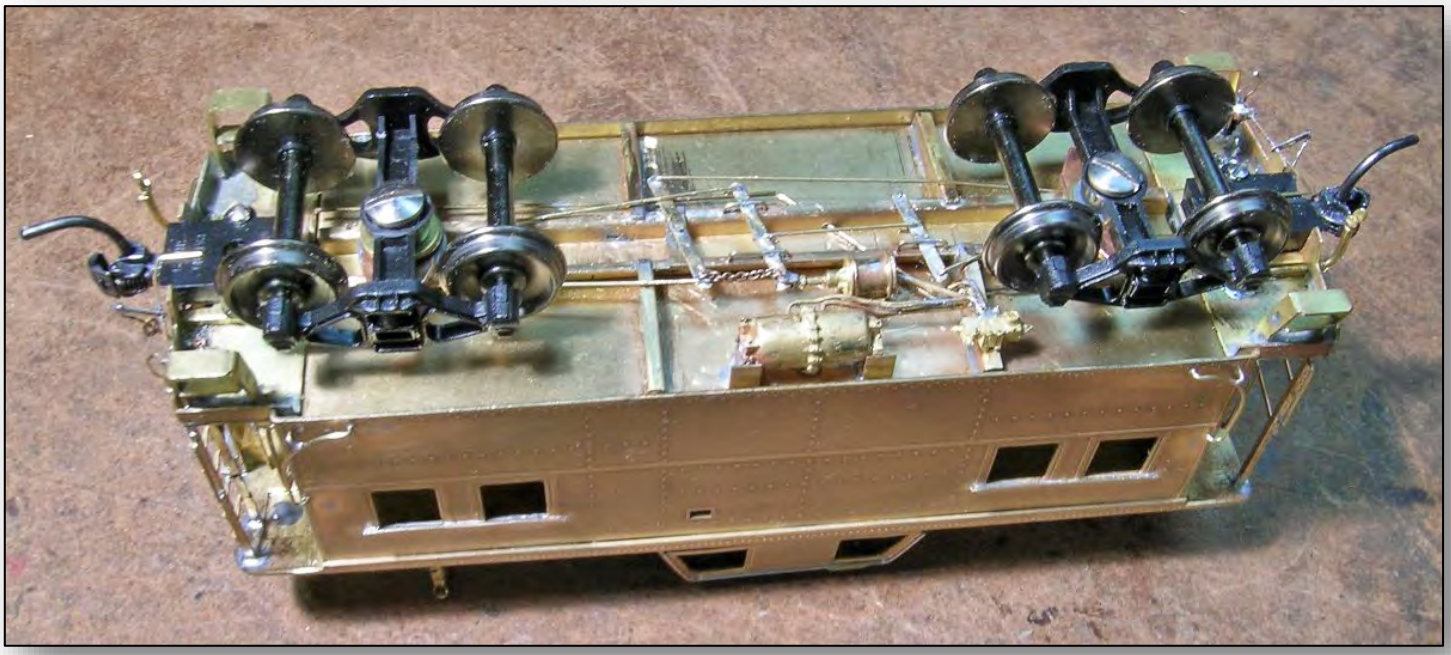
Underbody detail of model as-purchased includes centersill, brake cylinder and reservoir. Side sill tabs have not yet been removed.

These cars did not have full width bolsters, just a support for the trucks that extended outward from the centersill. Since the new trucks needed shimmed up considerably to get the car at the right height, I cut these support plates out of .030" brass to mimic the drawings and soldered them atop the truck mounting bushings. They are diamond shaped: .577" long by ,175" wide with a .085" flat at each end. The only other major structure on the underframe were the two sets of crossbearers. They are spaced 7' 3.625" apart, and as mentioned above, are offset 12.5" from the centerline of the car. I bent these out of .010" brass strip, tapered their height to sit on the top flange of the centersill at one end and to be just under flush with the car side sills on the other. I cut a small slot under the flange at the tall end with a motor tool cutoff wheel to fit around the centersill flange. I fit the part onto the centersill and clamped the outer end while I soldered the top flanges together. I then applied a bit of flux, squeezed the outer end of the cross bearer to the floor with the tweezers and fed some solder into the joint. This is one of those situations where you can then utilize the behavior of solder tending to flow towards the heat source to your advantage. After the end joint froze, I moved the tweezers to the middle of the cross bearer and reapplied the power. The initial blob of solder then re-melts and wicks towards the heat, distributing itself along the length of the part, eliminating the blob and the need to remove the initial excess. See photo sequence below.

Cross bearer tack-soldered to floor near outer end at left, heat being reapplied further along part at center, and finished joint resulting from subsequent wicking at right.

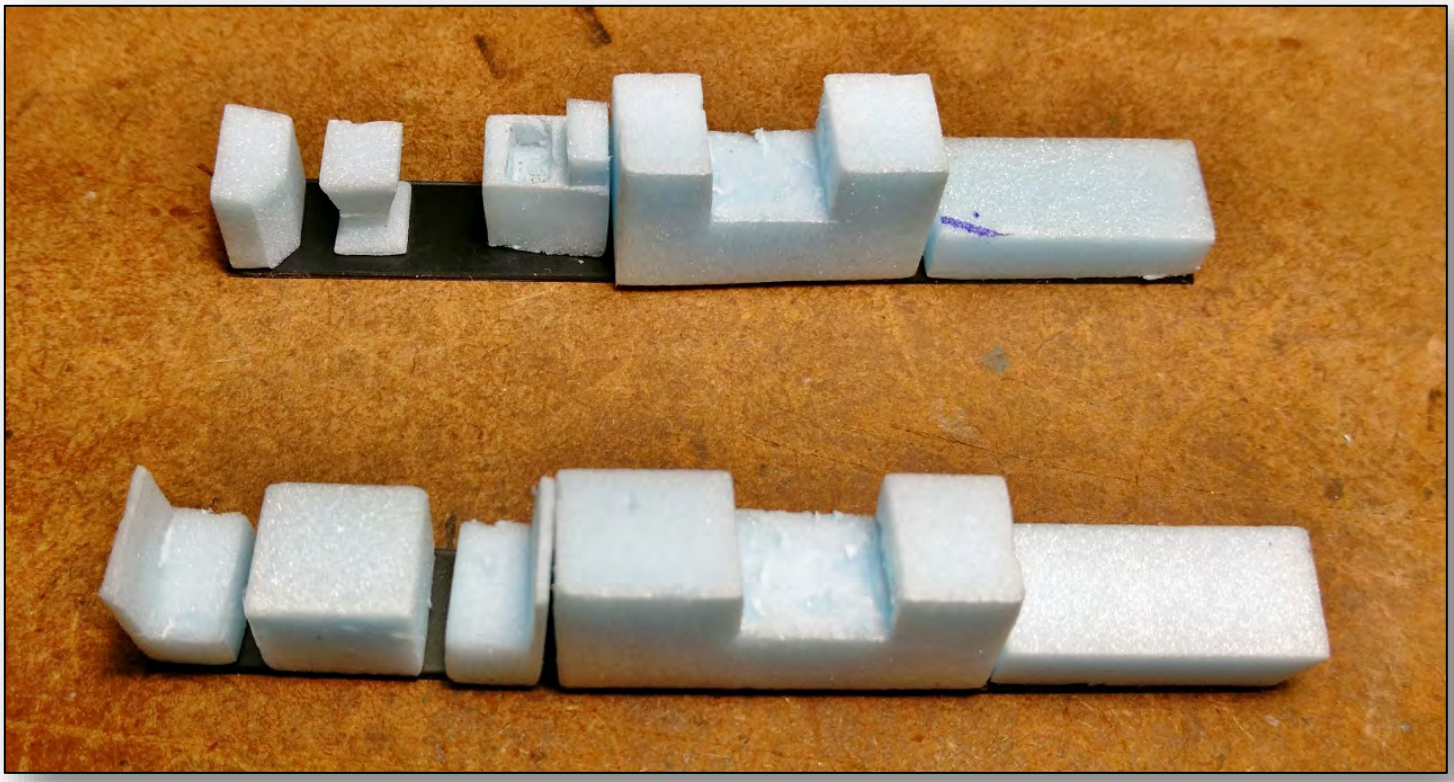


▲Bolster plates, cross bearers, trainline and mechanical brake components added to underframe. ▼ Completed underframe.



I kept the brake cylinder but replaced the sad excuse for a reservoir with a Wiseman Back Shop part HBS191 which has integral support brackets and air lines. I soldered vertical pieces of thin strip onto the front of these brackets to look more like the prototype. I then fabricated and added a trainline, piping, levers, rods, hangers and chain to complete the underbody details. It is an approximation based on what I could see in the photos and an N5 underbody drawing.

I like to put some token representation of the interior in my cabin cars so there is something to block the light such that it doesn't look empty when you happen to catch a view through the car. With typical bracing structure on brass cabin car models you can't easily just make a full-size floor, add the furniture and insert it. I cut two strips of styrene wide enough on which to mount the furnishings that could be easily maneuvered into the body after painting. (I then cut these each in half to get them in over the center brass cross-brace.) Following the N5 and N5c floor plans above, I roughly cut blocks of the blue foam insulation material used for home construction and/or layout scenery to represent the furniture and lockers. A sharp razor blade makes quick work of this. I glued the parts to the styrene strips with foam-friendly construction adhesive and hand painted them with craft paint: buff for most of it, black for the stove, coal bin and cushions.



Crude interior "furnishings" cut from foam and glued to styrene floor strips, ready for painting.

My last step before finishing was to add holders for the PRR marker lights. My approach to this is to strip the insulation off 24-gauge telephone wire and glue a section up underneath each corner of the roof in the bend under the eave. I then attach a section of the bare copper wire to each marker light, sticking out horizontally, with the exposed end tapered to a point. Once everything is finished, I can then mount the markers by simply sticking them into the under-eave tubes at either end of the car and can subsequently switch ends whenever I want. If you plan to bake the paint onto your model, you should glue these on after that step.

FINISHING

Using your favorite process to clean/scrub/blast brass models, prep the body and underframe for painting. The PRR interior rebuilding photos of the car show it has a two-tone paint scheme. Basically, the walls above a line just below the main windows, ceilings and cupola interior were light colored. The floor was varnished wood and the furniture, end doors and locker fronts were a darker color. Paint diagram notes show that a similarly described cream and buff scheme had been adopted for cabin cars through about 1960 when light green was introduced, so the light color was likely cream, and the darker then, presumably buff. Maybe owing to one of those black & white photography quirks, the buff looks darker than I would have expected. I sprayed the entire inside of the car Antique White for the cream, figuring the furniture would hide most of where it should be buff anyway, if it could be seen at all.

Although they are black and white photos, it is pretty clear that the car was painted red all over when rebuilt per the practice of that time and then remained as such throughout the period it wore the Circle Keystone scheme, not getting black roofs or cupola as had begun to occur on some cabin cars in the late 1940's. So, when dry, I masked the insides of all the windows and sprayed the entire outside plus the underframe Freight Car Color. I used a mix of five parts Santa Fe red to four parts Oxide Red Scalecoat-1 paint for this car. Trucks and wheelsets were painted dirty black. I later hand-painted the smoke jack and braces black and the curved side grabs, "L" shaped end grabs and vertical grabs on the end corner posts chrome yellow, as this practice was introduced in 1949. The side window sashes appear to have been left bare aluminum or stainless steel when built as was specified, but as with other cabins, they appear to have been painted later, so I left mine body color.

Broadside view illustrating proper location and spacing of the lettering.

I used the appropriate decal parts from a Middle Division (HCA-2 Cabin Cars - "Ball" Keystone Era) set to letter the car. Fortunately, all the necessary pieces are included in the set, including the proper built date, class and road number. The longest "PENNSYLVANIA" in the set was a bit shorter than the length needed to match the model to the prototype photos, so I cut it and the road number into individual pieces to get the spacings to match the photos. Although this is a bit of a pain, it does result in less decal film to try to hide between the letters and numbers. Since end numbers had been removed from cabins in 1930, only "PRR" appeared over the end doors. I applied the period-proper assignment designation as CENTRAL REGION. I wanted to simulate a cabin in good condition so I only applied a moderate application of weathering powders, particularly soot on the roof and cupola as appeared to be typical in the steam era. An overspray of flat finish protected the decals and weathering.

Having completed all the spray painting, I cut oversize windows from real glass to apply from the inside. I use microscope slide cover-slips: those thin glass sheets, about .006" - .010" thick, and about an inch square, intended to cover samples you wanted to protect when making slides for use with a microscope back in Science class. They are sold at scientific supply stores and are not terribly expensive or difficult to find. I use a pencil-style diamond tip scriber from Micro-Mark to score the glass. After scoring, just place the glass on a piece of metal with a nice square edge and tap the glass to break along the score. I then clean the pieces with household window cleaner to remove fingerprints and glue them to the inside surfaces of the window frames with model airplane "canopy cement", a clear, pliable adhesive. I then glued in the two 2-piece interior modules, placing the "floor" strips atop the brass framing structure, out against the interior walls of the body. Reassembling the remaining pieces and adding marker lights completes the project.

References

- Alvin F. Staufer, *Pennsy Power III,* ©1993, page 417.
- Robert H. Reid, *PC Railroader,* Volume 2 – No.1, January-February 1974, page 9.
- *Prophet's Pennsy,* PRRT&HS, 2009, page 103.
- Ian S. Fischer, *PRR Color Guide to Freight and Passenger Equipment Vol. 2,* Morning Sun Books, Inc., ©1996, page 102.
- *Caboose Data Book No. 2 – Cabin Cars of the Pennsylvania and Long Island Railroads,* N.J. International, Inc., N5C photos.
- David R. Sweetland, *PRR Color Guide to Freight and Passenger Equipment Vol. 1,* Morning Sun Books, Inc., ©1992, page 101.
- Gary C. Rauch, Robert L. Johnson, Frederic V. Shaefer, *The Keystone,* December 1974, page 3; cabin car painting and lettering article, diagrams.

Completed N5E

My Approach to Catenary

Ed Swain – Photos by the author

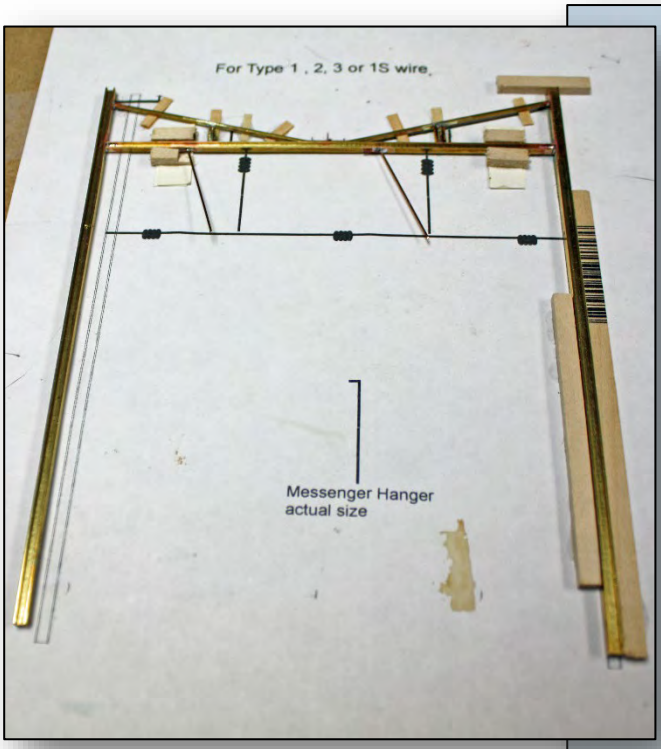
A GG1 moves along with a passenger train on the two-track electrified mainline.

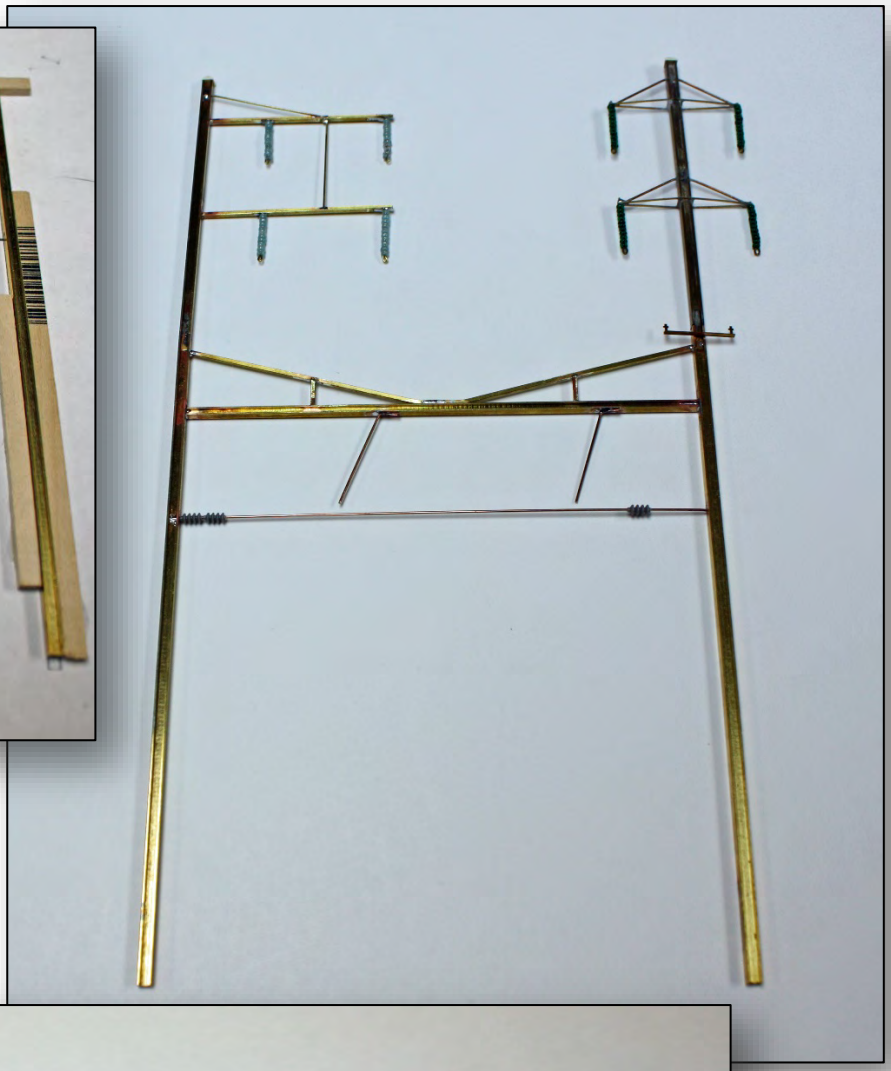
Growing up in New Jersey, I was always around the electrified main line corridor, and rode the Pennsylvania Railroad into Penn Station several times. While at Rutgers, I could watch the trains crossing the Raritan River from my dorm room. So, when planning my layout, I wanted to include some electrified territory.

My layout is freelanced, but centers around Harrisburg for passenger operation and Enola for freight operation. This way I can run GG1's and P5A's east of Harrisburg and Enola and steam or diesel on the west side. Since operation is a major focus on my layout, I knew it would not be practical to have catenary in the terminal, yards and shop areas. However, there is a 22-foot stretch of main line along one wall that is perfect for installing catenary, coming out of a wooded area behind the Enola engine facility and going into a tunnel into staging.

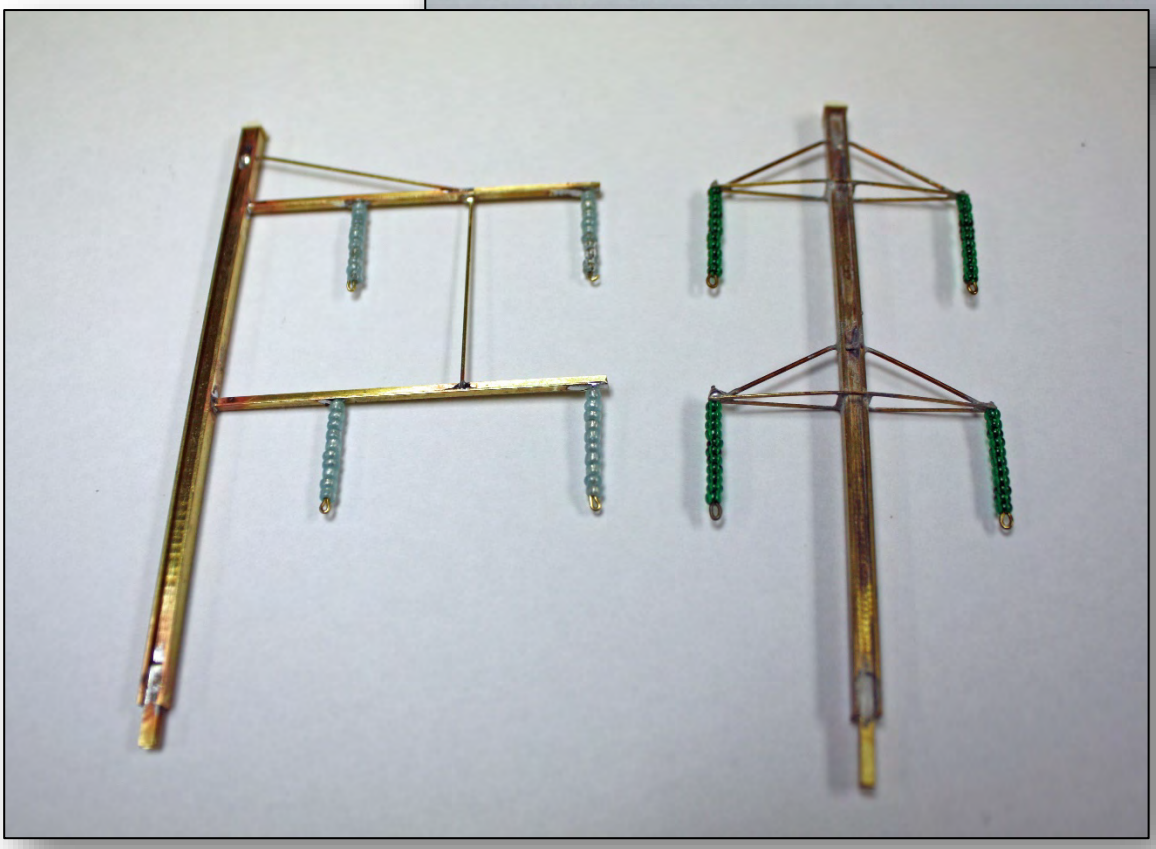
Model Memories makes a line of catenary products styled after the Pennsylvania, New Haven and New York Central Railroads. I elected to use their kits as the basis for the catenary bridges. They also sell single and double cross arm transmission line supports. Any bridges with signals were built from scratch.

The catenary bridges were assembled following the instructions that come with the kit. I made a jig to hold the parts while soldering the pieces using a resistance soldering set. There is an excellent liquid flux called Supersafe® Superior No. 30 Soft Soldering Flux Liquid, made by Superior Flux, that I apply using one of the small disposable cement brushes. For the area with close clearances, I scratchbuilt transmission arms with both transmission lines on the rail side. This is similar to what you see on the Elizabeth Curve in New Jersey. The completed towers were painted primer gray, then a light coat of old silver, and finally weathered with a rust/grimy black mix. Insulators where painted Tamiya red brown.





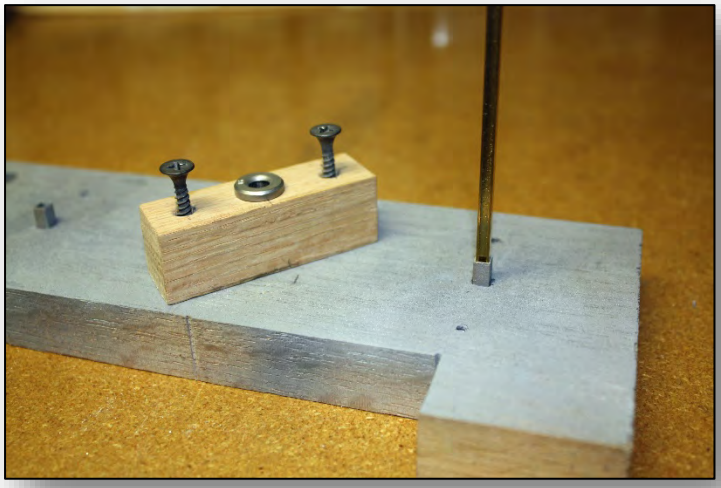
Catenary bridges and pole extensions assembled from Model Memories kits.

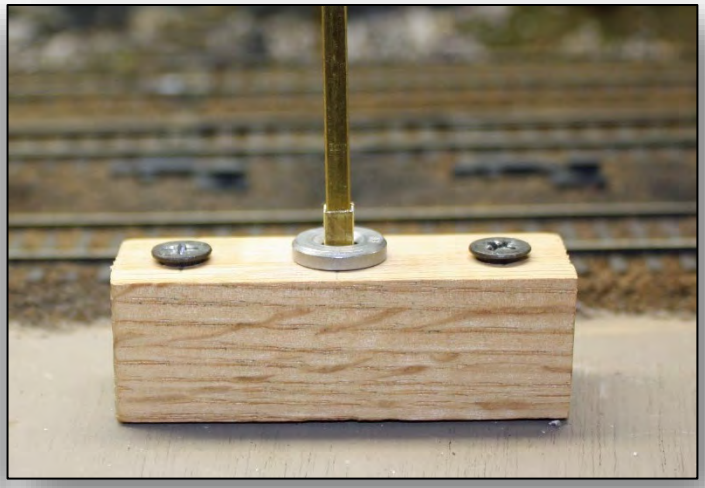


For installing the bridges, I wanted a method that met several criteria:

- Allows installation after the scenery is complete behind the catenary and the track is ballasted and weathered
- Can be accomplished from above the bench work
- Easily accommodates for variation in the width of the catenary bridges.

Model Memories uses brass 1/8" "H" for the bridge legs. It turns out there is a square brass tube that is a perfect slip fit over the 1/8' "H" legs. It also turns out that the diameter of the square tube is exactly a #3 drill. So, a #3 drill bushing held vertically in the proper location would allow a hole to be drilled for the square tube. The square tube could be pressed into the hole and the 1/8" brass leg could then be slipped into the tube, adjusted for proper height and fixed in place. To accomplish this, I cut two pieces of oak about ¾" square and 2" long. I drilled a hole in the center and pressed in a #3 drill bushing. Clearance holes were drilled in each end for screws to hold the jig in place.





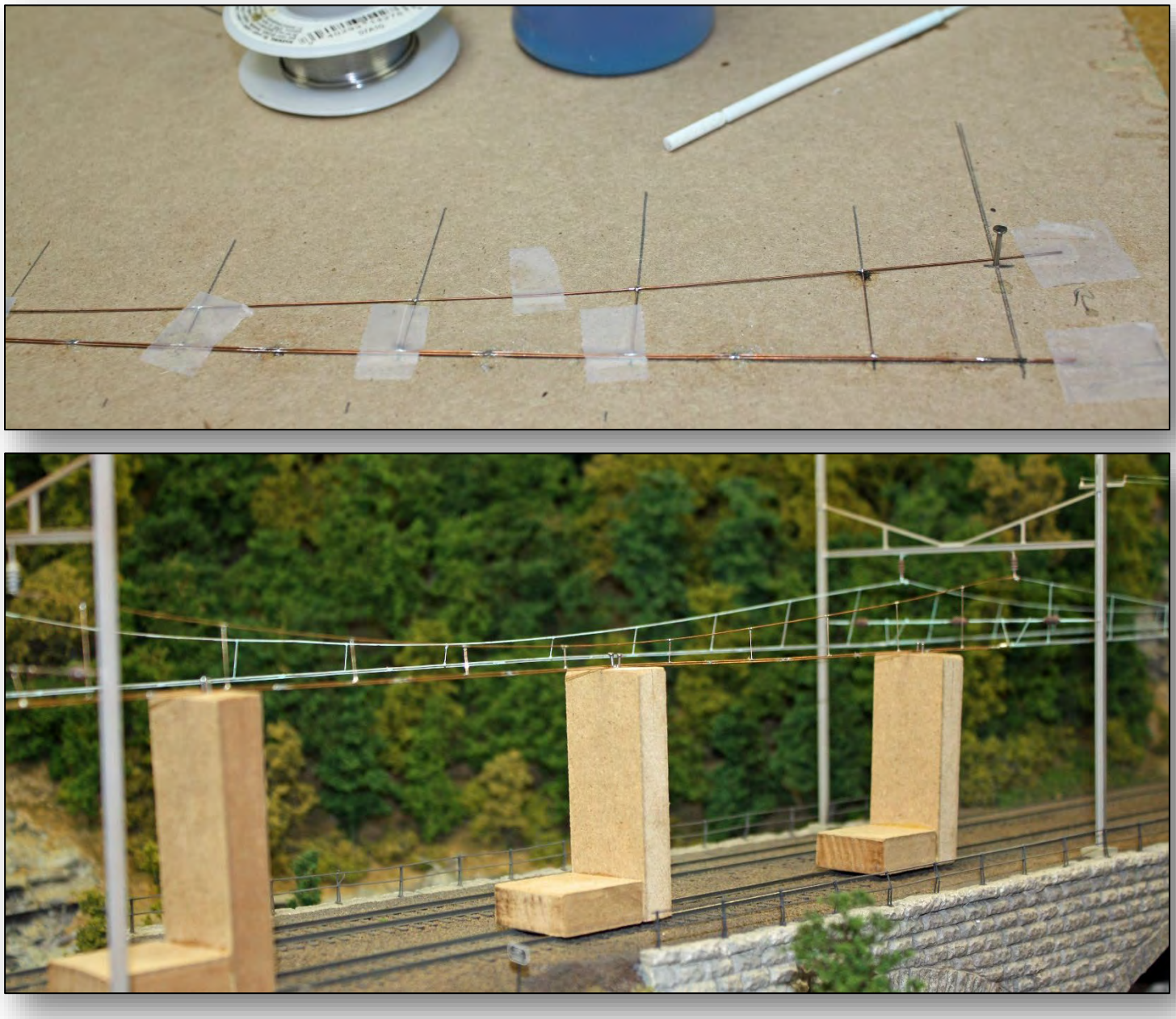
I cut pieces of oak about ¾" square and 2" long to support the catenary poles. A #3 drill bushing allowed the proper diameter hole for a square brass tube to hold the catenary H-columns. The screw holes are for attaching the blocks to the sub-roadbed.

The image on the left shows the square tube extending through the sub-roadbed. The image on the right shows a simulated pole foundation slipped over the square tube.

While laying out the location for the Catenary bridges, I made sure there was sub roadbed where the hole would be drilled to provide solid support. The bridges are spaced 17" apart. To install a completed bridge a 1" piece of square tube was slipped into each drill bushing, the jig with the square tube slipped on each leg of the bridge and aligned in place. Each jig is then held in place by the screws, the bridge and square tube removed, and the hole drilled. After removing the jig, the square tube is pressed in place, the bridge slipped in place, adjusted for height and held by a liberal application of ACC. This technique allows the mount on the far side to be drilled any time, and then the one on the near side when needed for installation.

The catenary was built, installed and painted following Andy Rubbo's articles in *The Keystone Modeler*, No. 50, September 2007 and No. 56, March 2008, using .015" and .010" diameter phosphor bronze wire. I use an Isotip® battery powered soldering iron, which works very well for the fine wire, both assembling the catenary sections and installing them on the bridges.

While working on the catenary, operation continues with the pantographs in the down position. Once the catenary is finished, I will fix the pantographs in an up position, just below the height of the catenary, since they will be operating in areas both with and without catenary.

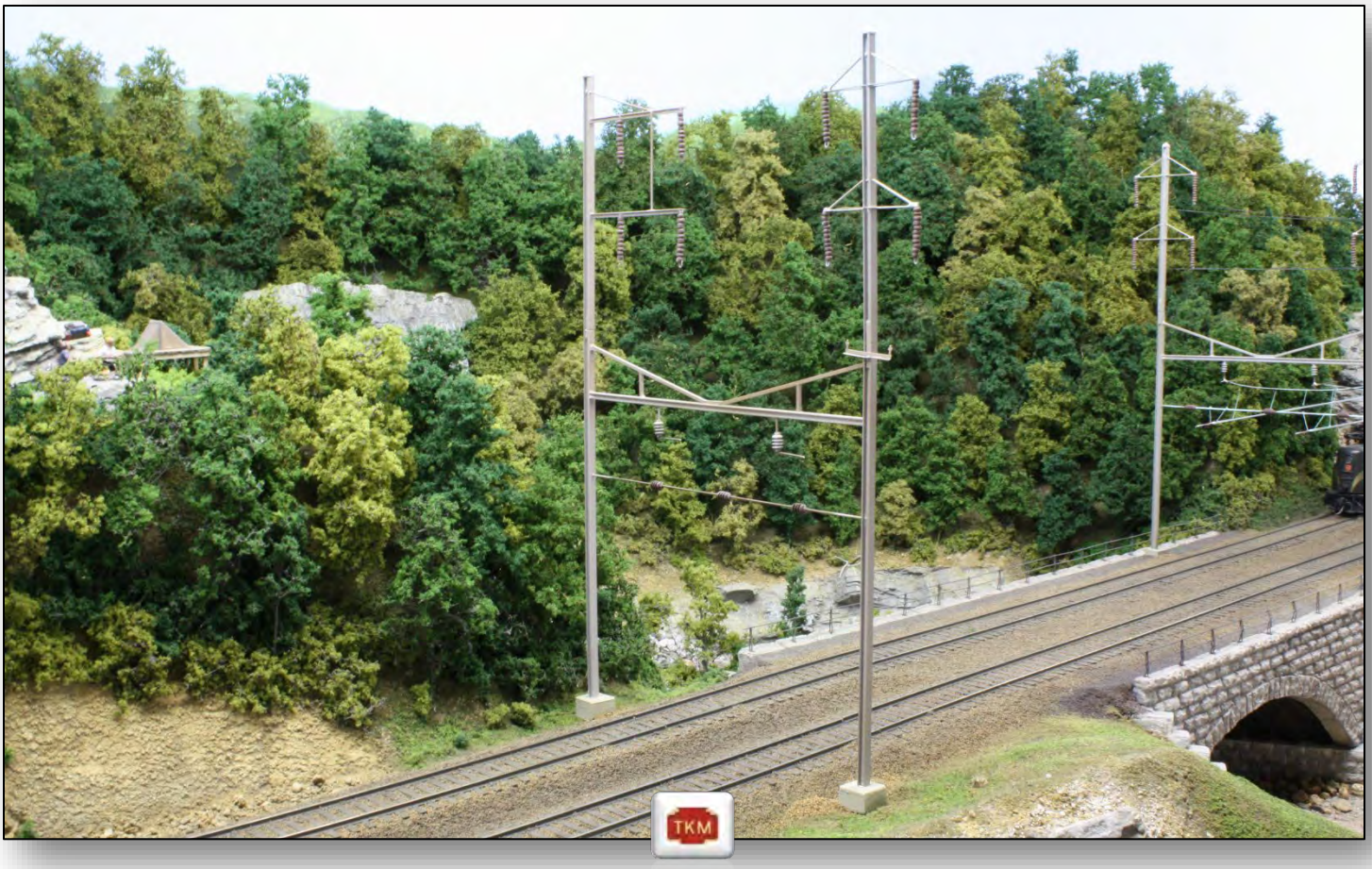


These pictures show assembly and installation of the catenary using Andy Rubbo's methods.

▲GG1 #4905 leads a passenger train under the wires. ▼ A steam powered freight is under wire leaving a tunnel and crossing a truss bridge.

▲ This substation is to step down the 132,000 AC volt transmission voltage to the 11,000-volt AC catenary voltage. ▼ A GG1-powered passenger station is leaving the truss bridge.

These two images show the catenary construction progressing through the layout.



The New England Chapter regularly schedules PRR operating sessions at model railroad clubs in the region. The HO-scale Silk City Model Railroad Club in Manchester, Connecticut has a model of the Horseshoe Curve. Tim Garner shot the trains during their 2010 visit. ◄ His original shot of a westbound K4s double-header by Ralph Weischedel and an eastbound behind Tom Speidel's S1 6-4-4-6 has a cluttered background.

▲ Tim drew in the mountains, revised the reservoirs, and added a touch of smoke in this retouched version of the same view. *(Both images, Tim Garner)*

► Lew Schneider, a long-time member of the New England Chapter and O hi-rail modeler and collector, shot this image of Tom Speidel's S1 entering Horseshoe Curve. *(Lew Schneider)*