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CANADIAN ASSOCIATION OF RAILWAY MODELLERS

FALL 2018 ISSUE #65

IN THIS ISSUE

a quarterly publication of the "Canadian Association of Railway Modellers"

THE CANADIAN ASSOCIATION OF RAILWAY MODELLERS

Founded October 15, 2003
Founding Members: John Johnston, Peter Moffett, David King, Lex Parker

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DIRECTOR AT LARGE	Peter Moffett	directorpete@caorm.org
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COVER PHOTO BY JOHN JOHNSTON: It is early August 2018 outside of Putnam, Ontario and 60 year old Ontario Southland FP9u #1400 and 61 year old GP9 #1620 have their train well in hand as they head east toward Ingersol.

MEMBERS AREA PASSWORD

USERNAME: gondola
PASSWORD: hopper

PROMOTING THE HOBBY OF RAILWAY MODELLING IN CANADA

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Material for the Canadian should be sent to:

John Johnston
41 Glenview Place,
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observation platform
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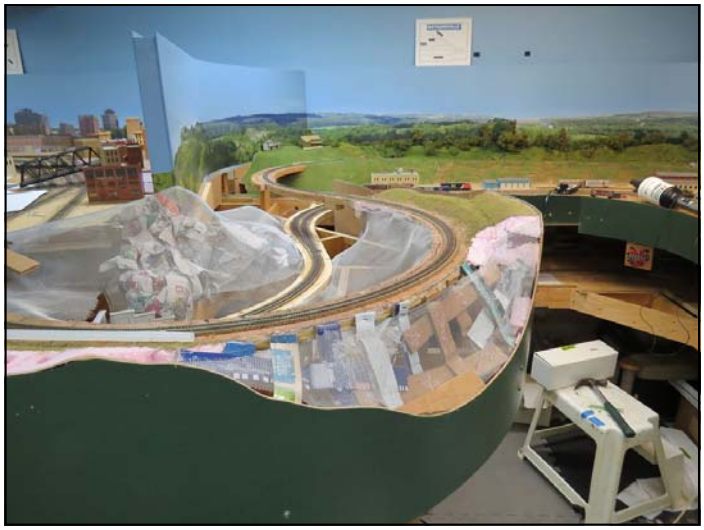
SCENERY CONTINUES ON THE GRAND TRUNK SOUTHERN

After hosting Jason Shron and his staff from Rapido Trains in March I decided that it was time to try and get some more scenery on the Grand Trunk Southern. In particular I wanted to scenic the area you see when you first enter the layout room. In the photo below you can see that area with the CN Turbo train going around the upper level loop. Clearly, it was going to be a bit of a challenge as there are two levels of track in close proximity to one another.

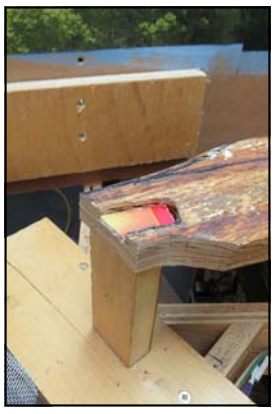
This is my fourth layout at home, and I spent 30 years in the HOMES Club, most of it focused on scenery, so I had some clear ideas in my head on how I wanted to proceed. The rest of the guys in our club group, however, didn't have much experience with scenery and we agreed that this project would be a great learning experience for them.

There was a significant amount of work that has gone into this project and I will not be able to cover all of it this month. I will try to share our experiences over the next several issues.

As you can see the fascia is uniform throughout the curve and I wanted that to change. The original idea was for a ballasted fill on about a third of the upper level track. We talked about whether to use foam (pink or blue), screening, or cardboard web to form the contours. The group doing this part of the task chose screening. After cutting the fascia out on the front, it was decided to use a combination of cardboard webbing and screening to provide support for the plaster. On the interior we used screening pushed up with newspapers stuffed in from underneath. The photo below clearly shows this stage of the construction.



The next step was to cut out the subroadbed to permit the installation of a bridge. Since this was on a curve, the type of bridge became an issue. We couldn't locate a bridge that would work for the curve we needed and so consideration was given to a tunnel. The difficulty with a tunnel is the turnout for Nathansville Siding that you see on this side of the bridge cut. After considerable research, I found a bridge on the Lehigh Valley. A curved ballasted deck girder supported by a steel structure across the tracks underneath. Perfect, we had a prototype for our bridge.

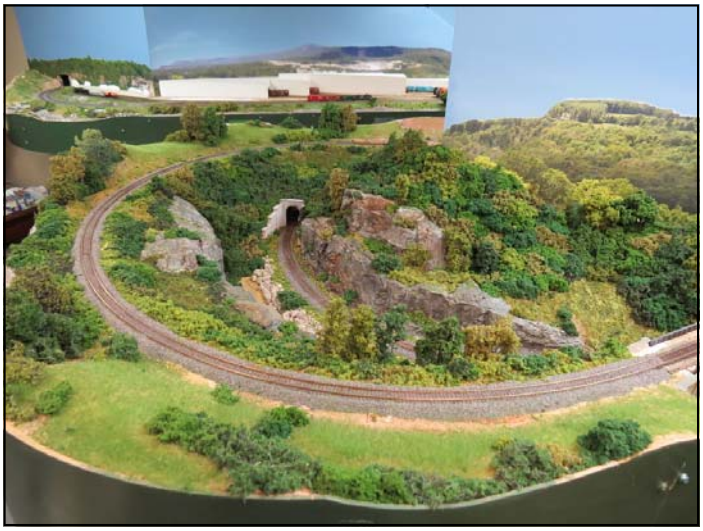


In order to install our bridge, we routered keys into the subroadbed on each side. The bridge itself would use 1/4 inch hardboard as its base with deck girders and a ballasted deck. One of the advantages of this type of construction is that we were able to install the bridge deck immediately, lay cork and re-install the track. This meant that the layout was opera-

tional again, excluding the mess, as construction continued. In the photograph below, you can see the 1/4 inch hardboard installed, track laid, and by the time of this photo, bridge abutments being installed. If I had guests I could clean the layout and run trains if necessary.

The next step was to begin the installation of rock castings. In the next issue I will share with you some of our successes and failures as we created and installed the rock castings. The photo at top right shows the first of the castings being placed in the cut.

The photo at bottom right is a teaser showing that we have finished the project and providing you with a sense of how everything does come together.



Calling All Photographers

Please submit photos for the 2019 CARM calendar

If you have an image that you would like to submit to us for use in the 2019 CARM calendar please read the following. We would like 6 high quality images of prototype scenes and 6 high quality images of model railroad scenes. These images need to be in sharp focus for most of the image, well lit, well composed and of interest. Images should be in landscape format. You do not need to edit the image as we would prefer to edit the image ourselves as to maximize the image for the printer. To submit an image for consideration follow these steps.

Submit a small JPG image (less then 100kb in size) for consideration
Obtain all of the information about the image including:
Location
Date
Photographer
Camera stats
Owner of items in the scene
Description of scene

Once accepted send the large file as a JPG, RAW, TIFF, etc.

Send your submissions to calendar@caorm.org before October 15th, 2018 Thank You

Chairman's Report

I have just spent the last ten days driving to and attending the annual Narrow Gauge Railroad Modelers Convention in Minneapolis, Minnesota. I drove, not because I love driving but because I was hauling a trailer with my recently completed Anyox Mine Narrow Gauge Railroad in it to erect and display at the convention for four days. It was well received I had lots of stimulating conversations with people, like the one who had visited the site in 1973 and taken photos of the old overhead catenary poles on the railroad grade which were still standing. Which brings me to the more important topic of CARM conventions and the fact that elsewhere in this issue you will find information about CARM's next mini convention which will be hosted by and held in the southwestern Ontario around London in May 2019. Put the dates in your diary and plan your time around attending that meet.

There are lots of great modelers and models in the London area as well as prototype displays of everything from historic steam and diesel mainline locomotives to Shays. I look forward to seeing lots of our members there and talking with you. Ultimately the greatest benefit of attending a meeting such is this, is to meet people and discuss and learn about their activities and describe yours as well as just meeting old friends who you haven't seen for a long time.

I would be remiss not to mention also another important gathering of modelers and layouts to be held in the Ottawa area over the weekend of 19th – 21st October, 2018. The Ottawa modelers have been putting on great gatherings for several years now and I have enjoyed all that I have attended. See www:capitaltrains.ca and learn about the self guided layout tours.

While I was busy finishing off my Anyox layout this summer prior to its debut, first at the Toronto Roundhouse show, then the Narrow Gauge Convention and next at the Greater Toronto Railroad Show in Brampton there was another saga unfolding in China with the announcement that the last of the custom manufacturing factories manufacturing locomotives and rolling stock for many of the big brand names was closing. This caused panic on the chat lines with doom and gloom predictions that all the moulds would be locked up forever and said locomotives would never see the light of day. I am no expert in the vagaries of the Chinese model manufacturing industry but I do sense that this is not the first time such a crisis has arisen. At one time all the best models were made in North America, then manufacturing moved to Japan and thereafter to South Korea and then to China. So maybe after a bit of a hiatus we will see Vietnam or Indonesia emerge as the new manufacturing hub. However another possibility is that manufacturing will move back to North America in spite of the labour costs issue. Two hints back up this assertion. Firstly I ordered a new locomotive recently being advertised, namely a chop nosed GP9, which is being sold with an add-on kit of detail parts so the buyer can complete the model themselves. Do you remember the KATO locomotives which were the best locomotives on the market for many years, they all came with a sprue of detail parts which one had to add oneself. The second evidence was when I attended a model train show in Leicester in the UK this summer and discovered a UK manufacturer of very high quality N, HO and O scale locomotives and freight cars. When I asked where they were manufactured they told me in Wales. I congratulated them on being able to successfully compete in the market with a locally made product and avoid the long distance container shipping. So the moral is that when everything looks like doom and gloom some innovative person will decide there is a different way to do things and successfully keep many modelers happy, which is what we all do in our smaller or bigger way when we scratchbuild cars and layouts to fit around our furnaces and other hazards of the basement.

I look forward to talking with many of our membership at one or other of the upcoming events and remember that if you can't get to the events I discussed above, check out the CARM website for a list of shows which are bound to include one or more in your area. Till the next issue of The Canadian have some fun modeling and operating layouts…….**GERALD**

PUBLICATION SCHEDULE FOR *THE CANADIAN*

***The Canadian* is published four times per year. Submission by authors or Chapters should be submitted by the following dates.**

Spring Issue: February 1 Summer Issue: May 1
Fall Issue: August 1 Winter Issue: November 1

Chapter Reports

SUPER MEET PLANNED FOR LONDON - MAY 17 TO MAY 19, 2019

Members of the London Chapter have met and are in the initial stages of planning CARM's next Super Meet to be held in the London area in May of next year. Currently plans include: Friday , May 17th - pizza party meet and greet. Guest Speaker - Railway history of St. Thomas. Saturday , May 18th - Annual Meeting , Tour of Elgin County Railway Museum and Interlocking Tower, and a St. Thomas layout tour. Sunday, May 19th - Tour of the CASO (Canada Southern) station and London layout tour. Planning work is continuing and there may be future announcements. Recommended accommodations are the Best Western Plus Stoneridge Inn & Conference Centre, 6675 Burtwistle Lane, London, ON, N6L 1H5. The group booking URL is: https://www.bestwestern.com/en US/book/hotel-rooms.66085.html?groupid+B56HN9T2

NATIONAL CAPITAL CHAPTER

The National Capital chapter took a brief road trip to Kingston to visit four layouts: John Licharson's HO layout, Scott Lamoreaux' N scale layout, Mike Pasch's HO layout and David Lay's English layout. Because there were 14 participants, we split into 2 groups, each group visiting 2 layouts in the morning and the remaining 2 in the afternoon. In between we retired to a local restaurant for a group lunch.

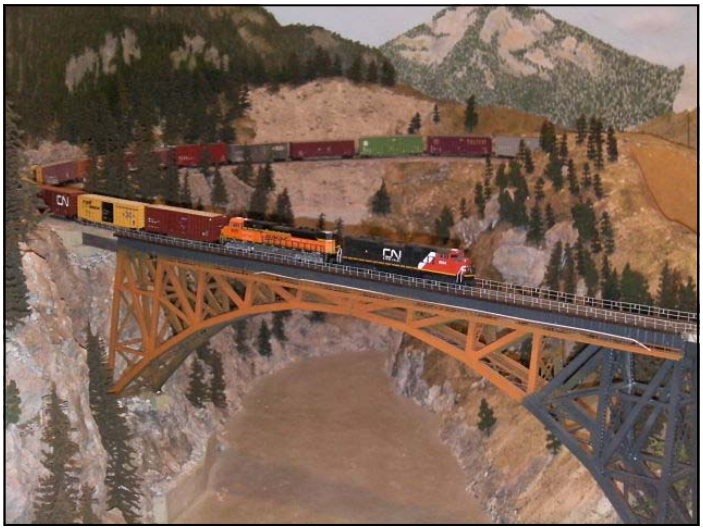
John Licharson has a small but nicely shadowboxed layout featuring a small stable of excellent running locomotives, a mixture of standard gauge, narrow gauge and dual gauge track. While some scenery has been started and the layout has a nicely done Chris Lyon backdrop, many of the structures are stand-ins or mock-ups showing John's intent.

Scott Lamoreaux has a small layout, that features the Fraser Canyon with a beautiful model of the Cisco bridge and an iconic view of the snow and rock slide sheds over that stretch of the line. A 5 track staging yard allows trains to come on scene or wait until performance time. Scott's layout was recently featured in a national model rail magazine.

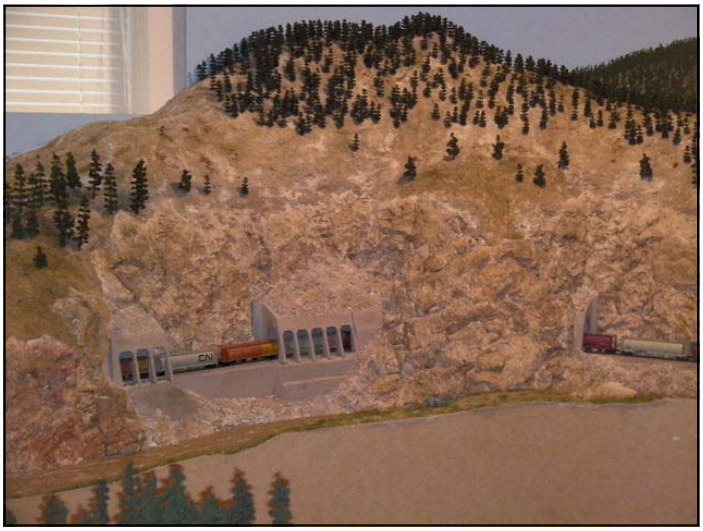
Mike Pasch is an N scale modeller who has started to explore the HO possibilities. He has a small L shaped switching layout in the minimalist style with a high scenery to track ratio, representing a fictitious line that has shrunk to a branch line and serves the few remaining customers. Structures are underway and should be a work of art when done. Connections to the outside world are via cassettes in the English layout style.

David Lay has built a nicely done layout representing England of his childhood. This large layout features large radius curves, beautifully running trains and some impressive electronics for control and signalling. Many beautiful structures compliment the trains and do an excellent job of setting the locale.

Our next excursion should be the Christmas lunch and there is the Capital Region layout tour(Saturday Oct 20 at St. Anthony's Banquet hall on Preston St in Ottawa) in the interim that is keeping a lot of Chapter members very busy!

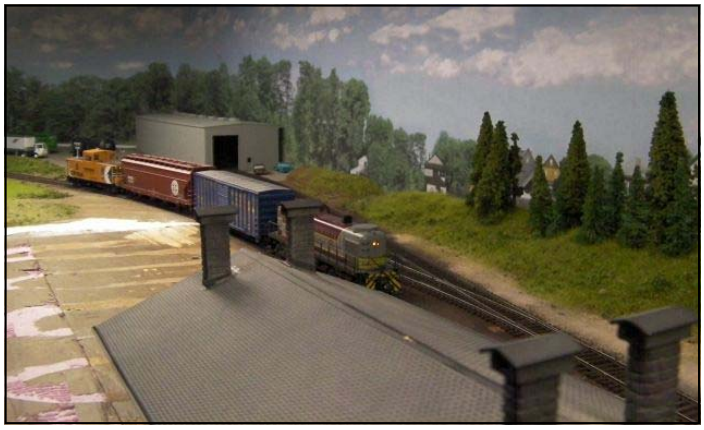


Photos Above and Below: Bruce Leckie: Scott Lamoreaux's N Scale layout featuring the Cisco Bridge and the Fraser Canyon.



Photos Above and Below: Bruce Leckie: David Lay's beautiful HO layout represents the England he remembers from his childhood.

Photos Above and Below: Bruce Leckie: John Licharson's HO layout has been built using an interesting shadow box technique.



Photos Above and Below: Bruce Leckie: Mike Pasch's under construction HO layout.

TORONTO CHAPTER

Stephen Gardiner and James Rasor presented a joint lecture to Chapter members at City Hall in February on modelling in small apartments. A joint slide show presentation showcasing James' and Stephen's small apartment modelling work desks and their storage solutions was given to the members. Side tables were laid out with samples of their models, tools, travelling work desks, and other items related to their lecture for everyone to see.

(Photos by James Rasor)

In May, Ian McIntosh visited Willie Waithe's CN Weston Subdivision layout for an operating session to help the operating crew test run Willie's Ship It operating system updates. On Sunday May 20 half a dozen Toronto Chapter members gathered at Willie's layout condo for a 4 hour operating session and lunch. A good time was had by all! As the photos show, the scenery is coming nicely.

(Photos by Ian McIntosh)

On March 10 and 11 Steve Hoshel (CARM Promotions Manager and Ontario Midwestern Chapter Chair) went to the Kingston CRHA Rail O Rama show to promote CARM and CARM membership. Saturday he was aided by Jason and Rob Essery (London and Area Chapter Chair and Assistant Chair) and by Ian McIntosh of the Toronto Chapter. Ian took some photos of layouts at the show. Across from the CARM table was the ARK (Associated Railroaders of Kingston) multi-table display. ARK is the Kingston equivalent of a combined local CARM chapter and the Toronto Railway Supper Club. They meet once a month at a restaurant, with slideshows and discussions, and sometimes have other get-togethers. This might have been the final Rail O Rama, but ARK is arranging a fall show on November 24 at a different location (see home.eol.ca/~ianmc/shows and click on "2018").

(Photos by Ian McIntosh)

The CARM booth at the Lakeshore Modellers Flea Market in April was ably taken care of by William Waithe, Mike Walton, Peter Hughes, and James Rasor. We had a fun day, we picked up some nice items we needed, we ran into Gerald Harper and Ian Jameson along with many others, gave out some Junior Engineer Certificates to those who successfully completed the CARM switching layout, and just generally had a great time.
(Photo by James Rasor)

In May CARM Toronto Chapter Members gathered at Panther Hobbies to see their N scale and HO scale layouts. Multiple trains were running and we had a wonderful personal tour of everything. You really need to look closely and spend some time there. A great deal is going on. At the end of the tour many of us stocked up on more modelling supplies.

(Photos by James Rasor)

Making Evergreen Trees – from Hemp!

By Neil Battie with Ted Rafuse: Images by Ted Rafuse

Believe it or not many of the pine trees on my layout are made from hemp. Not the leaves, but from the fibres that appear much like binder twine. I have learned that my method allows for the construction of many trees in a short period of time and when placed on my layout not only occupy scenic space but appear naturally realistic. To indicate pine needles in decay I simply leave the hemp colour. To indicate healthy pine needles I spray paint the fibres one or two shades of green. The raw materials are inexpensive, hemp fibre and florist's wire. My method is best explained in the following images.

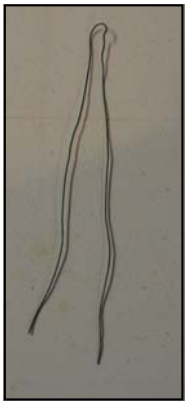
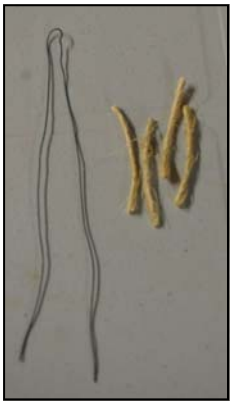


Image 1
This florist's wire has been bent in half around a drill bit to form a loop at one end. This material will eventually become the trunk of the tree.

Image 2
Hemp fibres are cut in 1½ to 2 inch approximate lengths from the second half of the necessary material to create the trees.



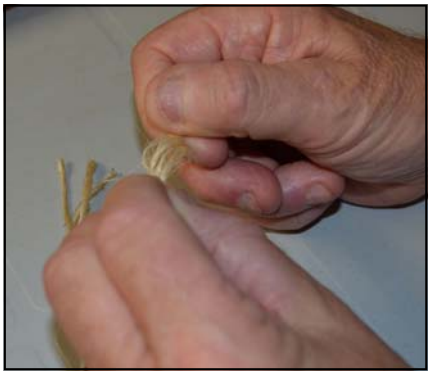


Image 3
Next step, twist the hemp fibres apart between thumbs so that the spread apart.

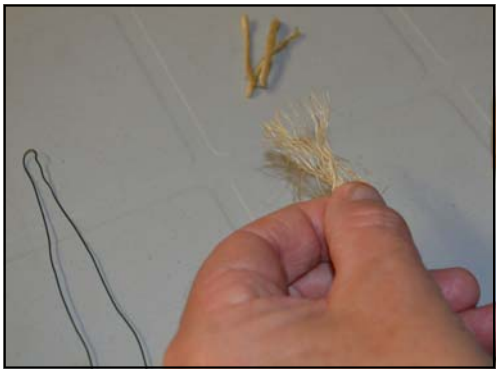


Image 4
After twisting the hemp fibre it will have the appearance as seen here.

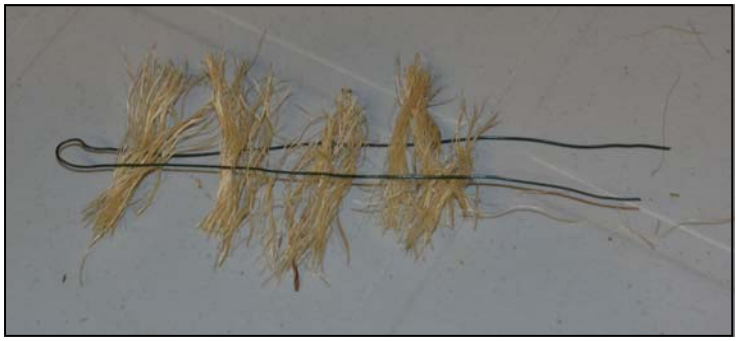


Image 5
When several bundles of hemp lengths have been untwisted, the bundles are placed randomly along the florist's wire with one arm of the wire under the hemp and the other arm of the wire over the hemp.

Image 6
Next take the assembled wire and hemp to a vise and clamp the loose ends of the wire into the jaws of the vice.

Image 7
This sequence involves inserting the stem of an elongated cup hook into the chuck of an electric drill. Place the cup hook into the looped end of the florist's wire. Slowly power the drill so that the wire is twisted onto itself and secures the hemp fibres along the 'trunk' of the tree.

Image 8
This is what the 'finished' tree will look like fresh from the operation performed at the vice.

Image 9
Remove the 'tree' from the vice and over a waste basket trim the fibres on an angle peaking the shortest branches towards the top looped, end.

Image 10
This image illustrates the final product. The trees have been painted green with spray can paint and several have been planted on the layout to form a cluster of pine trees.

RAILWAY MUSEUM OF EASTERN ONTARIO LAYOUT

Article and Photos by Bruce Leckie

Gilbert Lacroix and Bruce Leckie were approached at Rail-o-Rama in March of 2018 by volunteers with the Railway Museum of Eastern Ontario concerning building a layout for the museum. After several meetings, we decided to model the entire CN facilities in Smiths Falls, from the lift bridge to the CP interchange, circa 1955. The museum offered us a railcar to house the layout and did a lot of switching to spot it where we wanted it.

IMAGE ABOVE: Car spotted at Museum

We obtained a survey map of the area from Steve Hunter, and Gilbert drew up a track plan. At each end of the single track mainline is a reversing loop, with several staging tracks. There are several sidings in the area, and these were all included.

Because the interior of the car is 72 feet long, we had around 45 feet for the visible portion of the layout, and therefore very little selective compression was needed. We will be building the layout in modular form to allow us to work on it off site and these sections will be supported by cantilevered bench work.

This will be an interactive display and can be used in three ways:

1) Unattended, semi automatic: The visitor starts a cycle and brings a train onto the layout from the loop at one end, stops at the station, and then exits to the loop at the other end to finish the cycle. The control system is under development by another volunteer. This operation will be used most of the time.

2) Manual prototypical: If a knowledgeable volunteer is available, a visitor will be able to work as engineer, and

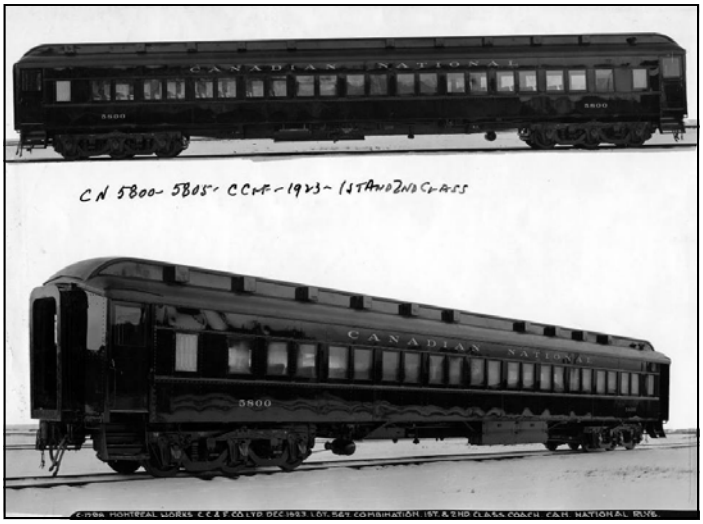


IMAGE ABOVE: Car as originally delivered

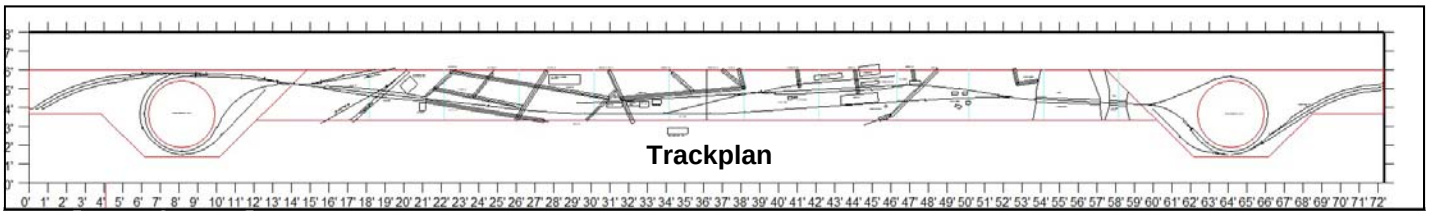
the volunteer as the conductor/brakeman. The team will use historical documents such as waybills and switch lists to duplicate the work done on a typical day in 1955, all the while explaining to the viewers what is happening and why.

3) Non prototypical operation: The layout volunteers stage an operating night, running extra passenger and freight trains.

Once the plan was done, we needed to gut the car, as the interior was in rough shape. Everything went out, including the concrete floor, and filled a 20 yard bin!

With the help of some volunteers, Randy Plunkett, Eric Halpin and Brian Read, we put in a new floor, repaired the doors so we could lock up the car and set out to finish the rest of the interior. The layout is on the east side of the car, matching the orientation of the prototype, and consists of a blank wall with partitions to hide the reversing loops at either end. Because that side of the car is very visible to the public, we took care to hide the framework where it crossed the windows. There is a lighting valence over the layout.

The windows on the west side were framed up and the interior profile of the car was largely retained on that side. There is considerable exhibit space available to the museum as well. The walls and ceiling are painted a light grey, and the floor is a slightly darker grey. The back-



Trackplan

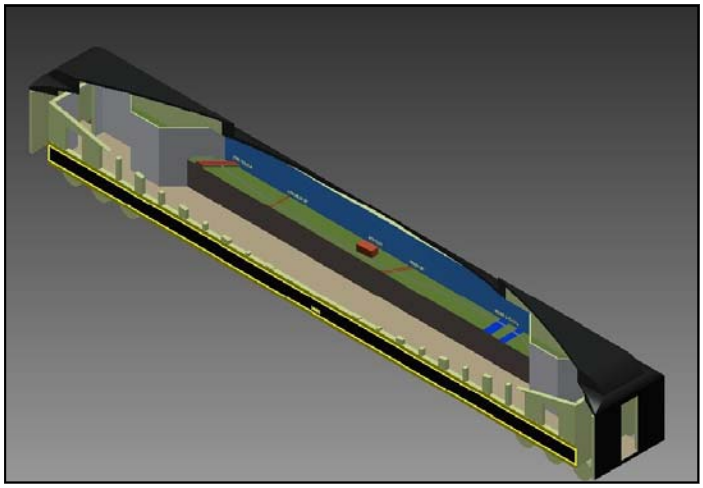
drop of the layout is a pale blue, of course.

A couple of large donations helped enormously: Rideau Home Building Centre donated the OSB for the walls (the largest single component) and a private individual from Milton, Ontario donated a huge quantity of model rail supplies and rolling stock. The town matched these donations giving us a healthy budget.

The next step is to replace the temporary electrical system and lighting to bring that up to code, and to start construction on the modules themselves. Most of this winter will be taken up with researching and building the needed structures. If anyone wishes to participate in this project , or to donate in any fashion, contact Gilbert or Bruce or one of the museum staff. We gratefully accept any assistance. Anyone is welcome to come out during museum hours to view the progress

IMAGE ABOVE LEFT: Car interior as delivered.
IMAGE ABOVE RIGHT: Remodelling of interior started.
IMAGE BELOW RIGHT: Remodelling of interior continued.
IMAGE BOTTOM RIGHT: New Plywood walls installed.

IMAGE BELOW: 3d rendering of layout in car



SOLO OPERATING: WHICH CAR GOES WHERE?

Article by Richard Morrison

Most of the time I operate my layout solo, running one train at a time. I tried one-person, multi-train operation but found it too stressful, especially when one train stalled or derailed while I was trying to set out or pick up cars with another. The turning point came when I stopped the wrong locomotive, with disastrous results.

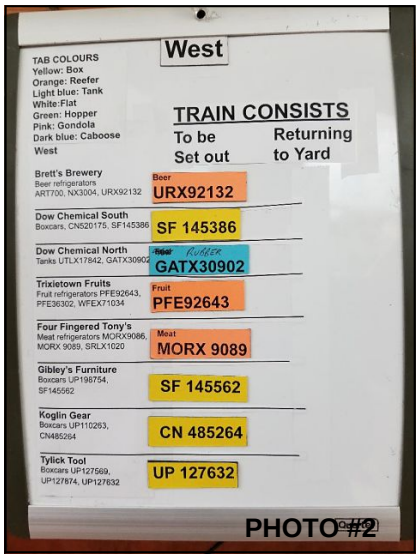
My spouse overheard shouted obscenities coming from the layout room. "You can't be having much fun," she said. "Why don't you collect stamps or something?"

Solo operation need not mean just running trains around to keep the track clean. The system outlined here allows solo, one-train operation that's both simple, yet challenging. Each train is made up in the yard and its cars are delivered to industries, with some cars at some industries switched out and brought back to the yard. There's plenty of challenge in making up trains and delivering the right car to the right customer. Return trips are also challenging, as only certain customers want their cars picked up. Two or three specific cars in the roster are allocated to each industry, with no duplication. Allowing each customer to request and ship out only its "own" cars makes operating tricky and ensures all cars get used regularly.

Magnetic strips follow each car. Every car on the layout is represented by a flexible magnetic strip that sticks to a magnetic whiteboard clipboard, and then to a sheet on the fascia. Stores such as Staples and Office Depot sell flexible magnetic sheets and strips that can be cut to make customized fridge magnets. I bought some of these, together with a few small whiteboards. The strips and pieces were cut into rectangles roughly ½" high and 2" wide.

I made a list of all my freight cars in large bold type and printed out the lists on different sheets of coloured paper, with a different colour for each freight car type. Once the lists were printed out, I cut out around each entry and stuck them down to the magnetic tabs.

Once a car is spotted at an industry, its magnetic tab goes on a strip on the fascia as close as possible to the industry. **SEE PHOTO #1**



Once a car is picked up, its tab goes on a magnetic clipboard-sized whiteboard that lists the industry and whether the car is being set out or picked up. The tab remains on the clipboard until it is set out back at the yard. **SEE PHOTO #2**

I built a whiteboard in front of the 40-car yard and used automotive striping tape to make 40 rectangles, each big enough for a car's magnetic strip. Each row of boxes across the whiteboard represents one of the six tracks in the yard, either seven, eight or nine rectangles across, depending on the length of the yard track. At a glance, you can see which car is where in the yard. **SEE PHOTO #3**

Operations:

Although you can also flip a coin, I run a random number generator to decide whether or not a specific industry needs a car, and if so, which one. If an industry requests a car, you look for its tab on the yard whiteboard, assemble it into a train, and affix its magnetic tab to the clipboard-sized whiteboard.

MODEL RAILWAY ANIMATION
PART 5: Parts & I²C

Text & Images by David King

Welcome as I change things up a little this time as I will cover 2 topics. The first topic will be on where to get additional parts to add so that you can complete some projects and not have to take them apart to try something else. In the second topic I will introduce you to I^2C, a communications protocol that will allow you to add a great number of devices with very little wiring needed. This approach depends on you adding libraries to your Arduino software, which really is not difficult, and doing some setup in your sketch. Both of these topics are related so that is why I'm putting them together in the same write up.

Obtaining More Parts

At this point in your learning I would think that you would like to start leaving some of the projects together but in order to do that you need additional items to build the next project. So, let us look at some of the places you can get these parts along with the advantages and disadvantages of each. This list I'm providing is just a sampling of the many suppliers that are out there so I would strongly suggest that you search out and review the suppliers to determine which are best for you.

Some suppliers of electronic components carry a very limited supply of items certain items so getting everything from one supplier can be difficult. Let us begin and look at who is out there.

Locally (meaning you can go to a store front location)

Company/Website	Location	Items
Sayal Electronics sayal.com	Throughout Southern Ontario	Microcontrollers including Arduino: Basic components: Add-on boards: Kits
Nutech Electronics nutechelectronics.com	2 Stores in Southern Ontario	Limited supply of microcontrollers: Basic components
A-1 Electronic Parts a1parts.ca	Toronto, Ontario	Limited supply of microcontrollers: Basic components

You should also be able to find other stores located in larger population areas. Most of the time the prices are a little higher at a public accessed store location but you do get the advantage of being able to get parts quickly if you need something in a hurry. Most of these retail outlets will offer shipping options as well.

On-Line Nationally

Company/Website	Location	Items
Allied Electronics & Automation ca-en.alliedelec.com	Based in Texas, USA with Canadian office in Ottawa	Microcontrollers including Arduino: Basic components: Add-on boards: Kits
Digi-Key Electronics digikey.ca	Based in Minnesota, USA with large world presence	Large selections of Microcontrollers including Arduino: Large selection of components: Add-on boards: Kits
Adafruit Industries adafruit.com: Also manufacture many of their own items.	Based in New York City, USA and ships worldwide	Large selections of Microcontrollers including Arduino: Basic components: Add-on boards: Kits: Has very large learning area and community support.
SparkFun sparkfun.com	Based in Colorado, USA and ships worldwide	Large selections of Microcontrollers including Arduino: Basic components: Add-on boards: Kits
Newark Element 4 canada.newark.com	Based in Mississauga, Ontario and ships worldwide with multiple warehouse locations	Large selections of Microcontrollers including Arduino: Large selection of components: Add-on boards: Kits
Robot Shop robotshop.com/ca/en/	Located in Maribel, Quebec with locations in some other countries	Large selections of Microcontrollers including Arduino: Basic components: Add-on boards: Kits

These are but some of the electronic suppliers that are available in North America. The all have shipping options as they usually don't have a retail store that you can visit. Depending on what you need and where it is coming from delivery time can range from just 1 day to many days. These types of suppliers usually have better pricing, but you will need to wait a little to get the items. Don't forget to factor in shipping costs as part of the value for your components.

On-Line International

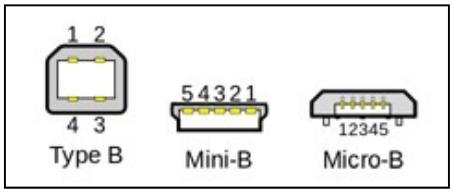
Company/Website	Location	Items
eBay ebay.ca	Worldwide	Almost anything is available
Ali Express aliexpress.com	Worldwide	Almost anything is available

These types of websites are fine for finding the parts you need but they do come from many different suppliers. The biggest advantage is usually the price, but you better not be in a hurry to get your items. Depending on the actual source location you could be waiting many weeks for their arrival.

The choice of which type of supplier to use is totally up to you. I do use at least one from each of the lists above, but you will need to make of your own mind which ones are best for you. I don't get any endorsements from any of them, but the one I like to most from each list are Sayal Electronics, Adafruit Industries and eBay.

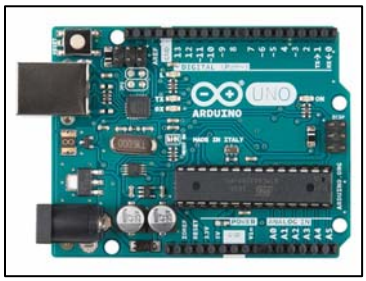
Microcontrollers

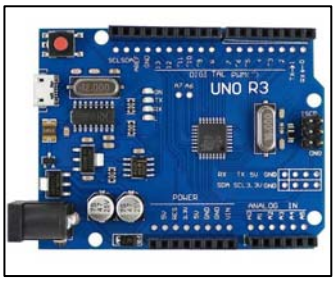
Up to this point all of the lessons have used the UNO R3 which is available from many different suppliers. All of the UNO R3 boards program the same but there are different communication protocols used. In some cases, you will not need to install any driver on your computer as the UNO R3 will be recognized right away. In other cases you may need to install a FTDI driver from Future Technology Devices International Ltd. from ftdichip.com/FTDrivers.htm, or the CP210x USB to UART Bridge Virtual COM Port (VCP) driver from silabs.com. The nice thing is once you have installed these drivers you should not need to install them again and your board should connect just fine.

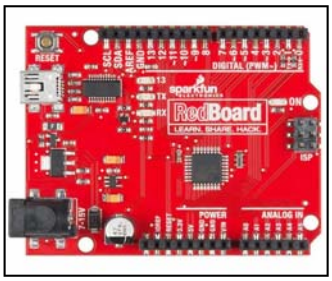


You also need to make sure that the USB cable you are using is a data cable, meaning that it has wiring inside for all of the pins and not just 2 that some charger cables have. There are also 3 different USB connectors used as shown below.

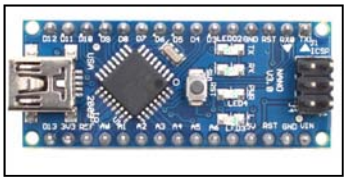
All of the UNO R3 boards that are made should have all of the same pinouts, analog and digital, as an original Arduino UNO R3 so you should have no trouble using them. The colour of the board may vary as well as the USB connection, but all of the other specifications should not vary. Here are some samples from Arduino, eBay, SparkFun and Adafruit.







Personally, I have used each of these boards and they all work fine.
There are many other microcontroller boards out there that physically look different, may have more or less connection pins and possibly operate using different voltage but they use the Arduino programming language. The biggest issue you will come across, depending on the board you choose, is that you may need to install a library file in the Arduino software, so it can access all of the features properly on the board of choice. Installing libraries is not difficult and I will show you a sample of how that is done, but first here are a few of the many microcontroller boards that are out there. These are the Mega, Circuit Playground Express, Feather Huzzah! and Nano.



Installing Microcontroller Libraries

If you use the Mega or Nano, you may not need to do anything special to get this board working. As for the Circuit Playground Express or the Feather Huzzah! Shown above you will need to install the library before you can use them. Adding libraries can seem very daunting the first time you do it, but it will get much easier as you move forward. Adding

any libraries or drivers are usually covered in linked documents that are on the site that you purchased the microcontroller board from. If they don't have a link usually a quick search from your computer will link you to the proper file.

Let's have a look at the steps you may need to follow if you were to use the Feather Huzzah! board shown above.

- Install the CP2104 USB driver to communicate with the board.
- Be sure you have installed the latest version of the Arduino software.
- Install the ESP8266 board package from the Preferences window in the Arduino software. This adds the needed files on your computer.
- Install the ESP8266 package by using the Boards Manager in the Arduino software.
- Now close the Arduino software and restart it. The board will now be on the list of available boards under the Tools tab of the Arduino software.

I'm sure that you are finding these steps difficult to follow, but I am giving you the link that will take you to the Learning section of the Adafruit Industries website that goes through these steps in detail.
https://learn.adafruit.com/adafruit-feather-huzzah-esp8266/using-arduino-ide

I've used more than 10 different Arduino based boards, so I have installed many different libraries with very few issues. If you do have a problem, you just need to do a quick web search and I can almost guarantee that you are not the only person to have had an issue installing a library. Most problems are quickly solved, and you will be on your way to expanding your knowledge and getting more out your projects.

I^2C

I^2C stands for Inter-Integrated Circuit and is pronounced I Squared C. This is a very popular communication protocol that is used with many microcontrollers regardless if they are being programmed using the Arduino, Python, Node MCU Lua, MicroPython, CircuitPython, JavaScript or any of the other possible programming languages. The reason for this popularity is that it is simple and each device that is connected uses a unique digital address. The key here is that each of the digital addresses need to be unique as using the same address can cause conflicts between the devices. This communication is also 2 way, meaning that the device could be receiving and/or sending information across the I^2C communication wiring.

The wiring for the I^2C uses 4 wires, 2 of which are used for power and this is +5 or +3.3 volts for most microcontrollers. The other 2 wires are used for the communications and are labelled as SDA and SCL on most of the microcontrollers. Boards like this UNO may also use some pinouts that have multiple uses. On the UNO pins A4 and A5 are also SDA and SCL pins so some care is needed if you are using the pins as analog pins and you also wish to use the I^2C communications.

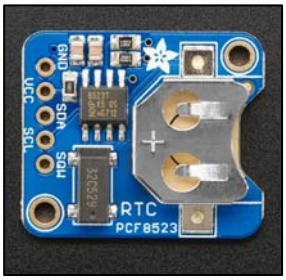
Most microcontrollers and their I^2C devices use the 7-bit address format but there is a variant using 10-bit addressing, we shouldn't come across any of those devices here. The address range is from 0 to 127 or 0000 000 to 1111 111 in binary or 0x00 to 0x77 in hexadecimal. There are a few reserved addresses and a few un-reserved addresses so that still leaves a lot of address available for manufactures of I2C device to use. In many cases smaller ranges of address are used to group similar devices together. An example of this is for manufacturers that are making real time clocks, RTC, to use with our microcontrollers. The address for most real time clocks use address 0x68. I can't see a reason why we would want more than one real time clock, so this should work out fine. We will be adding a real time clock in the extended article for Part 5 and you will need a small Lithium CR1220 coin cell battery.

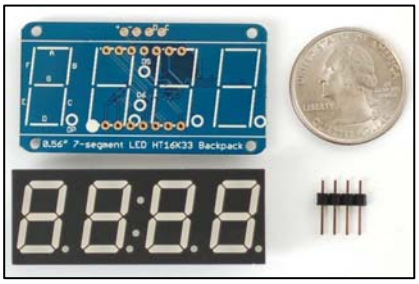
Another device we will be adding to the project in the extended article will be a LED 7-Segment display that uses the I2C protocol. The address for this device can range from 0x70 to 0x77 as you will see later. Here are images for these 2 devices and they are available from Adafruit Industries.

Want different ideas?
See prototype details in our books
- Ask for a free catalog sheet -

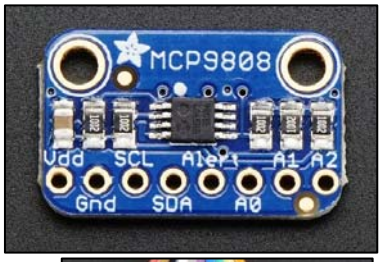
dale.wilson@fibreop.ca

or write to
Nickel Belt Rails
Box 483, Station "B"
Sudbury, ON, P3E 4P6





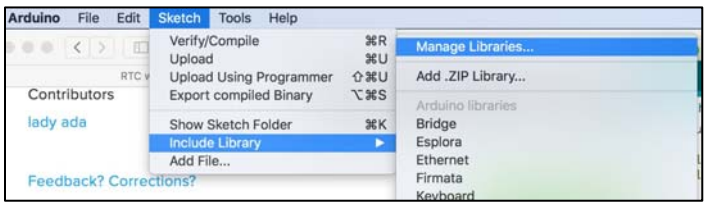
Other devices that are available are Light Sensors (TSL2561), Proximity Sensors (VCNL4010), Humidity and Temperature Sensors (MCP9808), Multi-Axis Accelerometers (LIS3DH), and OLED Displays. These are just a small sampling of the available devices.



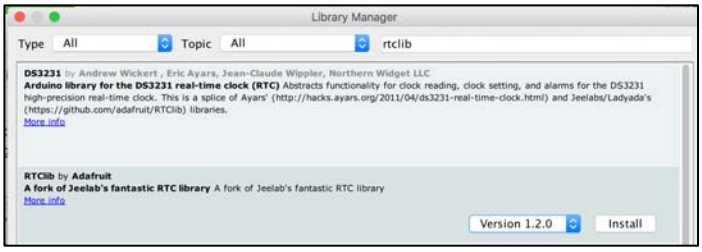
Installing Device Libraries

The process of installing device libraries is simpler than installing the libraries needed for the microcontrollers. This time you only need to complete the following steps.

Start the Arduino software and under the Sketch tab choose Include Library and then choose Manage Libraries…

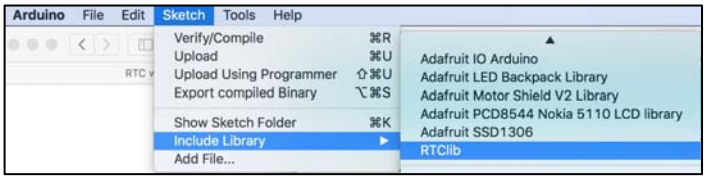


Next search for the library from the list. For our purpose of adding the library for the real time clock, search for rtclib. Choose the one from Adafruit and click on the More Info link. This should display the version number and an Install button if you have not previously added this library. Always choose the most recent version if there is a choice.

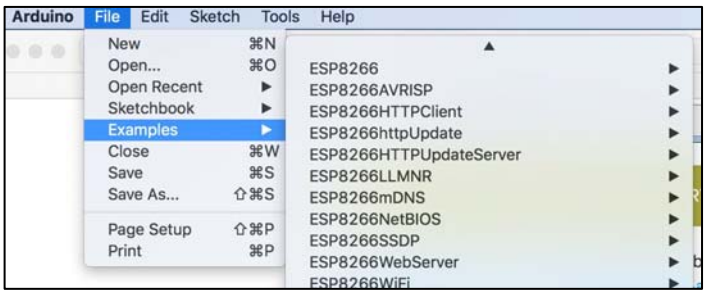


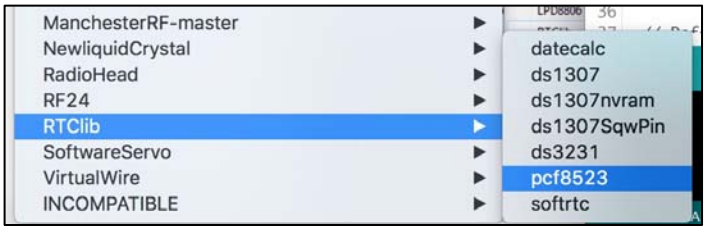
Once the library has been installed the description will be updated with the word INSTALLED displayed.

That's it, you should now be able to access that library from the Arduino software. If it is not showing up as a choice under the Sketch tab in the Include Library box and called RTClib you can try closing the Arduino software and then re-open it. This will refresh the menus.



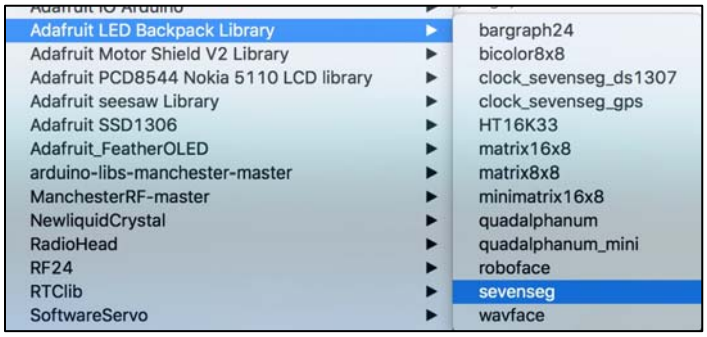
There is also an example file that you can open located in the File tab in the list located in the Examples area. Continue to the RTClib list and pick the model of real time clock that we are using, in this case the pcf8523. The sketch will open as a new file and you review it to see the code that is designed to work with the RTC module.





If you need more help be sure to check out the on-line tutorial on the Adafruit website at;
https://learn.adafruit.com/adafruit-pcf8523-real-time-clock/rtc-with-arduino

Now you can try adding the library for the LED 7-Segment display that I will be using for the project. The library you are looking for and the example files are located in the image below.



Conclusion

In this article I have shown that there are many choices out there for devices that can be added to your projects. Some are very simple, and others may take a lot more work on your part to get the most out of them. With a little patience and imagination, you can be creating some great projects.

I have also given you a hint of the items that you may wish to acquire to work on the project that is in the expanded article on the CARM website at WWW.CAORM.ORG in the Members Area under the tab Expanded Articles. You will need the real time clock module along with the battery and one of the LED 7-Segment displays. The displays are available with different display colours, so you can choose which ones work for you. Also, for the project I'll be using the UNO R3 since that is what we have been using so far along with a few LEDs (3) and some pushbuttons (4). There will also be a little bit of soldering to do this time.

ADAFRUIT 0.56" 4-DIGIT 7-SEGMENT DISPLAY W/I2C BACKPACK – RED

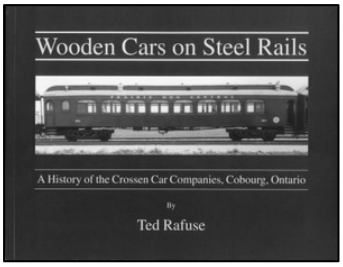
Product ID: 878 for red, 881 for blue, 880 for green, 879 for yellow

ADAFRUIT PCF8523 REAL TIME CLOCK ASSEMBLED BREAKOUT BOARD

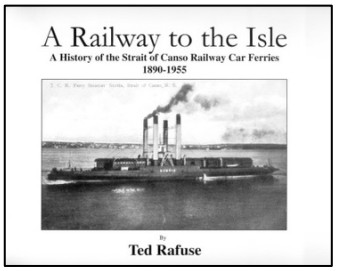
Product ID: 3295 and Product ID: 380 for the CR1220 battery

At this point you may have figured out what the project might be, but in case you haven't figured it out I'll be making a clock display for the layout that can be used to display the **Real Time** or the **Fast Time**. The fast rate will be adjustable at various ratios and the system will include a run/pause and set time for the fast clock. This will be a big project but if will join me this will be a fun project. As a side note you will need to do a little soldering.

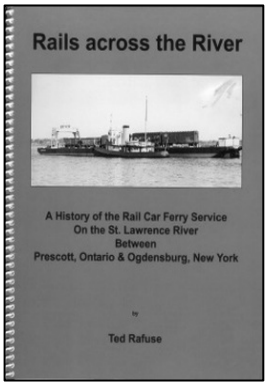
This is a project that you can start at any time even if you have not viewed the previous articles from this series. The previous articles are available in the preceding issues (#59, #60, #61, #62 and #64) of *The Canadian*, so enjoy!



Wooden Cars on Steel Rails chronicles the Crossen Car Manufacturing Co, Canada's largest independent builder of wooden rail cars 1866-2016.



A Railway to the Isle outlines the rail car ferry service between Cape Breton Island and Nova Scotia 1890-1955.

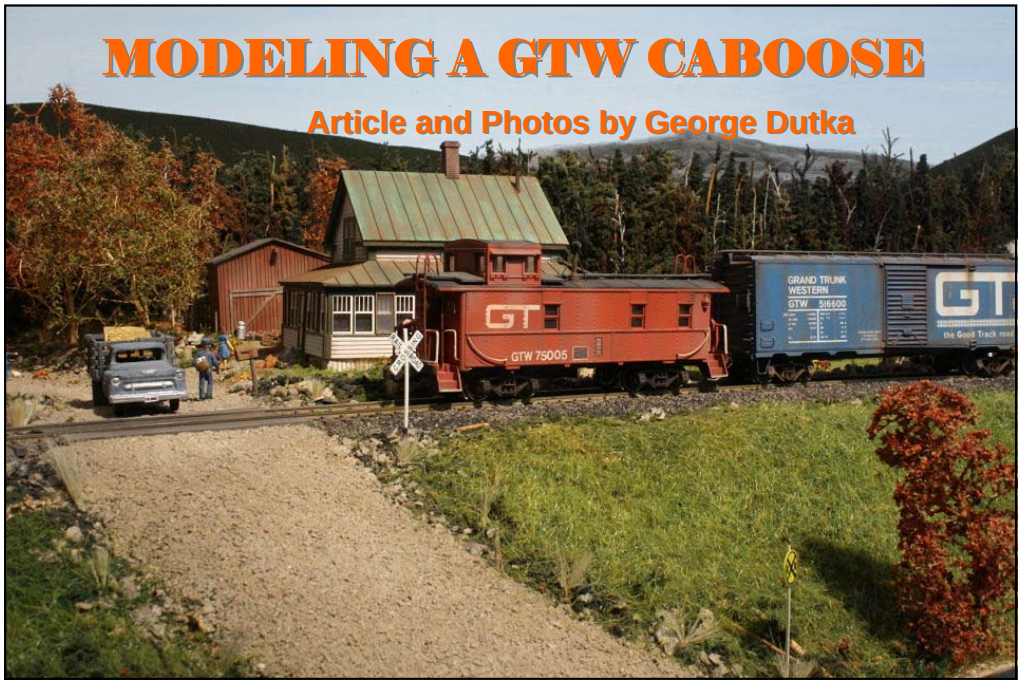


A History of the Rail Car Ferry Service on the St. Lawrence River Between Prescott, Ontario and Ogdensburg, New York, 1858-1970.

Order from Steampowerpublishing.org. Special for CARM readers, order all 3 books at once and obtain free mailing.

MODELING A GTW CABOOSE

Article and Photos by George Dutka



Back in the 1980's while a member of the Thames Valley Modular Railroad Club in London, Ontario I ran a fleet of GTW equipment. Once I left the club much of this equipment was sold off as I became interested in New England railroading. This caboose was one of the pieces sold off to my friend Peter Mumby back then. Recently Peter was thinning his collection and offered it back to me. I decided to make a few improvements to the caboose. Let's see if I can remember what I originally did to the caboose followed by my current updates.

The Prototype

The oldest steel cabooses the GTW rostered were 34 former Santa Fe cabooses built by American Car & Foundry numbered 75000-75033 and built in 1928. GTW 75010 was the last in-service caboose in this series assigned to yard and transfer service. One could see 75010 as late as 1992 working the yards. Today there are a few examples on display throughout Michigan.

As Originally Built

The model started as a Roco Santa Fe caboose. I began by adding Juneco caboose grab's, curved for the sides and angled for the end irons. I think the smoke stack is also a replacement. The end ladders are also changed out with brass options of the 1980's era . On the side of this caboose that has five windows I closed in the last window with a piece of square styrene. This window is the one on the cupola end as seen in the photos. Kadee number 5 couplers are added.

Now ready for paint I used a mix of Floquil caboose red and reefer orange. I think it would have been 75% red and 25% orange. I used CDS dry transfers for GT cabooses number 68. I also added a ACI label offered by Walthers. The end and side grabs are painted white. On some cabooses the top portion of the end ladders are white. This is the portion above the roof.

2017 GTW Caboose Update

During my upgrade I began by changing out the wheels with steel ones that are painted a rusty colour. I also bent uncoupling levers for each end. The smoke stack got wire supports as on the prototype. A Black Cat CNR brass etched screen door is painted and added partway open. I also added a Woodland Scenic figure which is a bit more modern to the end platform as the tail end brakeman.

The roof walk on these cabooses are wood so I painted mine with acrylic wood coloured paint, which is more of a wash. I then used some tube acrylic paints to add some rust spots and streaks. Pan Pastels and Bragdon powders are then used to finish the weathering. There was some Floquil dust that was sprayed on originally that these powders toned down.

Final thoughts

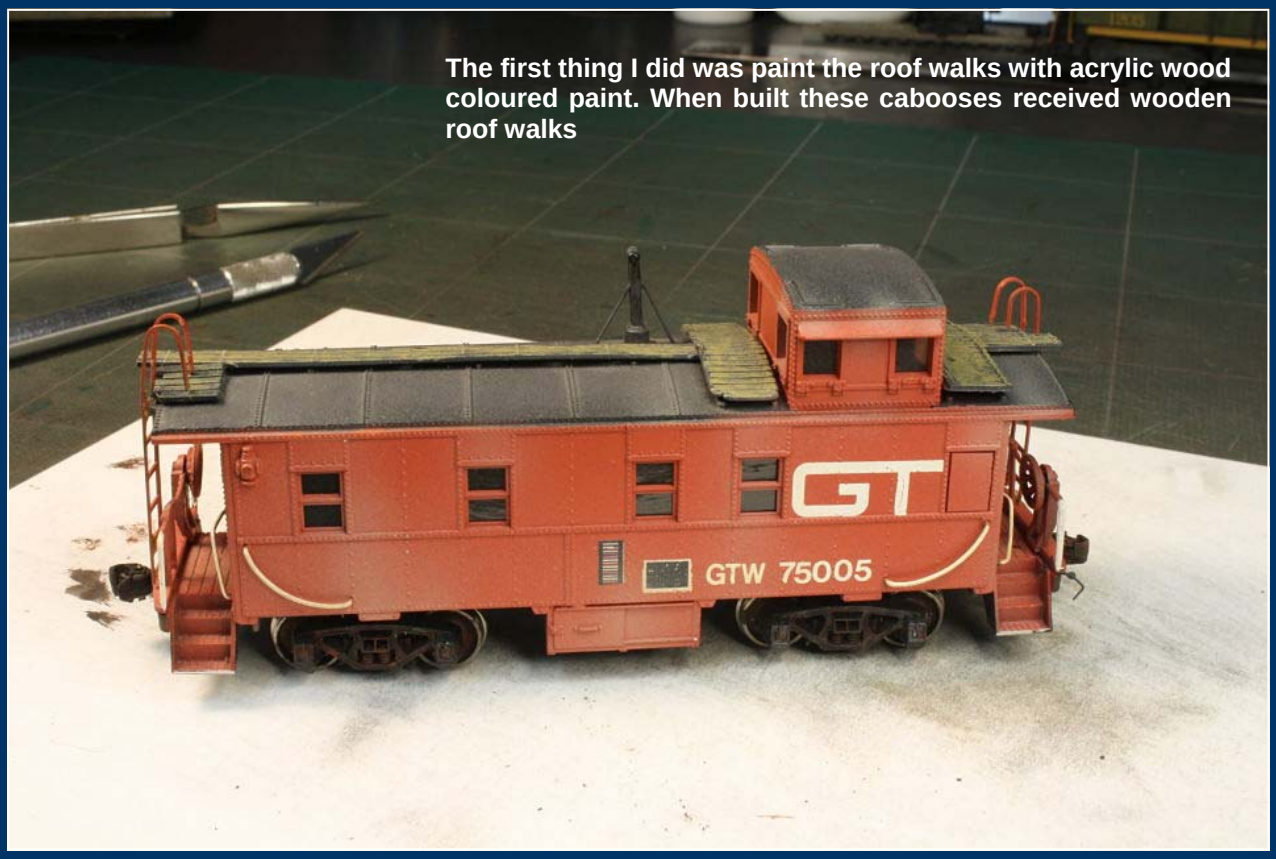
This is an easy project for one to complete. Models of these Santa Fe style caboose can be found for a very reasonable price at most train shows. Decals and dry transfers can still be found and Juneco still has stacks and grabs that one would need. If you look at the prototype photos one can see some variations that would make an interesting model. If you are interested in the CN family fleet of cabooses, this could be a good addition to one's collection.

Continued on back page.

Prototype Caboose 75007
This caboose has the steel panel covering the rear window as was common on the GT versions. This one is on display at the Lapeer, Mi station. June 10 2000, Chris Martin photo, Peter Mumby collection.

GTW CABOOSE

Photos by George Dutka



The first thing I did was paint the roof walks with acrylic wood coloured paint. When built these cabooses received wooden roof walks

A conductor has been added and some PanPastels are applied. I also added wire supports to the caboose stack. Some tub acrylics are also used. I also added a Black Cat CN style brass etched caboose screen door.