

THE

O

RESOURCE

NEWS, REVIEWS, INFORMATION TO USE

Vol. 1 No. 3

January/February

2014

SCALE

Scale Craft - The Elliott Donnelly years
Painting Railroad Cars Part 3
Chi Town Union Station Railroad
JMRI and Wireless Operations
The Cleveland O Scale Show
The Strasburg O Scale Show
The Magic of Lighting
Neenah O Scale Club
Trans Loading Sites
An English Shay

Bill Of Lading

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Published Bi Monthly

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January - February
Vol 1 #3

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

Looking down on a Union Pacific passenger train at the Chi Town Union Station Railroad.

Photo by Daniel Dawdy

Rear Cover Photo

Baltimore & Ohio's Capitol Limited waits for signals on the Chi Town Union Station Railroad.

Photo by Daniel Dawdy

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EDITORIAL COMMENT



Welcome to the New Year. Winter is here, and it's a good time to work on hobbies. We have some good modeling articles in this issue, but before we get into that, let's do some reminiscing. Those of you who read the magazine have been telling us about how much you like the history of the hobby. I'm glad of that because I like history, and it's fun to dig out the information. People are coming out of the shadows with information, and we should be able to continue the history articles for quite some time. In this issue, we take a look at Scale Craft and, primarily, Elliott Donnelley's involvement in it. I am from the Midwest, and Elliott Donnelley was a big figure in railway preservation around the Midwest. Elliott was also a large benefactor to Lake Forest College, and Art Miller, emeritus archivist from the college, was able to provide a lot of good material. I think you will find it interesting. There were some O Scale Shows in November, and we were able to go and get some photos from the shows. I like the shows because it is always good to catch up with other O Scalers. If you don't go to shows, I would recommend it, and while you are there, get to know some of the people. I never did myself, and now that I have gotten to know people, I look forward to when I can go to the shows. I went to the Strasburg show, and had a nice trip. I got to spend some time visiting, and talked to some people about possible future articles. We operated some trains at Dave Vaughn's house, and then had a nice chat with Bob Lavassi about some O Scale history. Dan and Amy went to the Cleveland show, and did some antiquing on the way there and home. I met them at the show. The Cleveland show always has a nice Friday dinner before the show. Be sure to read the article and see who the speaker was. Dan and Amy stopped on the way home Saturday in Michigan, and then met me at the Chi Town Union Station model railroad in Union Lake, Michigan on Sunday, where we made the stop to see Paul Gribbell and his huge O Scale layout. Wait till you see the photos of this layout and the article about it. Dan is at it again with the technical material. This time, he is getting into lighting on your layout. Dan is using a lot of LED lighting, and there are lots of advantages. Look at Dan's article for some information on this very versatile type of lighting. Dan also looks at JMRI and wireless operations. The Trans Loading Sites article will look at some variety in Trans Loading sites for modeling purposes. This is the modern term for a team track, but the concept has not changed. These are very simple sites to build into our model railroads, and add a lot of variety to the operation of your model railroad. They can also span any era you are modeling. Take a look to see if you could work one of these into your railroad. The Neenah Model Railroad Club had an open house, and my buddy, Dave Nitsch from Plymouth, and I went to see. The club was founded in 1964, and is located in a railroad depot from the 1870's. The club is fun for me because there are a lot of old timers like me who like to talk about history. However, take a look at the group photo. The club has a lot of young members that like the history of the old stuff too. They all have modern models, but are always interested when one of us drags some old things out. So, for all you doom and gloom people, the hobby is doing fine by us. Enjoy the hobby and this issue. See you next issue.

Glenn Guerra



NEWS AND REVIEWS

Joe Hayder at Weaver Models tells us that they are accepting memberships for the 2014 Collector Club. Being a member, you receive a limited run car and an additional gift each year. The 2013 car was a Borden's refrigerator car and a Weaver tool kit. If you are interested in limited run special paint schemes, take a look at their website. <http://www.weavermodels.com/>

Korber Models, makers of scale models, structures, and detail parts in HO, O and G scale, dropped us a note to say they have two new structure kits in O scale. These kits are designed to provide modelers with unique, simple to build, background buildings.

The Model 700 Background Apartment Building, which sells for \$65.00, packs great detail into a compact space, representing the ubiquitous multi-story brick buildings that covered the landscape from the stream through transition era up to today. Featuring over 50 windows, super detailed scale fire escapes, gutters and downspouts with cement foundation and stair details, all in a compact 3" by 13" footprint rising 12" tall. This building is an ideal addition to any layout, adding great visual interest in a very small space.

Korber Model 702 Background Tall City Building brings a towering 32" high presence to a layout in a compact space, needing only an 11" by 1" footprint. This 13 story building includes crisp window and door detail, complete three dimensional "limestone" walls, and striking arched two story windows on the lower level. Detailed cornice work can be seen on multiple levels of the structure. This cost effective kit sells for \$115.00.

"These unique additions to the Korber Models product line are a great addition to any layout," said Teresa Redmond, President of Korber Models. "and signify our continued commitment to model railroading." The products are manufactured in Ohio, continuing the long legacy of "Made in America" that has been synonymous with the Korber brand. Models are available for sale on the [Korber Models website](http://www.korbermodels.com/).



The new Korber Model 702 Background Tall City Building.



The New Korber 700 Background Apartment.

Tom Dempsey at [Clover House](#) told us that they have the .020" diameter spring temper phosphor-bronze wire in stock once again. It comes in 100 ft coils under part number 3278.

While visiting the Neenah Club during the recent open house, I photographed an original Delta Lines baggage car. The Delta Lines was a railroad built by Frank Ellison in the 1940's. Stan Bye was a visitor during a convention, and was able to purchase this baggage car from Frank's estate after he passed away. Frank modeled his equipment in 17/64th to the inch, and the cars are larger than 1/4 inch to the foot cars.



Another model at the Neenah club that belongs to Stan Bye is this 17/64" New York Central Hudson. The model is believed to be by Mini Scale. If you have any information, drop us a line. The NYC Hudson's were not particularly large locomotives and this model will tower over a Milwaukee 4-8-4 because of the 17/64th scale.




San Juan Car Company will soon be shipping their new standard gauge version of the UTLX frameless tank cars. These cars were originally built as standard gauge cars, and were converted to narrow gauge cars. They were quite common on the Colorado narrow gauge lines, and most people think of them as narrow gauge cars. The cars come ready to run with the new San Juan scale couplers. The wheels have highly detailed plastic centers with metal tires. The photo shows a pre-production model, and the production models will have blackened tires. There are many road numbers for UTLX, Milwaukee Road, and Pioneer Oil available. The price is \$89.95. [See their website](#) for more details.

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Cleveland O Scale Show

By Glenn Guerra

The Cleveland O Scale show was held at Lakeland College on November 3rd this year. This is an annual show on the east side of Cleveland. The show has some nice features to it. One of my favorites is the dinner on Friday before the the show. You travel to the show on Friday, and set up on Friday afternoon. With that out of the way, you get to have a relaxing dinner, and listen to a speaker.



The Friday night dinner is always an enjoyable part of the show.

This year's speaker was Don Wetzel, who worked on the design and drove the New York Central jet powered test train in 1966. His presentation was good and informative. Don even had a O Scale model of the M-497 to show everyone, as well as, the builders plate from the RDC they used for the conversion. It was less than 60 days from the time they got the word to build the M-497 until the record run. That included designing, building, testing and the actual runs. Don told us that on the final run, the M-497 actually outran the company airplane that was filming from above. This was quite an event in its day, and if you would like to know more, you can look on the Internet under M-497.



Don Wetzel at the podium telling us how they designed, built, and ran a 183 mph train in less than 60 days.

The show was the next day, and was held in the practice gym at the College. The location is good with plenty of parking, and the concession stand is always open for lunch. That's a big thing for those of us with tables since it's hard to get away.

There was a lot to see at the show. Dan, Amy, and I set up a computer at the show, and were showing people the new issue of *The O Scale Resource*. There were dealers, manufacturers, and individuals all selling at the show, so there was a good variety of models to see. The show is fun, and if you plan to come next year, I would recommend taking in the dinner.



Don Wetzel's O Scale Model of the M-497 on display at the dinner on Friday night.



A view of the show during the morning set up.



The O Scale Resource was at the show. Glenn Guerra on the left, then Amy and Dan Dawdy.



Bob Heil was there for Sunset.



Bob Lavassi is showing Joe Foehrkold from Baldwin Forge & Machine the underside of a model.



Bill McConnell was displaying his ready made turnouts at the show.



Lots to see, both new and old.



Bill Davis was in attendance with his extensive supply of parts and trucks.

Eastern PA 2 Rail O Scale Train Show/Swap Meet

By Glenn Guerra

The fall O Scale two rail show in Strasburg, Pennsylvania was held November 16 at the Strasburg Fire Department. The show is run by John Dunn and Rich Yoder. When they started the show, it was held in the meeting room at the Fire House. It has since spilled over into the bays where the trucks are kept. The show is always a lot of fun. Strasburg is in the heart of the Amish community, and there is always some good food. This year, they were serving homemade corn chowder. It really hit the spot come lunch time.



The show started in this meeting room, which is part of the fire house, and has grown out of it.



The show has spilled out of the meeting room and into the bays where the fire engines are kept.

I stayed with Dave Vaughn in Maryland this year, and after the show we went back to his house to run trains. Bob Lavassi joined us, and we had a good visit about the history of the hobby. Bob is with the New York Society of Model Engineers and is working on some history of the O Scale hobby.

The show this year had a good mix of manufacturers, dealers and people selling their own items. I like to kid the people with tables to see if they are going home with



More of the spill over into the fire truck bays.

more than they came with. Brian Scacce, editor of *O Scale Trains*, is a member of the Gauge O Guild, an English O Scale organization. The guild has regional groups around the world similar to the NMRA. Brian is part of the US chapter, and they had an English theme module set up. Rich Yoder of Rich Yoder models was selling his trucks and had a good variety of them.



Brian Scacce, editor of O Scale Trains, setting up an English theme module.



Rich Yoder looks like he is having fun. Rich had a lot of his trucks for sale, as well as information on new projects.



Bob Heil from Sunset was there. Bob is the East Coast rep for Sunset.

Dave Thompson from Harbor Belt Lines was there with an extensive line of products. In addition to carrying an extensive line of products, Dave is also developing his own products. He had a display of a new mail crane that he is working on.



Harbor Belt Lines had this new mail crane model on display.

Phil Kehr of K&P Brick & Building Co. was there with a large display of building kits and detail items. This was the first time that Phil had been at the Strasburg show, and he seemed to like it. Another newcomer was Arttista with their figures and detail items. Robert Buck of GSI was there with a display of their battery power components. The backyard railroad people have been using battery power to overcome dirty track on outdoor layouts. The technology is finding its way into O Scale, and is proving to work nicely.

A good time was had by all.



Phil Kehr of K&P Brick & Building Co. stands by his display.



Dave Thompson of Harbor Belt Lines was there with his extensive line of products



GSI had a battery power demonstration going on their table.



Arttista had a very large selection of their figures and detail items at the show.

Neenah Model Railroad Club Open House

By Glenn Guerra

During the weekend of December 7-8, the Neenah Model Railroad Club had an open house. The club was started in 1964, and is located in the old Milwaukee & Northern depot in Neenah, Wisconsin. The club was involved with a major overhaul of the layout the past few years, and this was the first open house where all the track was back in operation. The club announced the open house in local papers, and the crowd was steady both days.

For some history on the depot, the Milwaukee & Northern Railroad was started in 1872, and built from Milwaukee to Green Bay. A branch was built from Hilbert to Neenah at the same time. Very soon after, the railroad was controlled by the Wisconsin Central Railroad. In the 1909 bankruptcy of the Wisconsin Central, the Milwaukee Road acquired the Milwaukee & Northern, and it became the Milwaukee Road main line to the north. The branch from Hilbert to Neenah was used by the reorganized Wisconsin Central to go from Neenah through Hilbert and on to Manitowoc, where the railroad had a car ferry slip. When the Milwaukee Road collapsed, the SOO Line, which by now owned the Wisconsin Central Railroad, bought the Milwaukee Road. The SOO Line moved onto the Milwaukee Road and soon started selling off their old SOO trackage. A newly formed Wisconsin Central Railway purchased the spin off lines. The new Wisconsin Central Railway grew, and also purchased some of the Chicago & Northwestern lines in the north country. In a hostile takeover, the Canadian National purchased the Wisconsin Central Railway, therefore, today there are Canadian National trains running by the club depot. The local usually comes by the depot in the evening, and all the club members will file out of the building to wave at the crew as they go by.



Wally Rogers in the foreground runs his train while visitors look at the trains. Photo by Glenn Guerra



The home of the Neenah Model Railroad Club is the depot built by the Milwaukee & Northern Railroad in Neenah, Wisconsin during the 1870's. Photo by Dave Nitsch



*Some of the members of the Neenah Model Railroad Club
Pat Morressy, Luke Iverson, Jacob Woelfeld, Wally Rogers, Dennis Wittman, Robert Steffen, Fred Steffen
Missing from the photo was Stanley Bye, one of the founding members.
Photo by Dave Nitsch*



These buildings were falling apart when I first saw them. Dennis Wittman, who is a fairly recent member of the club, rebuilt, painted, and detailed them. Dennis has done many other buildings on the layout, and his techniques are very impressive. I will do an article with Dennis in a future issue so you can see some of his other work and his techniques. Photo by Dave Nitsch.



This milling complex was built many years ago by Joe Folmar. Joe is a Catholic priest who now resides in Greenville, Wisconsin. Those of you who are familiar with the Chicago & Northwestern will recognize the name. Joe has written a number of good books about the Chicago & Northwestern. Photo by Dave Nitsch



This is SOO Line country, and there is lots of SOO equipment on the layout. A Red Caboose GP-9 sits by a Weaver Alco FA. Photo by Dave Nitsch



This brass Alco RS-1 was built by Wally Rogers from a Kemtron Kit. Photo by Dave Nitsch



The Milwaukee Road is also well represented at the club. Stan Bye owns the two Atlas Erie built units on the high line. The F units also belong to Stan, and are a mix of All Nation and Atlas units. The Fairbanks Morris C Liners are AHM units with All Nation drives. Stan kit bashed the B unit from two A units. The foreground track has all Atlas products on it. Photo by Dave Nitsch.



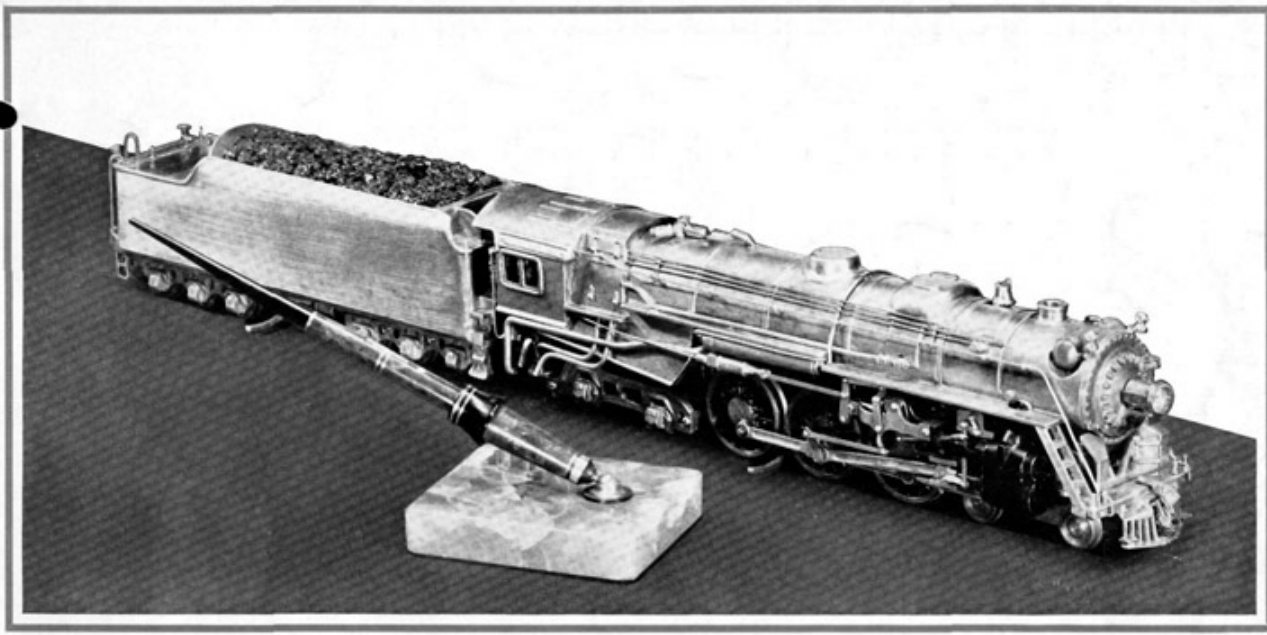
By Glenn Guerra

This story about Scale Craft starts in 1933 in Chicago, Illinois. To write this story, I relied on two articles that appeared in the December, 1947 issue of Model Railroader. Scale Craft had just been sold, and there was some history. In addition to those histories, and the ads in Model Railroader, I was able to see some catalogues at Lake Forest College's Donnelley and Lee Library in Lake Forest, Illinois. Some of the information is unclear, but I will note that in the text. Lastly, Elliott Donnelley wrote quite a bit in the catalogues, and I have decided to reproduce his contributions for you to see rather than try to paraphrase them. So, back to 1933.

According to the Model Railroader history from 1947, Scale Craft was started by Clifford H. Smith as Scale Models, Inc. That history states that Elliott Donnelley purchased the company in 1936 from Clifford Smith. The library at Lake Forest College has a catalogue that is not marked, and the date of issue is not known at this time. In that catalogue, Elliott Donnelley announces that he is the new president, and Clifford Smith is still on the Board of Directors. That announcement is reprinted in its entirety for you to see. It's possible that Elliott started working for, or with Clifford in 1933, and did not purchase the business outright at that time. The Model Railroader history states that Model Railroader used the mailing list supplied by Scale Models, Inc. for solicitations for their first issue in 1934. They also claimed that Scale Models, Inc. was one of the largest



This catalogue is not dated; however, the introduction on the inside indicates that this was the first catalogue issued while Elliott Donnelley was running Scale Craft. The quality of the graphics is an indication that RR Donnelley and Sons was involved in the printing and design. Courtesy of Special Collections, Donnelley and Lee Library, Lake Forest College.



A NEW POLICY . . .

IT IS a pleasure to place in your hands a copy of the first Catalog of SCALE-MODELS, INC.—the new Company which has succeeded to the business of American Model Engineers, Inc.

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level. Your patronage will help to make it possible, and we are anxious to do everything we can to make you a satisfied and permanent customer.

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More than this, we are in a position to give SERVICE to our customers. This is inclusive—immediate shipment of all orders, a prompt reply to all your correspondence, all questions answered including a complete Engineering Service to furnish you with special help and advice.

Elliott Donnelley, President
SCALE-MODELS, INC.

I wanted to show you this whole page, rather than paraphrase it because it's a good illustration of Elliott Donnelley's writing style and personality. He took an active interest in the hobby, and wrote quite a bit in the catalogues and data books that Scale Craft issued. Courtesy of Special Collections, Donnelley and Lee Library, Lake Forest College.

model manufacturers in the country at that time. Model Railroader stated that the Scale Models, Inc. factory was on the north side of Chicago. The catalogue has an address of 1516 South Wabash, on the south side of Chicago. This was the old printing district of Chicago, and I suspect that this was also a location of RR Donnelley offices. Elliott Donnelley was part of the third generation of the RR Donnelley publishing empire; therefore, it would make sense that he would have had the business office at his location or near by. So, some time around 1933 to 1936, Elliott Donnelley was getting involved with Scale Models, Inc. Note also in his introduction in the catalogue that Scale Models, Inc. is succeeding American Model Engineers, Inc. When you look at the cover of the

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Per foot of 6 1/2" to 7" long	50¢
Per foot of 7" to 7 1/2" long	50¢
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One of the ways Scale Craft stayed in touch with their customers was post cards. The quality of the work shows that Elliott Donnelley knew printing and had access, through his family, to good layout people. Courtesy of Special Collections, Donnelley and Lee Library, Lake Forest College.

catalogue, you can see some classy artwork done by some good layout people, and Elliott would certainly have had access to them.

Another way that Scale Models, Inc. stayed in touch with their customers was through post cards. Other manufacturers have done the same. Note on the post card that Scale Models, Inc. produces OO Scale models, as well as O Scale models. OO Scale was 1/8" to the

This 1937 catalogue is printed on high quality gloss paper with good photo reproduction. Besides the product listings in O and OO Scale, there is extensive data on how to plan and build your model railroad. Courtesy of Special Collections, Lake Forest College, Donnelley and Lee Library.



INTRODUCTION

WHEN a man can lay aside his cares and worries at the end of the day and become supreme dictator in a world of his own making, he's getting the greatest satisfaction that life can provide. He's doing the things he wants to do, and boredom vanishes forever. Mental recreations may become tiring, physical ones contingent upon weather or health, but the recreation of Model Railroading is independent of these conditions. Fifty thousand enthusiastic devotees of America's fastest growing hobby have learned the secret of really enjoying their spare hours and adding to the real value of living. What model railroading has done for them, it can do for you, and to the task of initiating the public into the secrets of the hobby, this catalog is dedicated.

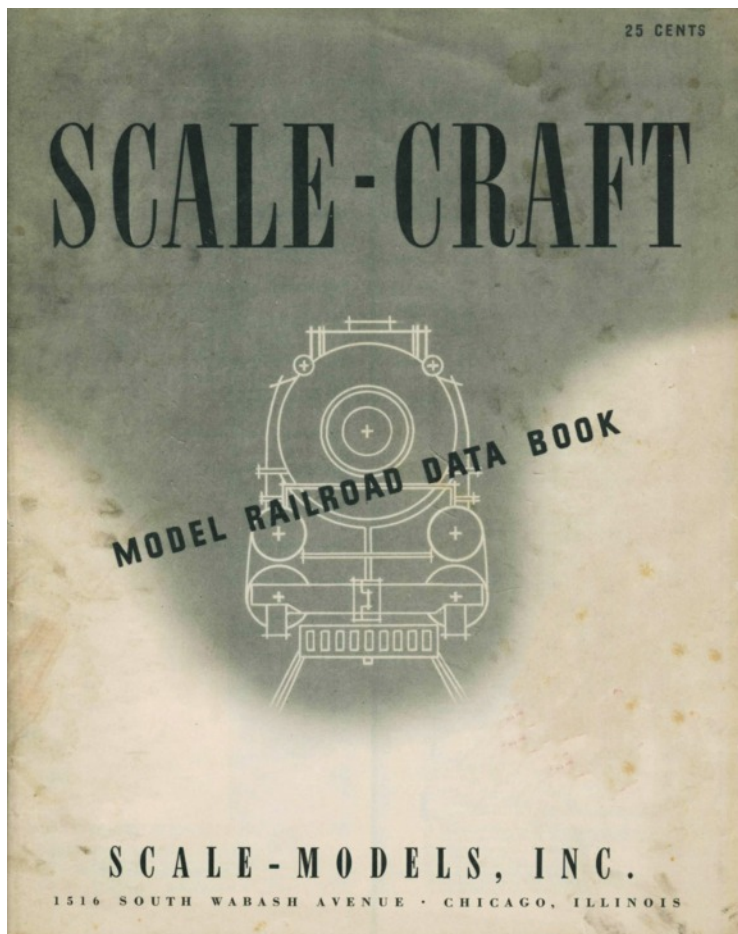
Beginners and veterans will find these pages packed with live,

interesting information. To the latter, whose patronage, suggestions and cooperation have advanced our success, we are deeply grateful. Likewise, to the railway executives who have aided us with a wealth of authentic information, we express our sincere thanks. Without this assistance it would have been impossible to reproduce the maze of external details appearing on full size locomotives and other equipment.

The history of our own industry is brief but interesting. About five years ago a small party of venturesome model railroaders began to manufacture and distribute parts and supplies for construction of scale model railroads. Their first thought was to promote the hobby among men and boys for whom railroads have always held a powerful romantic appeal. The response was instant, and has been growing ever since—proving that model railroading answers a yearning that's universal, and answers it in a manner so completely satisfying that the men who have taken up the hobby have become more and more absorbed in it, and have spread its fascination among their friends. Never has a recreation more thoroughly proven its value.

The introduction to the 1937 catalogue is another good example of Elliot Donnelley's writing style. Courtesy of Special Collections, Lake Forest College, Donnelley and Lee Library.

foot, or half of O Scale. There were a number of manufacturers in the US and some in Europe producing OO Scale models at this time. Eventually, HO Scale prevailed. In Europe, a common scale for modeling is 7 mm to the foot, and half of this is 3.5 mm to the foot, which is today's HO Scale.



This is the earliest Data Book I have seen, and is from 1939. Courtesy of Special Collections, Lake Forest College, Donnelley and Lee Library.

for MARCH, 1939 153

WORLD-FAMOUS

Pennsylvania K-4 Pacific Locomotive

There's no commoner type of locomotive in the world than this superb engine, none faster, none more famous anywhere. Certainly every model system ought to have one or more, especially in view of the improved, distinctive features which the "O" Gauge K-4 now provides at no extra cost.

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The K-4 Model is an exact reproduction of its prototype that pulls the crack New York to Chicago "Broadway Limited" and the famous "Detroit Arrow." Note in the illustration the full working Walschert valve gear, Laird type cross-head, power reverse gear, piping, etc., all faithfully reproduced.

We have K-4 Models that have run over 5,000 actual miles, or farther than Chicago to San Francisco and return, without a single major repair. The model will pull 16 to 20 passenger cars or 25 to 35 freight cars—and will take grades up to 3 per cent.

K-500 Hobby Kit Complete \$44.50

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THE BOLLES SPORTING GOODS CO. Cincinnati, Ohio	REGINALD DENNY INDUSTRIES, INC. Hollywood, California	PALACE HARDWARE COMPANY San Francisco, California	

SCALE-MODELS, INC.
1516 So. Wabash Avenue Chicago, Illinois

An ad from the March, 1939 Model Railroader touting the K-4 Pacific.

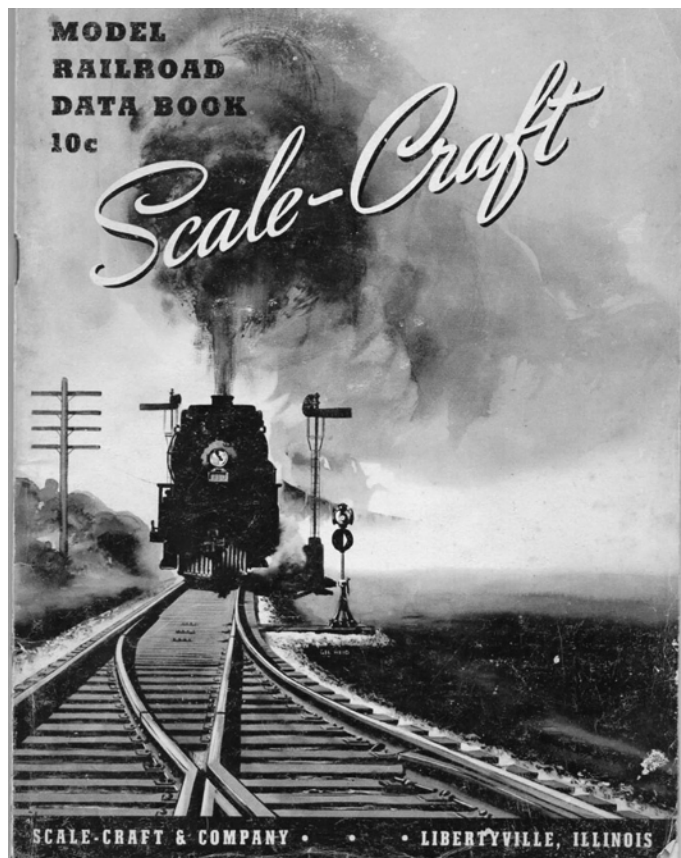
The next catalogue I was able to look at was from 1937. In this catalogue, Elliott wrote another introduction that well illustrates his writing style and feeling about the model railroad hobby. The library also had the 1939 catalogue called a Data Book. In this catalogue, Elliott goes into everything you need to know, at that time, about your model railroad. These data books covered everything about planing your layout, bench work, scenery, wiring, and running your model railroad. The amount of art work and layout work could not have been accomplished by many other manufacturers. All this time, Elliott was living in Lake Forest, Illinois and commuting on the train to Chicago. The company was growing, and Elliott must have wanted to get the offices and manufacturing under one roof. The 1940 Data Book had an address of Libertyville, Illinois. The curious thing is that the street address in Libertyville is never mentioned. Stan Bye, who I know through the Neenah Model Railroad Club, told me

The 1940 Data Book has more good quality illustration work, and is the first book with the Libertyville, Illinois address. Courtesy of Special Collections, Lake Forest College, Donnelley and Lee Library.



that his mother worked at Scale Craft during WWII as a lathe operator. He told me where the factory was located. When you go to this location, you can imagine why it was chosen. The Chicago North Shore and Milwaukee Electric Railroad ran a few blocks from Elliott's house in Lake Forest, and it had a branch that went to Libertyville. Once there, it was only a few blocks walk to the factory. Also, the catalogue now is for Scale Craft not Scale Models, Inc. The 1940 Data Book again illustrates the quality of graphic work that Elliott was able to put into his catalogues. These data books are also interesting because they contain photos and information about other models at the time. In the Model Railroader biography on Elliott and Scale Craft, they mention what an influence on the hobby Elliott was, and you can see that in these catalogues. Also, the warm friendly nature of the writing shows Elliott's demeanor well. Note the graphics on the cover of the 1940 Data Book. They are truly dramatic illustrations that make the railroads larger than life. The locomotive is working hard, and you can almost hear the stack and feel the ground tremble as the locomotive approaches. This was railroading to Elliott.

Elliott was born into a very wealthy family, and saw life from many perspectives. While he was very comfortable with people who worked for him, he also saw



The 1941 Data Book again shows the high quality graphic work that went into the Data Books. Collection of Glenn Guerra



the big picture. In the 1941 catalogue, he mentions the war in Europe, and how it was going to affect the model railroad hobby. These are the far reaching effects that heads of large industries think about, and it is an indication that Elliott, through his family, saw these things. Elliott was a far more capable person than was required to run a model railroad manufacturing firm. The Data Book has a letter from Elliott explaining the shortages brought on by the war in Europe. The Data Book is copyrighted 1941, but the text indicates that it is a 1941-1942 edition. This may indicate that Elliott saw that they would not be able to print a new Data Book for 1942, and therefore, called this book the 1941-1942 Data Book. I suspect that this book was issued prior to December 7, 1941, as it does not mention the United States being in the war yet. I reprinted the whole page for you to see, and to read for yourself. Again, this is a good illustration of Elliott's frankness and connection with the customers.

This page in the 1941 Data Book illustrates how the war was starting to impact manufacturing in the United States. Collection of Glenn Guerra

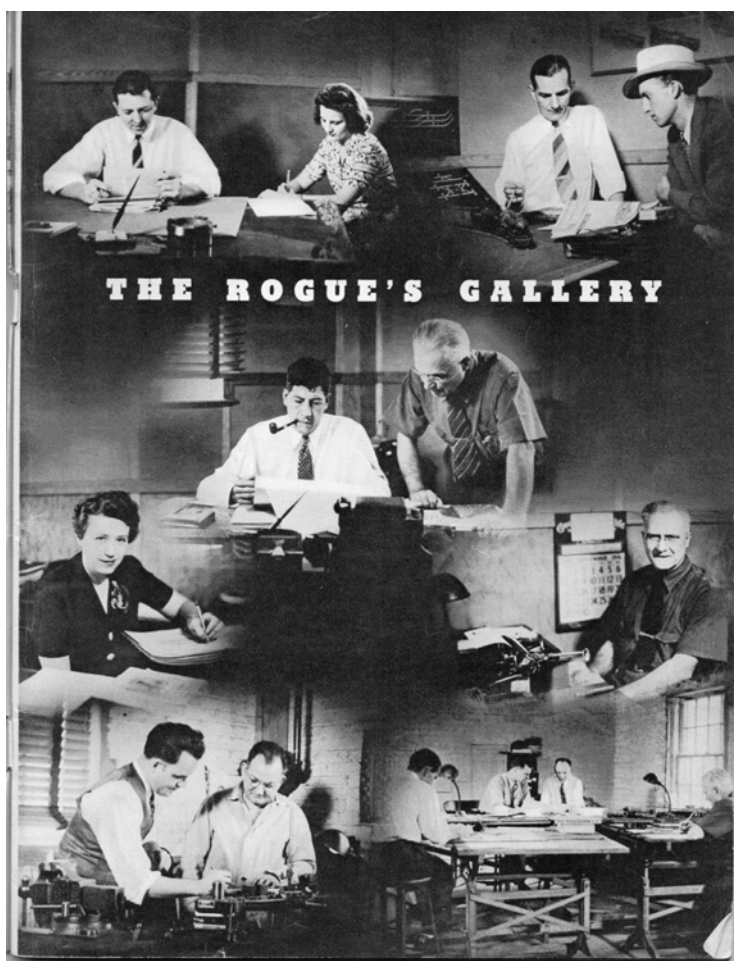


The 1941 Data Book shows the new factory in Libertyville. The text again illustrates Elliott's congenial nature. Collection of Glenn Guerra

Like all model manufacturers, Scale Craft did war work, and did it first. As the volume of work went up, so did the work force. As I mentioned, Stan Bye said his mother worked there during the war as a lathe operator. She did not know what she was making, but it took a long time. She would work for days on the same part. Stan thought that she was making molds or dies for small caliber anti-aircraft bullets. An article in the December, 1946 issue of Model Railroader mentioned that Scale Craft made cartridge punches and other high precision parts for the war effort. In addition, they made diesel locomotive sander valves and wash out plugs for steam locomotives. Model production ground to a halt. Most of the products in the 1941 Data Book were already out of production. Look at the table of contents, and you will see that 30 pages of the Data Book are on the subject of how to build your model railroad. The Pennsylvania K-4 was one of the first O Scale models built, and appears to have been prior to Elliott's involvement with the company. The Model Railroader article claims that the K-4 was one of the first massed produced models for the O Scale market. The K-4 had a rolled brass fabricated boiler whereas some of the later locomotives had die cast boilers.

As we have been talking about all along, Elliott had a connection to his employees and his customers. In the 1941 Data Book, there is a page that shows the new factory and another page with photos of the personnel. This is a theme that I keep touching on because it is so much a part of the Elliott Donnelley influence on Scale Craft.

As 1945 got underway, many people could see that there would be an end to WWII and they could get back to their normal lives. Elliott was aware of this as an ad in the March, 1945 Model Railroader indicates. During the war, Scale Craft did not advertise much, and now it was time to get connected with the customers again. I copied all the ads from 1945 so you could see the tone of the ads as the war was ending. The war with Japan ended in August of 1945, and the government lifted the restrictions on war materials production.



As you can see in the August, 1945 ad, the return to normalcy was not going to be an overnight thing. Also, Scale Craft was promoting the OO Scale line as heavily as the O Scale line. Elliott thought that 1/8" to the foot made much more sense than 3.5 mm to the foot, and was a firm supporter of OO Gauge. By December of 1945, it was obvious that during the war many people had moved, and some had been killed in the war. It was time to get the mailing list updated, and Elliott did what he always did, he appealed directly to the customers. I thought it was worth reproducing this letter also so you can read it in Elliott's own words. Throughout 1946, Scale Craft advertised parts, not whole kits. Some of these parts were new as a result of starting up again after the war. The big news came in December of 1946.



Tired ? Bored ?

Can't Get Away ?

We would like to help you, but the Chief Dispatcher says "positively NO—war work comes first!" He's right, of course, but we will be ready when the time arrives, to supply you with more and better models in both "O" and "OO" gauges.

SCALE-CRAFT & CO. LIBERTYVILLE ILLINOIS

By early 1945, people could see that WWII would be ending. Scale Craft was getting back in touch with their customers in this March, 1945 ad from Model Railroader

★

THE MAN IN THE CAB

has one eye constantly looking down the track watching all Scale-Craft "O" and "OO" postwar development plans while his other eye waits for the signal to proceed.

Let's all hope the order comes soon so that war contracts may be promptly laid away and the words "there is a war on" can be forgotten.

SCALE-CRAFT & CO. LIBERTYVILLE ILLINOIS

April, 1945 ad in Model Railroader.



IF Uncle Sam would let you snoop into some of those long trainloads of freight you see rolling in all directions you would frequently find something made in our shops on its way overseas.

In spite of all the rush and turmoil of war work, we are not forgetting our model friends. Plans and experiments are underway for many new and better models in both "O" and "OO" gauges.

SCALE-CRAFT & CO. LIBERTYVILLE ILLINOIS

May, 1945 ad in Model Railroader

Great things to come in "OO"



For several years prior to this country's entry into the present war, Scale-Craft was developing many types of equipment for "OO" gauge. Unfortunately, our plans were necessarily set aside for war production and the making of all model equipment stopped. We believe that the emergency, although it is still with us, will soon diminish and again we are placing our complete faith in the future of "OO" as the best of the smaller gauges. For this reason, our engineers are now working on plans for a greatly expanded line of "OO" as well as "O" gauge models.

SCALE-CRAFT & CO. LIBERTYVILLE ILLINOIS

June, 1945 ad in Model Railroader

★

LET'S FACE THE FACTS

★

While the Government has rescinded order L-81 which prohibited the making of model railroad equipment, and has seemingly given a clear track to proceed, there are still some hurdles that prevent immediate resumption of manufacture.

We are still at war and as a result materials are not plentiful. While some materials can be purchased in limited quantities after priority orders have been filled, other materials are still restricted for military or essential civilian use only.

With such shortages existing it is highly improbable that we will be able to get into production on any of our models until late this coming Fall.

SCALE-CRAFT & CO.
LIBERTYVILLE ILLINOIS

August, 1945 ad in Model Railroader

SCALE-CRAFT & CO.



Manufacturers of "0" and "00" Gauge Model Railroad Equipment

December 1, 1945

Dear Fellow Rail Fans:

During the past couple of months we have received a great many letters and postal cards from old friends showing new addresses which has about convinced me that our mailing list has become a total casualty of the war. As a result, if you are still interested in Scale-Craft equipment, I would very much appreciate it if you would drop us a postal card giving your permanent address so that we can send you our new catalogue as soon as it is published which, at the present date, will be sometime in January. It would help us and our dealers a great deal to serve you better if you would tell us what gauge you are interested in.

Sincerely yours,
SCALE-CRAFT & COMPANY

Elliott Donnelley
President

P. S. Please print your name and complete mailing address.

As I mentioned before, Elliott Donnelley was an heir to the RR Donnelley and Sons printing empire, and he was called on to assume a more active role in the printing business. As a result, Elliott sold Scale Craft. It's a bit ironic that Clifford Smith, from whom Elliott purchased Scale Craft, was called back to his family business and that is why he sold Scale Craft to Elliott. Scale Craft was sold to the West Coast distributor, Doug Douglas in Hollywood, California. There was a two page ad in the December, 1946 Model Railroader announcing the changes. I reprinted those ads in their entirety so you can read them. Along with the sale, Bert Barr, manager of production, moved west with Scale Craft. Doug Douglas started out rather slow, and after a few months, came out with a large ad thanking all the customers for their support. After that, the ads got smaller and fewer. It appears that Doug did not have the same success with Scale Craft that Elliott did.

According to Art Miller, emeritus archivist of Special collections at Lake Forest College, Elliott was very good with people. Art knew Elliott, and still has connections with the Donnelley family in Lake Forest. Elliott was Mayor of Lake Forest for a while, as well as a trustee and trustee chair of Lake Forest College during the 1960's.

SCALE-CRAFT & CO.



November 11, 1946

Dear Model Bedfellows:

The handwriting, I am afraid, is on the wall. I have to return to the family fold, R. R. Donnelley & Sons, as soon after January 1, 1947, as practical.

With this in the future and not being a superduper two-way executive, I find it necessary for me to give up all my connections with the model railroad manufacturing field.

Doug Douglass of Hollywood, Calif., our past West Coast distributor, has decided to carry on the torch for better model railroad equipment for me and has taken over Scale-Craft & Co., the famous model railroad line (my personal opinion, please) lock, stock, and barrel. Doug has the same ideals I've tried to promote and I feel sure he will bring up my baby far beyond my inmodest expectations.

From now on, I will be able to enjoy the hobby once again and I am starting immediately on my own system. Friendly suggestions are needed.

Sincerely yours,

Elliott Donnelley

Past Brass Hat of
SCALE-CRAFT & CO.

P. S. Model railroad manufacturers, please note. I am once again a mere fan, a very good prospective customer and I want your catalogues.

SCALE-CRAFT & CO.



November 11, 1946

Model Railroaders
Everywhere:

As the new president and owner of Scale-Craft & Co., I welcome this opportunity of publicly thanking Mr. Elliott Donnelley, past president and former owner of Scale-Craft & Co. for his contribution to the model railroad industry.

During the past 10 years under the burden of war work, then reconversion for the most part, Mr. Donnelley has given the model railroader that high quality which has won the respect of all for Scale-Craft products. He has consistently striven to give more dollar value and fun in everything he has offered through leading hobby dealers everywhere. His slogan "Working Models" has meant Scale-Craft model railroad equipment works. His ideals and plans for the future will be continued by the new management. I give you my pledge on that.

Scale-Craft is moving to Hollywood to continue production there. The business offices are now ready to receive your inquiries, fans and dealers. A new catalogue will be available as quickly as paper conditions permit.

We are looking forward to the privilege of serving you as well in the future as you have been served in the past.

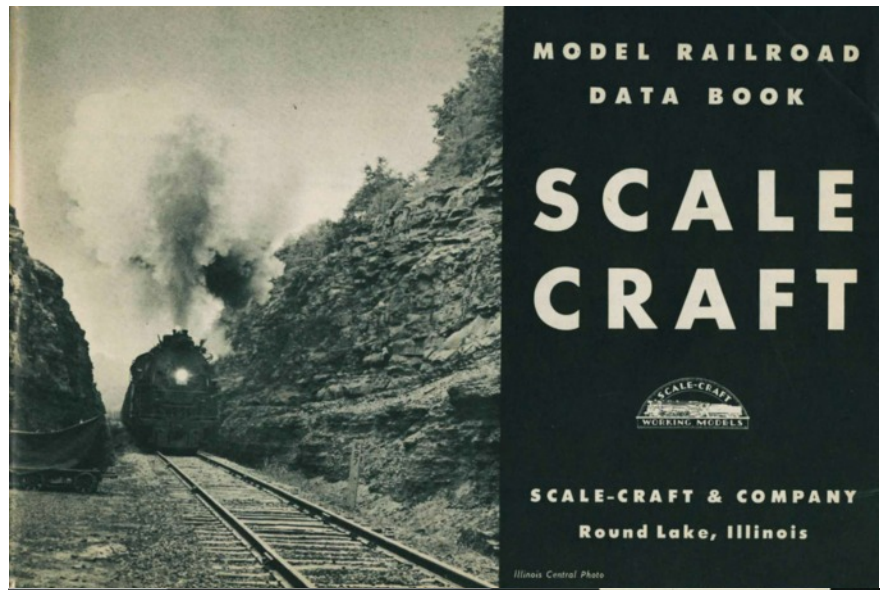
Sincerely yours,

Doug Douglas

He would personally tutor trouble makers at the school, usually turning them around. Elliott was also a big benefactor to railroad history. The first storage building at the Illinois Railway Museum was financed by Elliott. The locomotive shop at the Mid Continent Museum was also financed by Elliott, and has a bronze dedication plaque by the door. In Flint, Michigan, there is a narrow gauge D&RG 2-8-2 and cars that were once on the Donnelley estate in Lake Forest. Elliott was involved with the miniature train ride at the Brookfield Zoo west of Chicago. Elliott was also a collector of railroad material, which is now part of the Special Collection at Lake Forest College. So what does this have to do with Scale Craft?

In 1947, Elliott's involvement with Scale Craft did not end. By 1950 Doug Douglas had floundered. The 1950 Scale Craft Data Book had an announcement from Elliott that he was back with Scale Craft. At this time, Scale Craft was still offering the O Scale line, as well as, the OO Scale line. The address of Round Lake, Illinois is west of where the Libertyville factory was. The O Scale line did not last long, and by 1951 Scale Craft was announcing that they were only going to produce OO Scale items. Note the apology to the customers in the 1950 Data Book introduction. This may have also been for the sake of Scale Craft employees. The 1951 ad shows an address of 849 Summit Avenue in Lake Forest. When I was visiting Art Miller to look at the catalogues and other information at Lake Forest College, we went to see the Summit Avenue location. Summit Avenue is a two block long street with houses on one side of the street and a park on the other. Across the park from Summit Avenue is the Donnelley estate. Art told me that quite a few of the estate owners in Lake Forest owned homes for their help to live in. We suspect that this was the case with Scale Craft, and that whoever was in charge of production, was now living in the house at 849 Summit Avenue.

This was the last gasp for Scale Craft, and most likely was not at all profitable for Elliott, but was a way of supporting someone who had been loyal to him in the past. Scale Craft was finished with O Scale, and HO Scale was rapidly putting OO Scale by the wayside.



Scale-Craft has a new lease on life. What is past is past. We only hope that our old friends will "forgive our sins" and our new friends will never have cause for complaints that cannot be adjusted.

We still have great faith in the O and OO gauges and we intend to do everything in our power to further the popularity of these two gauges.

Our new policy of carrying on business will be strictly on the mail order basis—factory to consumer. We feel that we can serve the model railroad fraternity far better if we have direct contact with you as a customer rather than going through an intermediary. In the past this has been proven out a great many times. Mistakes, unfortunately, do happen. Whenever we have been able to get the gist of the trouble first-hand, we have always been able to straighten it out with the least amount of fuss to the satisfaction of everyone concerned.

Since the war, we realize that a great many Scale-Craft parts have gotten out into the hands of our customers which are not as they should have been. If you have any of such parts, please drop us a line and tell us about them. We are sure we can straighten out your trouble.

For the first time in many years we are listing at the end of the book hard to get tools which we feel are helpful to the model railroader. As a rule these tools can only be obtained in metropolitan areas. If you as a model railroad enthusiast find other tools which are not shown that you are having trouble obtaining, please let us know and we will be more than happy to get them for you if it is humanly possible.

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These two items are from the 1950 Data Book, and are the announcement of Elliott returning to Scale Craft.

**NEWS FOR
"OO" GAUGERS**

SCALE-CRAFT is back and going strong. We are now devoting all our efforts to bring "OO" the IDEAL GAUGE into prominence again.

We are now shipping Chicago & Northwestern Class H 4-8-4 Locos, 10 Wheelers, Combination Coach and Baggage Gas Electrics; Hoppers, Flat Cars, Reefers, Stock Cars, Cabooses; Passenger Coach and Baggage Cars; Pullman Sleepers, Diners, Observation Cars; G.E. and M.U. Power units, Fibre Tie Stripping, Midlin Track Kits, Motors and a host of other items. Send 10c for catalog and price list.

SCALE-CRAFT & CO.

new address
849 SUMMIT AVENUE
LAKE FOREST, ILLINOIS

We are now manufacturing only "OO"

An ad from the September, 1951 issue of Model Railroader

JMRI AND WIRELESS OPERATION

By Daniel Dawdy



Last issue, we talked about JMRI for programming your locomotive fleet. But, JMRI can be so much more. How would you like to run your train wirelessly without the large expense of buying all new DCC equipment? Well, you can do just that. All it takes is a wireless router and a smart phone. Many of you have a smart phone ie: iPhone, iPod Touch, or Android Phone. Nooks and Kindles will also work provided they have a wireless capability. In addition, many of you probably have a Wi-Fi router supplied by your Internet provider. If you do not have one, Wi-Fi routers are available for under \$40 at many places such as Walmart and Amazon.

I Don't Have / Want A Smart Phone

OK, fair enough, but you don't have to have a phone connected to a data plan. I have an iPhone 3 my daughter gave me. There is no SIM card, I simply use it to connect to my home network. I can't make a phone call, but I can surf the Web, and use it as an extra throttle. Now, you may already have a radio set up. I have the NCE radio and two throttles. These are kind of pricey, so the yard crews get the tethered versions. If you wanted to add more radio throttles, you can simply use your own, or your visiting operator's, smart phone or tablet. And, you can also buy older used phones and tablets for less than a new radio throttle. Therefore, even if you have a radio set up, phones allow for a cheap throttle alternative.

OK, so how does this work?

If your computer running JMRI is on your home network, you are almost ready. If not, you will need to set that up. Some of you may not want your JMRI computer to see the outside world. If so, then you can hook up an inexpensive Wi-Fi router without an Internet connection.

Software

First, you will need an “app” for your device. Listed below are apps needed, depending on device:

Engine Driver Throttle for Android <http://enginedriver.rclubs.org/>

WiThrottle for iPhone, iPod touch, or iPad <https://itunes.apple.com/us/app/withrottle/id344172578>

WiThrottle has a free version, WiThrottle Lite, as well as a \$9.99 version which allows you to have more features. Engine Driver is a free app.

Starting JMRI

Open JMRI and select Tools / Throttles / Start WiThrottle. See Figure 1. JMRI will start its software and display the window as shown in Figure 2.

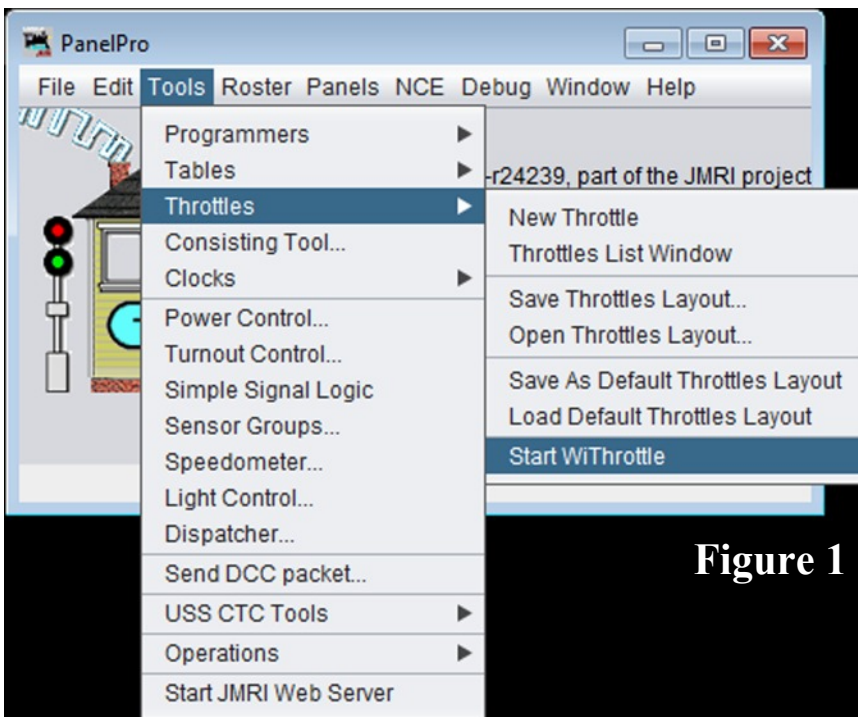


Figure 1



Figure 2

This window shows the IP address that is being broadcast, and that’s what the app will be looking for. You can also shut down all attached devices with the red X. The yellow symbol is the layout power. Yellow is the start up default as it does not know if the power to the track is on or off. Click that once, and it will turn red, shutting down all track power. Click it again and it will turn green, turning on all track power.

You can also go into the JMRI preferences area:

Edit / Preferences \ WiThrottle

and set up what you want to allow your operators to be able to do. See Figure 3.

If eStop is checked, the server listens for a return response from the mobile device. If the server does not receive a response in the seconds set (10 in this example), the affected throttle will idle its train.

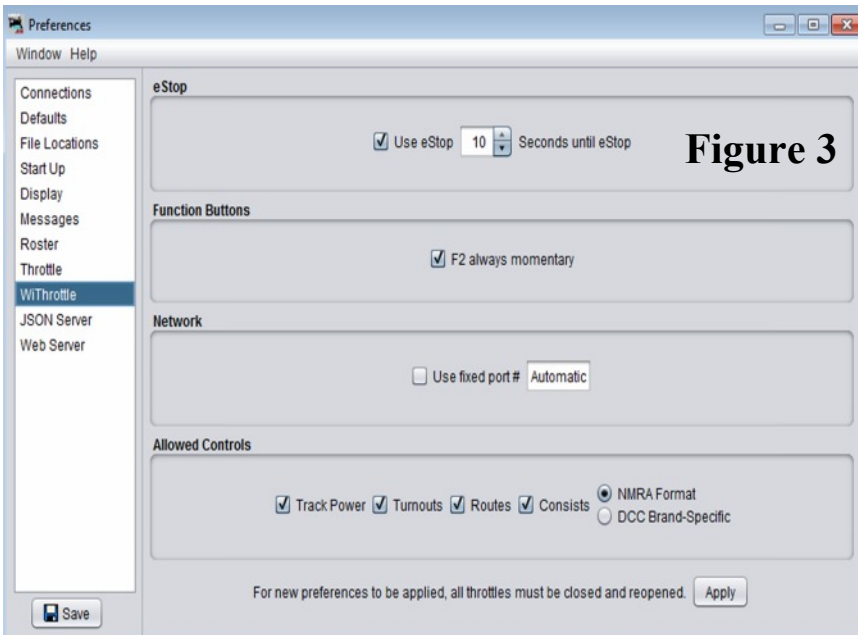


Figure 3

Leave the Function Buttons checked.

Network, in most cases, should remain set on Automatic.

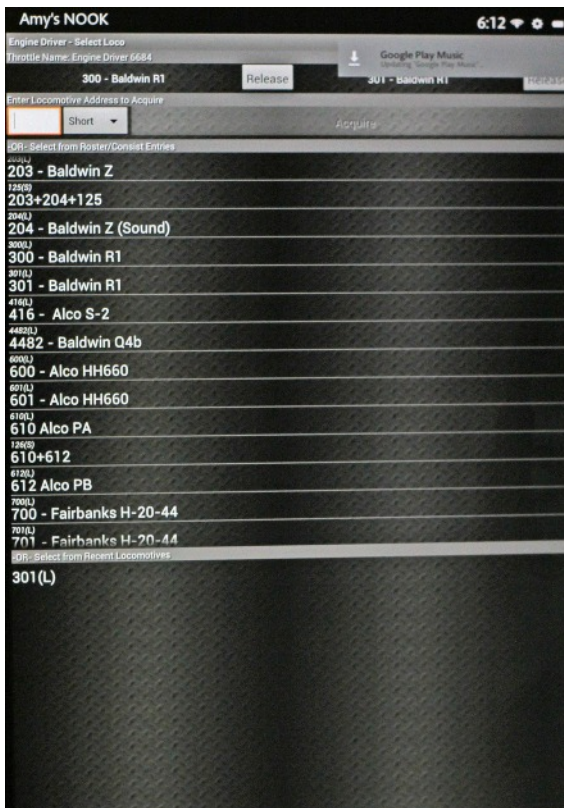
Allowed Controls, when checked, will allow the mobile throttles to access those controls. There may be times when you don't want an operator to be able to throw turnouts (assuming you have them programmed), shut down track power, or build & break a consist. You control what you allow your operators to have access to by checking or un-checking boxes.



The four images to the left are screen shots of the iPhone app called WiThrottle (paid version). The top left shows the default page. Not Set means we have not selected a locomotive or consist. The top right shows that I have selected locomotive 827 (L for long address). The bottom left shows my throttle ready to go. If you slide that screen to the left, the next set of function buttons will show. (Once gain, this is in the paid version.) The bottom right shows the paid version options of throttle type alerts and more.

The three pictures on the the next page show the Engine Driver Throttle running on my wife's Nook HD. It looks different, but allows for everything your DCC system will allow. In the top right image, I have two throttles set up for controlling two different locomotives. The picture on the bottom left shows the switches I have set up for DCC and, if allowed, this operator can throw them as needed.

Anything that your DCC system allows from throttles will also be allowed here. So, once again, if you have a radio set up now, this may be a way to add extra inexpensive throttles. If you do not have a wireless control DCC set up, here is a way to have one on the cheap. This is just one more example of the power of JMRI and DCC working together.



Postscript

This was very general overview of what JMRI is capable of doing for you. [Click here](#) for more information on JMRI: WiFi Throttle.



Howard Brothers Feed & Grain Complex

The Howard Brothers have been in the grain business for decades storing and shipping the local farmers' crops. They recently added a feed sales to their elevator complex to hopefully kick up the profits. The elevator can be build with or without the horizontal bands. The bands are usually seen on a studded versions of the elevators.

This complex is laser cut and engineered for easy construction. Other features include positionable doors & window sashes and removable roofs. Naturally, an ample supply of brass and white metal detail castings, including workers, are included. See more photos on our web site. This kit consists of laser-cut basswood, plywood, and cardstock. The footprint is a scale 180' x 100'; overall height is a scale 82 feet.

#18107 Howard Brothers Feed & Grain Complex O Scale \$379.95
Shipping - \$5.00/order in the US Foreign orders pay actual amount.

B. T. S. 1782 Trinity Rd **www.btsrr.com**
Belington, WV 26250 **304-823-3729**
Better Than Scratch! All Scale Catalog - \$8.00



By Glenn Guerra

Photos by Dan Dawdy

In the lake country northwest of Detroit, Michigan is the sleepy little cross roads town of Union Lake, Michigan. There was a grocery store in the town that closed, and the building was rented out until it became vacant in 1999. Today, that building houses an O Scale layout that will make your jaw drop.



This view is looking toward the rear of the room. The control tower is to the right just out of the photo. The two upper main lines are coming from the Chi-Town Union Station area. The foreground tracks come from a hidden freight staging yard.



The B&O Capitol Limited has just left Chi-Town station for its run around the layout. The run will take about 20 minutes to complete.

The layout is the dream of the owner, Paul Gribbell. Paul has been a member of the Detroit Model Railroad club since 1978, and always wanted a big layout done his way. He retired in 1997, and purchased 5 acres to build a home with a big basement for his layout. Unfortunately, his wife became ill and passed away in 1998 before they had a chance to start the new layout. Paul did not care for the location they had chosen, so he started looking for another location in which to live and build his O Scale layout. Paul thinks big. When he found the old grocery store, it looked like the ideal place. Paul purchased the building in February, 1999, and spent the next six months cleaning and preparing the interior for his layout. He started construction in June, 1999 working mostly by himself with the help of a buddy (when the buddy was not fishing or hunting). In 2002, Paul started dating the real estate agent who sold him the building, and soon they were married. The day after Thanksgiving 2005, the layout was opened to the public for the first time. Since that time, they have had a regular schedule, and are open from November 1 to mid March. You can find details on their website at: <http://www.chi-townunionstation.com/index.htm>



This view is looking from the front of the building to the back as you come in. The chairs on the right are a good place to sit and take in the sights. In the left of the photo, by the blue depot, there is a freight car red streak. For Dan to get this photo, he closed the shutter on the camera all the way and took a three second exposure to get the depth of field. The freight car red streak was a moving coal train that was 206 cars long. That is not a typo, the train was 206 cars long. We were sitting in the chairs watching and, at times, you could see the train going into a tunnel and coming out somewhere else at the same time.



This view is from the back of the room looking toward the front entrance. The seating chairs are on the left and the control tower is on the right behind the back drop.



The Super Chief has left Chi-Town on its run to Los Angeles. The scenery dwarfs the train, which is not always the case in O Scale.



This is the first view of the layout as you enter the room. The control tower is in the center behind the backdrop. From the control tower, you can see the whole layout.



The City of Everywhere is about to enter a tunnel in the mountains. Remember that this is O Scale, and you will start to get a feel for the size of the layout.



Dan was in the control tower, and took this photo looking down onto the layout. This is a view the public does not get to see, and it gives you some idea of the size. That is an O Scale train you are seeing, not N Scale.



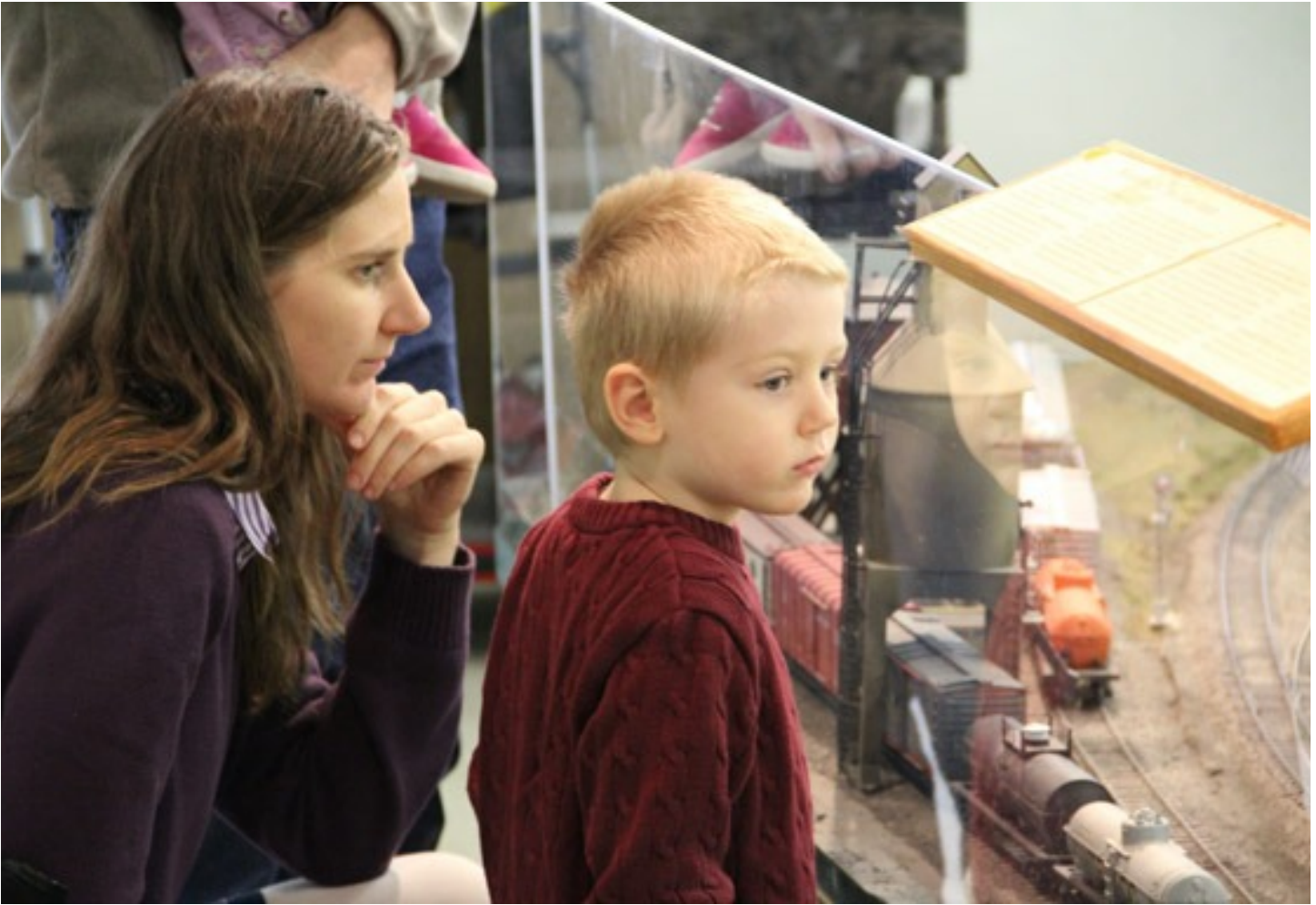
Another view of the layout from the control tower. This is the view that the operator sees. Remember that the UP train shown below has 18 inch long engines and cars making the train 26 feet long.



This is a view from the control tower looking down on Chi-Town Union Station. The Santa Fe Super Chief in the station is about 24 feet long.



Looking down from the control tower at Chi-Town Union Station. I have been here three times, and have yet to see all the passenger trains Paul has on the layout.



Every kid likes model trains.

And all of us are still kids at heart.

To give you some idea of the size of this layout, the building is 80' x 120' with a 15' x 20' addition. To date, there is 10,000 feet of track running, which is close to two actual miles. The turnouts are Old Pullman, and when they were no longer available, the turnouts were made in place using Right-Of-Way components. Paul has a small group of volunteers now that help him considerably with the layout. The equipment all belongs to the layout. Paul likes passenger trains, so they are the focus of the layout. There are many staging yards around the layout, and the main one for the passenger trains is Chi-Town Union Station. The station tracks can hold 15 car passenger trains, plus the locomotives pulling them. This is a sight to see. The whole layout is run from an elevated control room in the middle of the building. A custom designed computer system by Railroad & Co. dispatches and spaces the trains for their run. Dan spent some time talking with the computer people about the control system, and will do an article about it in a future issue of *The O Scale Resource*.

The layout gets a lot of local publicity, and Paul has a lot of fun with the people who come to see the layout. There are many families with young children that come to see the trains. For us older types, just sitting and watching all the different passenger trains go by is a real pleasure. This layout is worth going out of the way to see, and I would recommend it to everyone. Great job Paul, and thanks for having it open for all to see.

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Painting Railroad Cars

Part 3

By Glenn Guerra

In this article, I will talk a little about color. Now here is a topic that will get some people's fur up. So, before you start writing your response, let me say that this is not about what is the right color. Color is a very complex subject with many variables. I will start with some personal stories, and then get into some of the variables. With some of this information in hand, you will then start to have some idea how to mix a color that you think is right. To put it another way, here is some information that may help you get to the color you want.

To start, let me relate some personal experiences I have had. In 1993, I was hired to rebuild the Ft. Wayne & Wabash Valley interurban car at the Illinois Railway Museum. As expected, there was much consternation about the color. There were ways of matching the color using drift cards, Munsell color cards, and so on. My approach was to take a sample to the paint store and have it matched. I handed the guy the sample and he handed me a can of paint back with some scribbles on the lid. He did not use any sort of electronic gadget to determine the mix, he just went at it. I asked him what the scribbles were, and he said they were the mixing colors. I then asked what the colors were. He said they were Van Dyke Brown, Black, and Raw Sienna. I asked where the green was, and he said "there is no green



in there", to which I replied that "it looked green to me". His reply was again that there was no green. So, I had a can of paint that looked green, but had no green. On they way back to the museum, I was thinking that maybe I needed to know more about this. One of the guys at the museum worked in a lab preparing metal samples for microscopy work, and I asked him if he knew of a way to analyze my paint sample to see what was in it. He said that his mother worked for Dr. Walter McCrone in Chicago, and he would be able to tell. This is one of those things in life that just seem to fall out of nowhere. Dr. McCrone was one of the foremost experts in the world on forensic analysis using polarized light microscopy. Talk about the right person to get connected with. I called him, and he agreed to take a look. He looked at the original paint from the car, and came back with similar results to the paint store. Again, I asked where the green was, and he said there was no green in that paint. Take a look at the finished car, and you will see my consternation with all this. It was at this point I decided that, for the sake of history, it would be better to analyze the original paint to see what was in it so we at least had that; and then let the paint store do what they do as far as mixing.

This photo was taken at the Illinois Railway Museum in 1999. It will be a surprise to many of you but there is no green paint on this car. I painted the car, and had the paint mixed. I was as dumb founded as you when the people at the paint store told me there was no green paint in this color.



I painted this car around 2000. This was another lesson in paint mixing. The orange turned out to be a very difficult paint to mix.

Sheboygan Light Power and Railway Company interurban car #26. The car is painted a cream yellow and orange. Back to my favorite paint store I went, and purchased my paint. I put the yellow on first, and then went to paint the orange. The orange did not cover, and was almost a dye as opposed to a paint. Back to the paint store I went, and the guy said "I was afraid that might happen" so he added more mixing color. Well, it still did not work. At that point, I thought why not just add some red to the yellow and I will get orange. I remember this from art class in high school. So, I opened a can of the yellow and added some red sign painters paint. What I got was a pink pumpkin. Back to the paint store for another lesson in paint. It turns out that when you have house paint mixed, there are 3 different starting bases. By the way, these were wood cars, and I was painting them with flat house paint and varnishing them as the car was done originally. The three bases are light, medium, and heavy. What that means is, the light base has almost no filler in the paint. Next time you are at the store ask to see a can from the shelf without shaking it. It will be clear with a little filler on the bottom. As you would expect, the medium base has more filler, and the heavy base has a lot of filler. The yellow I was using is made from a heavy base with some yellow added. It covers well as you would expect. The problem with the orange is that the red will mix with the white fillers and give you pink. So, why not use just red and yellow? The mixing colors are expensive and they have no driers; therefore, they will cause the paint to dry poorly. Also, you could not overpower the effect of the red and white. What I ended up doing was to use sign painters paints, which have very high color concentrations, and mixed the orange that way. The sign painters paint had driers so I was all set.



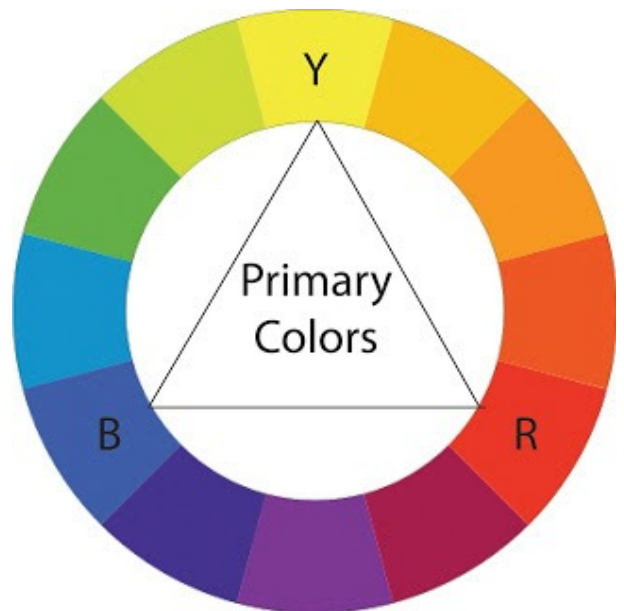
The Milwaukee Lake Shore and Western #63 at the Mid Continent Railway Museum in North Freedom Wisconsin. The yellow color was made with a heavy base, Yellow Ochre, and Chrome Yellow. The paint was a little flat until I varnished the car, and that made the color very bright.

Soon thereafter, I was enrolled in, and took the first class in polarized light microscopy to determine artists pigments at the McCrone Research Institute in Chicago. The class is designed for art conservators to validate works of art. Dr. McCrone had fun determining that works of art could not be what they claimed because one of the pigments was not invented at the time the painting was purported to have been done. For my purpose, we now knew what the original pigments used in the railroad paint were. I went on and took a second class in the same subject.

My next experience was about the year 2000 when I was working in Plymouth, Wisconsin rebuilding the

Well, my education was continuing. By now, I was reading lots of technical stuff on paint to try to see what I was working with. My next project was the Milwaukee Lake Shore and Western #63 at the Mid Continent Railway Museum in North Freedom, Wisconsin. On this project, I decided to do some in depth analysis of the paint job on the car. The first step was to get the color layers, and start to get a feel for the paint jobs on the car. I was looking to see if one was an original. The next step was to analyze the pigments using polarized light microscopy. I found was that the primer was tinted with Yellow Ochre, and the body color had some Lead Chromate. With this information in hand, I went to the paint store to get my paint. I told Jim that he needed to make this color, but could only use these pigments. This does not make this paint job something holy, but it was a fun exercise. At this point, I was satisfied that my analysis of the paint pigments used was at least preserving the information about the paint on the car, and that is what museums should be doing. As for the color being “right”, that is, and always will be, a personal viewpoint, and here is why.

What is color? This is very involved, and I won't pretend to understand all of it. I will not try to explain it all in depth, but if you are interested in more detail, I would recommend looking on the web for starters. Do a search on artist color wheel, and you will start getting a lot of information. Also, do a search on mixing paint colors. Ok, back to what is color. Let's start with the technical. Light and sound are composed of vibrations called waves. These vibrations are sensed by our eyes and ears and we know they are there. What makes one vibration seem violet, and another vibration seem yellow, is entirely up to our eye. Your eye has three receptors that pick up the vibrations and convert them to something your brain can deal with. So, that is the real simple description of how we perceive color. These vibrations come from a range we normally call visible light. If you put sunlight through a prism, it will be broken into the colors of the rainbow. The colors we see are there all



Shade Hue Tint

The hue of a color is its natural state. Blue pigments vary in hue as do other pigments. The addition of black produces the shades of that color. The addition of white affects the tint of that color.

This is the basic artist color wheel. This only works for pure color. The problem is that paint has black or white in it, and that changes things. In addition, pigments do not always fall into the pure colors.

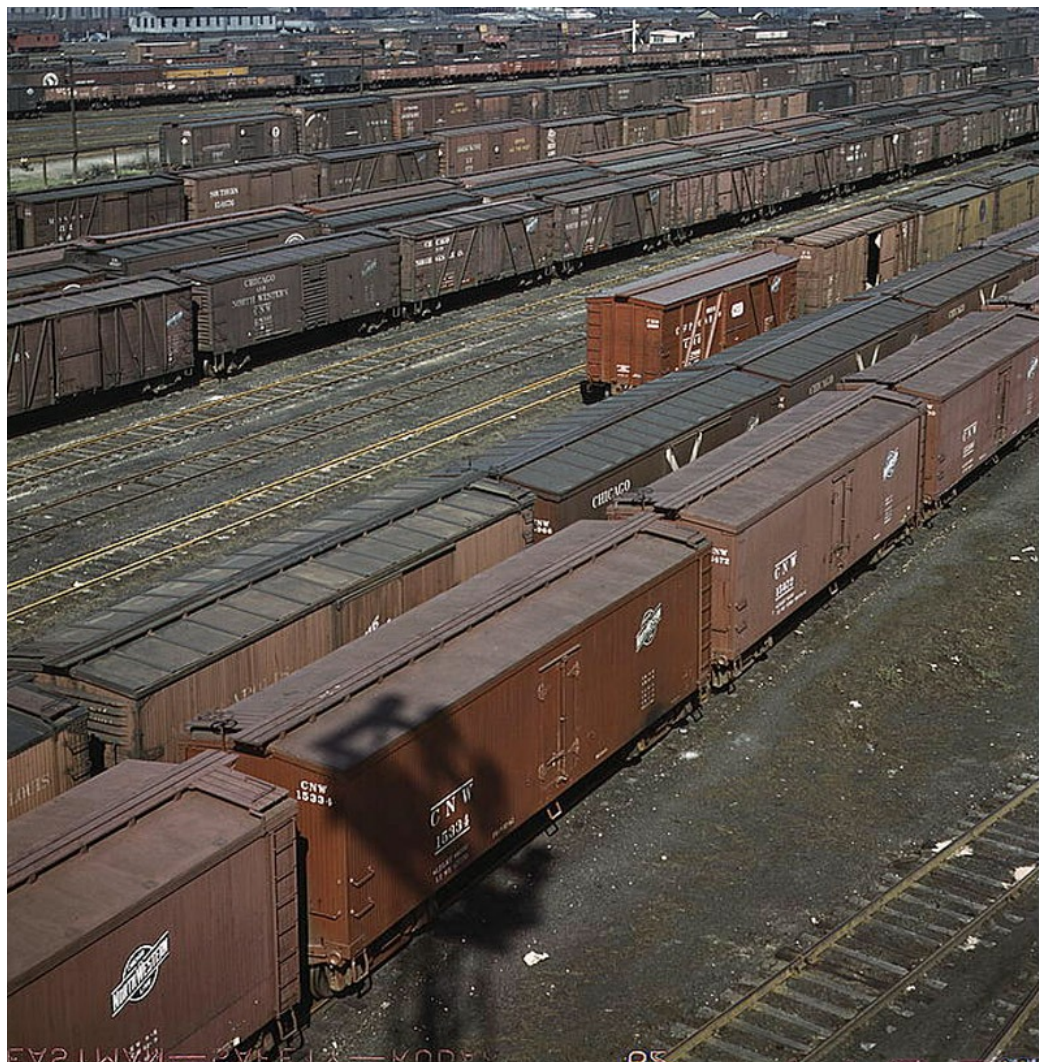
the time, but the combination of them looks white. The absence of them is black. In addition, the sunlight is not a uniform blend of vibrations. What makes a paint pigment appear the color it does is the difference in the how the light is absorbed and reflected. Some of the visible light we can see is reflected, and that is the color we see. Now, you can already start to see that the light source you are using will reflect different colors. If your light source is not the same as sunlight, then the part that is missing may not be reflected back, and therefore, you will not see it. Combinations of pigments will act the same way. The reason that you will not see the red and yellow separately in the orange is because your eye picks up the vibrations of both, and it becomes one color of the spectrum. Going back to the orange paint example, the white fillers are still reflecting light and our eye senses that. That is why I had the pink pumpkin. Scientists have studied color and our perception of it, and have been able to make a mathematical model. From that model, they have been able to create a color wheel that will derive any color we could see and assign it to a number. That is how the colors on a computer are derived. The artist color wheel I studied in art class was a little different. That wheel dealt with pure colors, and was a

starting point. I think this is enough to get us started here. What we want to get to is, how do we mix a paint that we think looks right on our models in our light source?

To start with, let's use the artist color wheel with pure colors to see what we get. This is a good starting place, and will work in model paints. Model paints do not have the amount of fillers in them that house paint does making them closer to pure colors. The first thing you will notice is that green is made of yellow and blue. So, how come there was no blue in my green paint on the railroad car? Because the basic artist color wheel does not take into account black and white. White is the reflectance of all light, and black is the absorption of all light. In the Ft. Wayne and Wabash Valley interurban car, the paint was made in a medium base, which means some white. Black and white affect color by changing the tint or shade. If you take a color and add black, you are increasing the shade. Add white, and you are increasing the tint. In addition, the paint pigments we use are not pure color. The color in a paint pigment varies in intensity or hue. So when we mix Red Ochre and Raw Sienna, we get something different than if we mix Red Ochre and Chrome Yellow. We will still get something in the orange area, but Chrome Yellow is much brighter, or has a different hue, than Raw Sienna. Confused yet? Me too. I told you I can't begin to explain all of this but, keep reading the theory on the web. Every little bit of knowledge you gain helps.

Now, on to our models. For me, variety of color on a fleet of freight cars looks good. When I paint models, I usually mess with the paint in the jar a little. There are a lot of things going on with the paint on railroad cars, and the colors vary a lot. We saw in the first article that paint is made of pigments and binders. The pigments and binders are affected by sunlight, and change over time. In the second article, we saw that the appearance of paint is affected by the gloss and clear top coats. Now, we have discussed color, and how combinations of colors look. Let's take a look at a few examples.

For the first example, let's talk about freight cars. Look at the photo taken by Jack Delano of the Chicago & North Western yards in 1943. There are almost no two cars that look like the same color. These photos are at the Library of Congress website under the Depression Era Photographs collection. There are many very good color photos like this, and if you have not already been to the website, I would recommend you take a look. Look at the refrigerator cars in the foreground. They are all the same type car for the same railroad, but no two are the same color. The #15334 appears to have the newest paint job, and that was probably how the other cars



This photo was taken by Jack Delano in 1943. The photo location is the C&NW Proviso yard near Chicago.

looked when new. Now, we could “weather” our model to change the color, but that would also change the lettering. Look at the other cars. The lettering is bright and sharp. There is not a lot of dirt on these cars, so what happened? Well, the paint is aging and changing color. I think the thing to do on the model would be to change the color of the paint first before painting the model. Next, letter it, and give it a very light dusting of some “weathering”. To do this, start with what you think is the original color. Many paint manufacturers sell paints blended to match railroad drift cards. You can start with one



Some samples of boxcar red I made. The lower left is boxcar red and white. The center is the same mix with some yellow. The far right is boxcar red and yellow.

of those. Now, think about what is in boxcar red. Remember from the first article that box car red is ground up iron oxide, and that varies. Remember also, that iron oxide can vary from Yellow Ochre all the way to almost black. Lastly, remember that the paint binders are deteriorated by sunlight. What has happened to the railroad cars is that the sun had deteriorated the binder first, and the binder on the surface was gone. Now the pigments are exposed to the weather. Iron oxides are fairly stable, but they can change. Water is both basic and acidic at the same time, and the rain can start to affect the color of the iron oxide. The acid effect of the water can add more water to the ionic bond of the iron oxide causing it to become more yellow. Therefore, the iron oxide may be reverting back to a more yellow appearance. The iron oxide will also be dissolved causing more of the white filler to show. Starting with a stock color, we could add white or yellow to the paint to change the color. I made a sample to see what would happen using boxcar red, yellow, and white, and suggest you try this yourself. Look at the photo above. The mix on the lower left is boxcar red and white. The color is a little too pink and pale compared to the cars in the photo. The sample on the lower right is boxcar red and yellow. This sample is too orange. The sample in the middle is the sample on the lower left with a bit of yellow added to it. I think the yellow helped. Try this on your own, and I think you will start to like mixing paint.

The next example is along the lines of color mixing to get the color we want. Pullman green or Olive Drab are similar colors, and are both not what you would think. Remember, there is no green in them. A little history will help here. Remember the Master Painters from article one? By the 1890’s, they are discussing the problems with keeping the cars looking clean and sharp. They are mentioning that, in the old days, the cars were painted Yellow Ochre quite a bit and this blended with the wood smoke from the engines. The result was that the cars did not look as dirty as they really were. When coal became the preferred fuel, the smoke was a different color, and it started to show on the yellow cars. In 1893, Pullman issued a booklet of photos showing their train on exhibit at the Chicago World’s Fair. In that booklet, there was a color rendition of the train, and the cars were a two tone brown. In the October, 1891 issue of Railroad Car Journal, the pigments used are described. The cars on display in Chicago must have had Tuscan red in them since they were a brown color. Note also that they describe having a greenish color if the red was taken out. How this color was derived has not been explained in anything I have seen, but I have some speculation. Next time you are out at a steam excursion or a steam threshing show, pay attention to the smoke. Some coal has a high sulphur content causing the black carbon and yellow sulphur to make the smoke look like Pullman green. Since this is what was covering the cars when they were in use, why not paint them this color? This is not the end of the story though. If you examine paint

chemically affinitized and enduring pigments as possible. The writer's preference lies in the use of some shade made by the union of three pigments only, namely, ivory black, golden ochre and Tuscan red. If one prefers a greenish tint, he has only to lessen the red; if a brownish cast, lessen the yellow and increase the red. Perhaps the "Pullman color," of the shade now used, which is composed of these colors, is about the best color, all things considered, that can be used. At least we prefer it to anything yet seen. Some of the mongrel shades made of a half-dozen evanescent colors, to suit the capricious, dreamland fancy of some railroad magnate, who knows

This is an excerpt from the Railroad Car Journal, October, 1891, pg 12, article titled Passenger Car Body Color. This describes the basic colors used to make the "Pullman" color.

the cars are darker. I suspect this was because of the oil smoke from the engines instead of coal smoke. The darker color would blend better with the blacker smoke. Try adding some black to your paint to see if it becomes the color you think it should be.

For the last example, I want to go to another Jack Delano photo. The photo shows a string of refrigerator cars at the Illinois Central freight house in Chicago in 1943. The cars are all the same

This is the sample I made for Pullman Green. You can see on the bottom row how the color changes with the addition of more black.



company catalogues, you will find up to five different colors of Pullman green in the catalogue. All of them have numbers, and were sold to the railroads. Now you are scouring the paint racks looking for the "right" color. Well, you can probably make what you want, and save yourself a lot of time. Remember that Pullman green is basically yellow and black. I made a sample to show how it works. I started with yellow and black. The more black you put in, the darker the color becomes. If you remember the Ft. Wayne & Wabash Valley car, that mix had Van Dyke Brown, black, and Raw Sienna. The Raw Sienna is the yellow. Brown can be made by red, yellow, and black. The red and yellow will make orange, and the addition of black will make the brown. The addition of Van Dyke Brown to the mix has the effect of adding red. You could add a very small amount of red to what I did in my sample to get yet another shade. As I do with freight cars, you could do with your passenger fleet. Take some cars that have been in service, and add some yellow to your paint. This will lighten it, making the car look aged. Those of you that are Southern Pacific fans have noticed that

again, but look at the variation. In this case, the paint has not changed, the cars are dirty. We can see this because the the lettering is very faint. In this case, we could start with the basic color of the car, which I am assuming was yellow. Next, letter the car. Now mix up some dirt color paint. I would use the black and yellow mix to get a shade of coal smoke color. Make it very thin so when it is sprayed on you can hardly tell it is there. When it dries you will notice the difference. For the touch up effect, put some masking tape in a few spots to preserve the original color. Vary the mix of your weathering paint and the amount you put on a car for variety.



Jack Delano photo in Chicago at the Illinois Central freight house in 1943.

Mixing color can be a very difficult and frustrating thing to do. It is something that takes many years to become proficient at. Find yourself an old time paint store or auto body paint store, and talk to the people mixing the paint. You will learn a lot. However, with a little knowledge, you can start to make the paint do what you want it to do. The variety will add interest to your models.

This concludes the articles on paint. I hope you have enjoyed them and they benefited you in your modeling endeavors.

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THE MAGIC OF LIGHTING



By Daniel Dawdy

When I was but a mere lad back in the 60's, we had a large layout in the basement. OK, so it was Lionel, but it was very large, and had many accessories. One of my favorite memories is going down to the layout at night, turning on our two ZW transformers, and cranking up the lights and accessories. Out went the basement lights, and the magic began. By playing with the transformer controls, I could take those number 53 bulbs inside all the stations, buildings, and signals from romantic interlude to full blown supernova.

Remembering those days was something I wanted to recreate on my current layout. Almost every building I have ever built, scratch or kit, has had well thought out lighting inside. Hanging bulbs is only half the battle, there is also all that wiring to be run and hidden inside, and a way for it to get outside. Since I started working on buildings in the late 90's, super small LED's or SMD (surface-mount device) were just beginning to find their way into products that the company I worked for made. This was way too early for most hobbyists, so I went with the standard incandescent lighting back then. I started with 12 volt GOW and GOR (grain of wheat and grain of rice) sized bulbs. My thought was to run these at 10 volts or so for longer life. I also started to use 1.5 volt bulbs for inside buildings because of the softness they portrayed. My favorite was the Miniaturics Lamp Shade w/Bulb 1.5V. Although the package said it was HO, it was really just right for O. I used them mostly inside the buildings, while using the 12V on the outside. Now mixing 1.5 and 12 volt systems in the same building can be tricky (also very dumb), but I color coded the wires coming out so as to not make a costly mistake.

In the beginning stages of the layout build, I ran a 12 volt line around as well as a 1.5 volt line. The idea was to tap off what I needed anywhere on the layout. A few years ago I started thinking about LEDs. They were larger, at 5mm or 3mm in size, but then I also thought about longevity. Incandescent lights will burn out, someday. LEDs will also, but their someday will be long after I've burned out. Unfortunately, there was that really bright white color that LEDs put out. It just did not look right for my 1947 time period. So let's take a look at a few things, and figure out that we can do.

What's a Kelvin?

Light has a color temperature, and that's measured in Kelvin (K). High color temperatures of over 5000K are said to be cool color, and often have a blue tone to them. Whereas low color temperatures of 2,500 – 3,200 are said to be warm color, and have yellow or orange tones to them. One would guess that as the color temperature (degree Kelvin) rose, it would be considered higher, but it's just the opposite. It's the color

Temperature	Source
1,700 K	Match flame
1,850 K	Candle flame, sunset/sunrise
2,700–3,300 K	Incandescent lamps
3,000 K	Soft (or Warm) White compact fluorescent lamps
3,200 K	Studio lamps, photofloods, etc.
3,350 K	Studio "CP" light
4,100–4,150 K	Moonlight
5,000 K	Horizon daylight
5,000 K	Tubular fluorescent lamps or Cool white/daylight compact fluorescent lamps (CFL)
5,500–6,000 K	Vertical daylight, electronic flash
6,200 K	Xenon short-arc lamp
6,500 K	Daylight, overcast
5,500–10,500 K	LCD or CRT screen
15,000–27,000 K	Clear blue poleward sky

These temperatures are merely characteristic and considerable variation may be present.

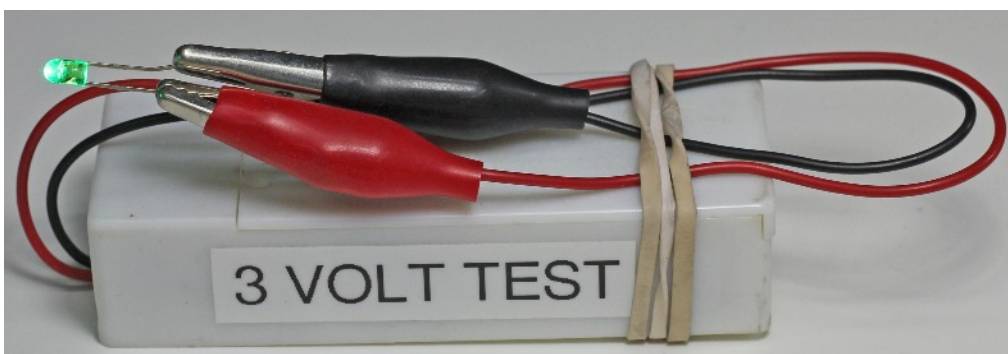
temperature that used to cause our film pictures to look green under fluorescent lighting, and orange/yellow inside without flash. In the past, most LEDs have been cool or cold. If you are modeling current times, that bright white is just fine as a headlight in a SD70, but not so good in a steam or early diesel. That bright white also does not look good in building interiors if modeling an older setting. My layout is set in 1947, so the small light bulbs worked well and looked the part. With LED bulbs, there are usually two options of white color available, and they are normally referred to as warm white or cool white. Warm white is about 3000K, and cool white is between 5000-6000K. Now, we have newer and smaller LEDs, and we can buy them in a color range that suits our needs.

How Do LEDs Work?

Without getting too complicated here, incandescent lights are voltage creatures; the higher the voltage, the brighter they become. LEDs are current creatures, and the current must be limited. That's where current limiting resistors comes in. It sounds complicated, but look at it this way: if I use 12 V incandescent bulbs, all my runs for lighting must be 12 V. I can't use a small plug-in transformer rated at 5 V or 7.5 V without affecting the light output for every bulb on the run. In my case, I had two wire runs under the layout, one at 12 V and one at 1.5V.

All LEDs have a forward voltage specification. That is the voltage that it turns on. On almost all the white LEDs I have worked with, the forward voltage is 3-3.2V. If you exceed that voltage, the internal resistance of the LED drops quickly causing the LED to draw more current. When that happens, it gets real bright, but for only a split second. So, what does this mean for us? Well, as long as your voltage run is greater than the the LED specification, it will work. You may need a current limiting resistor depending on the voltage. In other

words, you can run an LED with 5 volts, as well as with 12 volts, but the resistor you use will be different. Hang on to that thought for now, and I'll come back that in Drawing 2. LEDs also have a Anode lead and a Cathode lead. The Anode is the positive (+) side, while the Cathode is the negative (-)



side. Larger LEDs, like the 5mm and 3mm, have a small flat spot marking the Cathode. On a SMD LED, the pad for the Cathode is rectangular, while the Anode is kind of a U shaped. The good news is if you hook one up the wrong way round, it will not light, but it won't damage anything.

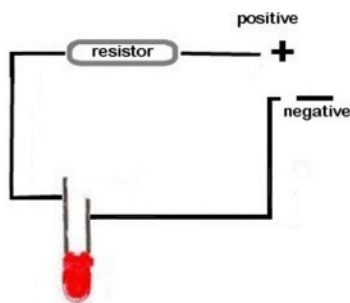
I have a battery box that came off an old Lemax light post. With two AA batteries, I can safely test the LED without the need for a resistor, and be sure I know which side is Anode (positive) and which is the Cathode (negative).

Series Wiring and Figuring it Out

OK, now let's talk about the current limiting resistor, and how to figure it all out. I found the best Webpage for doing the calculation. And, what's even better, you can save the page to your own computer and use it anytime (see postscript). Go to <http://www.quickar.com/noqbestledcalc.htm> You will see three sections for doing your calculations: Single LED, LEDs in series, and LEDs in parallel.

When using an LEDs, there are two specifications we must know. The first is Voltage Drop Across LED in volts. A typical white 3mm size has a forward voltage of 3.2-3.4V. The second thing we must know is the current rating in milliamps (mA). Our example is 20MA. The last piece of the puzzle is what voltage will you be using for this install? In my case, it's 12V, so we start plugging in numbers.

Single led



Supply Voltage
12 VOLTS

Voltage Drop Across LED
3.2 VOLTS

Desired LED Current
20 MILLIAMPS

Click To Calculate

Calculated Limiting Resistor
440 OHMS

Nearest higher rated 10% resistor
470 Ohm

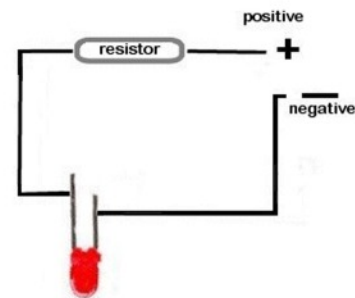
Calculated Resistor Wattage
0.176 WATTS

Safe pick is a resistor with power rating of
0.293 WATTS

Drawing 1 shows us that a 440 ohm, or closest commercial available resistor, will be 470 ohms, and we can probably use a ¼ watt without a problem. That will be easy to find at a local Radio Shack or online at such places as DigiKey.com and many others.

Single led

Drawing 1



Supply Voltage
9 VOLTS

Voltage Drop Across LED
3.2 VOLTS

Desired LED Current
20 MILLIAMPS

Click To Calculate

Calculated Limiting Resistor
290 OHMS

Nearest higher rated 10% resistor
330 Ohm

Calculated Resistor Wattage
0.116 WATTS

Safe pick is a resistor with power rating of
0.193 WATTS

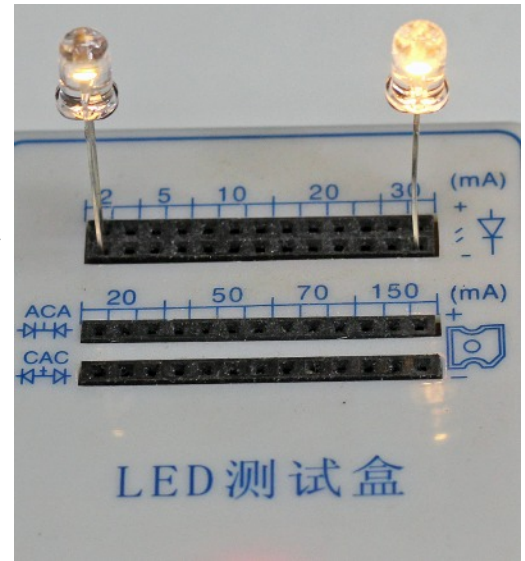
Drawing 2

In Drawing 2, we changed the voltage to a 9 volt supply, and we now use a 330 ohm ¼ watt resistor. These calculations are based on giving us the most light output without damaging the LED. That may be way too much light for what you want to do. So, looking back at our 12V example, I may want this as a marker light on a locomotive. Those are nowhere near as bright as the headlight. Therefore, we can use a higher resistor rating. If we pick a 750 ohm resistor, our LED will be less bright. Try a 1000 Ohm (1K ohm), and it will be dimmer still. That is one of the great advantages of LEDs. Even on the same power supply, voltage can easily be varied to get the brightness you want. You can wire up a simple test bed for this using your known supply voltage, some small alligator clips, and an assortment of resistors. Clip the

negative (-) side of the supply to the LED's Cathode, then clip the positive (+) side to a resistor, and then touch the resistor to the Anode. Too bright? Go to the next higher available resistor. That's kind of cumbersome, but does work. However, there is an easier way. Readily available for purchase is a 2-150 mA LED lamp tester box. If you do a search on "LED tester" you will find a bunch of them. The one I use was found on eBay for



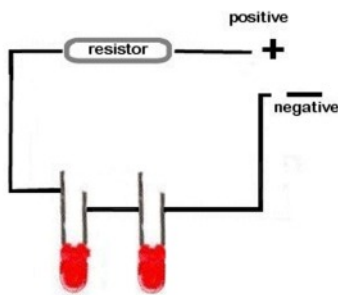
\$4.99 with a 9V battery and free shipping! What this allows you to do is simply plug in an LED to slots on the tester. The slots correspond to different milliamps. So, if the LED is too bright for your use and it's rated at 20 mA, plug it in a 10 mA slot and see if that is better. Now, doing it this way, we need to pull out Ohm's law which states: $R=V/I$ or resistance = voltage divided by current. $12V / 0.01A = 1200$ ohms or 1.2K. Yes, we could have pulled out Ohm's law a while ago, but the Webpage I referred to is much cooler and easier to use!



Same rated LED at 2mA and at 20mA

Back to the [Webpage calculator](#) we now have LEDs in series. It works the same way as before, but we can specify more than one LED in the circuit. Drawing 3 shows us with a 12 volt supply of 3.2 forward voltage LEDs and 20 mA using three LEDs, we need a 120 ohm resistor rated at 1/2 watt. For inside a building maybe three lamps is good enough and away you go. But, what if you wanted four LEDs?

Leds in series



Drawing 3

Supply Voltage VOLTS
 Voltage Drop Across LED VOLTS
 Desired LED Current MILLIAMPS
 How many leds connected

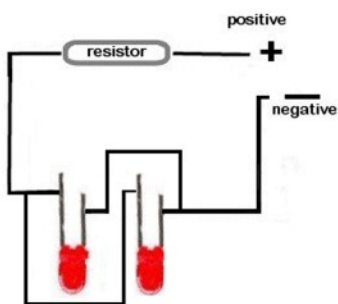
Calculated Limiting Resistor OHMS
 Nearest higher rated 10% resistor
 Calculated Resistor Wattage WATTS
 Safe pick is a resistor with power rating of WATTS

Try that in the the calculator. Oh-O... no can do. With each LED using 3.2 forward voltage ($3.2 \times 4 = 12.8V$) 12V will not be enough. OK, maybe in this example it will, but definitely not with 5 LEDs.

Welcome to Parallel Wiring

Parallel wiring takes care of our voltage problems. In my roundhouse (article header photo), I used .20 piano wire and ran it through the beams. Next I used flat topped LEDs, and simply soldered them to the wire. Six LEDs per run across the roundhouse. So, let's take a look at that circuit in drawing 4. To pull this off, I needed a 82 ohm resistor rated at least 1 1/2 watts. That is one trade off of parallel, I can still use 12 volts, but I am creating a lot of power that needs to be dissipated as heat. To be safe, I used an 82 ohm 2 watt resistor from digikey.com.

Leds in parallel



Drawing 4

Supply Voltage VOLTS
 Voltage Drop Across LED VOLTS
 Desired LED Current MILLIAMPS
 How many leds connected

Calculated Limiting Resistor OHMS
 Nearest higher rated 10% resistor
 Calculated Resistor Wattage WATTS
 Safe pick is a resistor with power rating of WATTS

I now also use a lot of SMD LEDs mainly due to their size. If the LED is less than 2 millimeters, it can be used in marker and class lights, as well as, in the cab and even firebox flicker. These are not as easy to use as the standard 3mm and other non SMD versions, but are definitely worth

looking into. You can buy these all ready wired, but they are pricey. In the next issue, we'll look at how to use these, and how it's really not difficult to solder them yourself.

I still like bulbs for outside buildings because, well, they are bulbs. SMD LEDs don't have the glass look, and if you are using the old style gooseneck lamp, you want to see a glass bulb sticking out of it. Another problem with many LEDs is they are extremely directional, whereas an incandescent bulb will disperse light in all directions, LEDs tend to have a very narrow beam. For the roundhouse picture in the beginning of this article, I used flat top LEDs which have a much wider dispersion pattern. Of course, you pay for that in size, but in this situation, it worked.



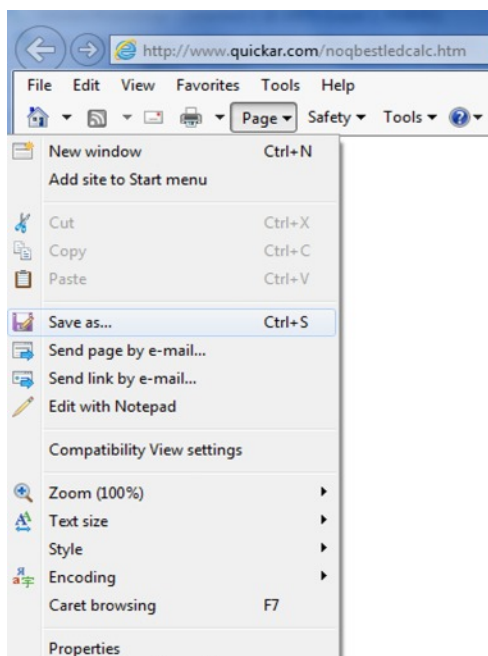
We have many choices in lighting today. LEDs come in all shapes and sizes, as do good old incandescent bulbs. Sometimes, we can even use lighting from other scales. In the image to the left, the Walthers lamp in the small scratch built storage shed worked well, and I think it's too large for HO, but works well in O.

In the next issue, we'll get into some building lighting, and show just how easy (or not too hard) it can be.

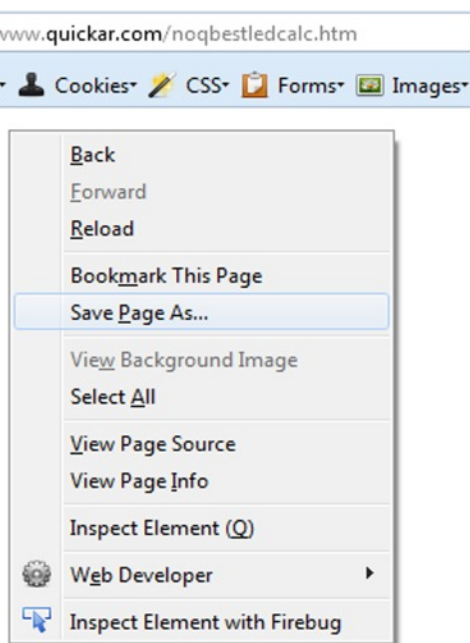
Postscript:

You can save many Web pages on your computer, and in the case of the LED calculation page, we used it, and it will still function. In Explorer, go to Tools / Save As. You will then will

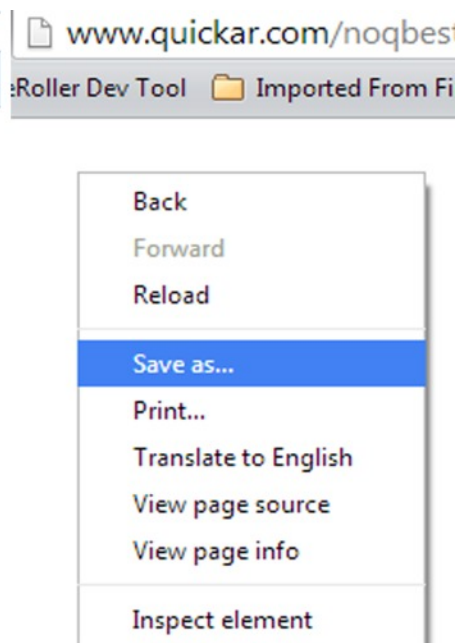
be prompted for a location to save the page called The Best Current Limiting Resistor Calculator for Led's.htm. Save that, and it will also create a new directory tied to that htm file called The Best Current Limiting Resistor Calculator for Led's_files. It's in that directory that the files to allow the page to function reside. Using Firefox, simply right click on any blank portion of the page, and select Save Page As. Using Chrome, right click and Save As. Now, this trick may not work on every Webpage, it depends on how they are coded.



Saving in Internet Explorer



Saving in Firefox



Saving in Chrome

Below is a list of common resistors. I normally use 5%, but 10% for what we are doing is just fine. You will notice that when the resistor calculator gives you a Calculated Limiting Resistor, it also shows the nearest higher rated 10% resistor that you may use. The chart shows these. Never go lower than what the resistor calculator or Ohm's Law calculates. The same goes for wattage. I try to err on the side of caution and safety, going with the higher recommendation.

SAFETY WARNING: These resistors do get hot, and using a lower rated wattage will get really hot and fail, or even worse, could generate enough heat to ignite their surroundings if enclosed in a wooden building or melt a plastic structure.

1	5.6	33	160	820	3.9K	20K	100K	510K	2.7M
1.1	6.2	36	180	910	4.3K	22K	110K	560K	3M
1.2	6.8	39	200	1K	4.7K	24K	120K	620K	3.3M
1.3	7.5	43	220	1.1K	5.1K	27K	130K	680K	3.6M
1.5	8.2	47	240	1.2K	5.6K	30K	150K	750K	3.9M
1.6	9.1	51	270	1.3K	6.2K	33K	160K	820K	4.3M
1.8	10	56	300	1.5K	6.6K	36K	180K	910K	4.7M
2	11	62	330	1.6K	7.5K	39K	200K	1M	5.1M
2.2	12	68	360	1.8K	8.2K	43K	220K	1.1M	5.6M
2.4	13	75	390	2K	9.1K	47K	240K	1.2M	6.2M
2.7	15	82	430	2.2K	10K	51K	270K	1.3M	6.8M
3	16	91	470	2.4K	11K	56K	300K	1.5M	7.5M
3.3	18	100	510	2.7K	12K	62K	330K	1.6M	8.2M
3.6	20	110	560	3K	13K	68K	360K	1.8M	9.1M
3.9	22	120	620	3.2K	15K	75K	390K	2M	10M
4.3	24	130	680	3.3K	16K	82K	430K	2.2M	15M
4.7	27	150	750	3.6K	18K	91K	470K	2.4M	22M

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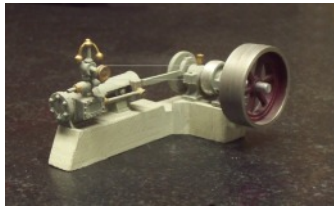


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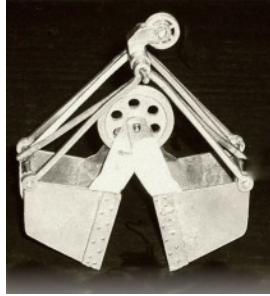
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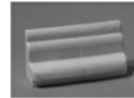
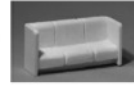


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Trans Loading Sites

We called these Team Tracks in the past

By Glenn Guerra

The image of a wagon with a team of horses pulling up along side of a railroad car and unloading or loading the car does not fit in today's world. However, the concept is alive and well. There has always been a need for people to ship or receive goods by rail, even though they did not have a rail siding of their own. The classic image of a team track is behind or along side of the depot. Today, the railroads are all chopped up, the depots are gone, and the teams of horses are gone as well. Trans Loading is now the current terminology for the activity, and it takes place at Trans Loading sites. These offer some interesting modeling possibilities. We have three locations around Plymouth, Wisconsin, and I will get into them in a bit.

Many Trans Loading sites are located by themselves with no supporting structures or facilities, other than a place to pull up next to the car. This can be a relatively simple place to model. Trans Loading sites can receive or ship just about anything. This can add interest to your operation and car routing if you operate your railroad. It can also add some interest to an otherwise difficult location on your railroad to fit an industry, or that favorite car that just does not seem to fit will now have a location on your railroad. This is not something that just fits contemporary railroading. When I lived in the Chicago area in the 1980's, there was a Team Track on the three track suburban line in Arlington Heights. About once a month, there would be a car spotted there with a truck next to it unloading the car. The railroad also used the siding to spot maintenance equipment when it was in the area.

I have some photos of Trans Loading sites that may offer some inspiration. In addition, I will point out some of the details that I think may be interesting when modeling the site. If you look around your area, you will find similar sites that may fit your railroad better.



This site is on the old Milwaukee Road main line north of Plymouth, Wisconsin. The line is broken north of Hilbert, Wisconsin, and the rest has two different owners. This section is owned by the state of Wisconsin and run by the Wisconsin & Southern Railroad. The location is known as J Landing. Photo by John Winter

This is the Trans Loading site north of Plymouth, Wisconsin. The site is owned by Sheboygan County, and they use the gravel for road work. The flatcar has rings that are off loaded here and trucked to Manitowoc, Wisconsin, about 40 miles away, where they are used to manufacture wind generator towers. The rock in the crane sling is Limestone that is quarried nearby. The stones get trucked from the quarry to the site, and are loaded five to a gondola. Some of them were being sent to Texas for use in a sea wall.

For modeling, note the simplicity of the site and the variety of possible uses. Photo by Jerry Thompson



In this close up of the flatcar on the Trans Load site, we can see some of the details around the site. For example, notice the pile of used ties to the right of the car. The tie gang went through recently and piled ties here to be picked up later. The load itself is interesting. Note the rust pattern on the rings laying on their side. Think about how you would want to model this because it really shows that there are individual rings. Also, note the writing on the large rings, and again, the different rust pattern on the rings. The rings could be made out of slices of plastic water pipe or plastic electrical conduit. Make them individually, and paint them separate. Add some red or yellow to your rust paint to get some tone variation. Don't forget to drill out the bolt holes on the outer rings. Photo by Jerry Thompson



A train of gondolas loaded with rock is ready to depart from the J Landing Trans Load site north of Plymouth, Wisconsin. Photo by John Winter



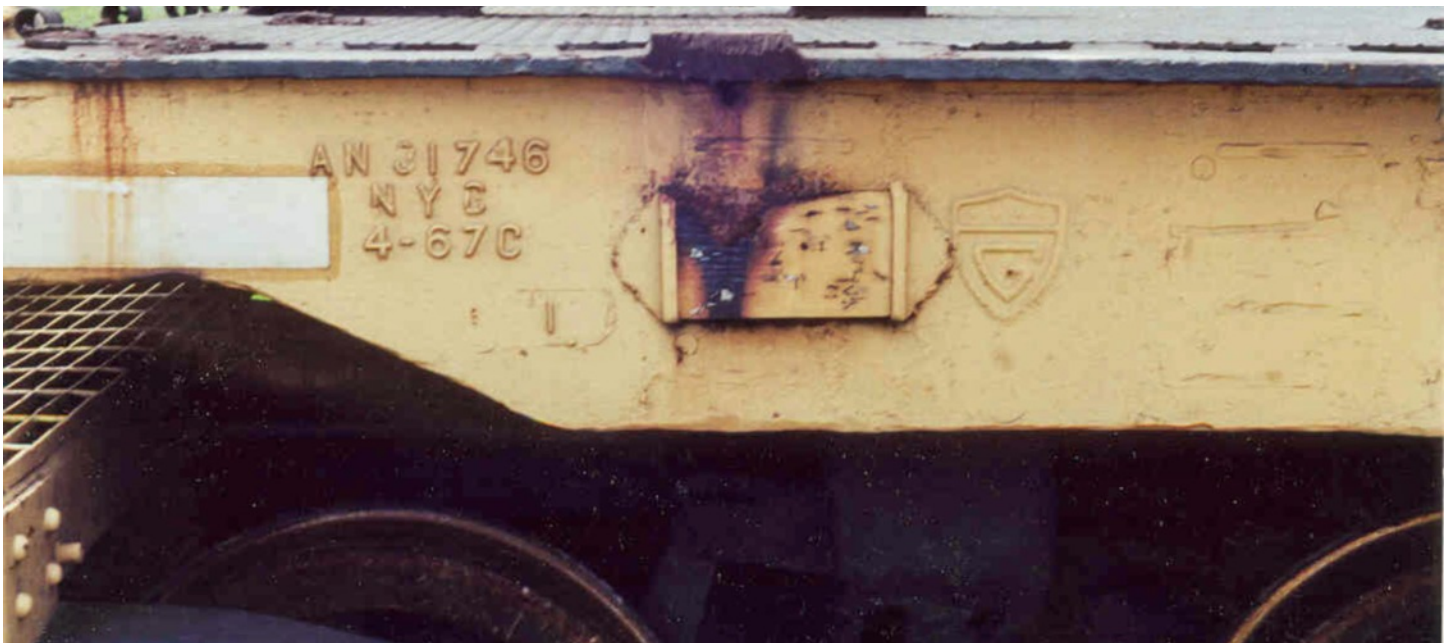
Another view of the J Landing Trans Loading site showing the stones lined up ready to load. The site is a flat place to load any kind of car, and offers a lot of modeling possibilities. In this case, all you need is a few machines and a bunch of rocks. The rocks could even be picked up and put in your gondolas for shipment, and then they would leave the site loaded. Photo by John Winter



These two photos are taken at Shingleton, Michigan. The cars are sitting on the house track that ran behind the depot. This was originally a team track that never went away. The cars are spotted, and the loggers drive up with loads of pulp wood and load the cars. This type of activity has been going on at this location for over 100 years, and could fit any era of modeling by changing some of the details. For example, you could put the depot back for an older era. Note the bark and clutter laying around in the top photo. These kinds of detail make the scene. This scene could work well on small layouts, and provide traffic to your operation. Photos by Glenn Guerra



These two photos show examples of Trans Loading facilities at terminals. The top photo is Portage, Wisconsin at the old Milwaukee Road, now Canadian Pacific, yard. The bottom photo is Green Bay, Wisconsin at the old Chicago & Northwestern, now Canadian National, yard. Both facilities have a raised platform to get up to car floor height. In addition, both facilities are located for easy access to the public road, and to keep the people loading the car away from the main part of the yard. In the photo at Green Bay, the boxcar had a load of plywood that started burning. They had the door open and were pouring water into the car. Note the differences in the platform and ramp. One is nice clean concrete, and the other is a concrete form filled with gravel. Photos by Glenn Guerra



This car showed up in Plymouth around 2001. The transformer was unloaded in Plymouth, and trucked to the final location. The car is a cast one-piece car made by General Steel Castings for the NYC in 1967. For those who are interested, Archer Transfers makes the raised General Steel Casting trademark. This car was a beast, and the empty weight of the car was more than the load it could carry. The building in the back of the top photo is the Borden plant where they make process cheese. The car was sitting on the passing track, and was unloaded there. This is an example of a highly specialized car showing up to be trans loaded. You can make a Trans Load site work for almost any kind of load. Photos by Glenn Guerra



Trans Loading sites can even be used as a place to put wrecked cars so the scrapper can cut them up. This photo was taken in Summit, Arkansas on the Missouri Pacific line through the Ozarks in 1984. The car is sitting on the old depot grounds, and the track to the left of the car was the old team track behind the depot. Photo by Glenn Guerra



We are back in Plymouth again, looking north. The covered hopper cars are full of plastic pellets that get loaded into trucks and hauled to nearby plastic molding places. The cars are sitting on the old Milwaukee Road team track. There was a railroad freight house and a private warehouse on the track at one time. Today, the trucks pull up alongside the cars to unload them. The railroad also uses the site as a staging area for their maintenance. The tan depot is the old Milwaukee Road depot, and the red building behind the crossing signal is the old Chicago & Northwestern depot. The track in the foreground is the old C&NW line from Sheboygan to Fond Du Lac. The tracks crossed over each other just past the depot, and continued on next to each other for a few miles before separating. The Milwaukee depot is used by the railroad, and the C&NW depot is a restaurant. The site is approximately the same as it has been for 100 years. The difference is in the details. If you are modeling the modern era, do it as the photo shows. Don't forget to add the abandoned tracks in the weeds and



Back in Plymouth looking south from the same location as the last photo. The cars are parked on the old C&NW main line to Sheboygan. The line was purchased by the state seven years ago, and is getting rebuilt back toward Sheboygan. When the line gets to Sheboygan Falls, the hopper cars will be able to be spotted at Bemis Plastic and not have to be trans loaded. For now, the cars are parked here, and a road has been built along side the cars for the trucks to drive on. The tall white building is a cold storage locker full of cheese that was once Kraft Foods. To the right of the cold storage locker is the old Milwaukee Road main line to Milwaukee. The Milwaukee and C&NW both served Kraft on different sides of the building. Behind Kraft was the Lakeshire Cheese complex, but it burned down in the 1990's. The brick building is also on the Milwaukee Road, and is the old Stokely canning factory. Many of the old sidings are still in the weeds; so, if you model a contemporary scene, don't forget abandoned facilities. You can also mix old buildings with modern cars. The

fresh excavating and new track would show activity. The scene works on your railroad by providing a destination for cars that there are no local industries.

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An English Shay

By Tim Daltry

Ludlow
England

Several years ago I purchased, on E-Bay, an unbuilt Kemtron Shay kit that came with a spare wheel set. I enjoy building 'O' scale locomotives of interesting prototypes, and usually these are a combination of kit components and scratch building. I also take great interest in reading old railway books and studying photos in the hope that my models will be more realistic.

Building The Kemtron Shay Kit

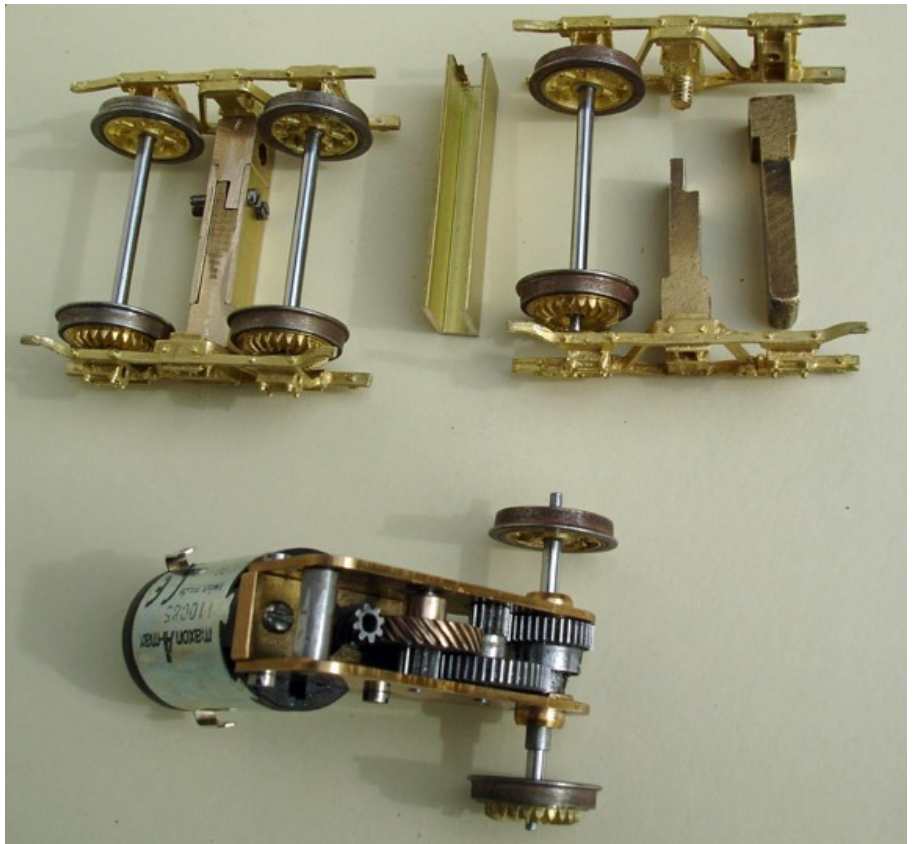
In general, I found this kit goes together very well, and the detailed instructions are excellent. However, I felt that neither the original gear set, or the updated delrin gears, gave the power or smooth running required for an 'O' scale model.

In England, there is a specialist model gearbox manufacturer called ABC Gears, website www.abcgears.co.uk. They supply a range of high quality gearboxes, and also custom build to customer specification.

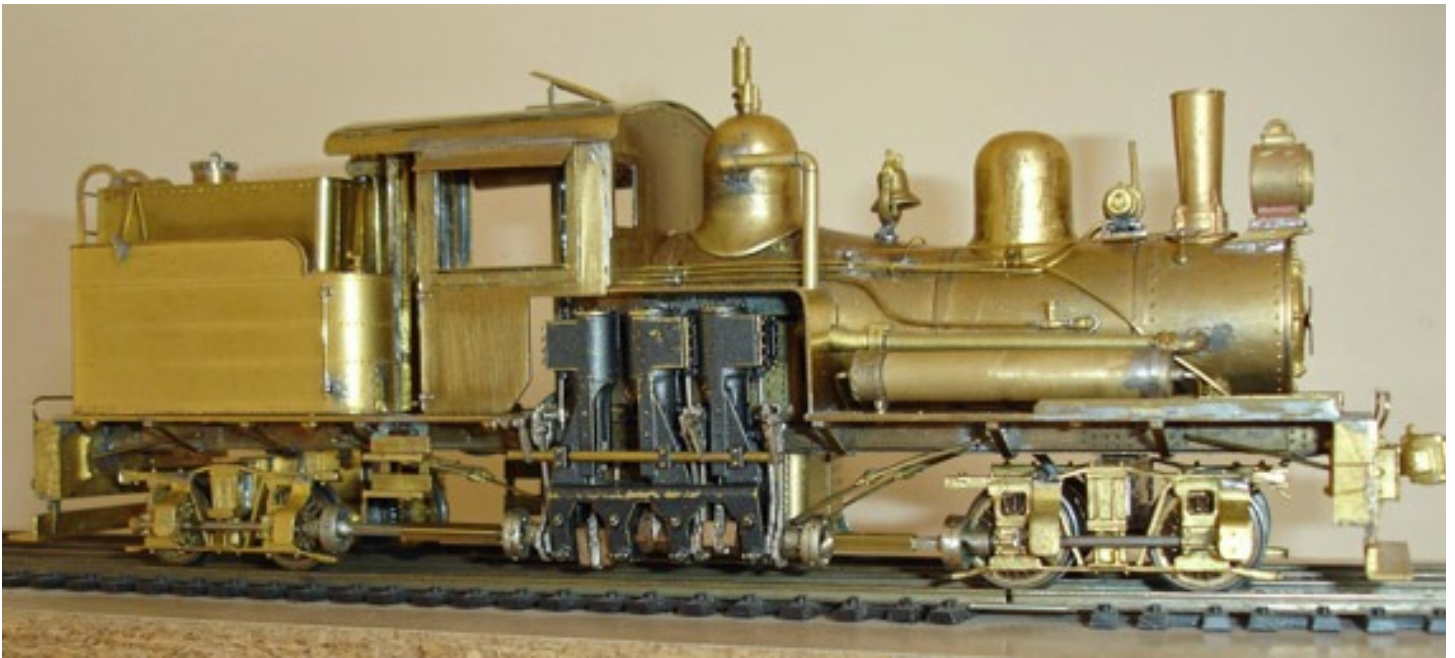
The photo best illustrates how I constructed the truck assemblies and incorporated the combined four-stage reduction gearbox, complete with Maxon motor, that ABC Gears supplied for me. Not cheap at around \$200 plus shipping, but the power and slow speed running are superb. New 3/32" diameter axles were required 42mm long and the ends turned to the same profile as the On3 axles.

In my locomotive building, I try to incorporate features that will ease future maintenance and repairs.

This photo shows the English built drive train that Tim used on his model. It also shows how he widened the track gauge from 3 ft. To 4 ft. 8-1/2 in. by reworking the bolsters. (Glenn)



Therefore, the bogie frames can be dismantled. Each side frame has a circular lug which was converted to a screw fixing with a 4BA die to which was screwed a piece of brass salvaged from old 13 amp British electrical plugs. A scarf joint was made to join the two lateral truck beams made secure with a piece of brass channel, and all drilled through with two 10BA bolts. Finally, when I was happy that the wheel sets were square and sat flat on the track, I soldered the end of each beam to the side frame. There are also smaller end beams to support the bogie brakes, and these are secured with removable pins. I tend to use the BA series of screw threads purely because these nuts and bolts are easier to obtain in England than metric equivalents.



This photo shows my Kemtron Shay nearing completion, with scratchbuilt cab and with the gearbox driving the second axle from the left.

By pure chance, this Kemtron kit came complete with a spare set of wheelsets and some other useful spares including frame rails, which I put to one side for another possible Shay project.

I Discover Lima Shay No. 618

In the Shay reference book, “Titan of the Timber”, by Michael Koch, there is a reference to one Shay, works number 618, being supplied to England in 1900. This was a surprise to me, and so I set out to research this engine.

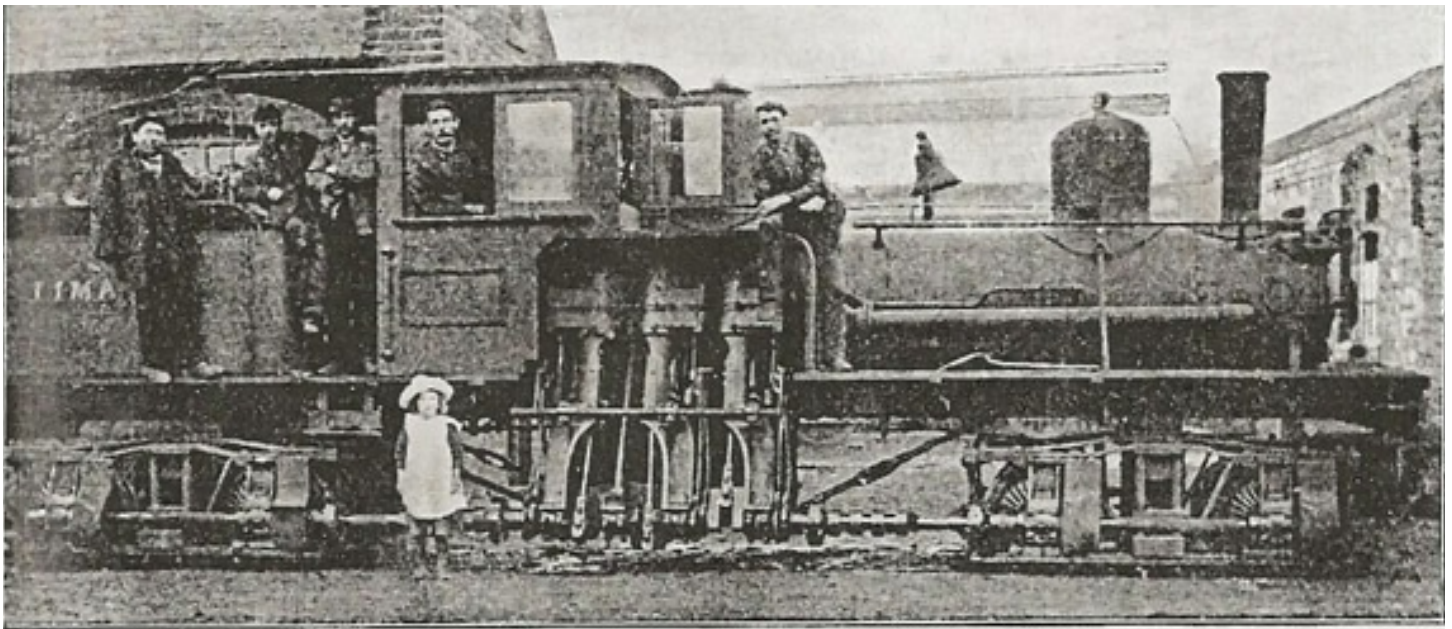
It is recorded that around 1900, British locomotive builders could not keep pace with demand. As a result, several American builders supplied engines to the UK, and Baldwin alone supplied 70 to mainline British railway operators. It was apparently standard gauge, and worked at the ironfounders Alfred Hickman in Bilston, Staffordshire, until it was scrapped in about 1912. Now, if you look it up on Wikipedia, it appears under the title of the Beast of Bilston. The loco appears to have been a class 20-2 Shay, and I then realized that the bogie side frames and wheel diameter should be the same as the class 36-2 Kemtron model.

Brilliant! I had a project for my spare wheelset. I was reasonably confident that with a combination of scratch building and brass cast components from PSC, this could form the basis of an O scale model. Unfortunately, a key component is the correct bracket style cylinder which is not currently available from PSC and, therefore, I just had to sit back and hope that one would appear eventually on E-Bay. After about a year, I struck lucky and was able to purchase a relevant kit manufactured by the Back Shop. I also purchased a number of fittings from PSC.

Researching the Prototype

I live not far from the Staffordshire site where Lima Shay 618 worked, and decided to visit the archives of the main Wolverhampton public library in the hope that they might have additional information. Unfortunately, I could find no specific references to the engine, but it was interesting to study some old, large scale maps. These showed that at the end of the 19th century, the Bilston area was a mass of mining, quarrying, iron foundries and other heavy industry. Not for nothing was this area called the Black Country. One map showed part of the Alfred Hickman railway system on which there were many sharp radius curves down to perhaps 50' radius. Possibly, the railway owners thought a Shay would be ideal in this working environment. At all events, the engine had a short working life and was soon scrapped, presumably as being non-standard.

Building the model of Shay No. 618



This is the only known photo of Lima Shay No. 618 which appeared in a 1930 edition of The Locomotive Magazine.

Since I had no reference drawing, I set about building the chassis in the hope that I could locate the trucks and cylinder assembly to the same relative positions as shown in the side view photo. I was also reasonably confident that by comparing other photos of similar vintage Shays, one could incorporate detail not shown in this picture – for example, the cylinder assembly is probably inclined and not vertical. First, I constructed the truck assemblies and the ABC Gears motor assembly exactly as my Kemtron model. Unfortunately, I found building the Back Shop cylinder set to be a total nightmare. Some castings are impossibly fragile, and I soon broke an eccentric strap and had to make 6 new ones out of some sheet nickel silver. The valve gear can only function if there is no bind or slop, and in all there are 43 separate components. The crankshaft is retained with 4 bearing caps and, fortunately, there was just space to drill and tap the edge of each with a 14BA retaining screw. This proved essential as I needed to frequently release the crankshaft and various bits of valvegear to gently file any tight spots. Eventually, all ran smoothly.

Before final assembly of the crankshaft, I needed to ensure that the line shaft was in a straight line linking the truck assemblies, and also that the cylinder assembly was inclined and not vertical.

I next constructed a basic Shay chassis with frame rails and assessed that the truck king pins should be 4.81" apart. My understanding is that a type 20-2 Shay has an overall wheelbase of 23'10", and this would tally with my model having a similar overall wheelbase of just under 6".

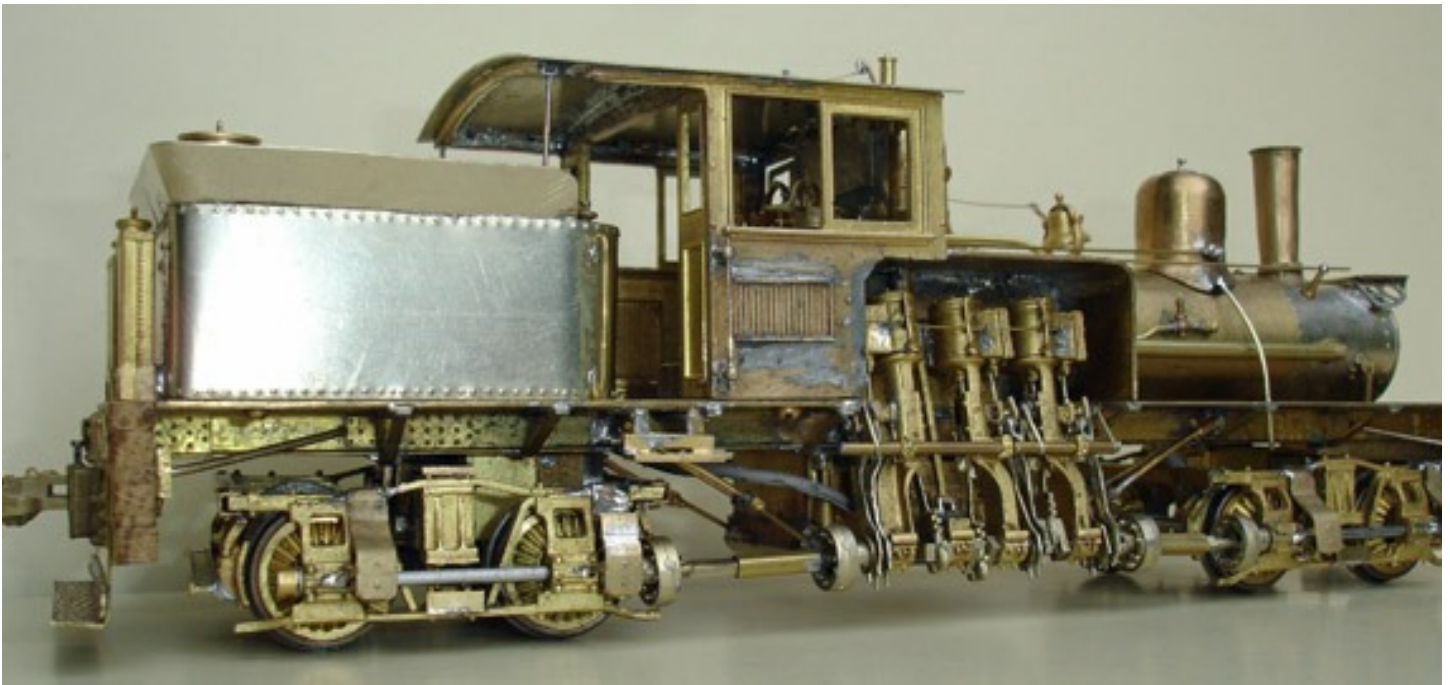
Using a piece of 1/16" rod, I could link up the trucks and cylinders and use this as a pivot to incline the cylinder assemblies. The next challenge was to construct a cylinder sub frame which could hold the cylinders in the correct alignment, but still allow them to be released for any subsequent maintenance. Therefore, the bogie frames can be dismantled. Each side frame has a circular lug which was converted to a screw fixing with a 4BA die to which was screwed a piece of brass salvaged from old 13 amp British electrical plugs. A scarf joint was made to join the two lateral truck beams, and made secure with a piece of brass channel and all drilled through with two 10BA bolts. Finally, when I was happy that the wheel sets were square and sat flat on the track, I soldered the end of each beam to the side frame. There are also smaller end beams to support the bogie brakes, and these are secured with removable pins. Again, I tend to use the BA series of screw threads purely because these nuts and bolts are easier to obtain in England than metric equivalents.

The photo shows the underneath details of my completed model, and how the cylinder block can be unscrewed from the chassis. It also shows tiny screw heads retaining the crankshaft, and the ends of the universal joints have small holes drilled in the bearing. This was my solution to inserting Loctite bearing sealant in the hole and then hand rotating the coupling so that the sealant does not spread further along the shaft. Each truck assembly has wiper pick-ups. I think PSC can still supply all the various castings, apart from wheelsets and cylinders. Without doubt, the hardest and longest part of the project was to construct a working chassis.



This photo shows the underneath details of my completed model, and how the cylinder block can be unscrewed from the chassis. It also shows tiny screw heads retaining the crankshaft and the ends of the universal joints have small holes drilled in the bearing. (Tim)

I also decided that the model would be built in the condition that it probably left America. Therefore, it would not include British style buffers and three link couplings. This is purely because, at some time in the future, I intend to build a West Coast style logging layout on which to run my stock. The drawbar beams are made of pieces of oak stuck together with epoxy glue, but otherwise all the superstructure is solder construction.

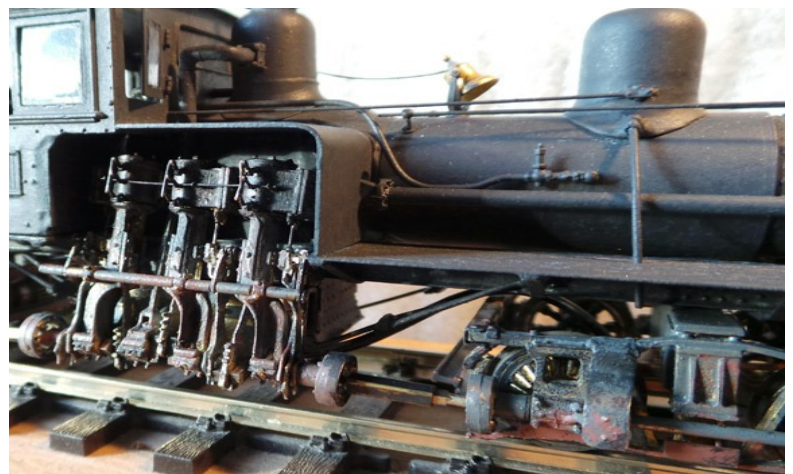


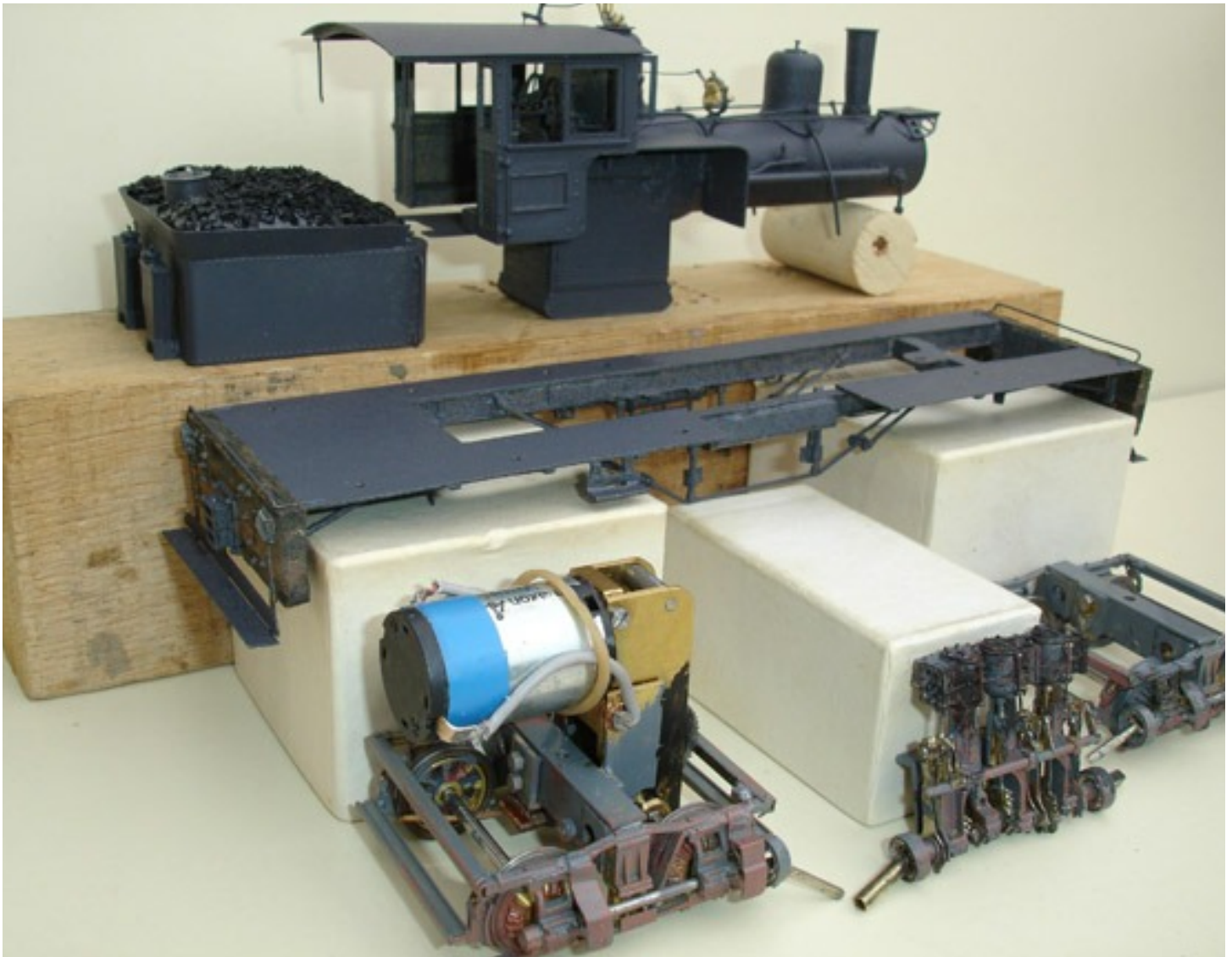
The finished model ready for paint.

Finally, a photo to show how tiny the Class 20-2 Shay is compared with my modified Max Gray type 80-2 Shay on the right. Again, this model has an ABC Gears gearbox (slightly larger at approximately \$250 plus shipping) driving the rear axle. I fitted a wood bunker and new drawbar beams. I am pleased with the model I built, but undoubtedly my favourite Shay is the very robust and powerful Max Gray model.

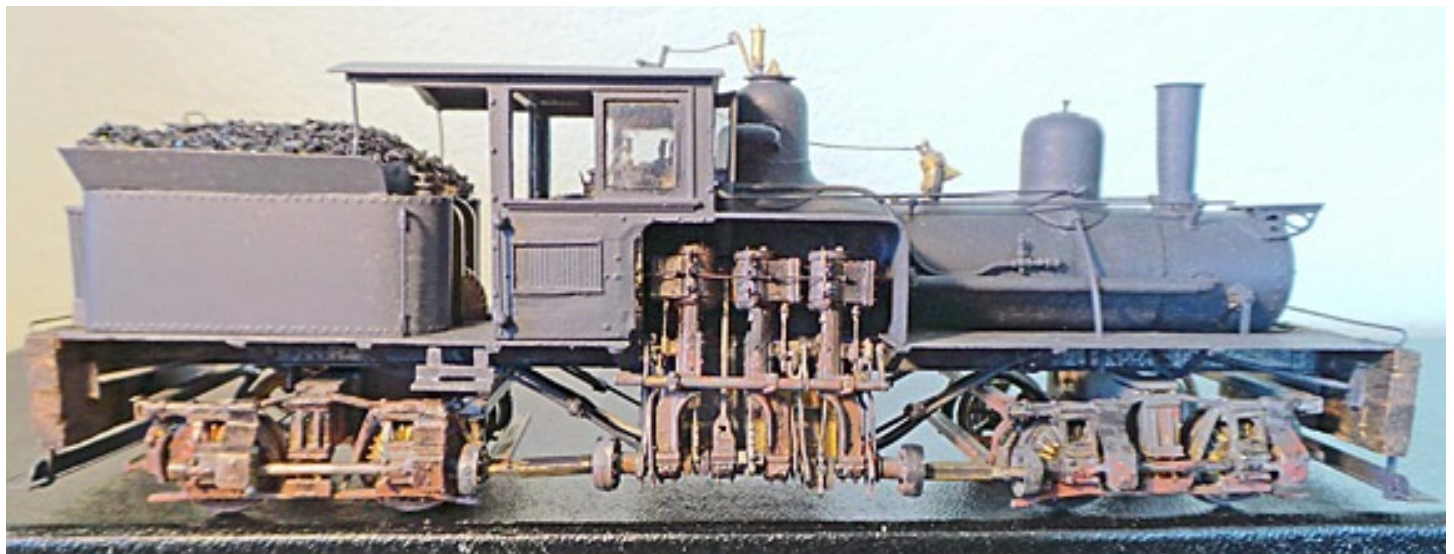


This view shows the inclined cylinder assembly Tim needed to make when he made the engine a standard gauge model. (Glenn)





This photograph shows the various components of the Shay. The majority of the boiler, cab and tank is scratchbuilt from brass and nickel silver. However, as a starting point, I modified a pair of PSC brass cab sides, whilst the boiler incorporates a part PSSH8133 wagon top boiler section and 36" diameter smoke box door. Then, it was just a question of slowly building a bit at a time and seeing how it compared with various photos. Frequently, I would make a part, only for it to be altered/discarded. I think the headlamp bracket was my third attempt. (Tim)



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