The Piedmont Division Timetable

PIEDMONT DIVISION
SER NMRA

Volume 26 Number 3
Effective 12:01 AM ET Friday, July 1, 2022

Steve Funsten's Cass, WV HO Module

PIEDMONT DIVISION

NATIONAL MODEL RAILROAD ASSOCIATION

TIMETABLE

VOLUME 26

No. 3

Effective 12:01am, Eastern Time

TUESDAY, JULY 12, 2022

Jim Datka . . . . . Editor and Publisher
Doug Alexander. . . . . Associate Editor
James Bando. . . . . Photo Editor

CONTRIBUTORS

Mike Deaton — Perry Lamb
Steve Funsten — Joe Sullivan
Tom Gordon — Bob Wood

Deadline for the 4th Quarter 2022 TIMETABLE:

Wednesday, September 7, 2022

Send Submissions to:
timetable@piedmont-div.org

"We're All About The Trains"

We Have Content...*and I Didn't Write It!*

Like the masthead to the left? Like the cover photo? Those are the efforts of our resident graphic artist and Assistant Editor Doug Alexander! Doug has some great photo layouts you will be seeing on the cover of future issues.

This cover is Steve Funsten's incredible Cass, WV HO module he scratch built for the challenging NMRA Achievement Program's Prototype Model certificate. Steve describes how he was able to accurately duplicate scale buildings in a town he has never visited. Having seen several of his models up close, he is a flawless scratch builder.

Bob Wood provides a well researched and thorough comparison of the DCC Concepts Cobalt iP Digital turnout motor to the industry leader, Circuitron's Tortoise. Does the upstart have what it takes to on the champion? Bob considers everything from what's in the box, to the features, installation, programming and total cost of using both units.

Co-chairs Mike Deaton and Joe Sullivan have the 20th Annual Piedmont Pilgrimage building steam for in-person layout tours this fall. If you have not opened your layout in the past but would like to be considered for this year's tour, they would love to hear from you.

The winning entries in the Spring Model and Photo Contests are presented in this issue. Thanks to all the members participating in the April contests. Please get your models and pictures ready for the Fall contests.

The clinics in the last quarter were outstanding—interesting topics and practical advise—and we have some great topics coming up for this quarter. See if you can detect the subliminal messaging in the write-up on Scott Dunlap's clinic.

Committee Changes

We have had some recent changes to our volunteer committee chairs. Sally Bando has turned over the reins of the Marketing Committee to Doug Alexander. Sally has done an outstanding job and is a prime reason our events have been so successful and growing. Sally will continue to provide marketing support to the Piedmont Division Model Train Show.

Chuck and Mary Ann Hoesch have provided outreach and support to members of our Division as the Good and Welfare Committee and recently announced their retirement from this role. Chuck has also played key roles in Division elections. Rick Coble will be managing our elections this Fall.

Changes to this Timetable

As our slick new website has expanded features such as Division Railroad Clubs and Area Hobby Shops and Services, these will no longer appear in the Timetable.

—Jim Datka
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Piedmont Division Superintendent's Report
Summer 2022

Greetings and welcome to the start of Summer! Must be summer, its hot, humid, and the AC is working. The only really good thing about Summer, like Winter, is it makes me want to go down to the basement and work on the railroad. Well, there is the pool, but I do love trains!

The Summer is starting out busy for us in the Piedmont Division! We have a great slate of clinics at our monthly meetings, our new website, www.piedmont-div.org is up and running. Content continues to be added. The Pilgrimage website is progressing as is The Piedmont Division Model Train Show site. All three have the same look and feel and the content is more easily added and edited. Bob Kelshaw and his team have done an amazing job on this project. Thanks folks!

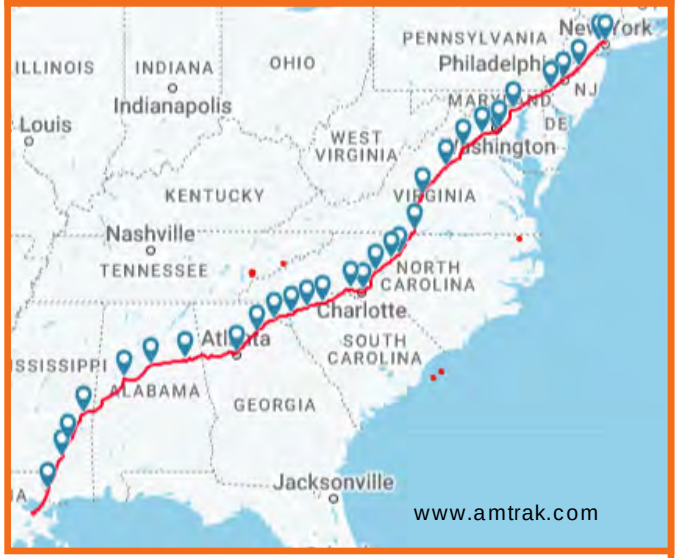
Our June meeting featured Scott Dunlap and a discussion of the AP Author Certificate. Scott described his process in completing this certificate and what paperwork he produced during his journey. I am interested in this clinic as the Author Certificate will be my next step towards MMR. Finally, we had a member-only open house with Peter and Lori Thomas.

July's clinic should be very interesting! Craig Knox, creator of much of the video for our Virtual Piedmont Pilgrimages over the past couple of years, will present a session on "Shooting the Crescent." Using both photographs and video "footage," Craig will demonstrate tips and techniques for producing quality video and, hopefully photo, images of our favorite subjects. In our Bring-and-Brag segment, we'll be treated to samples of favored prototype railroadiana. I think that will be fun to see!

In August, we are having a clinic that will, I think, make many Digitrax users happy. Norm Stenzel will be presenting 'Digitrax Tricks of the Trade, Making your Digitrax System ALMOST bullet proof'. While my DCC system isn't from Digitrax, I know a huge number of layouts, in our area, that are. In fact, there are a huge number of Digitrax layouts in the Region. This should be a great clinic!

As always, our meetings are also available on WebEx, in the Division's room, at:
perrylamb.my.webex.com/meet/perry_lamb

Route of Amtrak's Crescent



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Division Superintendent's Report—Summer 2022

(continued)

The Division is also working towards our biggest Fall event, annual Piedmont Pilgrimage. Of special note, this is the 20th Anniversary Pilgrimage! The Pilgrimage will be running the last half of October and most of November, over the weekends. This year, we will have all live and in person tours, and are looking forward to being back to a full schedule. I know there has been a lot of progress on a number of layouts in the area and this year's event should be grand. Heck, I might even have my own new town of Crescent, Washington ready for viewing!

As things continue to return to normal, I am thankful that I live in such an active Division and Region. The Piedmont Division continues to be, I believe, the most active Division in the NMRA. We conduct monthly in-person and virtual meetings, our Train 'N Camp program is active. We have members actively working in the AP program, and our major annual events, the Pilgrimage and our Train Show, draw in modelers of all ages. We also live in a Region that is just as active. Planning for the Cartersville Express 2023 SER Convention in Cartersville (Thursday, September 14 thru Saturday, September 16, 2023) is in high gear. There will be a slate of excellent clinicians, layouts on tour and open for operations, and both the hotel and convention center are easily accessible and are first class facilities. I'm looking forward to attending and I hope you are too!

OK, it is time for me to stop writing and to get back to my real job. Not time to retire yet, sadly. Later this evening, it will be time to get back to the workbench and another project. In the meantime, take time to enjoy model railroading.

Until next time, Engage!

—Perry Lamb

Superintendent, Piedmont Division

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Help Our Division By Volunteering!

Piedmont Division monthly meetings are held at:

Holy Innocents' Episcopal Church

805 Mt. Vernon Highway, Atlanta, GA 30327

PIEDMONT DIVISION
SER NMRA

Division meeting are open to everyone. Come join us to see what fun Model Railroading is. See Division Calendar for details.

We hope to see you at our next meeting!

Director of Finance Report

June Transactions:

Income				
Admin Income				
Meeting 'bucket' contributions				
	6/15/22	Piedmont Division	Deposit	$111.00
	6/14/22	Piedmont Division	Deposit	$125.00
Total Meeting 'bucket' contrib...				$236.00
Meeting 'paypal' contributions				$52.90
Total Admin Income				$288.90
Expenses				
Admin Expense				
Dr. Joe Senior Scholarship Fund				-$78.00
Meeting Room Rental				-$300.00
Miscellaneous Expense				
	6/15/22	Piedmont Division	A. Welch Shed Repair	-$850.00
Software & Internet				
Mailchimp				
	6/14/22	Piedmont Division	CREDIT CARD ********	-$53.10
Total Admin Expense				-$1,281.10
Total				-$992.20

June Assets Decrease $992.20

ACCOUNT	2021 12/31/21	2022 1/31/22	2022 2/28/22	2022 3/31/22	2022 4/30/22	2022 5/31/22	2022 6/30/22
Assets							
Cash							
Piedmont Div Train Show	$20,407.06	$20,767.06	$13,179.20	$31,313.52	$20,584.99	$19,411.74	$19,411.74
Piedmont Division	$4,434.21	$2,881.18	$3,448.43	$3,959.60	$13,082.34	$12,875.08	$11,882.88
SER 2023 Convention	$0.00	$100.00	$500.00	$500.00	$500.00	$500.00	$500.00
TIAA CDs	$41,848.53	$41,848.53	$41,848.53	$41,848.53	$41,848.53	$41,848.53	$41,848.53
Total Cash	$66,689.80	$65,596.77	$58,976.16	$77,621.65	$76,015.86	$74,635.35	$73,643.15

I established the Dr. Joe Sr. Scholarship Fund as a separate sub-account, with a starting balance of $1200, the estimated amount received from auctioning paintings donated by Dr. Joe. The first NMRA membership scholarship, for $78, went to Eamon Hickey.

—Jim Foley
Director of Finance
finance@piedmont-div.org
404 542-4660

Southeast Railroad Museum's Model Train Days

On June 11th & 12th, the Division's N Scale Ambassador Layout was on-hand for the museum's two-day event. Our Division was promoted and the layout supported by Doug Alexander, Scott Dunlap, Gary Fish, Tom Gordon, Jerry Michnewicz, Doug and Tim Munnell, John Stevens and myself.

This was my first visit to the Museum and I had no idea about the size and scale of their prototype collections. I especially enjoyed being able to get inside cars from many eras to see first-hand what passengers enjoyed during the Golden Age of travel by rail.

—Jim Datka

Photos by Walt Liles

The 20th Annual Piedmont Pilgrimage is On Track and Rolling Out

The 2022 Piedmont Pilgrimage is really "picking up steam" for this fall! We are delighted to announce that our 20th Annual event will once again feature traditional open house, in-person layout tours at the homes of many of our fine modelers.

We are planning for this year's tours to start up on Saturday morning, October 22nd, running through five weekends, concluding on Sunday evening, November 20th.

The Pilgrimage Committee is currently working on the master schedule for this year's tours. As of mid-June, we have well over 40 layout tour hosts with whom we are working, and probably more to come. As usual, there will be layouts available all around the greater Atlanta metropolitan area.

If you have a model railroad somewhere in the Piedmont Division that has not been included in the Pilgrimage before, and you would like to host an open house with us this year, please quickly contact either:

Joe Sullivan joesullivanx2377@gmail.com

Mike Deaton mdeaton@mindspring.com

In conjunction with the new Piedmont Division website, we are about to roll out a new Piedmont Pilgrimage website: piedmont-div.org/pilgrimage By mid-July, we expect to publish our first info and updates for our 2022 program. As soon as tour schedules become available, we'll start posting those on the website. The new Piedmont Pilgrimage website will be your source for all tour schedules, layout descriptions, directions, and program updates. With our new website, we also expect to have a helpful new "layout tour routing" feature, to help you plan your personal layout tour visits.

Unlike the two "Covid" years past, we are not planning to present any new "virtual layout tour" videos for 2022. But virtually all of our 2020 and 2021 videos are still available out on the Piedmont Division's YouTube channel, at: www.youtube.com/channel/UC7vxNTIr80By8mPyFxhphBQ .

We are offering Pilgrimage "Pike Ads" for our members again this year. A Pike Ad is your calling card published on the Piedmont Pilgrimage website "Supporters" page. Pike Ads are a great way to promote your layout, and to help support the Piedmont Division's programs. Displaying your Pike Ad on our website costs just $10. Design services and/or business card printing for your Pike Ad will also be available (for an additional fee). Please contact Jim Foley at finance@piedmont-div.org for more information, or to place your order.

Besides hosting a layout tour, another great way to support the Pilgrimage is to volunteer as an Operator Assistant. Our "O.A.s" help our hosts run trains during the open houses, so our hosts can better "host" their guests. Your service as an "O.A." earns credits toward your NMRA Achievement Program Volunteer Certificate. Please contact Joe Sullivan or Mike Deaton if you are interested in being an Operator Assistant volunteer. We also plan to have signup sheets available at the August and September Division meetings.

(continued on next page)

20th Annual Piedmont Pilgrimage (continued)

The Piedmont Pilgrimage is one of our Division's most successful programs to support and promote model railroading. It is very popular with the public, even those who are not model railroaders.

We are grateful for all of our member volunteers who open their layouts for these tours. It is a very rewarding and heart-warming activity for those model railroaders who have worked so hard to prepare their layouts for others to see. This is a unique opportunity for everyone else to see their work and experience their vision. It is a great chance to ask questions and learn how you can enhance your own layout. And we are simply thrilled to be able to present these open house layout tour events for our 20th year!

On behalf of the Piedmont Pilgrimage Committee, your Piedmont Pilgrimage Co-Chairpersons thank you for your support. We hope you will join us in person this fall! And don't forget, November is National Model Railroad Month!

—Mike Deaton
mdeaton@mindspring.com

—Joe Sullivan
joesullivanx2377@gmail.com

Separated at Birth?

Photo by Hunter Terrell

Metro-Goldwyn-Mayer

NMRA Partnership Program

Like saving money? Your membership can save you up to 25% from more than 50 manufacturers and distributors of model railroad equipment, supplies and services.

Simply login to the NMRA.ORG website and highlight the "Benefits" tab on the member home page. Then click on "NMRA Partnership Program" in the pull down menu. This will take you to a page listing all of the participating vendors with detailed instructions on how to take advantage of their discounts. It even includes links to the vendor websites. Nothing could be easier!

Start saving today by taking advantage of this outstanding NMRA member benefit!

Unexpected Prototype Application

Passenger Coach as a Bridge

Piedmont Division Calendar

Piedmont Division Meeting

TUESDAY, JULY 12 — 6 PM BOD; 7-9 PM Division Mtg

Clinician: Craig Knox — Title: Shooting the Crescent

Prototype videography and photography – how to do it, featuring footage and examples!

BRING & BRAG: Protype railroadiana or whatever you have been working on and want to share.

Train 'N Camp: Weathering

SATURDAY, JULY 16 — 1:00 PM to 4:00 PM

Back by popular demand! Covenant Presbyterian Church, Canton Road, Marietta, GA 30066. For more info contact training@piedmont-div.org

North GA Modurail Model Train Exhibit

SATURDAY, JULY 23 — 9:00 AM to 5:00 PM

SUNDAY, JULY 24 — 12:00 PM to 3:00 PM

Smoke Rise Baptist Church, 5109 Hugh Howell Road, Stone Mountain, Georgia For info email mailcar@northgeorgiamodurail.org

Piedmont Division Meeting

TUESDAY, AUGUST 9 — 6 PM BOD; 7-9 PM Division Mtg

Clinician: Norm Stenzel — Title: Tricks of the Trade: Making your Digitrax System Almost Bullet Proof

BRING & BRAG: Automobiles that you have built and/or weathered to make more realistic, or whatever you have been working on and want to share.

Golden Spike Model Train Show

SATURDAY, AUGUST 27 — 9:00 AM to 4:00 PM

Gas South Conference Center (formerly Infinite Energy Forum) 6400 Sugarloaf Parkway, Duluth, Georgia 30097 For more info go to gserr.com

Piedmont Division Meeting

TUESDAY, SEPTEMBER 13 — 6 PM BOD; 7-9 PM Division Mtg

Clinician: Joe Nichols, Jr. — Title: Coil Detectors, Car Cameras and Drones

BRING & BRAG: Interesting technology you're working on or installing, or whatever you have been working on and want to share.

Train 'N Camp: Hand Laying Track

SATURDAY, SEPTEMBER 24

Learn how to hand lay track using Fast Track jigs. Please note that spots need to be reserved, and they may already be filled. Date and time may change as the event gets closer. Exact location to be announced at a later date. For more info contact training@piedmont-div.org

Piedmont Division Meeting

TUESDAY, OCTOBER 11 — 6 PM BOD; 7-9 PM Division Mtg

Clinician: Stefan Bartelski — Title: How to Make Your Own Photo Backdrops

BRING & BRAG: Passenger cars that you have modified (painting, lighting and interior installations, etc.), or whatever you have been working on and want to share.

20th Annual Piedmont Pilgrimage

SATURDAY, OCTOBER 22ND through SUNDAY NOVEMBER 20

For more info contact pilgrimage@piedmont-div.org

Piedmont Division Meeting

TUESDAY, NOVEMBER 8 — 6 PM BOD; 7-9 PM Division Mtg

Clinician: Ovidiu Trifanescu — Title: **"Would it Stick?..." (A Clinic about Hobby Glues)**

BRING & BRAG: Interesting structure where you have added interiors and/or lighting, or whatever you have been working on and want to share.

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Expires Dec 1, 2017

Engineer's Wish List

Embroidery
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by On-Line Consign, Inc.

Sally Bando | 404.550.4816 | sbandogeorgia@comcast.net

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TRAIN RIDES

NORTH GEORGIA LIVE STEAMERS ⊗ CONYERS & HIGHTOWER RAILROAD

Saturdays
1:00-4:30

2022 Schedule
April 30, May 21, Oct 1, Nov 5

Cash Only — 1632 Centennial Olympic Parkway, Conyers, GA — Cash Only

Piedmont Division's April Meeting

Jim & Christopher Davis: *Adding Realism to Your Operations*

If you missed Jim and his son Christopher's presentation, do yourself a favor and see it on our YouTube channel at piedmont-div.org/division-youtube-channel

Jim provided examples of real world situations from his more than 30 year career in railroading, half of that as a Dispatcher for the Norfolk Southern Railroad. He described situations where things did not go exactly as planned, the impact it had on operations and how the Dispatcher and railroad responded. Most examples were issues modelers never consider in our own operations, but clearly happen to the prototype.

Jim and Christopher would then described how you can incorporate these events into operations on a home layout. They showed several ways a crisis can be planned and staged in an operating session, and how crews and Dispatchers can respond. They even provided examples of paperwork that can communicate problems and direct efforts for their resolution!

It was a very interesting and entertaining presentation that gave a glimpse into the behind-the-scenes challenges—some funny, some deadly serious—of operating a major railroad. Their ideas can make your next operating session a surprising and memorable event by purposefully making things go wrong.

Superintendent Perry Lamb is awarded the NMRA Certificate of Achievement Model Railroad Engineer-Civil

First Time Meeting Attendees

M. Bud Willis

Pam Kinnaman

David McDonald

"Perry, thank for you for a great meeting this evening. It was fascinating to hear about real operations and how we can introduce them to op sessions. I was amazed at the stories and so appreciate the time everyone put into this meeting."

—Walter Tieck

Photos by James Bando

Piedmont Division's April Meeting
Bring-And-Brag

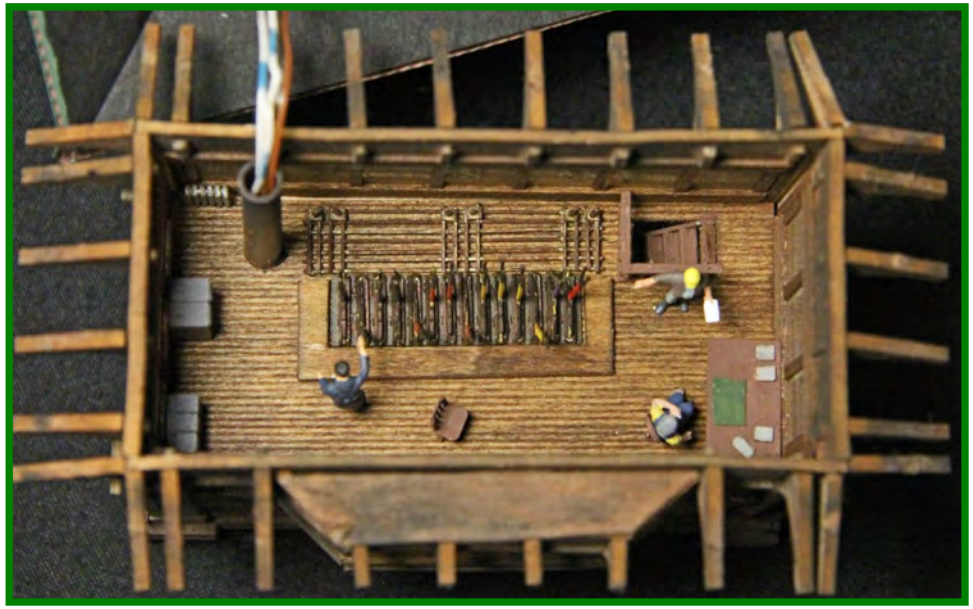
Stefan Bartelski brought a Walthers Glacier Gravel kit that he modified for use in a marble quarry on the Marble Hill branch his Blue Ridge Line railroad

Eamon Hickey shared two of his favorite locomotives: a UP diesel and an ATSF wood-fired 10 wheel steamer

Photos by Jim Datka

Piedmont Division's April Meeting
Bring-And-Brag

In addition to his Model Contest entries, Mike Cummings showed several structures that were previously judged, including a hay barn, freight station and a Delaware, Lackawanna & Western Railroad tower complete with a beautifully detailed interior featuring armstrong turnout levers



Photos by Jim Datka

Piedmont Division's May Meeting

Perry Lamb: *Kitbashing a Bulkhead Mlitary Vehicle Transporter*

Perry gave a fascinating presentation of the history and variations of the railroad flat cars that transport heavy military vehicles. He showed examples of prototypes and how he modeled it on his Utah, Colorado and Western Railroad. He went step-by-step through how he modeled, detailed and weathered his rolling stock, and showed how it fit into his layout.

There were several discussions during his presentation with members who served in the military and witnessed the prototypes. Anyone modeling military rail transport learned detailed information that creates models with a higher level of realism and authenticity.

Photos by James Bando

The results of the Spring Model and Photo Contest were announced at the meeting and appear in a later section of this issue.

First Time Meeting Attendees

Andrew Lindermann

David Haralambow

Piedmont Division's May Meeting
Bring-And-Brag

Ken Stinnette presented an E8 he painted in Central of Georgia livery, and several passenger cars that he has modified or kitbashed to be true to the prototype. This included a passenger/baggage combine that he created from Kato cars—the only model of its kind in existence.

A new member brought in a Santa Fe 2-10-2 locomotive he relettered looking for suggestions and advice on how to improve his techniques. Unfortunately I was unable to get his name or a photo, but fortunately several members quickly flocked to his aid.

Joe Sullivan brought beautifully weathered open gondolas with scrap metal, partial sand and interchangeable coal loads.

Photos by James Bando and Jim Datka

Piedmont Division's June Meeting
Scott Dunlap: *Earning the NMRA Author Certificate*

Scott detailed the requirements for the NMRA Achievement Program's Model Railroad Author certificate, and showed how members can earn points toward completion. (*hint, hint*) He detailed how he wrote just a few articles in various media to quickly earn one-half of the points necessary. (*so easy!*)

He provided helpful hints to get started (*great ideas!*) and described what editors are looking for in submissions and identified resources (*so many!*) to make your writing easier and more professional. (*YOU can do it, too!*)

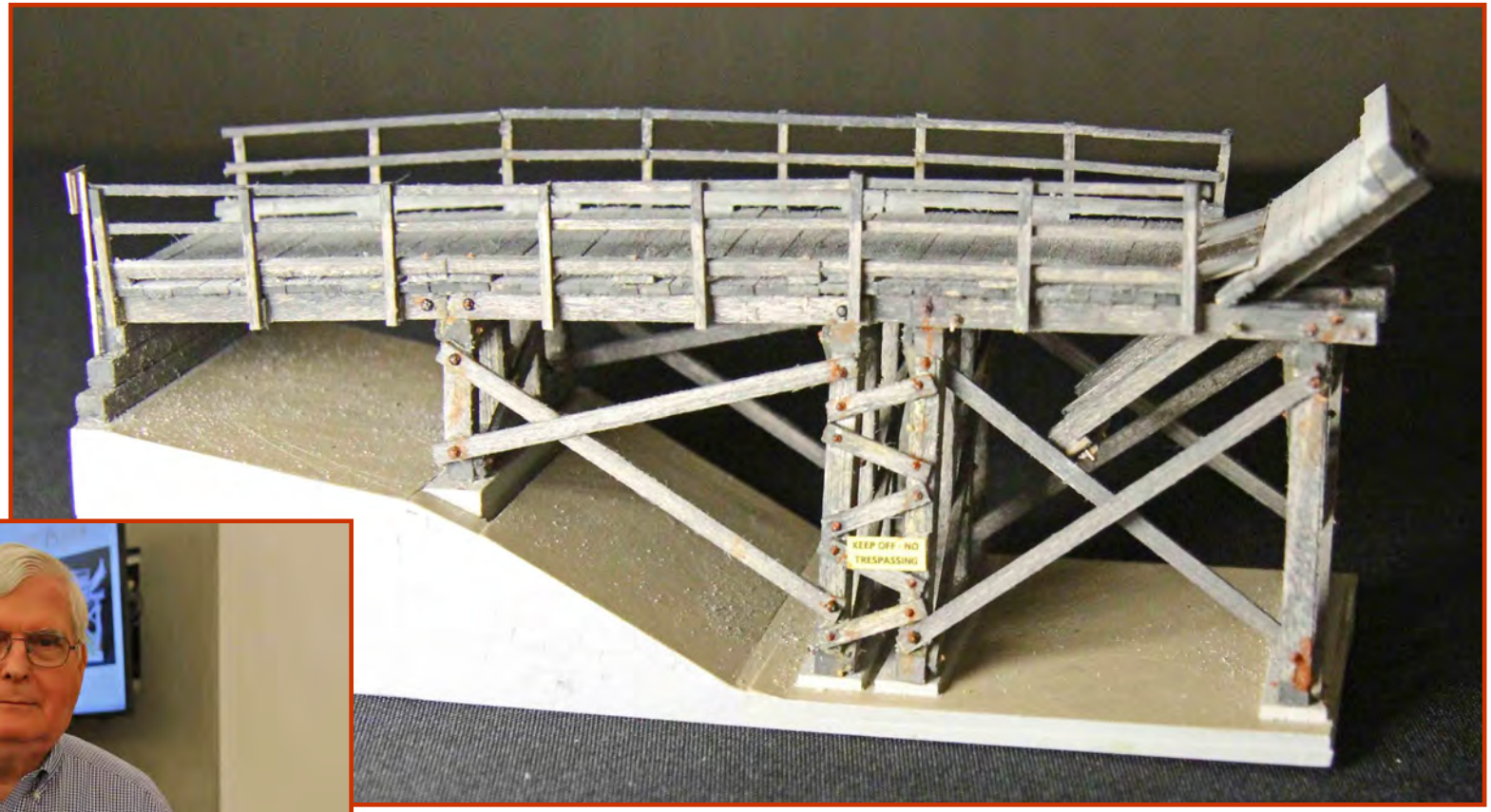
The key factor is that the article must relate to the hobby. (*which YOU love and know so well*) For example, an article about a fallen flag would only count if it related how to model it. (*but could still be a great article*)

Scott promised that anyone submitting articles to our *Timetable* would quickly attain fame, financial reward and immediate hair regrowth. (*OK, I may have made some of that up—Editor*)

Photo by James Bando

Achievement Program April 2022 Model Contest Winners
Structures – First Place and Merit Award

Joe Sullivan — HO Timber Truck Dump Trestle

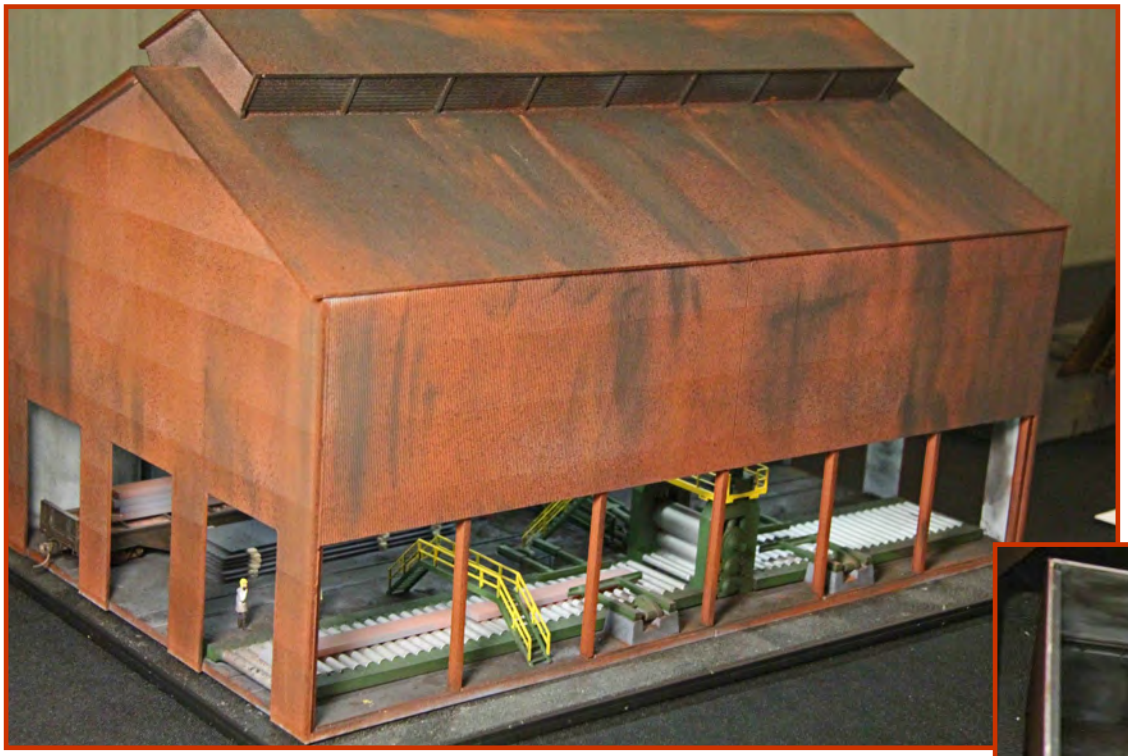


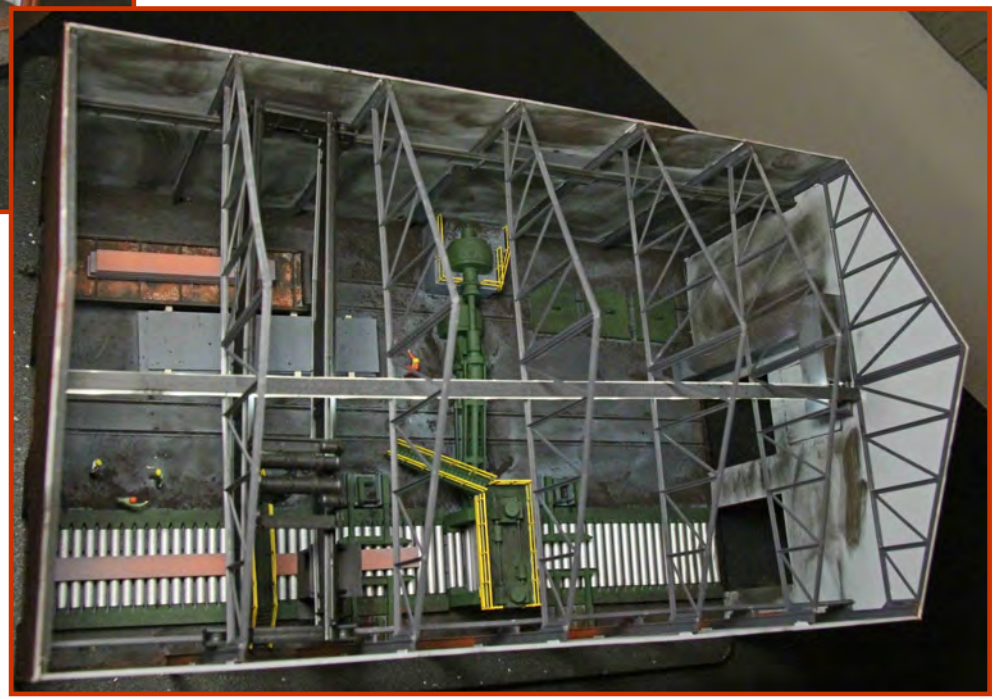
Achievement Program April 2022 Model Contest Winners
Structures – Second Place

Mike Cummings — HO Truck Coal Dump

Achievement Program April 2022 Model Contest Winners
Structures – Third Place

Mike Cummings — HO Pocono Steel Rolling Mill





Achievement Program April 2022 Photo Contest Winners
Color Prototype – First Place

Raymond Stewart — Big Boy

Achievement Program April 2022 Photo Contest Winners
Color Prototype – Second Place

Rob Keeney — UP Clearance onto Mainline

Achievement Program April 2022 Photo Contest Winners
Color Prototype – Third Place

Raymond Stewart — Old Steam Meets Newest Locomotive on the Rails

Achievement Program April 2022 Photo Contest Winners
Color Models – First Place

Scott Dunlap — Heading to Bernardsville

Achievement Program April 2022 Photo Contest Winners
Color Models – Second Place

Scott Dunlap — Connection at Bernardsville

Achievement Program April 2022 Photo Contest Winners
Color Models – Third Place

Scott Dunlap — Ready for Rush Hour

Achievement Program April 2022 Photo Contest Winners
Panorama – First Place

Scott Dunlap — The Capitol Limited Tours the Hudson, Delaware and Ohio Railroad

Achievement Program April 2022 Photo Contest Winners
Working on the Railroad – First Place

Rob Keeney — Engineer: "Call me"

Achievement Program April 2022 Photo Contest Winners
Working on the Railroad – Second Place

John Bacon — Polished Through Use!

Achievement Program April 2022 Photo Contest Winners
Working on the Railroad – Third Place

Rob Keeney — Ghost Rails

Cass, West Virginia Diorama

By Steve Funsten

Looking to spend some quality fun time at the work bench? Have you ever considered scratch building a prototype model? After thinking about it, I did, and chose the town of Cass, West Virginia. Cass was a logging town that later became a major attraction featuring a railroad that now hauls tourists instead of timber.

Let's start off with a little of history about the prototype.

Founded in 1901, Cass, West Virginia began as a small logging town located adjacent to the Greenbrier River in Pocahontas County. The town was named after Joseph Kerr Cass, the vice president and cofounder of the West Virginia Pulp and Paper Company.

Cass was a small company town for those working the West Virginia Pulp and Paper Company logging the virgin timbered hills of nearby Cheat Mountain. The cut logs were brought down the mountain by rail to the town where they were processed for paper and hardwood-flooring companies throughout the United States.

Laborers working the sawmill and the locomotive repair shop lived with their families in 52 white-fenced company houses built in orderly rows on a hill south of the company store.

The sawmill closed in 1960. In 1963, the state of West Virginia bought the logging railroad converting it into a tourist attraction. Eager passengers were given the opportunity to ride the rails into the vast Monongahela National Forest. In the late 1970s, the state also bought most of the town and buildings to create a new Cass Scenic Railroad State Park. The Cass mill burned down in 1982 and was never rebuilt. In 1980 the Cass Historic District was listed on the National Register of Historic Places.

Jim Datka

The present-day town of Cass is comprised of a company store (pictured left) which houses a gift shop, a restaurant, a history museum, an old US Post Office and the depot like those built for the C&O RR. The Cass tourist railroad runs open-air excursion cars powered by Shay, Climax and Heisler locomotives from the town up to Whittaker Station, the halfway point where a restored logger's camp has been recreated on the mountain. The train then continues its laborious journey up the Mountain to Bald Knob, the third highest peak in West Virginia. Grades on the railroad are as steep as 11%, making it the steepest adhesion grade railroad in the world. The railroad's climb to the summit also includes two switchbacks. The low-geared Shays are always placed on the downhill side of the train.

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Cass, West Virginia Diorama

By Steve Funsten

The reason for modeling this prototype diorama was envisioned about four years ago. Searching for logging railroads on the internet, I ran across what I thought would be a perfect scene I could recreate for the NMRA Achievement Program's Prototype Modeler Certificate, one of the eleven categories to choose from in the AP program.

The concept is to recreate a prototype scene containing a minimum of six models of prototype equipment and/or structures. The requirements for the six models are to have at least one from each of the following categories: rolling stock, railroad structure, caboose or passenger car, and motive power. There is no specified size or modeling scale for the diorama other than it being large enough to adequately display the required models.


Jim Datka

Many modelers pursuing the MMR® (Master Model Railroader) status consider the AP Prototype Modeler to be one of the more challenging categories in the AP program. I enjoy the challenge of scratch building anything so the idea seemed like a fun project even though I knew it would involve quite a bit of work.

If you're not yet aware of the NMRA Achievement Program, you might want to consider looking into it at nmra.org. The NMRA AP program is really an excellent way to improve and fine tune your modeling skills.

Modeling logging railroads and related sites have always been a favorite of many model railroaders. Having personally spent 30 years logging timber across North Georgia, modeling a scene like the logging town of Cass seemed to be a perfect fit. Blue Ox Timber was the name of my former timber harvesting company which operated across north Georgia. Blue Ox Timber shut down logging operations in 2008 and suddenly I found myself with ample free time.

I ran across an old box of nice N scale locomotives and rolling stock I purchased as a teenager, but N scale seemed much easier to see and work on when I was younger, so the decision was made to sell them through an online auction. The new plan was to start modeling in HO scale.

What started as a small hobby of selling trains grew into a full-time model train business with customers spanning the globe. Coming up with a name for the new model train business wasn't difficult, and so it was named Blue Ox Trains after the old logging company. The store is located in Roswell, Georgia, an Atlanta suburb, and is now one of the most popular brick and mortar stores in the southeast.

There was also an ulterior motive for building the three scratch built structures for the diorama. All three structures could first be evaluated individually to hopefully score sufficient points for Merit Awards in the NMRA AP Structures category. The same structures could be used again in the prototype model diorama. This is allowed in the rules for AP Prototype Modeler.

While the town of Cass, WV has remained relatively unchanged for most of its 100 plus years, the setting or era for this diorama is the fall of 1983. 1982 is the most modern automobile model year displayed on the layout just to be sure everything matches from a prototypical standpoint.

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Cass, West Virginia Diorama

By Steve Funsten

Having never visited Cass personally, I relied predominately on a multitude of photos for reference material I found as readily available online.

The bench work for the Cass diorama is simple built using 1x4's and ½" plywood. It measures 4' wide x 3' deep and has leg pockets with removable legs for easy transporting. The module is built to NMRA standards so it will easily conform to other modules built to the same specifications.

A very handy tool that many modelers may not be familiar with is the ability to measure distances using Google Earth Maps. The distance measuring tool is available when using "satellite view". This is done by right clicking your mouse on any point of the map or structure and a drop-down box will appear. Left click on "Measure distance" and then click any other point on the map. This tool was used extensively to measure the size the structures needed to be, as well as how to place them on the diorama. For example. on Google maps the depot roof measures 91' and the model measures 91' in HO scale.

Adobe Photoshop Elements was used extensively to scale and size all aspects of the structure builds as seen in the following photo. A combination of Tichy and Grandt Line windows were used in the construction of all three structures. Signage, including the train bulletin board, credit card signs and REA accepted on the depot were created in Adobe photoshop and printed to scale.

The oak wooden trash barrels are Campbell Scale Models wooden detail parts which were stained and painted to simulate having a trash bag liner.

The benches used around the depot are Woodland Scenics painted to match the structure. Window glazing on the depot is real cut glass which is a product available from Ngineering. The roof shingles chosen for the depot were Bar Mills slate gray shingles lightly weathered with Floquil oak stain. All the doors and windows were kit bashed to match the prototype.

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Jim Datka

Cass, West Virginia Diorama

By Steve Funsten

The first structure on the list to build was the depot which was scratch built using Northeastern Scale Models basswood scribed and dimension lumber. The depot interior is lighted using three Miniatronics Surface Mount LEDs (SMD). The depot also has three lamps above each of the three front doors illuminating the front porch. These lamps were scratch built by soldering straight brass tube into Campbell Scale Models shades, then the wired LED's were threaded through the shade and tube. I then carefully bent the tube 90 degrees.

The roof arch supports and detail trim around the entire depot were yet another labor of love and quite a modeling challenge. All roof supports were scratch built individually. Curved pieces were modeled by soaking basswood 4x4's in warm water and clamping them to dry around an old 35mm film container. Pieces of 4x4 basswood wood were turned using a drill as a mini lathe to create the rounded ends on the trim pieces. All joints were dado cut with an X-acto knife to add stability to the joints.

The Cass Company Store, which was the next structure to be completed, and was built using Mt Albers scribed siding and wood glue. All measurements were calculated using a digital micrometer and scaling many online photos. The company store structure contains well over 800 parts. All lower level first floor doors and windows are all scratch built and/or kit bashed to match the prototype to perfection. The first-floor left side store front windows were designed on the computer and a printed pattern was created which was very helpful in building the storefront doors and windows. To be more specific, the wood parts were glued together directly on the printed pattern and then excess paper was removed using an X-acto knife.

Close to one hundred windows and doors on three sides of the Company store were modeled with Grandt Line and scratch built windows and glazed with .010 Lexan. All signage on the building was designed in Photoshop to match the signs on the prototype. The porch roof supports, and brass porch support columns were all scratch built with brass and wood. The main building windows and doors were all cut out using a Silver Bullet drag knife cutter. This machine works like a printer as it is controlled by a pattern you design on the computer and then uses a drag knife blade to cut what you've designed. The same cutter was also used to cut out the "1902" raised letters out of .020 wood. The entire exterior of the structure was painted with Tamiya primer white spray paint. In my opinion, Tamiya spray paints are fantastic for a smooth finish on any model. The roof on the company store is removable so an interior can be added later. It has a simulated gravel roofing material using mixed colors of fine ballast as well as several spots of tar patched areas.

Jim Datka

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Cass, West Virginia Diorama

By Steve Funsten

Creating the landscaping, grasses and turf scenery throughout the diorama was done by first applying a layer of Woodland Scenic's clump foliage and allowing it to dry. The next step was going back over the clump foliage layer with various shades of Peco 2mm and 4mm static grasses for an amazingly realistic look.

All the background trees were scratch built starting with dead boxwood armatures found in my yard. Next, Scenic Express SuperTree material was tediously glued to the armatures to form the crowns. Several various colors of Scenic Express foliage were blended to create the trees as well as using the same for ground cover below the tree lines. Simulated dead wood debris on the ground was made by cutting tips off a decorative dark wicker straw broom. This stuff makes very realistic looking HO fallen limbs.

All trees, shrubs and flowers seem to blend wonderfully with the printed photo backdrop. Thicket type material was also added between the diorama edge along the backdrop to create the illusion of a smooth transition.

The flex track used is Atlas code 100. While code 83 might have been a better choice aesthetically, most modules this diorama will be joined to use code 100. After laying the track, the rails ties and roadbed were all sprayed with Rustoleum camouflage brown. I clean the tops of the rails with a boxcutter blade or similar while still wet, then after it has dried, I go back with a nail buff block. These sanding blocks are inexpensive and very handy for many modeling projects. They can be found at any local beauty supply for about $1 each and come in various grits.

The ballast used on the track was Woodland Scenics medium gray blend mixed with a small amount of Woodland Scenics brown and some dark actual river sand added for a varied blend of colors.

The two-lane road and parking lot were created using Woodland Scenics super strength hydrocal blended with RIT black dye for a dark color. The surface of the road was brought to life by applying AK Interactive black top texture thinned with a white acrylic to create the faded gray topcoat and then weathered with various colors of PanPastels. Striping the roads was accomplished using both Woodland Scenics road striping pens and PanPastels.

Several wood retaining walls were built using stained Northeastern Scale Lumber basswood 8x8 timbers. Always stain strip wood pieces and allow them to dry before gluing them together. One of my favorite stain colors is Minwax Jacobean thinned with about 3 or 4 parts mineral spirits to 1 part stain. The concrete walls were made using styrene and painted with Woodland Scenics concrete gray.

The backdrop for the module is a 16" x 48" photo printed on matte photo paper. It was enlarged using Adobe Photo Shop Elements and printed using an Epson Stylus 4800 roll printer. The photo was then glued to a 2' x 4' piece of ¼ inch lauan plywood using 3M Super 77 spray glue before being attached to the module.

The telephone poles were made from dowels sanded down and stained. Walthers transformers and insulators were painted and added to the poles. EZ line was used for power lines and plain black thread for phone lines. The guy wires on the poles were made of phosphorus bronze wire painted silver and yellow.

The structures on the diorama include the depot, company store and post office. All three structures were scratch built using 100's of photos as mentioned earlier and all three earned Merit Awards before being placed into the diorama.

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Cass, West Virginia Diorama

By Steve Funsten

The original legendary Shay #5 locomotive was built by Lima for Greenbrier and Elk River Railroad in November 1905. This turn-of-the-century class C-80 Shay has been pulling the grades (up to 11%) up Cheat Mountain to Bald Knob for well over 100 years, making it one of the oldest locomotives in continuous service on its original line, and the second oldest Shay in existence.

The Cass #5 Shay model used on this diorama started as a Bachmann 3 truck undecorated model with a decoder installed, prototypical lettering added and lightly weathered.

Two excursion cars used on the diorama were Bachmann RTR cars which were weathered top to bottom. The actual prototype cars have a steel ladder that drops down on one end to allow easy loading and unloading of passengers. On both excursion car models, one side panel was carefully removed using a Dremel and file. An Alexander metal ladder detail part was kit bashed to fit and installed. Many various passenger figures were added to the cars anticipating the exciting ride up the steep grade mountain.

Cass has not operated logs cars since the early 60's so the log flat car would not usually be seen loaded on the tracks in 1983, but there would have been a constant flow of log cars prior to early 1960. The log flat car model on the diorama was kit bashed/scratch built out of an old Varney 40' flat car frame. The cut 16' logs are crepe myrtle branches.

The flat car deck was built board by board with stained 2x6 boards. The log car is weathered, has metal wheels and Kadee #148 couplers added . It is based on the 1920's photos of Mower Lumber Co. pulling logs off Cheat Mtn.

The hand car is a Tichy kit that was built and weathered.

This project took quite a bit of time but was quite fun to create.

The diorama was recently evaluated for NMRA AP Prototype Modeler. The Cass, WV entry received a high score and I was awarded the Certificate. My current plan is to expand the scene by scratch building more of the town's company houses on an adjacent module.

The NMRA AP Prototype Models certificate may seem overwhelming at first, but why not give it a try?

—Steve Funsten

Slow Motion Turnout Motors Compared
Cobalt iP Digital Vs. Tortoise™

by Robert E. (Bob) Wood, Jr.

It is 2022, and technology – whether it's telephones, computers, automobiles, or model railroading equipment – continues to change, hopefully for the better. Many of us have been building our railroad empires for decades using equipment that was available at the time, and often we found ways to make it work reliably and beyond what the manufacturers intended when they designed it. When we suggested improvements for their products, most manufacturers listened to us.

For the operation of turnouts, many model railroaders have been using Circuitron's Tortoise, which is probably the most widely used turnout motor on the market and has earned its stellar reputation. The Tortoise is a proven reliable solution for that purpose at an MSRP of $22.95 each, and Circuitron also manufactures the SMAIL (Slow Motion Activator with Integrated (DCC) Logic) for an MSRP of $46.95 each.

Cobalt iP Digital Turnout Motors

Dr. Larry Puckett, "The DCC Guy" and Contributing Editor of *Model Railroader* magazine, discusses the DCC Concepts, Ltd. Cobalt iP Digital turnout motor in his video "*Is The Cobalt iP Digital A Tortoise Slayer?*" and he gives several reasons to consider using the Cobalt iP Digital – iP stands for "Intelligent Power" - instead of Circuitron's Tortoise or SMAIL, including several Cobalt standard features which must be added to the Tortoise, thus increasing the overall cost of using the Tortoise.

DCC Concepts, Ltd. offers four turnout motors:

- Cobalt Classic Omega Analog
- Cobalt iP Analog
- Cobalt iP Digital
- Cobalt-SS Surface Mount

The first three listed are the same size (1.57" x 1.77" x 2.6") compared to the Tortoise (2" x 2" x 3.25"), which means that they may fit into spaces under your layout where a Tortoise will not.

Features and Benefits of the Cobalt iP Digital Turnout Motor

The purpose of this report is to focus on the features and benefits of the Cobalt iP Digital, which includes an embedded integrated circuit (IC) board which functions as a decoder for the turnout motor.

Quieter. The black areas within the Cobalt pictured below are sound absorbing material which makes it run quieter, and the gears are a better-quality engineering material which is superior to standard plastic.

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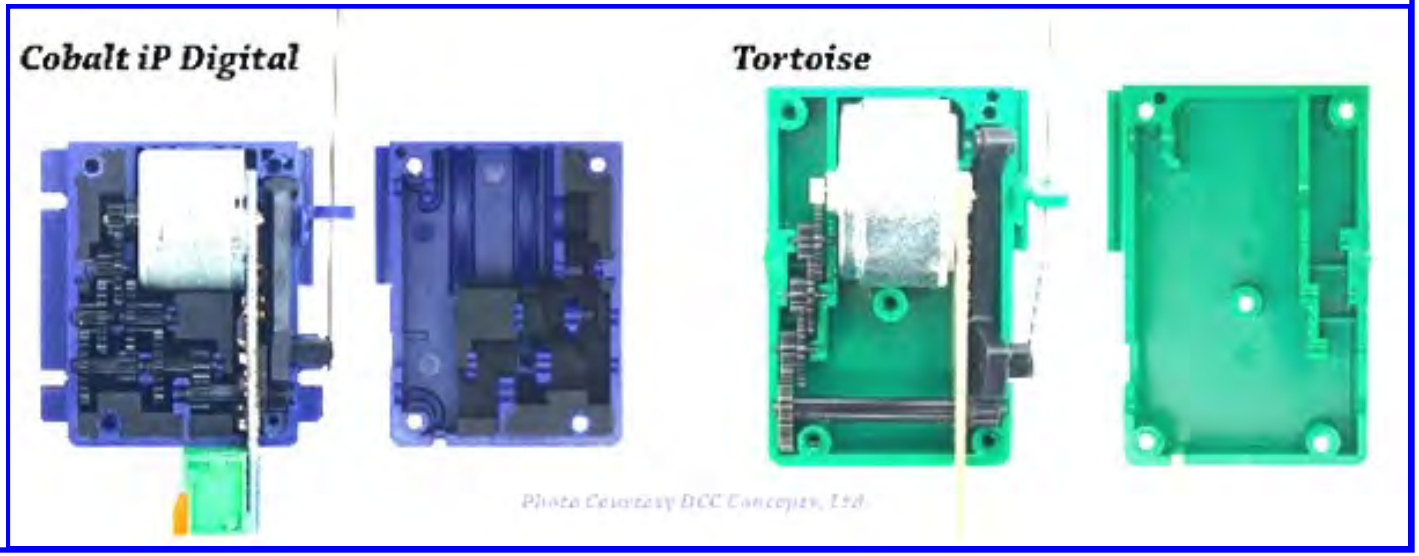
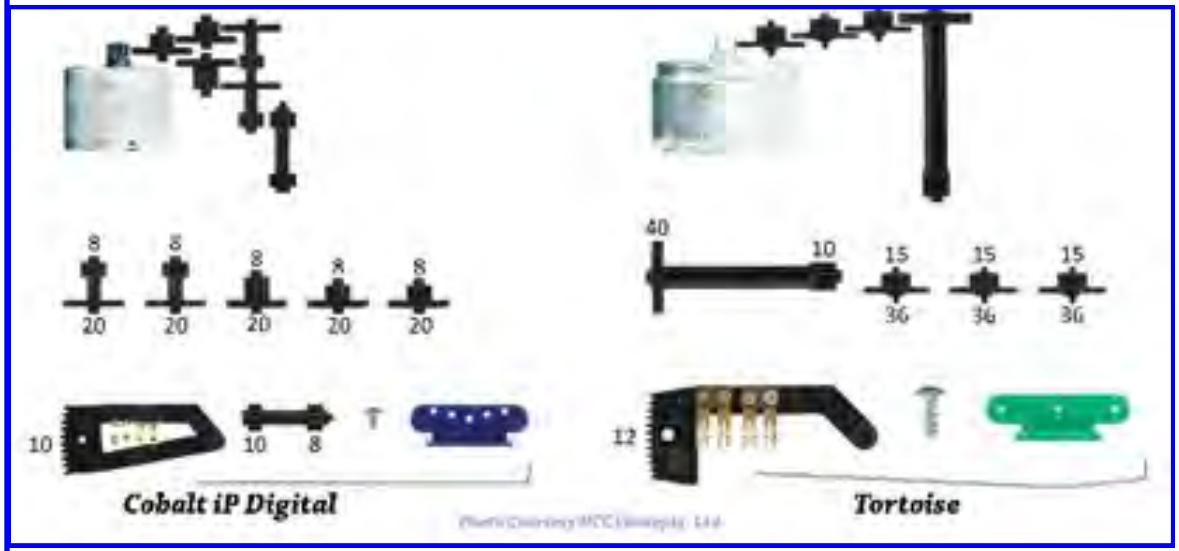


COBALT IP DIGITAL VS. TORTOISE

(CONTINUED)

Greater torque and durability. DCC Concepts claims that the Cobalt is good for sprung blade turnouts and large-scale use with far more power than the Tortoise can manage. The photo below shows the gearing structure and the gear ratios in each unit. The additional gearing presumably gives the Cobalt the torque necessary to turn even larger scale turnouts, such as O-scale and G-scale. As a result, the Cobalt lasts almost forever! DCC Concepts' testing shows that the Cobalt has been thrown some 200,000 times without failure before testing was stopped.



Easier connection. This picture shows a comparison of the circuit boards from the two switch machine motors. On the Cobalt, you can see dozens of solder joints while there are only two on the Tortoise. There are several electronic components attached to the Cobalt circuit board which provide the logic and addressing capability. In addition, the spring-loaded contacts are soldered to the Cobalt circuit board while the user must solder wiring to the Tortoise Circuit board.

Draws less current. In the first three minutes of a later video (*Who Needs A DCC Accessory Power Bus?*), Dr. Puckett points out that the Cobalt – like the Tortoise – is a slow-motion turnout motor; however, the Cobalt does not employ a stall motor which the Tortoise uses. The advantage is that the Cobalt draws about 40mA of current only when in motion. After completing its motion, the Cobalt motor shuts off, and the unit draws less than 5mA as the embedded IC decoder waits for its next command. This means that 200 idle Cobalts would draw about 1 amp of current. You would have to activate (throw) 25 Cobalts simultaneously to draw 1 amp of current. The Tortoise draws about 15-16mA when stalled.

What's In the Box? Here is what you get when you open the box for each turnout:

Circuitron Tortoise	DCC Concepts Cobalt iP Digital
Tortoise	Cobalt iP Digital
Fulcrum	Fulcrum
Throw wire (3.5" x 0.025")	Throw wire (pre-bent heavier gauge)
Throw wire retaining screw	Throw wire washer head retaining screw
	Precut double-side sticky foam pad
	5 each mounting screws

In the Tortoise Instruction Sheet, Circuitron suggests "Apply double-faced foam tape (available at hardware stores) to the entire top surface…" and recommends #4 x ½" wood or sheet metal screws to attach the Tortoise under the layout. They also suggest applying a bead of silicone RTV (bathtub caulk) around the two mounting flanges under the layout, but none of these three items is included. Under the Wiring heading, Circuitron says, "We recommend locating an 8-position terminal block near the TORTOISE and running the wires from the TORTOISE to it. In this way, any changes in wiring can be made at the terminal block without having to desolder connections on the board."

Nothing additional needed. The Cobalt iP Digital includes everything required to physically install it. A trip to the hardware store for sticky tape, mounting screws, and terminal blocks is not necessary. And the throw-wire is a heavier gauge than the one that comes with the Tortoise, so there is no need to go to the hobby store to replace it. And that saves time and money.

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COBALT IP DIGITAL VS. TORTOISE

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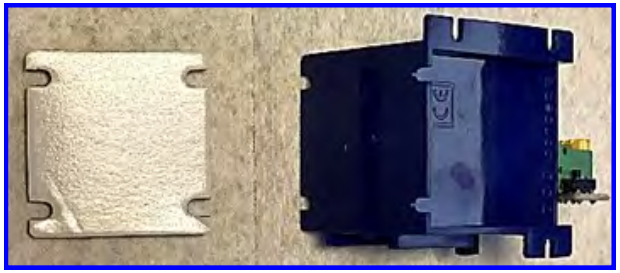
INSTALLATION



The Cobalt comes with a precut double-sided sticky foam pad that covers the top of the unit and holds it in place while you drill and install the included mounting screws. The foam pad provides sound isolation from the layout base resulting in quieter operation. The Cobalt also includes internal sound-deadening material to make it even quieter in operation, as shown in a previous section.

The Cobalt iP Digital also has the capability of being mounted horizontally which is difficult for the Tortoise (it doesn't have the mounting flanges.) This may require the use of the Cobalt Right-Angle Adapter w/Mounting Hardware (3-Pack, SKU: DCP-RA3) at a MSRP of about $15.00.

The Cobalt ships from the factory with the motor in the center position making installation easier as the throw wire is already centered as you insert it through the layout base and the turnout throw bar. The included throw wire is a heavier gauge than the one included with the Tortoise (many Tortoise users replace its included throw wire with a heavier gauge prior to installation.)

Also, the Cobalt throw wire is pre-bent and ready for installation. Simply insert the fulcrum bar into the rails on the Cobalt, add the throw wire passing it through the center hole on the fulcrum bar, and then insert the bent end of the wire into the smaller top hole on the end of the throw arm, securing it in place with the provided washer head screw.

Many modelers have used the Acculite SNAP Edge-card to Screw Terminal adapters when installing Tortoise machines, or they have pre-soldered a wiring harness onto the Tortoise edge-card connector with the other end connected to a terminal block mounted under the layout near the Tortoise. Connections to the Tortoise are then made to the terminal block, as suggested by Circuitron.

The Cobalt has an integrated spring-loaded solderless connector bar. Just strip about 0.39 inch (10mm) of insulation from each wire twisting the strands, depress the Cobalt connector, insert the wire, and release. The manufacturer suggests not tinning the wires as it makes them more susceptible to slipping out of the connector. And each Cobalt has a label affixed next to the connectors which identifies which wire to connect to each contact.

Notice the yellow "SWITCH WIRING ONLY" label reminds the user not to connect the power leads to the incorrect pushbutton switch terminals which voids the Lifetime Warranty.

PROGRAMMING

In Larry Puckett's video, he demonstrates how to program and address the Cobalt iP Digital directly from your DCC throttle rather than using a stationary decoder like the Digitrax DS-64. You address the switch machine from your Digitrax throttle, and the address is stored in your Command Station and in the Cobalt iP Digital. Similar functions are presumably available on NCE and Lenz DCC Systems, as well.

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COBALT IP DIGITAL VS. TORTOISE

(CONTINUED)

PROGRAMMING (CONTINUED)

The Cobalt iP Digital comes with its throw-bar physically pre-centered until it is commanded for the first time. It also has a built-in software structure for automatic centering that makes future installations easier. (Address 199 and 198 are used for activation/deactivation). In the picture on the previous page, note that there is a slide switch affixed to the left of the terminal connectors. The switch is marked with two positions – "Set" and "Run," the use of which is explained below.

Activate Self-Centering:

1. Put the switch into the "SET" position.
2. Set the address to 199. To do this, use your controller's instructions for changing a turnout.
3. Use your controller's commands to Throw and Close the turnout. Repeat twice to be sure.
4. Return the switch to the "RUN" position.
5. Cycle the power off and on (physically disconnect an input lead).

Cobalt iP Digital will now automatically self-center every time power is connected.

De-activate Self-Centering (once installation is done):

1. Put the switch into the "SET" position.
2. Set address to 198, then use the same procedure as for "Activate."
3. Use your controller's commands to Throw and Close the turnout. Repeat twice to be sure.
4. Return the switch to the "RUN" position.
5. Cycle the power off and on (physically disconnect an input lead).

Programming Switch Number

After de-activating self-centering, follow the same procedure as Activate Self-Centering above, substituting the desired switch number.

1. Put the switch into the "SET" position.
2. Set the address to your desired switch number. To do this, use your controller's instructions for changing a turnout address.
3. Use your controller's commands to Throw and Close the turnout. Repeat twice to be sure.
4. Return the switch to the "RUN" position.
5. Cycle the power off and on (physically disconnect an input lead).

ROUTING

Many model railroaders use an operations procedure called routing, which is the ability to throw multiple turnouts by throwing one route number. This is often used to bypass multiple alternate routes while traveling through a yard ladder. That function can be programmed through the Digitrax Command System. This procedure can be found online on the Digitrax website:

> Digitrax Evolution Express Family Manual Go to page 24, Paragraph 7.3.4 Route Editor

The procedure is also available in the print publications listed below:

> Digitrax Super Chief xtra Starter Set Manual Includes Instructions for DCS100 and DCS200 Command Station Booster, et al
>
> Page 83-85, Paragraph 15.4 Route Basics
>
> The Digitrax Big Book of DCC on Page 109, under Operations. The procedure for programming Digitrax DS-54s (the DS-64 was not available when the book was published, and it has now been replaced by the DS-74) is described, and then it states the following:
>
> "The third approach is to keep a list of turnouts in the Command Station so that a group of turnouts will operate when a single command is given… A DCS-100 can store up to 32 routes of this kind. Each route can contain up to eight turnout addresses."

Apparently, each of these Digitrax Command Stations can support up to 32 routes. There is also a discussion of "nested routes" which can be used to increase the number of turnouts in a single route. From the initial route, you can nest up to three levels deep, and with careful planning and programming, you can assemble up to 120 switch commands in a single route.

These three sources indicate that the DS-54 or DS-64 is not necessary to program a route for the Cobalt iP Digital turnout motors, and that eliminates a large investment of money as well as time. Routing can be handled within the Command Station, and that seems to be the preferred approach by Digitrax.

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Cobalt iP Digital vs. Tortoise

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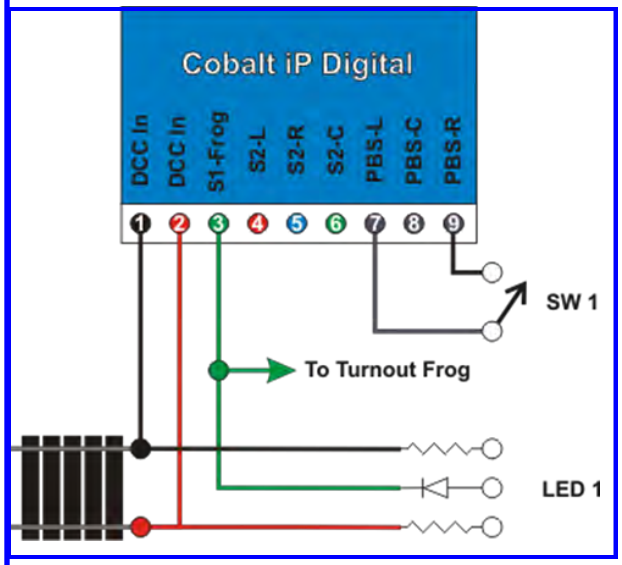
Wiring Diagram Comparisons

Included in this section are diagrams comparing the wiring necessary for the Cobalt iP Digital and the Tortoise. Since the Cobalt iP Digital has an onboard stationary decoder, it does not require an external decoder, such as the Digitrax DS-64 or DS-74. Power is supplied directly from the DCC track power or from a DCC Accessory Power Bus. Both the Cobalt and the Tortoise will provide the appropriate frog power switching.

Cobalt iP Digital Wiring Diagram (Powered by Track)

This is the classical approach to wiring track-related accessories. The major disadvantage of this approach is that the number of turnouts must be considered along with the current requirement to power the track, locomotives, sound decoders, layout and rolling stock lighting, et al. But the wiring is simpler, and the wire lengths should be shorter.



Track power (Rail A and Rail B) is connected to each DCC In (1 and 2.)

SW1 is a normally open momentary-contact switch connected to PBS-L and PBS-R. Two switches can be wired with one lead from each switch connected to PBS-C and the remaining lead from one switch to PBS-L and the remaining lead from the other switch to PBS-R.

LED1 is a 3mm bicolor 3-lead LED (Red/Green) which has each of its anodes (short leads) connected through a 1.5kΩ – 5kΩ resistor to track power. As the resistor value increases, brightness of the LED decreases. Its common cathode is connected through a 1N4001 or a 1N4002 diode to the S1-Frog lead.

Since the Cobalt iP Digital has an embedded decoder, follow the programming instructions above to set the appropriate turnout number using your Command Station power and an appropriate throttle.

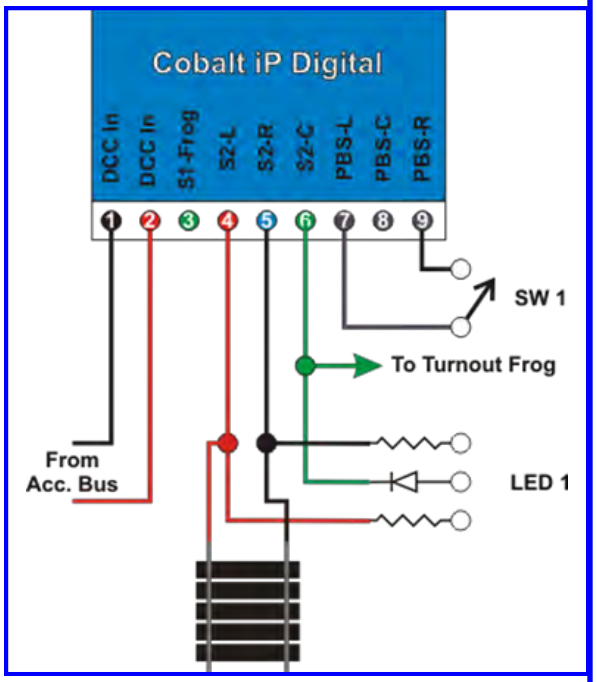
Cobalt iP Digital Wiring Diagram (Powered by Accessory Bus)

An alternative approach is to power the turnouts with an accessory bus, leaving all of the track power to run locomotives and their onboard accessories. Dr. Larry Puckett details this procedure in his video, *Who Needs A DCC Accessory Power Bus?*

Accessory Bus power is connected to each DCC In (1 and 2) to power the turnout machine.

SW1 is a normally open momentary-contact switch connected to PBS-L (7) and PBS-R (9.) Two switches can be wired with one lead from each switch connected to PBS-C (8) and the remaining lead from one switch to PBS-L (7) and the remaining lead from the other switch to PBS-R (9.)

The frog needs power taken from the track or track bus, so the connection "S1-Frog" can not be used because it takes its feed from the accessory bus instead of the track. Consequently, track power is connected to "S2-L" and "S2-R" (4 and 5.) The turnout frog is connected to "S2-C" (6.)



LED1 is a 3mm bicolor 3-lead LED (Red/Green) which has its anodes (short leads) connected through a 1.5kΩ – 5kΩ resistor to track power. As the resistor value increases, brightness of the LED decreases. Its common cathode is connected through a 1N4001 or 1N4002 diode to the S2-C Frog lead.

Since the Cobalt iP Digital has an embedded decoder, follow the programming instructions above to set the appropriate turnout number using your Command Station power and an appropriate throttle.

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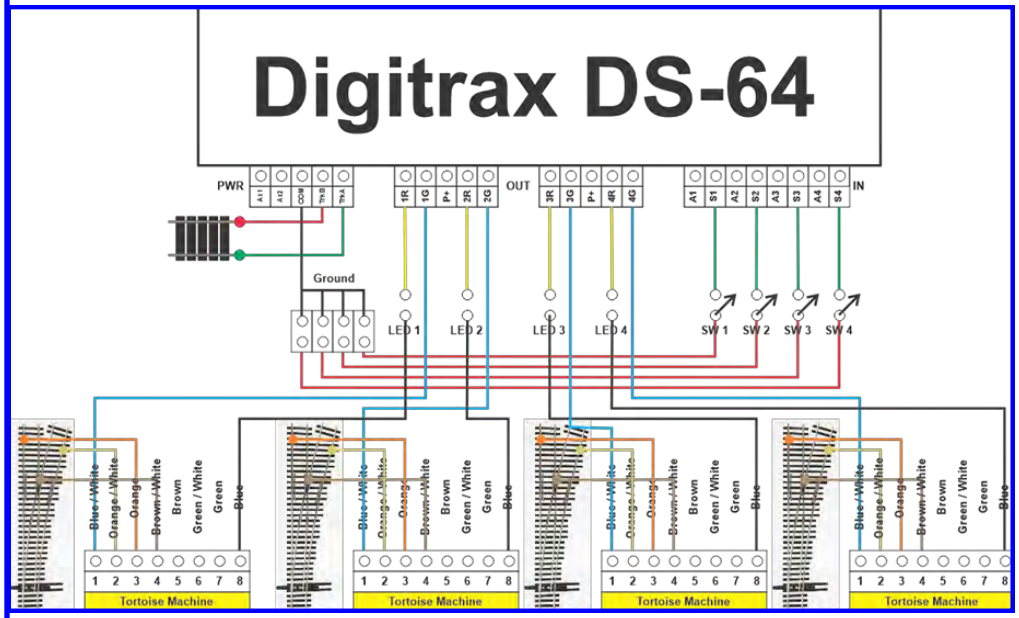
Cobalt iP Digital vs. Tortoise

(continued)

Tortoise Wiring Diagram

Because the Tortoise relies on an external stationary decoder, such as the Digitrax DS-64 for remote addressing up to four turnout machines,



the diagram may seem more complicated than it really is.

Track power from Rail A and Rail B is connected to the TrkA and TrkB terminals of the DS-64. The COM terminal is wired through physical switches to Input Terminals S1-S4 respectively of the DS-64.

Tortoise power is connected from Terminal 8 of each Tortoise through an LED to Output Terminals 1R – 4R respectively, and Terminal 1 of each Tortoise is connected to Output Terminals 1G – 4G, respectively.

The diagram shows the wiring of the turnout Frog. Terminals 2 and 3 of the Tortoise are connected to the rail power, and Terminal 4 is connected to the Frog of the turnout.

The diagram above shows some eighty (80) soldered and screw-terminal connections must be made to attach four (4) Tortoises to a single Digitrax DS-64. The optional use of terminal strips increases the number of connections required.

Comparative Cost Analysis

From current pricing on eBay, the following is a price comparison for one dozen of the Cobalt iP Digital vs. the Tortoise:

Item	Qty	Price	Price per Turnout
Cobalt iP Digital	12-pack	$ 219.99	$ 18.33
Tortoise	12-pack	$ 208.97	$ 17.41
Acculite SNAPConnector	6-pack	$ 33.74	$ 5.62
Digitrax DS-64	4-channel	$ 63.49	$ 15.75
Total Tortoise Price		$ 466.92**	$ 38.78
Tortoise	12-pack	$ 208.97	$ 17.41
Acculite SNAP Connector	6-pack	$ 33.74	$ 5.62
Digitrax DS-74	4-channel	$ 63.20	$ 15.75
Digitrax DSXC4 Connect-Board	1 / DS-74	$ 13.60	$ 3.40
Digitrax DSXCP1 Switch w/ LEDs	4 / DS-74	$ 49.16	$ 12.29
Total Tortoise Price		$ 654.33**	$ 54.48

That is a savings of about $20-$36 per turnout, the wiring is much simpler (less connections to make and possibly fail) and involves a lot less labor.

Items in this table were priced at eBay seller ID: modelrrsupply, Mountain Subdivision Hobbies in Ontario, NY.

[** Total Tortoise Price includes 2 each 6-packs of the Acculite SNAP connectors and 3 each Digitrax DS-64 or DS-74, making the Tortoise more like the Cobalt iP Digital. If using the DS-74, you may want to add DSXC4 Connect Board ($13.60) and 4 each DSXCP1 Control Panel Switch w/LEDs ($12.29 each) which brings the cost of the DS-74 to $125.96 to run four Tortoise machines. In addition, you may wish to replace the Tortoise throw wire with a larger diameter wire and add the double-sticky pad and mounting screws. Prices may vary with the myriad of vendors that are available online and locally.]

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COBALT IP DIGITAL VS. TORTOISE

(CONTINUED)

TORTOISE VS. COBALT IP DIGITAL WARRANTY

CIRCUITRON warrants the TORTOISE against defects in materials and workmanship for a period of nine (9) years from the date of purchase. CIRCUITRON will repair or, at its option, replace those components that prove defective, provided the product is returned (properly packed and shipping prepaid) directly to the factory. This warranty covers all defects incurred in normal use of the TORTOISE and does not apply in the following cases:

- If damage to the device results from abuse, mishandling, accident or failure to follow instructions.
- If failure of the auxiliary switching contacts results from application of current loads exceeding the ratings.
- If either the product label or date stamp label have been damaged, altered or removed.
- If the product has been used for a purpose other than that intended or in a commercial or club layout.

Requests for warranty service must include a dated proof of purchase, a written description of the nature of the problem and $3.00 US for shipping and handling.

DCCConcepts guarantees and warranties are always made in respect of the original owner of the products. While our first priority is to always be sure that users of our products are given the best possible service, we do also reserve the right to request proof of purchase so we can properly establish that you were the original purchaser and user of the product. DCCconcepts use the best quality materials, testing each and every Cobalt iP Digital turnout motor multiple times prior to packaging for sale and so we have no hesitation in providing the best warranty possible. Simple promises only need simple words: If your Cobalt iP Digital ever fails or needs service when it is being used under fair and reasonable conditions we will repair/replace it at no charge. We offer this guarantee to you for as long as you own it.

CONCLUSIONS

As you can see from the wiring diagrams, fewer connections are required for the Cobalt iP Digital than for the Tortoise when it is desired to throw turnouts remotely from the DCC throttle. This reduces installation time considerably as well as making the installation much less susceptible to wiring and programming errors. It will also eliminate potential time-consuming troubleshooting of errors.

From the wiring diagrams above, approximately eighty (80) soldered or screw-type connections are required to install a Digitrax DS-64/74 and four (4) Tortoises. Wiring four (4) Cobalt iP Digital turnout motors requires fifty-six (56) connections, twenty (20) of which are made to spring connectors on the Cobalt iP Digital.

The spring-loaded electrical contacts on the Cobalt iP Digital make wiring much easier and faster than soldering or using the Acculite edge-card connectors with the screw terminals on the Tortoise. The finished connection should be just as solid as the soldered or screw-down connections.

Programming a turnout number to each Cobalt iP Digital requires less steps than programming the Digitrax DS-64/74 for each of the four turnouts (the DS-64 outputs) connected to it. Again, this saves time and reduces the chance for introducing errors. It also saves money since you don't need to buy a DS-64 or DS-74!

The Tortoise comes from the factory with the fulcrum, a throw wire (3.5" x 0.025"), and a screw to attach the throw wire to the output arm. Many users find the included throw wire too flimsy, and they will replace it with a heavier gauge wire (purchased separately.) This requires drilling out the throw arm mounting hole with an appropriately-sized bit in a pin vise. It is then necessary to bend the throw wire to the proper configuration as shown on the installation instruction sheet. After installing the fulcrum and throw wire, it is recommended to use double-sided sticky foam tape (purchased separately) to attach the top of the Tortoise to the bottom of the layout. This makes installing the mounting screws (also, purchased separately) much easier.

The Cobalt iP Digital comes from the factory with a double-sided sticky foam pad (pre-cut to match the top of the Cobalt), the fulcrum, a heavier gauge properly bent throw wire, a washer head screw to mount the throw-wire to the output arm, and five screws (they give you one extra!) to secure the turnout motor to the bottom of your layout. Everything you need for installation is in the box, and that eliminates shopping time!

The Circuitron Tortoise Warranty covers failures for a period of nine years. The warranty for the DCC Concepts Cobalt iP Digital covers failures for as long as you own it.

Finally, there is an approximate $20 to $36 cost-savings per turnout when using the Cobalt iP Digital. Multiply that by 50 to 80 turnouts on a typical layout, and that adds up to some significant money that could be used for other things.

Continued on next page

Cobalt iP Digital vs. Tortoise

(continued)

Simplicity = Reliability.

The DCC Concepts, Ltd. Cobalt iP Digital turnout motor is worth investigating for use on your layout if you are adding switch machines or just planning a new layout. It is not the intent of this report to suggest that you should replace your installed Tortoise switch machines because they have proven themselves to be reliable for many years. However, technology advances, and sometimes the improvements are worth exploring. The Cobalt iP Digital includes many benefits that must be considered.

—Bob Wood

The author has utilized several resources listed below to compile this report. Several Cobalt iP Digital turnout motors were purchased with which to do hands-on experiments. A special thanks to Mr. Howard Goodwin, MMR® #556 who helped with the evaluation and subsequent wiring which resulted in the included diagrams.

Bibliography

Items in the cost comparison table were priced at eBay seller ID: modelrrsupply, Mountain Subdivision Hobbies, at mountain-subdivision-hobbies.mybigcommerce.com in Ontario, NY. The link is to their website (off-eBay.) The following vendors reportedly carry the Cobalt iP Digital, and there may be other vendors as well:

www.blueoxtrains.com

www.bobthetrainguy.com

www.ironplanethobbies.com

www.trainz.com

YouTube Videos by Dr. Larry Puckett, The DCC Guy, Contributing Editor of Model Railroader Magazine, and Author of several books on DCC and Model Railroading in general

188. Is The Cobalt Digital A Tortoise Slayer? at www.youtube.com/watch?v=0fp_31gVri4

190. Who Needs A DCC Accessory Power Bus? at www.youtube.com/watch?v=APX60bUOUCY

197. Fully Automate Your DCC Reverse Loops at www.youtube.com/watch?v=6qpkbL0Pqwg

DCC Concepts, Ltd. Resources

DCC Concepts Home Page at www.dccconcepts.com

Cobalt iP Digital Owner's Manual at www.dccconcepts.com/wp-content/uploads/2000/02/Cobalt-iP-Digital-Manual-v3-20190512.pdf

Circuitron, Inc. Resources

Circuitron Home Page at circuitron.com

Tortoise™ Instruction Sheet

Digitrax Resources

Digitrax DS64 Stationary Decoder Installation Manual at www.digitrax.com/media/apps/products/stationary-decoders/ds64/documents/DS64_flattened.pdf

Programming the DS64 (YouTube Video by Digitrax, Inc.) at www.youtube.com/watch?v=1JCo86J1WJI

Digitrax Evolution Express Family Manual

(Covers: DCS210+, DT602's and UR93) at www.digitrax.com/media/apps/products/starter-sets/evox/documents/Evolution_Express_Manual.pdf

Special Thanks: To Howard Goodwin, MMR #556, for his interest and help in evaluating these two products and teaching me the things I had forgotten about diodes and LEDs.

To Rob Dodds and Jim Travis, for their assistance learning to wire and program the Digitrax DS64 to make Tortoises work correctly and for introducing me to the concept of Routing.

About the Author:

Robert E. (Bob) Wood, Jr. is President/Owner of Eagle Marketing Systems, Inc. with a background in computer programming, technical writing, computer sales, and audio/video staging, recording, and editing. He has some forty (40) published videos, mostly involving the building and operation of model railroads. He has been an active member of the Piedmont Division, Southeastern Region, NMRA, Inc. since 2008, and he currently serves as Secretary of The North Atlanta Rail Barons operating group within that organization.