

# The Modeler's Journal

A Free Journal for Today's Modeler

VOLUME II

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

JUL-SEP 2019

## Building Air Power

Be Sure To Check  
Out Columns From  
Harry M. Haythorn,  
Jack Hykaway, Ron Marsh,  
and The Track Planner

Featuring Filippus G.  
Anagnostopoulos's  
Award-Winning  
Diorama!



Cover Photograph Courtesy of Filippus G. Anagnostopoulos.



# Editor's Note...

In this summer issue of *The Modeler's Journal*, we feature the award-winning work of Filippus G. Anagnostopoulos in a pictorial essay of one of his dioramas featuring a scratch-built shelter (hanger), and two F16C fighter jet models. The work is detailed and accurate to the prototypes.

In "The Modeler's Workshop" Ron Marsh discusses two fundamental concepts of railroad operations that are important to understand when operating a functional model railroad: train authority and car forwarding. It is quite an educational essay.

The Track Planner (Bill Beranek), has some fun exploring the concept of building a dream layout that, within reason, is the utopia of track planning. Bill applies his seven design elements and other design parameters to show us what it possibly would take to build this dream layout and what that design might look like. Once you read his column, think about what your design vision and utopia is for your layout.

In his column "UP-Hub" Harry M. Haythorn documents how he custom-builds UP's Theater Car 420 *Fox River*. For those following his car build series (and even if you are not), you will definitely enjoy this article.

And finally, in his column "Jack's Junction" Jack Hykaway explores the F40 and writes about how the reincarnated F40PH diesel saved North American passenger service in the 1970s and became the hero of a vulnerable time.

We hope you enjoy this issue. Happy modeling!

– **Loggin' Locos**  
Editor-In-Chief



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*A Hellenic Air Force Demo Team  
"Zeus" F-16C Block 52 sits on the  
tarmac after another successful air  
show.*

*This and more within this issue of  
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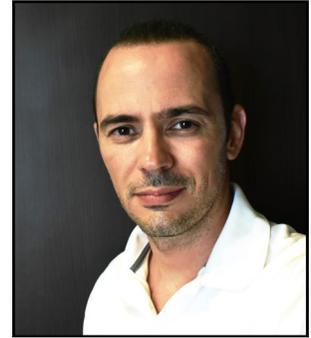
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Ron Marsh



# Building Air Power

**S**ince my early childhood, I have had a passion for aviation and airplanes which has led me to this amazing hobby where I assemble plastic model kits - mainly airplane themes. I wanted to have these incredible machines which I admire, in my home, even if they are just models. I started with a few basic supplies and very little information or research as there weren't many resources and there were only a few aviation-related magazines available for purchase at the time. I had to steal a few hours here and there from studying to assemble my favorite jet airplane models, hand-paint them, and finally place them in my showcase.



**By Filippus G.  
Anagnostopoulos**

A few years later, the Internet proliferated and offered vast amounts of information. New materials became available in the marketplace and new techniques helped me develop my favorite hobby. A couple of years ago I decided to level up and buy my first airbrush, an Iwata HP-CR Revolution. I started practicing on old models that were broken and unfinished to get familiar with the new tool. After a few months, I fell in love with painting with an airbrush, so I purchased a second airbrush. This time I chose an Iwata HP-C PLUS and I've used it for countless models since. In this article, I will present to you one of my latest projects which I can say I'm really proud of.

All photographs by Filippus G. Anagnostopoulos.

Filippos started model making with a few basic supplies and over the course of the past 27 years, has made many award-winning models and dioramas.



# 1:72 Scale Scratch-Built Hardened Aircraft Shelter with a Tamiya F-16C Block 50 of the Hellenic Air Force (HAF)



This specific diorama had been in my mind for more than twenty years. My goal was to represent a typical day of the 341<sup>st</sup> Squadron that is based on the 111<sup>th</sup> Combat Wing at Nea Anchialos Air Base near Volos' City in Greece. The role of the squadron is to suppress any enemy air attacks and to defend Greek airspace. I started researching by studying a few photographs of that era in a number of aviation magazines. I decided to try building it using some cheap and easy to find materials; wood for the main base, hard cardboard, and white glue. Choosing simple materials that were readily available kept the costs down and provided a fun challenge. However, some of the best plans never really come together, and this was the case with this model - the final result didn't satisfy me as I thought it was poorly detailed.

The project was then benched for two years before my inspiration was reignited by some images I had found online. This time, I used new materials and took my time, carefully researching the model's prototype. I recycled the main structure of the shelter from the previous model; however, the steel tubes of the interior were replaced, as were the main doors. Fortunately, all of the measurements I made a few years ago were 90% accurate to the prototype. I compared it using Google Earth and I was really happy with the results.





## The Construction

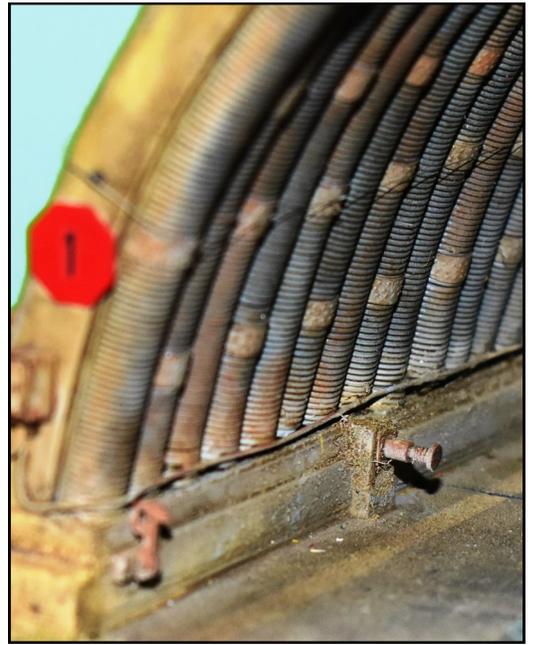
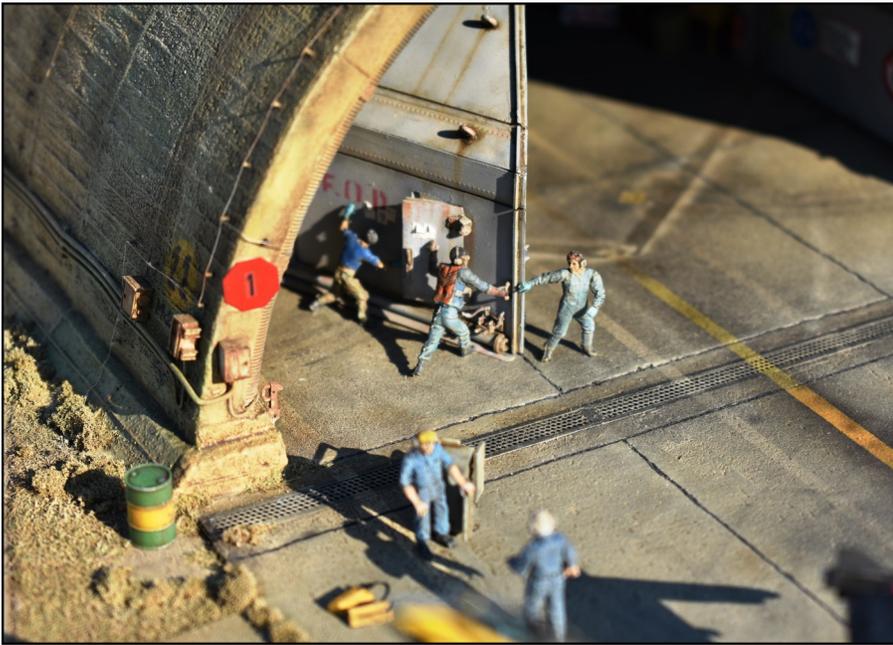
Building from the base up, I started on the plywood designing the “floorplan” of the diorama and then I glued cork sheets in place. After some trial and error, I found the best location for the shelter, and I also engraved the pattern of the tarmac tiles (mimicking the pattern visible on Google Earth), at this time. The tiles are square and measure about 8cm x 8cm in 1:72-scale.

The shelter was made using cardboard and is held together by an abundance of white glue. This amount of glue was necessary so that I could simulate the curved shape of the prototype. In order to recreate the interior hardened steel tubes, I used the power cord which I wrapped with fishing line. I used nearly 150 meters of fishing line to cover ten 30cm pieces of the cord! To create the doors, I used cardboard and a sheet of Evergreen styrene plastic for the plating (please see materials list). Finally, I used a mix of the various Evergreen rods

## The Materials

- 36cm x 66cm x 3cm Plywood for the Base
- Cardboard Cartons
- Cork Sheets
- Evergreen Sheet Styrene 0.4mm, 0.13mm, and 0.25mm
- Evergreen Strips 0.75mm x 2.0mm, 0.56mm x 0.84mm, 0.5mm x 0.5mm, 0.25mm x 4.8mm, 1.09mm x 1.09mm, and 0.4mm x 0.5mm
- Evergreen Rods 0.5mm, 1.0mm, 1.2mm, 0.88mm, and 1.6mm
- Flexible Power Cord NYLHY 2 \* 0.5 White Polyclone Round (H03VV-F 2 x 0.5 White)
- Fishing Line
- White Glue
- Super Glue
- Balsa Wood Strips 10mm x 10mm
- Putty
- Maquets Grass
- Thread
- AK Terrains - Desert Sand
- AK Terrains - Asphalt
- AK Terrains - Concrete
- Gunze Colors
- Van Gogh Oil Colors





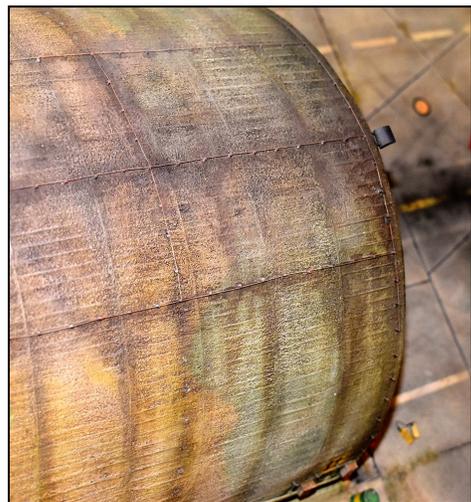
and strips to build the door mechanisms. The interior wall of the shelter and the exterior surface were again made of cardboard and were coated with AK Concrete.

Before I applied the AK Concrete, I glued down some pieces of thread onto the roof of the shelter to represent the mold lines of the real concrete surface. After the shelter construction was nearly complete (only painting and a few wire details remained), I coated the entire tarmac surface with AK Asphalt. I tried to give a different texture to each of the individual tiles, just like in real airbase tarmacs. Finally, I used the AK Desert Sand to represent the ground around the tarmac and added maquet grass in some specific areas.

The last details on the shelter and the base were made from a mix of Evergreen sheet styrene, rods, and strips. These details included the spotlight on the top of the model, the power lines and the boxes beside the shelter, as well as the numerous floodlights to name a few.

Once the details were in place, the diorama was ready for the paintbrush. I used different tans, browns, and greys for the tarmac and several tones of green and tan for the shelter's camouflage colors. Various grey colors were used for the interior and for the steel doors. I painted the small construction area which was used for storing the FOD water and other barrels in red.





I chose yellow and white for the various guidelines on the surface of the asphalt. The last order of business was to wash the whole surface with Van Gogh Raw Umber. Washing the surface increased the contrast of the model and made every detail and texture pop, giving the diorama a more realistic look.

## The Kits:

- 1:72 Tamiya F-16CJ Block 50 Fighting Falcon
- 1:72 Eduard F-16CJ Block 50 BigSin
- 1:72 Hasegawa U.S. Aerospace Ground Equipment Set
- 1:72 Italeri NATO Pilots and Ground Crews
- 1:72 Verlinden Airbase Flight Line Accessories

The main kit of the diorama is the Tamiya F-16CJ. It's an amazing kit, and when combined with Eduard's BigSin kit, the final kitbashed product gives quite an accurate representation of the Greek F-16c Block 50 of the 341st squadron. I didn't face any problems building the kit; it was actually a very smooth and pleasurable build.

Once built, I was ready to apply the paint. The Ghost Scheme camouflage used on these jets is inspired by the US F-16N Aggressors of the US Navy. The camouflage consists of three blue-grey shades, which are very suitable for the Greek environment. This scheme has been used by the Hellenic Air Force since the day the first F-16 landed in Greece in the late 1980s, and the Greek F-4E Phantoms that still fly for the HAF, are painted in these colors. For my model, I chose what is in my opinion, the most accurate set of colors.







For some of the details, I used a variety of pieces from a variety of kits. From the Hasegawa Ground Equipment set, I used only the A/M32A-60A Generator, the A/M32C-10 Air Conditioner, the MC-1A High-Pressure Compressor, and the NF-2 Lighting Unit. Since the upper part of the lighting unit was not quite to scale, I myself scratch-built that piece. The fire extinguisher was also scratch-built from the ground up using Evergreen rods, a piece of sprue plastic, wire, and two wheels found in a spare box.

The figures are a wide mix of Hasegawa and the Italeri set "NATO Pilots and Ground Crews." There are several figures on the diorama, including a pilot inspecting the aircraft (all of the pilots are painted in a prototypical khaki green uniform), and several engineers that are painted in their prototypical blue uniforms. The engineers are positioned as if they are trying to manually close the giant hardened door of the shelter.

Hellenic Air Force's  
F-16C Block 52 - Demo Team "Zeus"



After years of effort collecting information and pictures to create an accurate result, the model was finally complete. The model has been awarded 14 times in four different plastic model shows. I would like to thank some good friends of mine, who provided me with some basic information and close-up pictures of the prototype; their contribution was crucial so I could accurately recreate the model. I would like to dedicate this build to the whole staff of the Hellenic Air Force and those who gave their lives in war for peace. I hope you have enjoyed reading this article and have enjoyed the photographs of the diorama and some of the other models I have built!

### **About the Author**

Filippos G. Anagnostopoulos is a native of Greece and lives in Alimos which is a southern suburb of Athens by the sea. He studied construction design and for the last nine years, he has been working as a VIP private security officer. He enjoys building models of jet airplanes and dioramas for fun and has been making model airplanes for the last 27 years. You can check out photographs of Filippos's other award-winning modeling work on his Facebook page [Phil SMP](#).



# Gain A New Perspective With The Track Planner!

Follow Bill Beranek's column "A Perspective on Track Planning" in every issue of **The Modeler's Journal**.

Topics include:

- ✓ Principles of Track Planning
- ✓ Designing for Operations
- ✓ Proper Benchwork Design
- ✓ Dissecting Track Plans

And much, much more!



# The Modeler's Workshop

WITH  
**RON MARSH**  
RTNT

## Fundamentals of Model Railroad Operations



[Watch Video](#)  
*Train Authority*



[Watch Video](#)  
*Car Forwarding*



**By Ron Marsh**

All photographs by Ron Marsh.

**M**odelers of any type have their pet projects. Regardless of what type of modeling you do, there are certainly some aspects of modeling that you enjoy, and some that you simply feel that you must get through to get the project finished. As a model railroader, one aspect of my niche that I find most satisfying is operating a functional model railroad. It is making the models come alive and simulating the prototype - that is the ultimate expression of the hobby for me.

As we think about model railroad operations, it is easy to get caught up in all the jobs and terminology such as dispatchers, train orders, timetables, switch lists, OS, etc. To truly understand how operations work, for both the prototype and the model, one needs to understand two fundamental concepts: train authority and car forwarding.

Train authority is the system that gives trains permission to occupy and move along the mainline within the railroad system. The purpose of the train authority system is to protect trains from collisions with opposing trains or those operating at different speeds while moving goods around the system. There have been many different train authority systems used by prototype and model railroads alike, but let us look briefly at a few representative examples.

A basic train authority system for a model railroad is the sequential order system which is best for small layouts and crews and allows trains to operate in a given order. Trains are given authority to operate on the main when the previous train has finished its work and cleared the main.

On the other end of the spectrum, one of the most complex and interesting operating systems is the Timetable and Train Order (TT&TO) system. This system was used by prototype railroads from the late 1800s through the mid-twentieth century. Trains are given authority based on classification, direction, and time. This system defines the parameters in which a train may operate along a given section of the mainline within certain time limits; it is easy enough to understand and logical to operate. However, it becomes more complicated and interesting when something changes the schedule such as late trains, derailments, etc. It is at these times that paperwork multiplies, dispatchers become more stressed, and trains crews must be extra aware (see Figure 1).

If one is modeling in a more modern era, one may prefer to use track

**Figure 1.**  
The depot that still stands in Wallace, North Carolina still has its train order signal intact.

This signal would have told train crews if they needed to receive train orders under a TT&TO system.



**Figure 3 (below right).** This is the switch list form used on my home layout. It provides ample space for a train crew worker to list all the cars to be picked up and set out on a specific job.

**Figure 2 (below left).** This is a copy of the track warrants I use on my layout. The simple fill-in-the-blank format is prototypical and gives the train crew all the information they need to work safely and efficiently.

**TEXAS COLORADO  
AND WESTERN RAILWAY**

**Track Warrant**

No. \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/20\_\_\_\_

To: \_\_\_\_\_ At: \_\_\_\_\_

1.  Track Warrant No. \_\_\_\_\_ is void.

2.  Proceed from \_\_\_\_\_ to \_\_\_\_\_ on track \_\_\_\_\_.

3.  Work between \_\_\_\_\_ and \_\_\_\_\_ on track \_\_\_\_\_.

4.  Not in effect until after arrival of \_\_\_\_\_ at \_\_\_\_\_.

5.  Hold main track at last named point.

6.  Clear main track at last named point.

7.  This authority expires at \_\_\_\_\_.

8.  Other instructions: \_\_\_\_\_

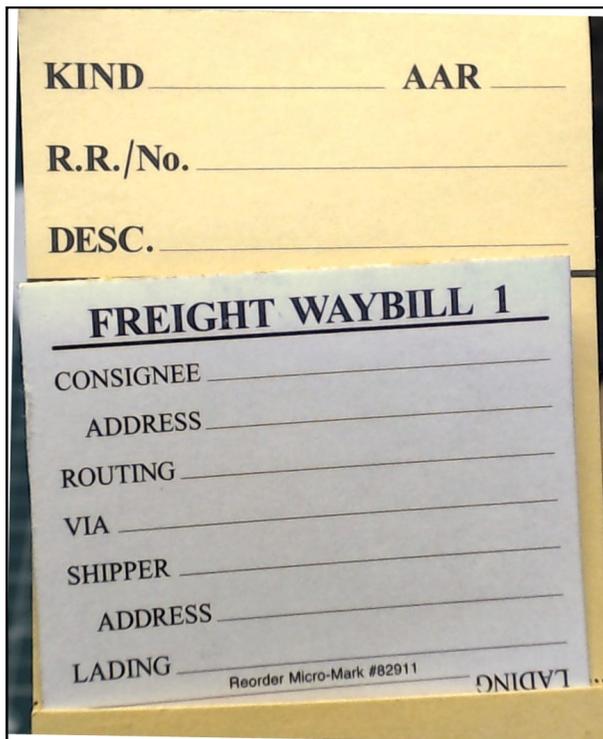
\_\_\_\_\_

OK (time) \_\_\_\_\_ Dispatcher (initials) \_\_\_\_\_

**TEXAS, COLORADO &  
WESTERN RAILWAY  
SWITCH LIST**

Train \_\_\_\_\_ At \_\_\_\_\_ Date \_\_\_\_\_

	Road	Number	Type	Destination
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
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*Figure 4. This example of a car card and a waybill shows where the specific car originated and where it is destined in one operating session.*

warrant control. This system is highly dispatcher centric. In this system, the dispatcher keeps track of all trains, where they are authorized to operate, and how they are proceeding along their route. The dispatcher dictates train orders to train crews via telephone or radio to issue track warrants (see Figure 2, an image of my track warrant), authorizing them to operate within certain limits of track and time. Track warrants can be coupled with signaling systems that indicate clearance of the tracks, but authority is still given via track warrants.

These are only a few representative train authority systems. We could also discuss manual block control, direct traffic management, centralized traffic control, and others, but time and space do not permit. It suffices to say, there are many efficient ways to grant train authority. The crucial factor is that a system is in place to protect trains from incidents while they do their work.

Once trains can move around the system via train authority, train crews need to know what goods they will be moving and how they will move them. These questions are answered with the second fundamental concept of operations, car forwarding. Car forwarding is the system by which freight cars are moved within a railroad system for the most efficient and safe operation. Car forwarding tells the train crews what cars are to be moved, from where they are coming, where they are going, what they are hauling, and any special arrangements that should be considered in their handling.

For the purpose of a model railroad, car forwarding needs to begin with some important information that is gained from doing a traffic pattern analysis. The analysis is a survey of the model railroad, its various industries, the types of commodities they ship and receive, and the types of cars needed to transport those commodities, as well as the number of

spots in the industry track, yards, and staging. This analysis dictates how many cars are on the layout, how many cars can be moved in specific trains, and what types of cars are needed in those trains. Once we have this information, we can begin to plan what cars will move where, when, and why.

Like train authority systems, there are many types of car forwarding systems with specific uses in specific situations. The most basic of these systems is the car in/car out system. While not prototypical, this system is a good place to start having fun operating trains, especially on smaller layouts. This system recognizes that certain types of cars are needed in specific industries. The owner stages the trains with the right number and types of cars prior to the operating session. As operations proceed, train crews pull cars from industries and replace them with the same number and types of cars from their train. For example, if a boxcar and a covered hopper are pulled from an industry, they will be replaced with another boxcar and covered hopper. This system is simple, fun, and requires no paperwork.

Another more prototypical car forward system is the use of switch lists. Switch lists can be prepared in advance of the operating session. These lists tell train crews exactly which cars to include in their train and which cars should be set out and pulled at each location along their route. Switch lists are one of the most prototypical systems from the perspective of the train crew, as real railroaders typically operate from switch lists. These switch lists can be handwritten, (see Figure 3), or



*Figure 5. This example of a car card and a waybill shows where the specific car originated and where it is destined in one operating session.*

they can be generated by an automated system like JMRI and printed by a computer. In some cases, switch lists can be part of a cyclical system and can be saved for reuse in a later operating session.

The most popular car forwarding system in the last few decades has been car cards and waybills. In this system, each car is assigned a card with identifying information from the car recorded on it. This car card carries a two- or four-cycle waybill which describes the car's point of origin and destination at any given time (see Figure 4). While switch lists are prototypical from the train crew's perspective, waybills are prototypical from a shipper's standpoint. One way to increase the play value of an operating session and increase one's crew size is to combine waybills and switch lists into a single system (see Figure 5). In this case, a two-person train crew receives a

pack of waybills for their train. The conductor of the train uses these waybills to prepare a switch list that guides the crew with its work on a job.

Train operations are complex and fascinating aspects of model railroading. We have barely begun to scratch the surface of their complexity here. You can see, however, that an understanding of these two fundamental concepts—train authority and car forwarding—take one a long way towards understanding the basics of how operations work and why railroads exist. To learn more, please check out my videos on [train authority](#) and [car forwarding](#) on my [YouTube channel](#).

Happy Modeling, Ron. 

## About the Author

Ron Marsh is a pastor in Southwest Missouri. He grew up in West Central Missouri where he became a railfan of the Gulf, Mobile & Ohio and Missouri Pacific Railroads at an early age.

Ron has been a model railroader for over 20 years and has modeled 1970s Missouri Pacific and contemporary BNSF.

He is currently working on his third layout—the Texas, Colorado & Western—depicting BNSF operations in North Texas and Colorado in 2008. He is a member of the [N Scale Enthusiasts](#) – a national organization for N scalers.

Ron posts model railroading videos weekly to his YouTube channel, [Ron's Trains N Things](#).

# A Perspective On Track Planning



By William (Bill) J. Beranek - The Track Planner

## The Utopia of Track Planning

**W**hat if tomorrow you woke up and your layout space had increased by 200 or 300 percent? For some, the initial response might be, "I've been transported to Shangri-La." But after the excitement subsides, serious questions start creeping in. At the top of the list would be, "with your newfound space, could you design and build the layout of your dreams?"

Initially, the answer might be, "absolutely" or "you bet I could." As a professional track planner, I'm betting the response would be something less once the pencil meets paper.

For this column, I thought it would be an interesting exercise to see what a professional might design

(within reason), versus the average model railroader.

Occasionally, I'm contacted by clients who because of relocation or a remodel, end up doubling or tripling available space. Most of us have heard the term writer's block.

What about a designer's block? In almost every case the reason they're contacting me is that the designer's block is preventing them from coming up with their dream track plan. In the world of a professional designer, this is a very predictable situation, as very few model railroaders sit around designing "what if" track plans.

### **Setting Sensible Parameters**

To keep this exercise within the realm of possibilities, I used a rectan-

gular shaped space measuring 20' x 40' setting the area at 800 square feet. I chose 800 square feet because it is two and a half to three times larger than the average track plan I have designed and is at the upper limit of most home layouts.

The second parameter was a challenge. Should I get crazy and design a three or four-level layout? It is something the average modeler would never build because of time and funds. Or do I design a plan that the average modeler could see themselves building? While it would be fun to dream, I chose the latter. Hopefully, I've designed a track plan from which the modeler can study and learn.

I chose to design a two-level track plan where the emphasis is on de-

signing a mini-transportation system and not just a model railroad. A plan that can be operated in a prototypical manner, but one that still has the option of continuous running. The plan is not going to show every single detail because that would require weeks for design work – something I don't have the time to do. I want the reader to get the basic idea of how a professional designer would use the available space.

## The New Space

For those who do get to experience a doubling or tripling of space, the process of designing and building a new layout isn't as straight forward as one would think. Questions, that were not relevant in the old space, suddenly become very relevant.

- What type of track configuration should I go with?
- Do I stay with the same prototype?
- Do I stay in the same era?
- Do I stay with the same scale?
- Do I change geographical location?
- Do I go into a completely different direction?

Factors like the amount of building materials needed (lumber, track, wiring, and scenery), are going to increase substantially. Once you have the preliminary design, calculating the amount of building material needed is fairly straight forward. The factor that does not calculate well is time!

Time does not equate like building materials. I've had clients become frustrated with my designs because it is taking them longer to build the benchwork than they anticipated. What looked fairly simple on paper didn't equate to quick construction. There is no simple formula for how long it takes to build a model railroad. Experience has taught me that without help it takes the average model railroader considerably longer than they anticipate.

## Basic Design Parameters

As I said earlier, I thought it would be fun and hopefully educational to walk the readers through how a professional designer would design a track plan when space was increased two to three times.

Here are some basic design elements we need to set:

- ✓ **Room/Space** – The room/space will be a standard rectangular shape measuring 20' x 40' with one entry door.
- ✓ **Scale** – I'll go with HO because of its popularity.
- ✓ **Track Code** – Code 83 tracks, again because of its popularity.
- ✓ **Minimum Mainline Radius** – I will use 30".
- ✓ **Minimum Mainline Turnouts** – I will use #8's.
- ✓ **Benchwork Configuration** – The benchwork will traverse around the walls with two opposing center peninsulas.
- ✓ **Track Configuration** – The track configuration will be point-

to-point with hidden staging and continuous running capabilities.

The Purpose for the Railroad – The overall design will concentrate on two large industries: coal and lumber. Coal and lumber have and need numerous supporting industries thus increasing design options. They also make good candidates for large layouts due to the high volume of rail traffic both industries generate.

Proto-Freelance – The design will emphasize 'proto-freelance' which I consider the best of both worlds, as I'll explain later.

## My Seven Design Elements

On the front page of my website is a detailed account of the seven design elements I use when designing track plans:

1. Walk-along mainlines
2. Narrow benchwork
3. Long mainline runs
4. Trains traveling through scenes once
5. Peninsulas with view blocks
6. Staging yards
7. Prototypical operations

Anyone new to the hobby should study and apply these elements to their model railroad design. These seven elements will help you design a mini transportation system and not just a model railroad. Many new modelers have a hard time thinking "beyond the basement". Think of your layout as a small portion of a much larger nationwide transporta-

tion system. In combination, the seven elements will help you avoid serious mistakes and you will end up with a fun and well-functioning layout.

## Proto-Freelance

The design will be proto-freelance, while not representing any particular prototype, it will maintain prototype characteristics. Proto-Freelance offers the best of both worlds – the prototype gives you the foundation while freelancing allows you to stray from the limitations of the prototype. Freelancing also allows you to venture into areas that are of interest to you. I would never recommend designing a track plan that tries to mimic all aspects of a prototype; even the smallest short line railroad would be too large to be

believable when reduced to the HO scale.

When designing proto-freelanced track plans, you need to be careful that you don't overdo either the freelance or the prototype. When completed, you want the design to be believable. I'm constantly advising my clients that it's easier to design a track plan that is based on one hundred miles or less, rather than trying to design a model railroad, that in the real world covers thousands of miles.

## Designing the Plan

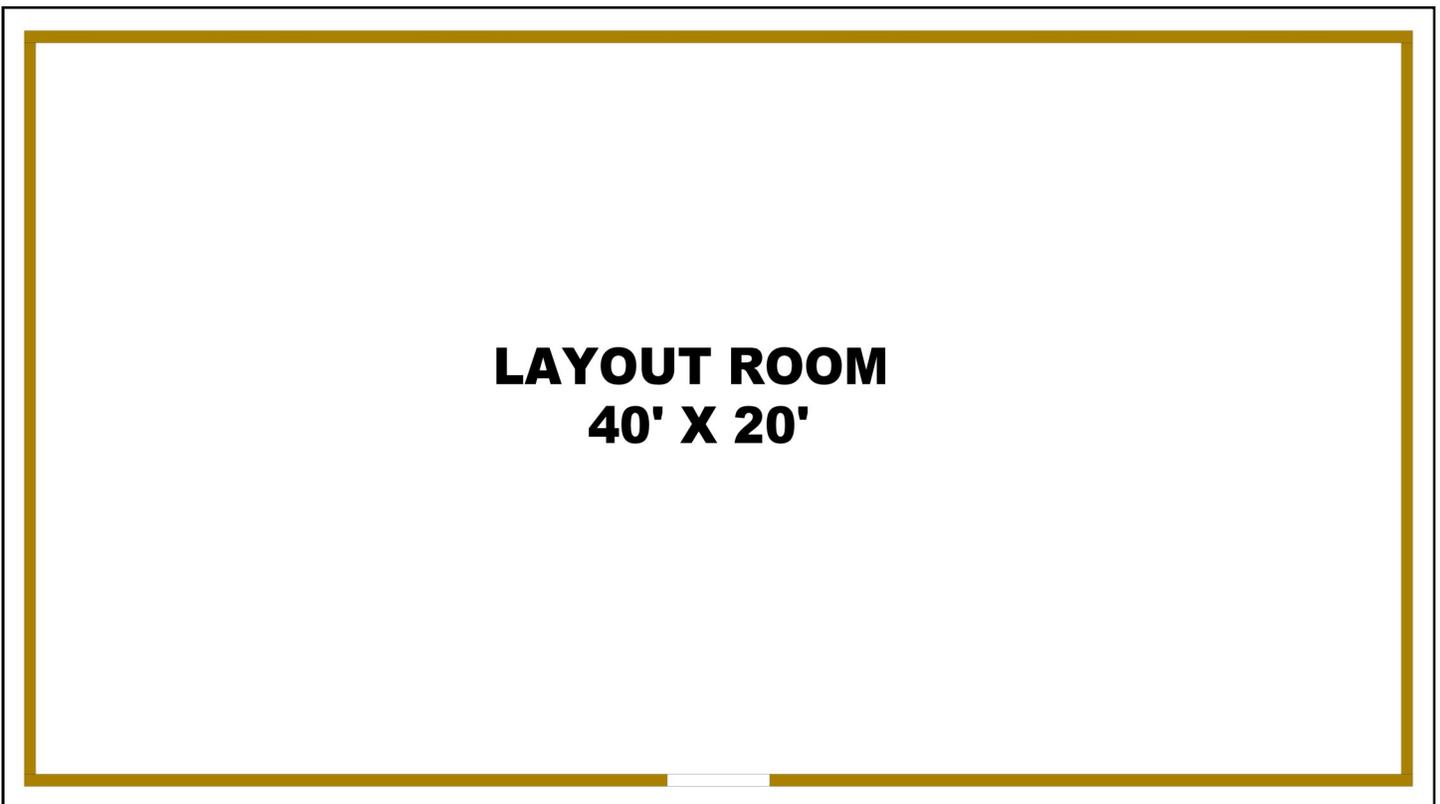
The average model railroader tends to start the design process by designing the benchwork first. Then, they try to fit a track plan to the benchwork. The professional re-

verses the process – he starts by designing the basics of the mainline first and then fits the benchwork to the track.

## The Space/Room (Picture 1)

The room is a simple rectangular space measuring 40 feet by 20 feet with an entry door along the south wall and no obstructions. Rectangular shaped spaces are easier to design in. Perfectly square spaces create design problems with benchwork, aisles, etc. A non-standard size 15' x 10' bedroom is easier to work with than your standard 10' x 12' bedroom. Space where you have a 1-1/2 to 1 or 2 to 1 ratio of width to length makes for better design space.

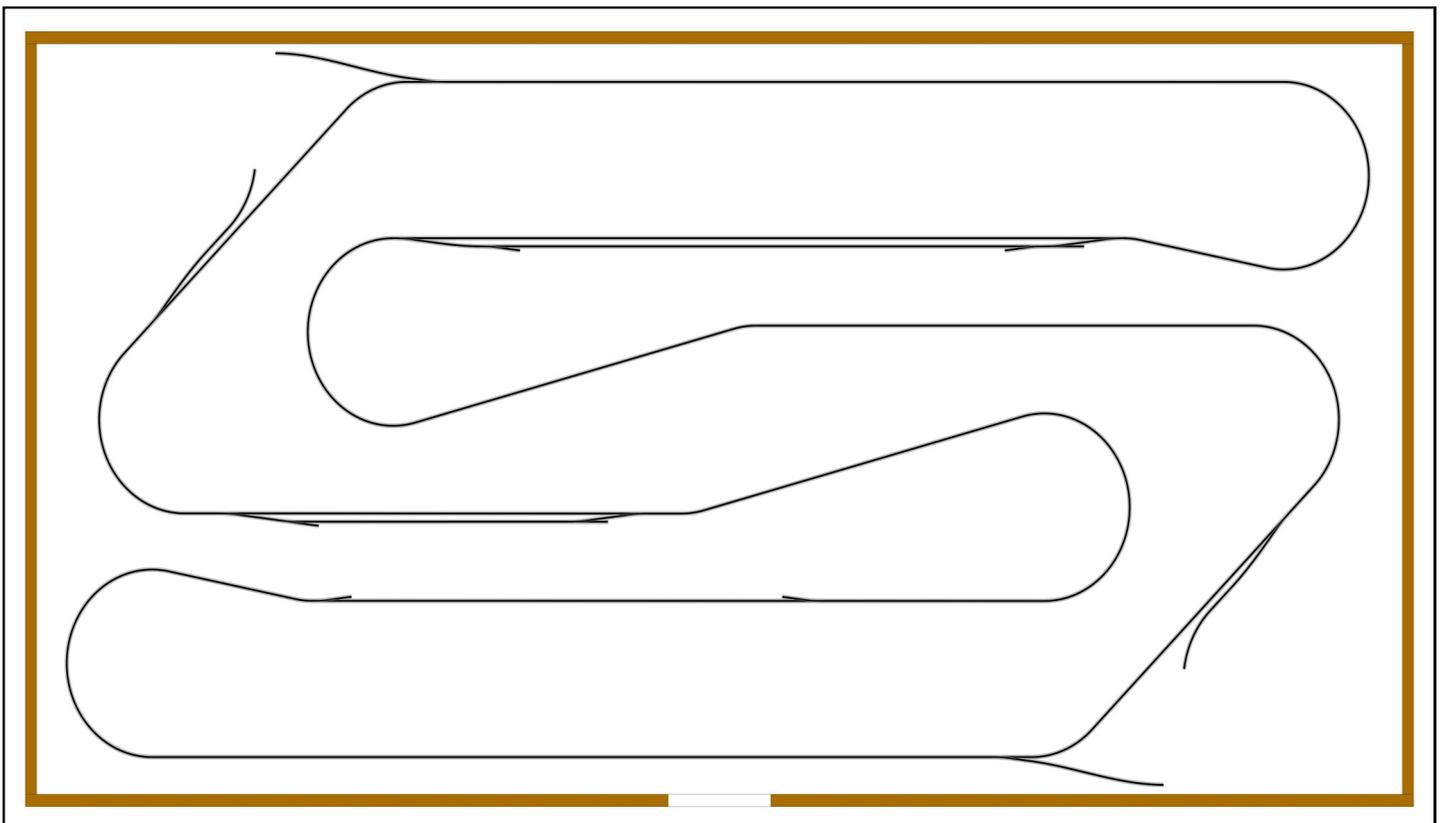
*Picture 1: The Space/Room*





*Picture 2: Helix Configuration*

*Picture 3: Mainline Configuration*



## Helix Configuration (Picture 2)

Since this particular design is going to have two lower-level staging yards, the designer needs to establish the locations and the radii of both helixes which will connect the staging yards to the mainline. The helix locations are determined and designed prior to adding any main or branchline trackage. In picture five, you can see the helix track and the benchwork placement.

## Mainline Configuration (Picture 3)

Picture three shows the basic mainline configurations. The key word is “basic” configuration; it is not the final mainline configuration. It simply

gives the designers a general idea of how the mainline will flow through the room/space. At this point, no branchline track work has been added.

## Benchwork Configuration (Picture 4)

Picture four shows the benchwork configuration. At this point, the benchwork design is close to what the final configuration will look like.

## Branchline Configuration (Picture 5)

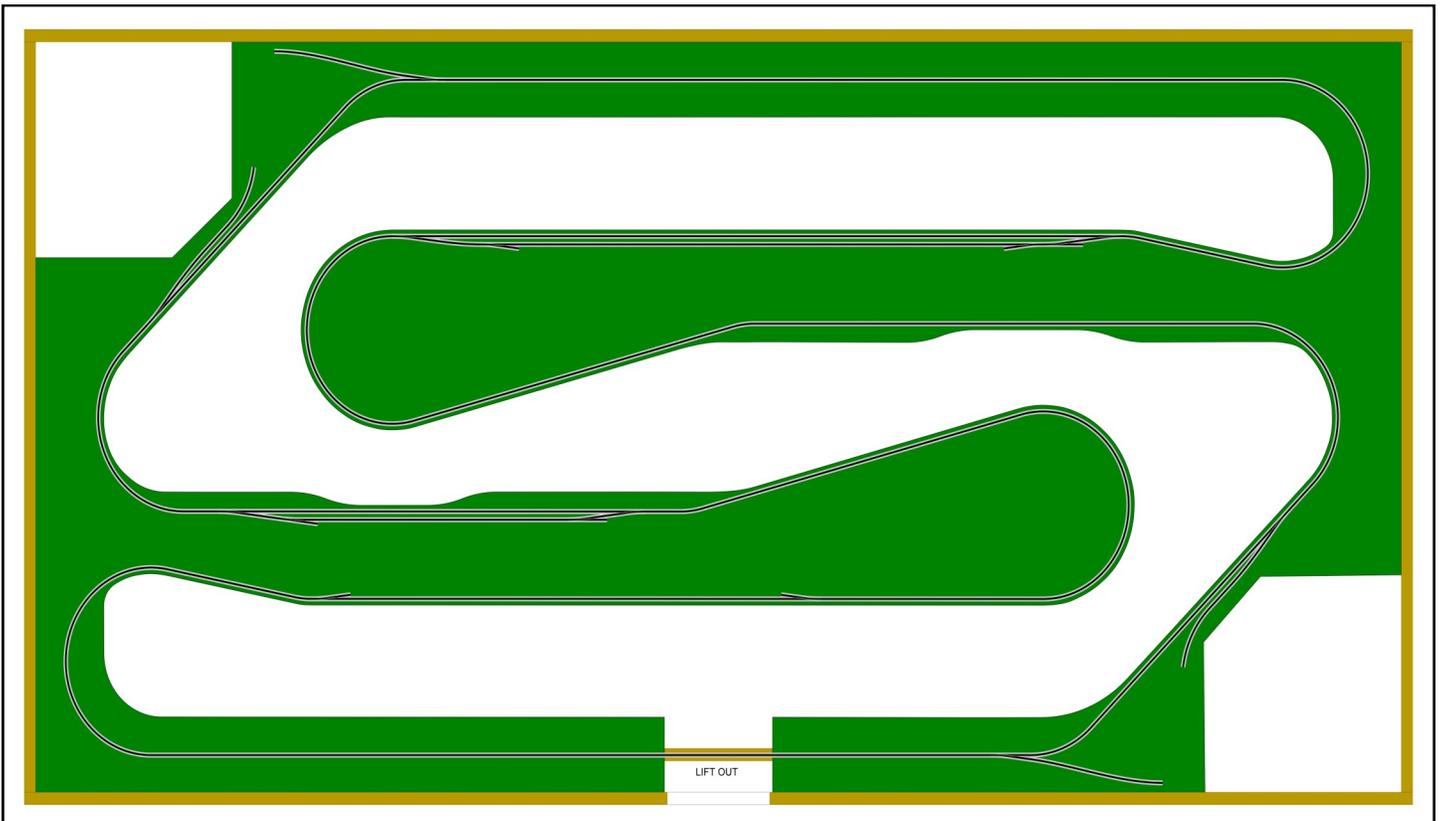
Picture five shows the addition of the branchline track work and the helixes. I have color-coded and labeled the track for easier identification. At this point, I’ve added a cou-

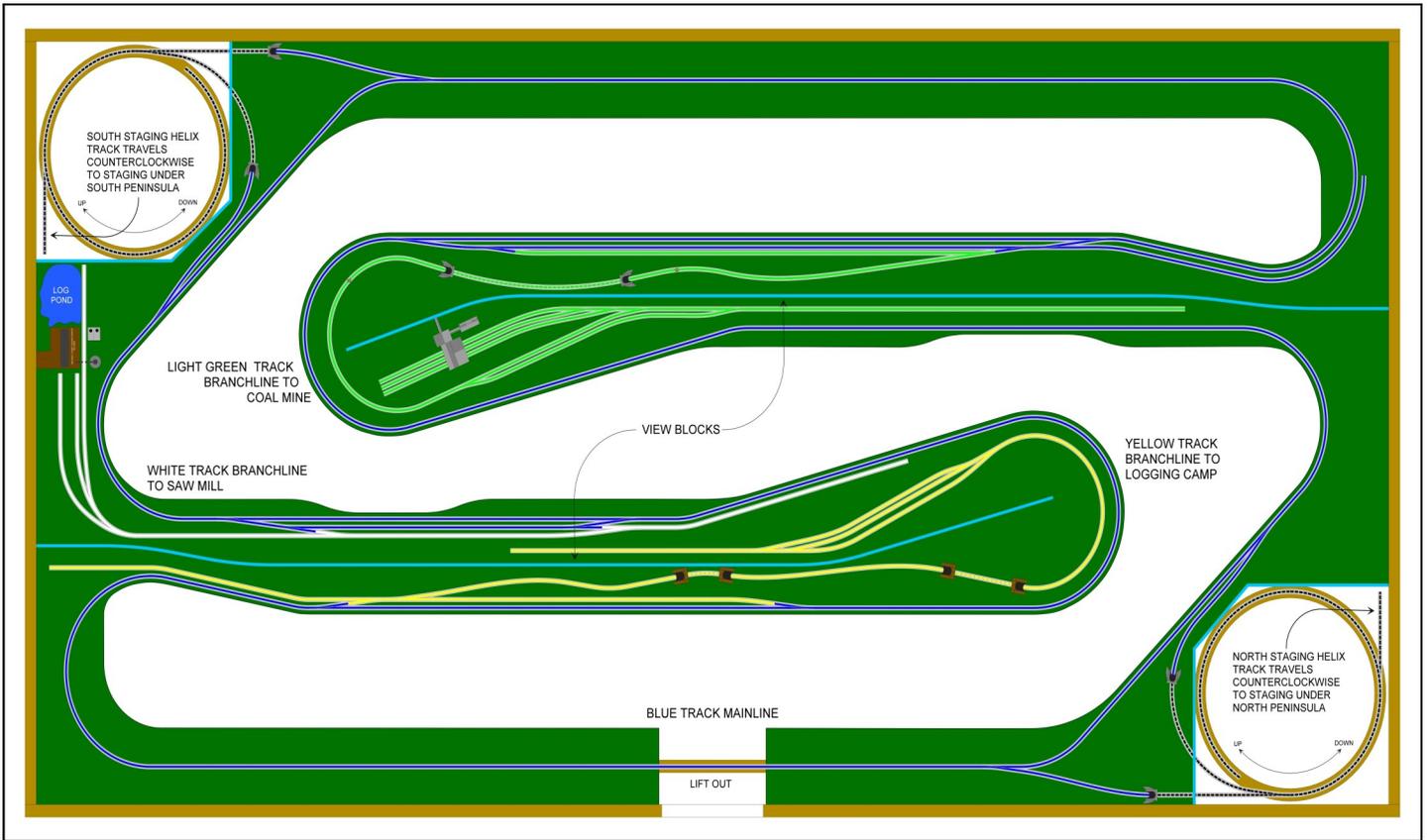
ple of structures, mainly to make sure they fit the desired locations. I have included the helix track work to show how they connect to the mainline. I’ve also added view blocks around both helixes and through the center of both peninsulas. The view blocks on the peninsulas are in their general locations. As the plan evolves, the view blocks will be moved slightly to accommodate track or scenery.

## Semi-Final Configuration (Picture 6)

In picture six you can see where I have added labeling for potential industry locations. The industry types and sizes will be determined as the plan evolves. Along the north wall, I have projected the location of the

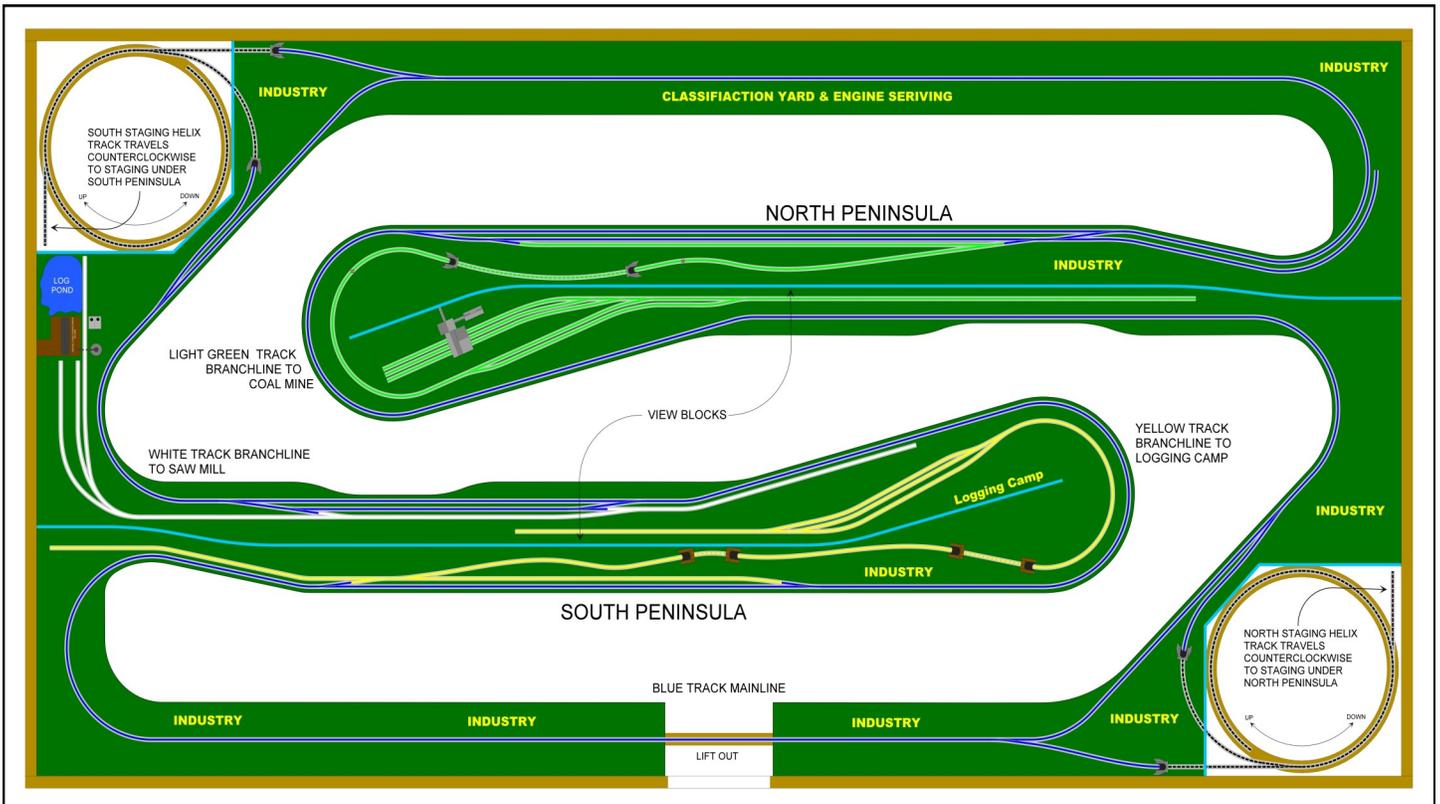
*Picture 4: Benchwork Configuration*





Picture 5: Branchline Configuration

Picture 6: Semi-Final Configuration



main classification yard and engine servicing facilities. The exact main-line and yard configuration will be determined as the plan evolves. At this point, all of the detail work begins as the basic design concept is locked in. I'll add industries, rearrange track work (where necessary), create tunnels, mountain scenes, city scenes, etc., and anything else the client has requested during the initial conversation phase.

## Staging – Lower Level (Picture 7)

Designing the staging level is fairly straight forward. Part of the benchwork follows the outline of the upper main benchwork (shown in a light-green shade). The track configuration contains a reverse loop for

the automatic restaging of trains. The size of the staging yard (i.e. length and the number of tracks), is based on the overall size of the layout. In this case, there are five staging tracks in each yard. This will allow for ten trains to run during an operating session, not counting locals and turns that would run strictly on the visible portions of the main level.

### A Word About “Point-to-Point Operations”

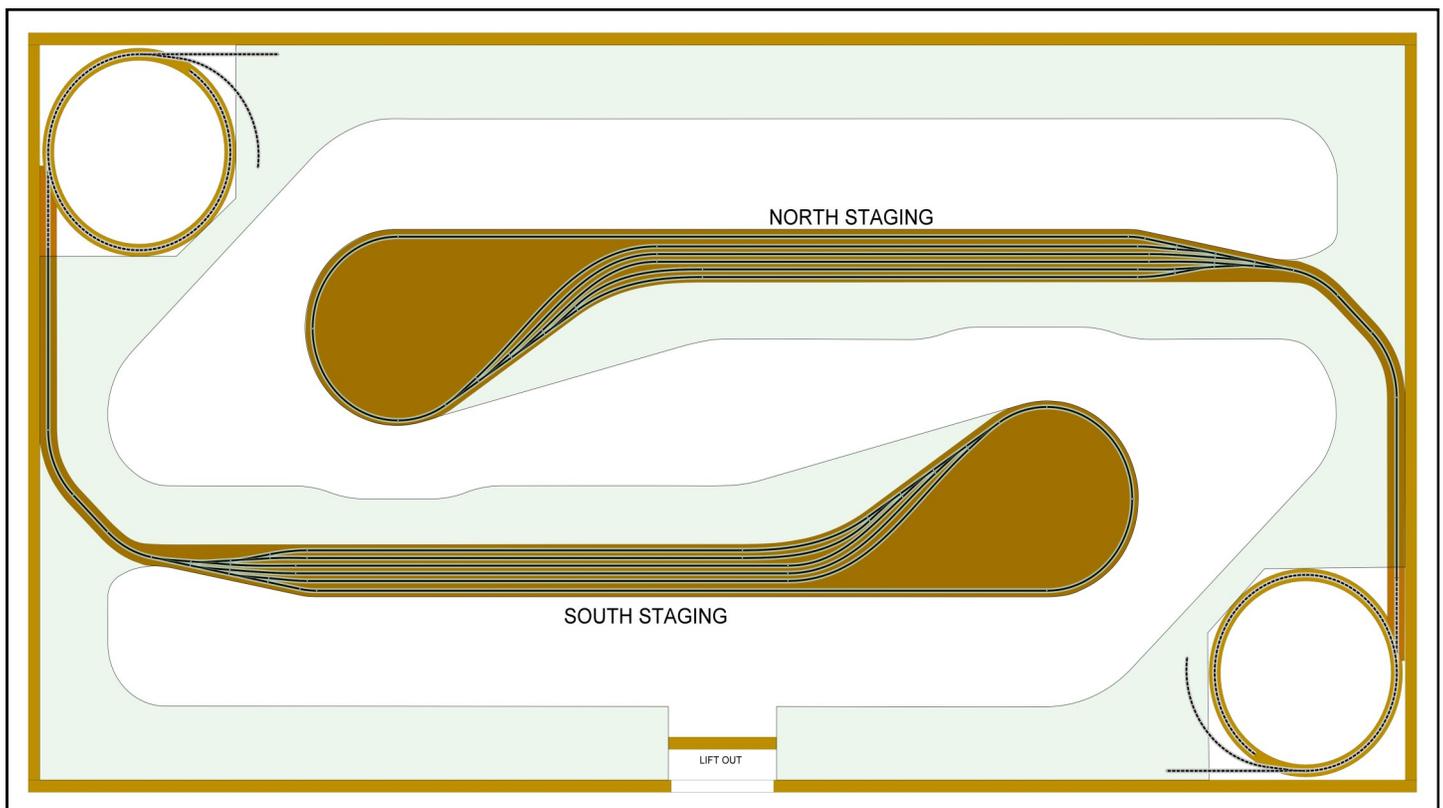
The plan's main features will be coal and lumber with point-to-point operations. For prototypical operations, you'll need places for trains to “come from” and places for trains to “go to”, i.e. staging. You'll want operators to bring their trains from

staging onto the visible portion of the layout and follow their trains as they traverse the room. You'll also need somewhere for the operators to send their trains.

The myth that a true point-to-point layout eliminates the possibility of continuous running is false. About 80% of my clients want continuous running capabilities. When I mention point-to-point operations they always ask if that means no continuous running. Most of my multi-level point-to-point designs have continuous running capabilities.

If you want your layout to operate in a true prototypical manner, designing a point-to-point track plan is mandatory. Otherwise, you are going to have trains running in circles, which is not very prototypical.

*Picture 7: Staging – Lower Level*



For those who do get to experience a doubling or tripling of space, the process of designing and building a new layout isn't as straight forward as one would think.

## Free Space

About half of my clients do not want to build a multi-level layout sighting helixes as their main opposition. When I remind them that all of the space above and below the main level is FREE SPACE, their thinking starts to change and maybe a helix isn't such a bad idea. If used properly, helixes can double or triple the size of your layout. Otherwise, you've got a lot of WASTED SPACE.

## Reviewing Key Design Elements

- ✓ **Lower Staging** – Lower-level staging will allow true prototypical point-to-point operations.
- ✓ **Opposing Peninsulas** – This is the key design element of this plan. It allows for multiple large industries and dramatically increases the run length of the mainline. The view blocks further increase the feeling of a large layout.
- ✓ **Single Track Mainline** – The single track mainline makes for more interesting and prototypical operating sessions. Typically, coal and logging operations are in geographical areas where double track mainlines are not possible. Plus, the single track mainline leaves room for more scenery. A common mistake the new modeler makes is having too much track in relation to the scenery. In the real world, it is just the opposite.
- ✓ **View Blocks & Vignettes** – The advantage of the around the walls center peninsula design is the ability to include view blocks running through the center of peninsulas. View blocks allow for small individual vignette scenes. As operators follow their trains around the room, they will run through changing scenes, thus creating the illusion of time, distance, and the fact they are going somewhere; they're not standing in one location watching trains run in circles.

## Final Thoughts

I hope you have enjoyed this insight into how a professional track planner would go about designing a track plan for a large room/space. I have tried to keep the design fairly simple, hopefully encouraging those lucky enough to have a large space, to think outside the box and design a layout that will operate like the prototype and offer many years of enjoyment. And if you do wake up the very next day and find your layout space has increased by 200 to 300 percent, you are now better prepared to design your dream layout.



## About the Author

Bill Beranek - The Track Planner has over forty years in the model railroading hobby. Bill enjoys golfing, traveling, and of course designing "prototypical operations" focused track plans. He has been a member of a local 135+ member model railroad club since 2003 and has served twice as the club's president, twice as a board member, and is currently serving as the club's treasurer.

Bill is currently working on his latest triple-deck HO scale layout depicting the SP&S (Spokane, Portland & Seattle Railway) in southern Washington and the OTL (Oregon Trunk Line) on the upper level in northern Oregon in the mid-50s.

You can find out more about Bill—The Track Planner at [www.thetrackplanner.com](http://www.thetrackplanner.com).



Harry M. Haythorn, UPHS #4043

## Modeling UP's Theater Car 420 - Fox River

*All Photographs Courtesy of Harry M. Haythorn, unless indicated.*

**W**elcome back to the UP Hub, and back to the Heritage Car build series. This time, we are going to discuss the process of building the UP Theater Car 420, *Fox River*. This car is among the favorites of railfans, modelers, and railroad officials. This car is easily identified by its large back theater window and the four stepped windows on each side, at the rear of the car. I build these cars in multiple styles and eras, and I will discuss the build and show some of the options you may choose to replicate for your layout.

### Car History

This beautiful car was built by Pullman Standard as Canadian National Lounge-Sleeper 1087 *Cape Breton* and served on CN until VIA Rail purchased the car in 1978. It was subsequently purchased by Chicago and Northwestern in 1985. The CNW rebuilt the car and converted it into a theater inspection car. *Fox River*

was part of CNW's business fleet for ten years before becoming the property of the Union Pacific when it acquired the CNW through its 1995 merger. For two years, the *Fox River* remained in CNW colors as it toured around UP's system. In 1997, the car was remodeled by the passenger car department at Fox Park in Omaha, NE and was repainted to match the UP colors during its remodeling. Interestingly, the interior of the car was not changed as the cars retained the CNW-era green seats. The car served in yellow and gray until 2006 when the roof was painted white to keep the interior cooler in the summer months, which helped preserve the A/C system.

### Modeling Fox River

In 2000, Overland Models released 100 of these cars in UP colors and in 2003, 85 CNW-painted cars were released in brass. Both types of these cars are going for very high prices on the second-hand market - the last UP *Fox River* I know of went

for an astonishing \$1,650. I have had both types of brass cars in my shop for installing figures and to perform lighting upgrades for clients.

Since acquiring a \$1,650 car is out of reach for many, let's talk about a more realistic option for the average model railroader and for those who are just getting into prototypical passenger train modeling. We will do what modelers have been doing for eons: we will build one. I've built a few of these years ago using the tried-and-true method of cutting the windows out with a knife and filing them to fit. Now, I use custom laser-cut sides from my supplier Union Station Products, which is much more precise. The supplier now has these available for purchase.

For the structure of the *Fox River*, I use a Walther's Pullman Standard 6-6-4 sleeper. These are the closest match to the typical interiors and undercarriages of theater cars. Of course, a few tweaks are needed: I add underbody details and build up



*UPP 420 Fox River in the Chicago area. Photograph courtesy of my friend Dillon Goble.*

the floor in the theater section so that the car has stepped theater-style seating. I source seats from coach/chair cars.

This car has a massive set of side windows on each side along the theater seating section, and this is the primary reason that I use the 6-6-4 as it has the upper berth windows

already cut into the sides. The Walters "skeleton" must be trimmed near the top enough to have clear windows on both sides, and the rear theater window needs to be cut out as well. It's important to leave enough of the original structure above the windows so that the roof can still be fitted securely. The nibbler (a tool for more precise and

cleaner cutting of plastics and sheet metal), comes in handy for this exact reason.

Once the roof and sides fit it's time to paint them. As most of you know, I use Scalecoat paint which I apply with my airbrush. I apply the top red stripe with paint and not with a decal, as the removable roofs

*The OMI CNW Fox River – This brass beauty belongs to Dillon Goble.*





*Above: The car sides are ready for paint.*



*Left: The painted sides are headed to the drying booth.*

on Walthers cars make the decals more likely to be damaged.

Once everything is painted, it's time to assemble the car. Before installing the walls it is important to fix the window glazing. Remember to use canopy glue or good quality plastic cement so that the windows don't craze. I also add tint to them at this time. To create a tinted effect, I use self-stick tint from the local auto parts store. This makes for

a very easy way to realistically tint the glass.

Next is to add the skeleton back to the car, assemble the interior, add figures, and decide if you are going to do track lights. If you plan on installing lighting, they need to be wired at this time before the car is assembled (trust me - I learned this the hard way). Once the lights and the interior are in and are installed to your liking, it is time to start the

final car assembly. This includes gluing the sides of the car to the superstructure and adding trucks, couplers and a diaphragm to the car body.

Now that the car is closer to being finished, I will build the triple track inspection lights - also called "alien eyes" - under each side of the theater window. I use 3/32" brass tube cut to about 1/16<sup>th</sup> of an inch which I then solder together in a triangle/pyramid shape. Then, before gluing

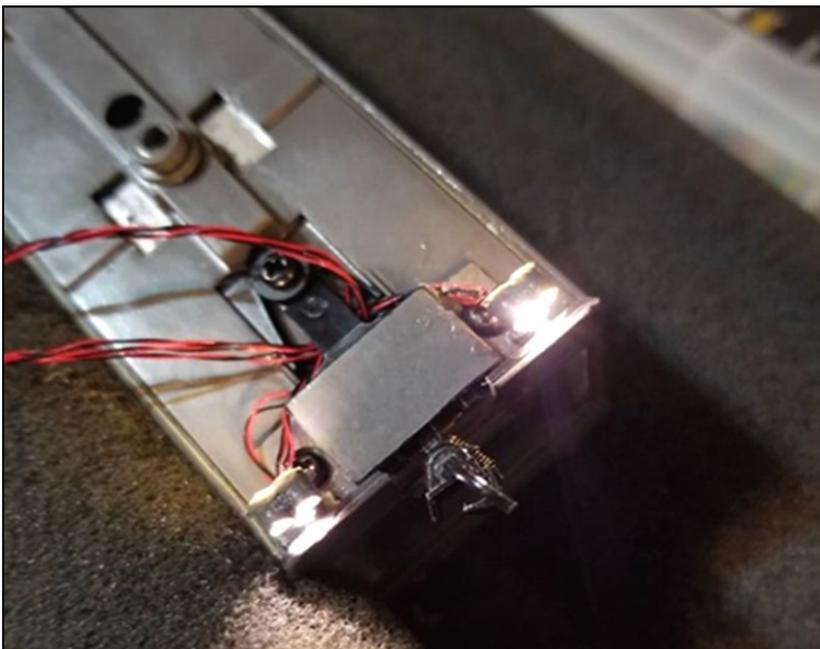


*Above: The car interior has been assembled and the car skeleton is ready for the track lights and the sides.*

*Below: The car sides are attached to the frame.*



*Below: The LEDs are installed and are looking good!*



the assembly to the underside of the floor, I add a square piece of brass to the top and the fourth piece of round brass tubing and then I paint the assembly gray. After the glue has set, I thread the LEDs into the light tubes and test them again before using a bit of canopy cement to secure them permanently.

The final steps include adding rooftop details such as GPS domes and kitchen vents. These are a mix of commercial parts and scratch-built items. Once these are secured, I begin applying decals.

For the decals, I use stripes and let-



*Above: The rooftop details are on; they are a mix of commercial and scratch-built parts.*

*Below: Here we see the Fox River ready to bring up the rear of a special. The track lights are on and she is ready to roll.*



tering from Micro Scale Decals on these builds. The part numbers for the specific decal sheets are as follows: 87-623 (stripes) and 87-1056 (business and executive car lettering). Once the decals are set, I clear-coat the car to protect them. I hope you have enjoyed this look at custom building UPP 420 Fox River.

Thanks for following along with the build of these cars and I hope you will find this information helpful. I post regular car build updates on my [UP Nebraska Division](#) group and the [Union Pacific HO Model Railroading](#) group on Facebook. If you would

like to inquire about my services, you can reach me through these groups. Until next time, may your signals be green, and your tracks smooth. 🚂

### **About the Author**

Harry is a rancher in Nebraska who works with his father and grandfather to help run their 22,000-acre, 1,500-head of mother-cow, ranch.

Harry has been model railroading for over 20 years and models the Union

Pacific Steam era from the 1930s to the 1960s, in central and western Nebraska.

Harry is a Sustaining Member of the Union Pacific Historical Society and a member of the UPHS Streamliner 100 club. He is a National Model Railroad Association member currently working on his Master Model Railroader Certificate.

Harry regularly posts videos on his YouTube page. You can follow Harry as he works on his 7th layout at <https://www.youtube.com/channel/UC6-MPHmYU3Cc2uEVfjZDIcQ>.



Three rebuilt F40PH-2 locomotives emerge from a tunnel at Yale, BC, on the head end of VIA's eastbound *Canadian*.

# The Fantastic F40

## Hero of a Vulnerable Time



By Jack Hykaway

All photographs by Jack Hykaway, unless Indicated.

**S**awoke from my deep sleep to the crackle of the train manager's radio. The transmission was indecipherable at first but after a few crackles the deep and robotic voice of CN's wayside defect detectors emerged through the static:

CN detector. WATROUS mile, one-seven-eight point three. No defects. Repeat. No defects. Temperature, eight C. Total axle, one-zero-zero. Speed, eight-zero. Detector out.

The radio fell silent, and I rolled up my window shade and peered into the vast Saskatchewan darkness. My tired eyes could barely make out the silhouettes of hills rolling like waves along the right-of-way, while the

faint whine of the locomotive's air horn made the scene even eerier. Like distant ocean liners sailing on a blackened sea, the lights of farmyards and small towns twinkled on the horizon and eventually, they bobbed out of view. The detector's transmission confirmed the blistering pace that the train was setting – the 6,000 horses of the two F40PH-2 locomotives on the head end were running free at 80 MPH and we would surely catch up to schedule by daybreak. But who cared if we did. For now, I was cozy in my bed being gently rocked back to deep sleep by the rhythm of the rails, listening to the faint moan of the locomotive's horn and the distant, yet recognizable hum of the EMD's 645 prime mover pulsing through my cabin's window.

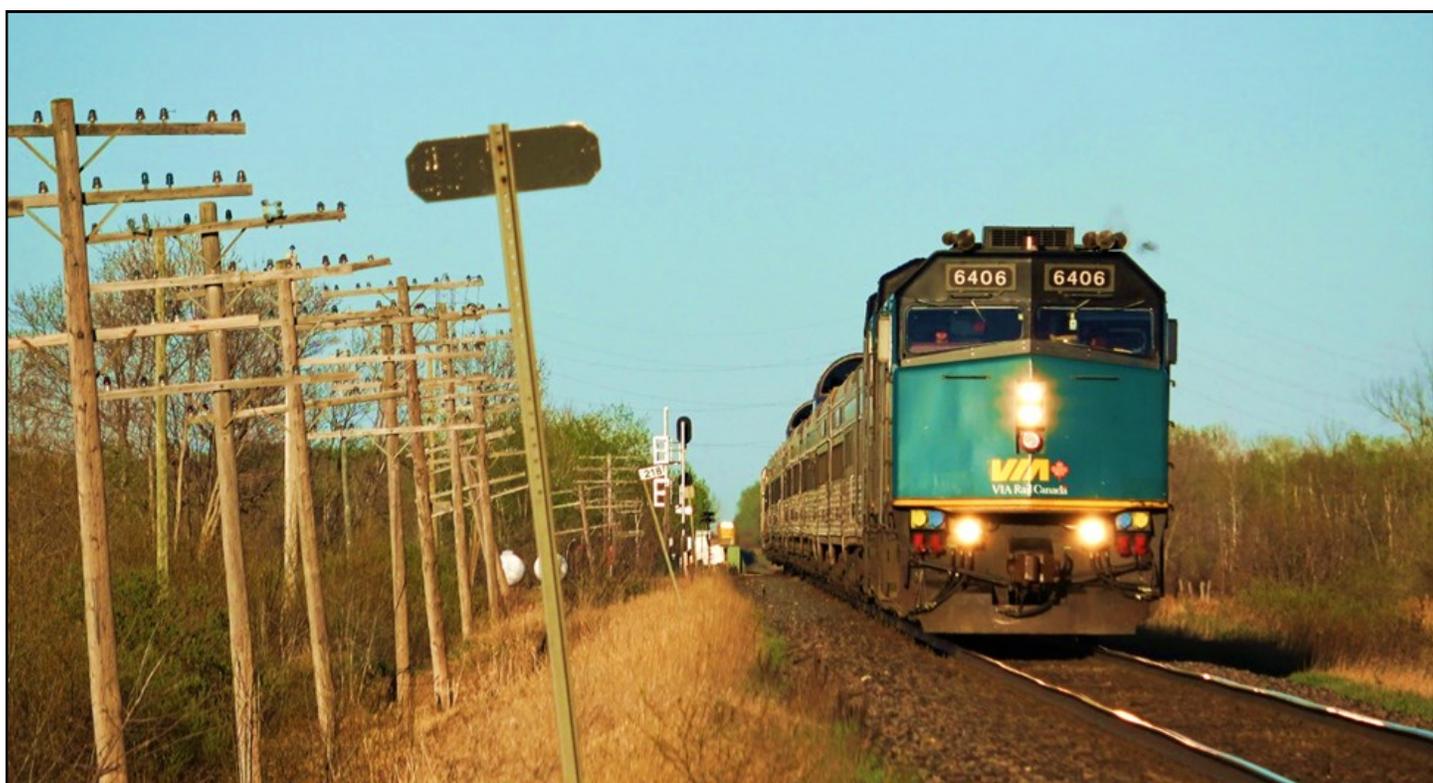
The streamliner I'm referring to is the legendary *Canadian*, operated bi-

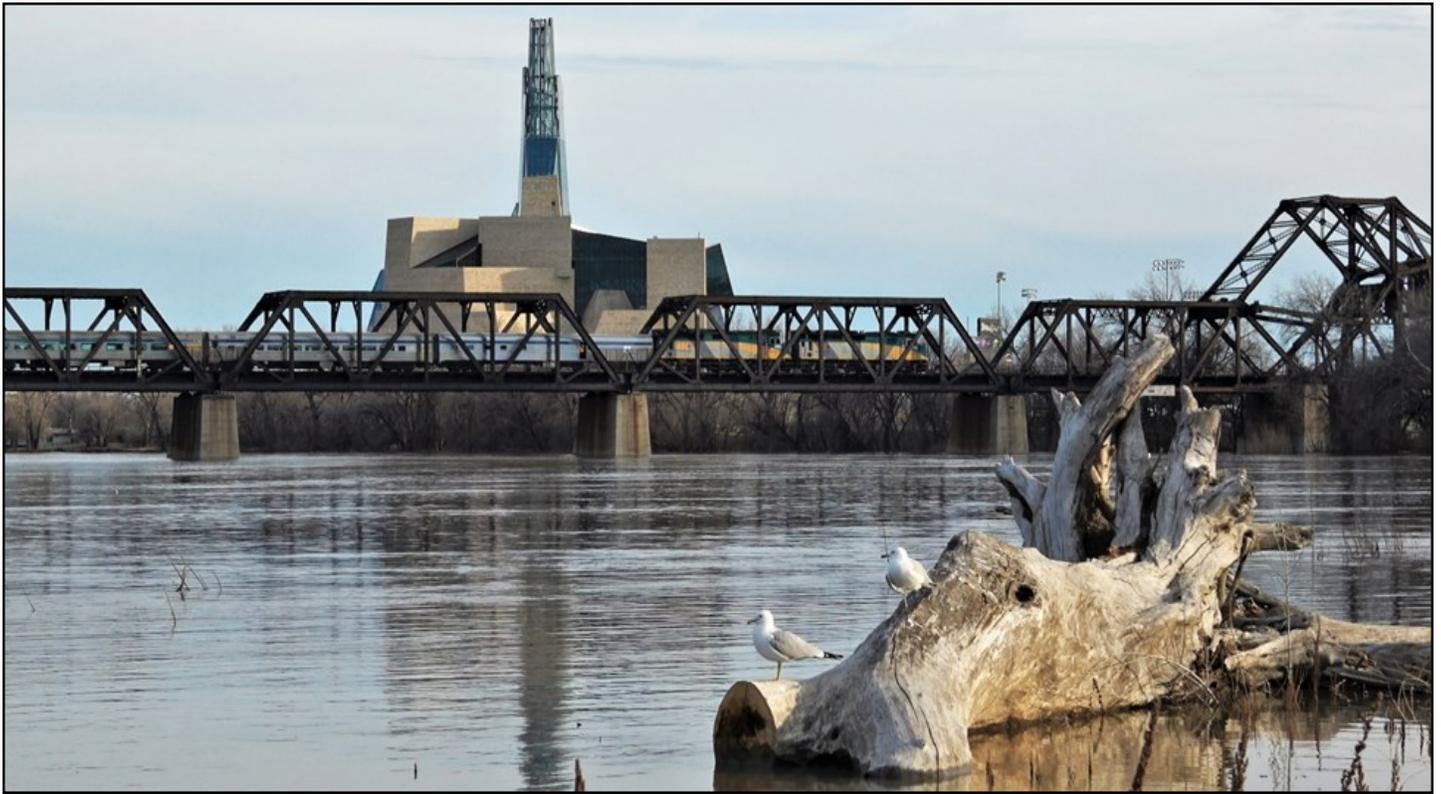
weekly connecting Toronto with Vancouver. As with all VIA services outside of the Quebec City, QC to Windsor, ON, the *Canadian* operates exclusively with 1980s-era EMD F40PH-2 locomotives. These workhorses are often credited for having saved passenger rail service in North America during a vulnerable time for rail travel. They have traversed millions of miles for regional and cross-country rail routes and have cemented their impressive reputation in the history books since they were first introduced in 1976.

### Passenger's Savior

In the 1970s, passenger service was in disarray across The United States and Canada. The privately-owned passenger trains of the 1950s had already been losing money for over a decade, and therefore, investment in new locomotives for passenger

*VIA F40PH-2 No. 6406 leads VIA train 1 through eastern Manitoba.*





*Two F40s cross the swollen Red River in Winnipeg, as two seagulls look on.*

trains through the 60s and early 70s was next to none. When Amtrak assumed operation of all intercity passenger services in the United States in May of 1971, they inherited 1950s-era diesel locomotives and equipment. Executives at Amtrak worked tirelessly over the next several years to develop a brand – hundreds of locomotives and passenger cars were painted with the appropriate red, white, and blue color scheme; however, a flashy coat of paint didn't fix mechanical issues found under the hood.

Amtrak's fleet of motive power was aged and tired, having already served for years under the predecessors' flags. The railroad was plagued with motive power issues, specifically from their SDP40F diesel locomotives which were used on most long-haul routes. Amtrak turned to locomotive builder EMD, and the two

companies worked together to create a new locomotive that would best meet Amtrak's needs. Thus, the F40PH was born, and the first 30 locomotives were released to Amtrak beginning in 1976. These models were powerful pullers with gearing that allowed them to reach speeds of up to 103 MPH. Their reliability was demonstrated in the following years and Amtrak was impressed with their performance. Several more orders were placed and at their peak, Amtrak maintained a fleet of 216 F40PH locomotives.

### **Early F40PHs – The Screamers**

The **H** in the name indicates that the F40s were designed to supply “Head End Power” (abbreviated as HEP), to the passenger coaches. The power is used for heating, cooling, and light-

ing – amenities that passengers have expected on board for many years. Some coaches have some form of battery backup in case there is an electrical interruption, but under normal operating conditions the locomotive's prime mover is responsible for maintaining a constant electrical source for the train. It is necessary that this V-16 prime mover consistently spin at a high RPM to generate large amounts of power, and therefore they earned the nickname “screamers,” because their engines continue roaring even while sitting still in stations.

Because of their popularity, the F40PH was eventually released with an elongated body to house an additional smaller engine specifically for electrical generation. These models were among the last F40s built and they were (and are), especially popular among commuter railroads who



*Two Music City Star trains' EMD F40PH locomotives wait for service at the Lebanon, Tennessee yards.*

*The third FH40PH locomotive (furthest away), is painted in the Amtrak Pacific Surfliner scheme.*

*Photograph has been released into the public domain by its author, [Newrkv at English Wikipedia](#).*

operate services which are stopped frequently in stations. Keeping the enormous 645 prime mover running continuously in high gear is costly and therefore introducing a second smaller engine drastically reduces the amount of fuel being burned, saves on maintenance costs, and reduces downtime for the locomotive.

VIA Rail's fleet of F40PH-2s was recently overhauled to include a separate diesel engine for electrical generation, which can generate up to 500kW of electrical power for passenger cars. Since VIA's locomo-

tives did not have the elongated body, a housing was fabricated on top of the locomotives' rear walkways.

The F40's popularity was shared by Chicago's Regional Transportation Authority (RTA), which purchased many F40PH locomotives – and several units of the sister locomotive model F40PHM-2, which featured a more streamlined nose – for use on various commuter routes to and from downtown Chicago. Metra, which now operates commuter trains in Chicagoland, still operates a

large fleet of F40-type locomotives daily, as do several other agencies such as Boston's MBTA, San Diego's Coast Rail Express, and Nashville's Music City Star to name a few.

Amtrak has since retired its fleet of F40PH locomotives and has replaced them with several different models from General Electric's Genesis series of locomotives. Amtrak has converted a handful of F40s to NPCUs (Non-Powered Control Units), for use as cab-cars on push-pull services primarily in California, the Pacific North-West, and the

*VIA 6443 is in charge of the westbound Canadian, as it passes through Dugald, MB at speed just after sunrise.*





*Diesel fumes are blown sideways by the wind as VIA train 693 to Churchill, MB accelerates westward. The second unit is used as insurance on this train – the territory it traverses is so remote that a breakdown of one unit could mean a day’s wait for a rescue locomotive.*

Northeast. Many of Amtrak’s F40s have been purchased by commuter railroads and tourist railroads for a second lease on life. Canadian National also has three ex-Amtrak F40PH locomotives, which were acquired when the railroad purchased the Rio Grande’s *Ski Train* equipment. The three locomotives are currently being used to power sightseeing trains through the scenic Agawa Canyon north of Sault Ste. Marie, Ontario.

All these years later, the seemingly everlasting F40 continues to roll on across Canada as the backbone of VIA Rail’s motive power fleet. The recently-overhauled units have an abundance of life left in them, and they will continue to power trains from coast-to-coast-to-coast for years to come. EMD and the F40 locomotives have earned their place

in the history books while continuing to reinforce their legacy of reliability in revenue service across North America on tourist and commuter railroads.

### Further Reading and Watching:

Train Talk: Episode 2: <https://www.youtube.com/watch?v=FGYsuSkaVYs&t>

VIA Rail’s F40PH-2 statistics: <https://corpo.viarail.ca/en/projects-infrastructure/train-fleet/locomotives-f40ph-2>

F40 Preservation Society: <http://www.f40ph.org/>

American Rails: <https://www.american-rails.com/757099.html>



### About the Author

Jack Hykaway is a student, currently attending a post-secondary institution in his hometown of Winnipeg, Canada. He is an amateur videographer and writer and enjoys exploring and documenting nearby railroads and railroad operations in both written and visual formats of his work.

Jack’s main focus of late has been producing his column *Jack’s Junction* for *The Modeler’s Journal*.

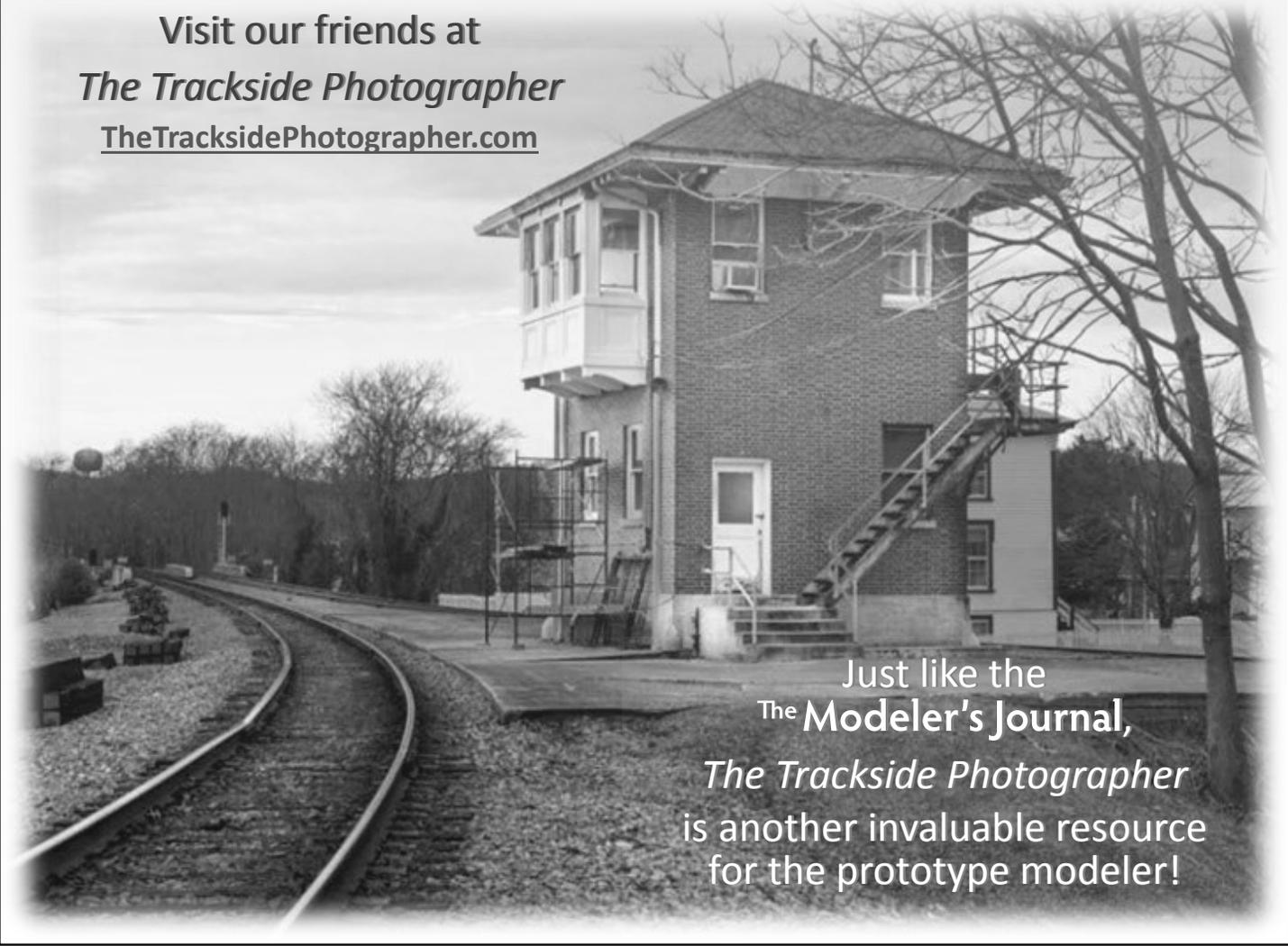
Follow along with Jack’s videography on his YouTube channel at <https://www.youtube.com/user/WinnipegRailfaner1>.

# The Trackside Photographer

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