The Trolleyville Times

February 2016

ld be at your dealers this month! - - See pre-production models and the 3D printed Models of Siemens San Diego S

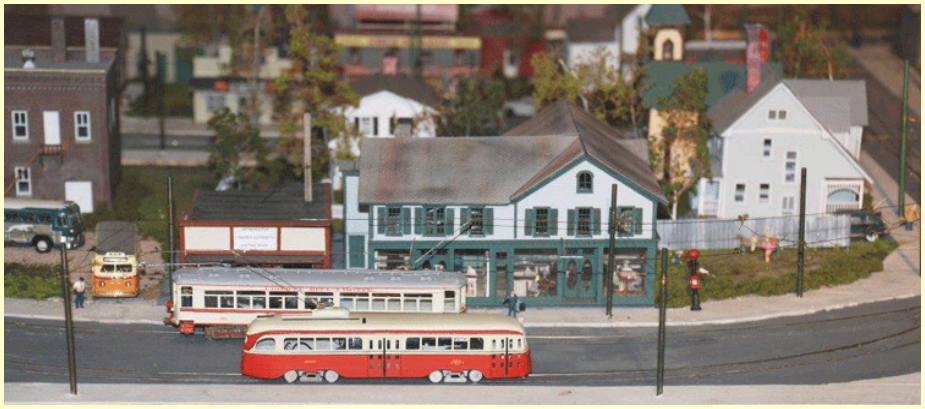
IN THIS ISSUE:

MODELING ACTIVITY.....

Toronto Transit Commission Car 4041 Enters Operation on Richard Allman's Main Line Transit.

The Model:

The prototype Toronto 4041 was one of 140 President's Conference Committee (PCC) cars delivered to the Toronto Transportation Commission in August 1938 and assigned TTC Class A-1. Toronto would go on to acquire 300 PCC cars of the pre-war air-electric design between 1938 and 1945 and acquire 27 more Air-Electric PCC cars from Cincinnati in 1950-1051. Photos throughout this article were taken at various places on the Main Line Transit.



Photos 1 and 2: TCC 4041 and LVT 701 at the Trolley Terminal Siding in the New England Village.

The shell used for the 4041 was fabricated by Shapeways using the 3D printing process. Other PCC shells are also available but the Toronto shells require some distinctive features, which were supplied in a collaborative venture by several suppliers, including GHB. Those features include (1) the distinctive dash lights in the front, (2) the horizontal bumpers below the front and rear anti-climbers, (3) the extension of the trolley boards over the rear of the car, and (4) the next car light on the front of the roof. These are typical and essential details for Toronto PCC's. The kit from Shapeways

includes both the shorter pole shroud which is typical of the pre-war PCC's and was used in constructing the A-1 class car and the longer pole shroud, typical of wartime and post-war PCC's. This means that a modeler can model either the A-1 or else the A-3 series 4200-4259 which had the longer pole shroud but the same front skirting below the front anticlimber as the A-1's. Richard chose a more personally pleasing paint scheme to him, that is the brighter red used later rather than the sometimes maroon of TTC used in the early days of PCC operation. The drive is the standard 1999 Bowser trolley drive with 26 inch wheels and an A-Line 20040 flywheel, which makes it smooth running. Shapeways provided a floor, but he preferred to use a Bowser metal PCC floor provided by Custom Traxx. The floor required some filing at the ends, not a big deal. The trolley pole he chose was a Miniatures by Eric (HT-P2) PCC pole. It was the one from his personal stash that he feels tracks best. Richard feels that Custom Traxx also has great Toronto decal sets with all the numerals, logos, stripes and destination signs needed to complete the car. He states that he would not attempt to letter a Toronto car without Custom Traxx' decals!! The project is not for the timid. The shell must be soaked overnight in isopropyl alcohol then cleaned with dish soap. The gentle scrubbing resulted in breakage of the windshield visor and a window post by the motorman's seat that needed to be patched. Color matching was a challenge. The finishing required almost 400 scale feet of one-inch scale black striping, so keep all sharp objects away from him!

Photo 3: Another view at the Trolley Terminal

Photo 4: TTC 4041 approaching Keystone Junction

Photo 5: TTC 4041 after taking the diversion switch at Keystone Junction.

Photo 6: TTC 4041 after leaving Keystone Junction.

The shell is not perfect but it is good, and he says that he was happy with the finished result. The Shapeways floor does not appear to be strong enough and was not a good fit under the shell. The way the floor mounts are placed in the ends means a headlight cannot be placed in front without potential structural damage to the car shell. More coordination between the users and those making 3D drawings would help alleviate these issues. The current Shapeways 3D printing process is improving, but still shows horizontal grooving up close, despite sanding. Overly vigorous sanding could create further problems. The usual PCC roof mat is missing but Richard stated that he could live with that. The decal set was very complete although he feels that the logo that is in the back above the rear window should be a bit smaller. He claims that if he hadn't pointed it out, who would have known? Similarly, Richard feels that the Railroad Roman numerals under the front headlight should be a bit smaller, but he won't tell if you don't. Two details remain to be applied: a handrail at the middle of the center door, and a trolley pole hook. PCC hooks especially are a bear to make. He still must add around 8 grams (about ¼ ounce) of weight under the car to help it climb steeper grades.

There are many persons who contributed to the success of this project, and deserve credit:

(1) To Shapeways, GHB (George Barsky) and others for making the model and for accepting advice for necessary details;
(2) To Bowser (Lee English) for the excellent, durable drive which is so easy to install;
(3) To Miniatures by Eric (Eric Courtney) for the trolley pole that tracks nicely;
(4) To Custom Traxx (George Huckaby) for the decals;
(5) To the authors of what after 42 years still is the definitive history of Toronto trolleys, Fifty Years of Progressive Transit: A History of the Toronto Transit Commission by friends John Bromley and Jack May;
(6) To lifelong friend Fred Schneider whose two Carlson-Schneider volumes on PCC cars are an essential reference; (7) To John Bromley, who provided some absolutely stunning color photos of TTC PCC's that were essential for details. John is the undisputed resident authority on all things TTC;
(8) To Patrick Lavalle who is a skilled HO scale modeler. Patrick and his wife Patricia are career TTC trolley operators. Patrick visited the Halton County Radial Museum and provided some great detail shots of 4000, the first Toronto PCC.

Photo 7: TTC 4041 descending from the overpass above Keystone Junction.

Photo 8: TTC 4041 heading toward Keystone Junction

Photo 9: TTC 4041 entering Keystone Junction.

Photo 10: TTC 4041 heading from Keystone Junction to Bay State Junction.

None of Richard's HO trolley projects happen without the mentoring, support, hospitality and enormous forbearance of his great friend Bob Dietrich who always provides something new about detailing and construction, who endures Richard's ravings while he applies one inch striping and who helps him unmake inevitable mistakes. Funny Bob doesn't seem to make mistakes on his cars! Next projects: Scranton Electromobile - Bob is couple weeks ahead of Richard, then a Hagerstown and Frederick Combine car. Next Richard will finish a Pacific Electric 1200 car, and after that LVT car 706, an Atlantic City Brilliner, and maybe a Wilkes-Barre Type 5 car. Now that his graduate program at Creighton is finished, he can finally get that Seaver Street-Franklin Park Boston module finished.

The Prototype (And Some Background):

The prototype of car 4041 was a Presidents' Conference Committee (PCC) car. The PCC was a body of visionary transit executives who convened beginning in the late 1920's. They recognized that the street railway industry was deeply troubled by aging and archaic car fleets, crumbling infrastructure, the economic crisis of the Great Depression and cheap automobiles and gasoline and thousands of miles of paved roads. If the industry was to survive, new, technologically modern and aesthetically pleasing streetcars were essential. After a series of promising preliminary models in Brooklyn, Chicago and Washington, the first group of PCC cars was delivered in Brooklyn in 1937, an experimental one-of-a-kind car from Clark Equipment Company and 99 cars from St. Louis Car Company. By the time the last PCC car was produced for San Francisco in 1952, more than 5000 of these modern vehicles would be built in the US and Canada. Many thousands more would be built in Europe and the former Soviet bloc countries into the 1980's where thousands continue in operation. The PCC car was a life extender for many North American trolley operations. PCC operation has a few North American remnants, including the F-Line in San Francisco, Route 15 in Philadelphia, the Ashmont-Mattapan line in Boston, a short loop in Kenosha, Wisconsin, another downtown loop operation in San Diego, and some remaining PCC operation on the Exhibition Line in Toronto. Several of these operations are both heritage operations and regular transit operations. A combined heritage and transit loop is currently in development in El Paso with some early ex-San Diego PCC cars. Among North American PCC operators, Toronto was the largest and for many years, reputed to be the best in maintenance, even with the harsh winters. This resulted in long life for the PCC's in Toronto and when many became surplus, extended life in places where some were later sold. The car modeled, 4041 was part of the first order of PCC's Toronto obtained. There were 140 cars in the order, the largest single class of Toronto PCC cars. They were delivered in late 1938. At that time, Toronto became the third largest operator of PCC's after Pittsburgh and Washington. The three cities would vie with each other in having the most PCC's until the start of World War Two, when Philadelphia also became a large purchaser. Toronto would eventually have 540 new PCC's. They would have the largest fleet in North American by the mid 1950's because besides the new cars they purchased, they also acquired 205 well maintained second hand cars from Cincinnati (52), Cleveland (75), Birmingham (48) and Kansas City (30), with a total fleet of 744 cars, larger than its closest rivals: Chicago with 683 (all but 83 postwar acquisitions), Pittsburgh with 666, Philadelphia with 550, Washington with 490, Boston with 345, St. Louis with 300 and Baltimore with 275. The other properties began drastically reducing their trolley operations while Toronto was maintaining and improving its operation. This would drive Toronto's aggressive acquisition of second hand cars that would run for many more years. The PCC would be the centerpiece of transit operation in Toronto for almost 30 years. The opening of the Yonge Street Subway in 1954 meant the end of the line for most pre-PCC trolleys. The University Avenue extension of the Yonge Street subway opened in 1963 in anticipation of a needed physical link between the Yonge and Bloor-Danforth lines. The crosstown Bloor Danforth Subway opening in 1966 meant the end of operation for almost all of the pre-war and wartime air-electric cars including 4041. Still, more than 400 PCC's would remain in operation until the early 1980's when a new generation of trolleys, the Canadian Light Rail Vehicles (CLRV's) and the Articulated Light Rail Vehicles (ALRV's) entered service on what was and still is a dense, extensive and well-patronized trolley system. As car 4041 enters operation on Main Line Transit, a new generation of low floor, five-section articulated trolleys built by Bombardier is slowly entering operation in Toronto, replacing the CLRV's and ALRV's. Car 4041 was part of what TTC named the A-1 class. They were assembled and painted by Canadian Car and Foundry in Montreal under license from St. Louis Car Company with trucks from Clark Equipment Company They entered service on the St. Clair Line but quickly were introduced to the Bloor and

Dundas lines. Eventually there would be 13 classes of PCC's, including 175 cars equipped for multiple unit operation. As more PCC cars in other series arrived, almost 125 more by the outbreak of World War II, other routes acquired PCC operations. Among the routes that the A-1's would serve was King, which is what I modeled with a typical westbound destination of Roncesvalles Car House several miles southwest of Downtown Toronto where King Street, Queen Street, the Queensway, and Roncesvalles Avenue converge and where more trolley action can still be observed today than almost anywhere. Although trolleys were and are still a vital piece of transit operation in Toronto, the city's postwar evolution into a world-class metropolis meant that heavy rapid transit with subways would be needed. The Yonge Street Subway in 1954, the University Avenue connector in 1963, and the Bloor-Danforth in 1966 would replace very heavy trolley lines. The A-1 class would survive until 1967-1968 when the Bloor Danforth Subway extension replaced remnants of the heavy Bloor trolley line and several other routes. The A-1's were sufficiently sound that many of them (but not 4041) were part of a sale of 140 surplus PCC's to Alexandria, Egypt. The first A-1 car, 4000 is preserved at an operating trolley museum near Toronto. No property in North America had as much PCC operation and in Richard's opinion no one did it better than Toronto.

The Modeler:

Richard Allman is a lifelong trolley guy. He grew up in the western Philadelphia suburbs where he still lives. He has been an active HO trolley modeler for more than 20 years. His favorite prototypes are the cars of the Philadelphia Suburban Transportation Company's Red Arrow Lines and he has modeled every car type that ran during the PST era. He has also modeled the Liberty Bell Limited cars of the Lehigh Valley Transit Co., Boston cars, Chicago Surface Lines standard cars, and PCC cars in general. He has built or acquired other assorted cars as well, including models of Philadelphia, Baltimore and Pacific Electric prototypes among others. His Main Line Transit is a Pennsylvania town connected to a New England village by a side of the road operation similar to the West Chester Pike near where he grew up. A major extension is underway that will connect to a module which is the Boston Elevated Railway's Seaver Street loop on the northern edge of Franklin Park in Roxbury where the Seaver Street-Dudley via Humboldt Avenue route looped and the Egleston-Mattapan via Seaver Street and Blue Hill Avenue line passed. Rich's grandparents lived nearby. Rich is also a prototype fan with wide interests, including traction history and current light rail development worldwide. He is an avid photographer of rail transit operations. He has served twice as President of East Penn Traction Club and is one of the producers of the East Penn calendar. Rich is a physician-educator who works at Einstein Medical Center Philadelphia where he is the current medical staff President. He is also on the faculty of the Sidney Kimmel School of Medicine, formerly Jefferson Medical College, his alma mater. He recently completed his Master of Science in Health Care Ethics at Creighton University. Rich lives with his wife Suzanne and their 2 year-old golden retriever Teddy. Rich and Suzanne have 2 adult children, a great son-in-law, and 2 grandchildren, none of whom have more than a casual interest in trolleys.

CURRENT EVENTS.....

Southern California Miniature Trains Super Center!

***

By now, most Los Angeles area miniature train lovers are aware that after almost 60 years of operation, Allied Model Trains, formerly of West Los Angeles and Culver City, declared bankruptcy in July 2015 and went up in flames in August. This was a great blow to all those area customers that relied on that store for their hobby needs. That was the bad news!

But today we have some good news:

In May 2015, Trolleyville introduced you to two miniature train hobby shops, **Arnie's Model Trains** and **Milepost 38 Toy Trains** that are located next to each other in Westminster, CA. Westminster is in Orange Country about 35 miles south of Los Angeles (LAX) International Airport on I-405. These two shops make up what we call the Southern California Miniature Trains (SCMT) Super Center. They serve both major sectors of the miniature trains hobby, Scale Modelers and Toy Train Enthusiasts. At right is the current Model Railroader listing and advertisement for **Arnie's Model Trains.**

Trolleyville staff members have continued to visit the SCMT Super Center on at least a weekly basis since our May 2015 article and we can attest to the store always has customers, some from as far south as San Diego examining the bargain tables and taking advantage of the various sales and special events that are periodically announced over the internet. On January 16th, **Arnie's Model Trains** hosted the operating Light Rail Vehicle Display of the Southern California Traction Club and on January 23rd **Milepost 38 Toy Trains** hosted the MTH National DCS Wi-Fi Day, demonstrating smart phone and tablet operation of model trains.

There is usually some special activity each weekend at the SCMT Super Center. Just check their web sites at www.arniesmodeltrains.com or www.milepost38modeltrains.com. Below are some of the activities during January.

On Saturday, January 16th, the LRV Display was set up in the middle of the store where all customers had easy access.

Above is a close up of one part of the display with an operating Faller Bus, SDMTS S70 4012 and 4053 along with a SEPTA Kawasaki LRT and a Halling Innsbruck Flexity in the background.

This mockup of a Santa Fe Alco Passenger Engine was a fixture at the original Milepost 38 was retained when the shop was moved!

Matt Haynes, Milepost 38 Store Manager, is demonstrating the MTS DCS Wi-Fi for operating trains during a store clinic on January 23, 2016!

The **SCMT Super Center** Van, shown below, clearly demonstrates the committment to miniature trains. Somebody here is partial to the ATSF Warbonnet!:

Arnie's Model Trains serves the scale modelers in On3, HO and N scales while **Milepost 38 Toy Trains** serves the Toy Train lovers in O, S and G gauges. There are many different ways to describe the differences between Toy Train Lovers and Scale Modelers but the simplest way to define each is that Scale Modelers emphasize the accuracy of their models to the prototype while the Toy Trains emphasize the fun of running trains.

Since we first became familiar with and told you about **Arnie's** and **Milepost 38**, we have spent a lot of time at the **SCMT Super Center** and we can tell potential customers that you will probably find what you want when you visit as most of the stock is displayed openly for all to see. Very little is stored in drawers and otherwise hidden from view as will be evident from the following photos:

Typical Locomotive Display Cabinets

HO Scale Track Display Area

Walthers HO Structure Stock & Display

Woodland Scenics Display

Athearn Stock & Display

Walthers Rolling Stock Display

These stores are a fun experience so we highly recommend the **SCMT Super Center**. In the next photo are (left to right) Kevin Honda, Arnie's Model Trains Store Manager and Greg Arnold, Owner of the **SCMT Super Center**.

The **SCMT Super Center** is one enjoyable place to visit and do business. Our staff spends a lot of time there. In 1989, Allen Drucker moved his Allied Model Trains into a building that was a miniature of Los Angeles Union Station. The building was a magnet that drew railfans and non-railfans to the 12,600 sq ft facility. Now the building houses Samy's Camera. We think that the 7,000 sq ft **SCMT Super Center** is equally worthwhile to visit and in addition there are bargains all over the place.

The other half of the **SCMT Super Center** is **Milepost 38 Toy Trains**. More about them in our next issue.

Cincinnati and Kansas City Streetcar Activity !

***

The Cincinnati Streetcar is a 3.6 mile route that stretches along Race Street in Over-the-Rhine (OTR) to Central Parkway, to Walnut in the Central Business District (CBD) to Second Street at the Banks, up Main Street to 12th street to Elm Street in OTR to Henry Street just north of Findlay Market as shown in the next illustration (map).

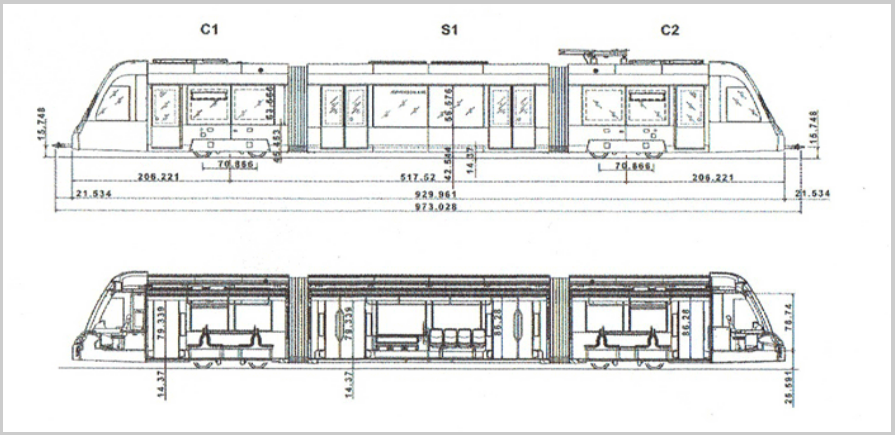
It is scheduled to open to the public in the fall of 2016 with five vehicles. The first vehicle arrived on October 30, 2015 and has been undergoing testing ever since. Each car can carry as many as 267 passengers and is 77' 6" long. Top speed is 43 miles per hour.

The Downtown Kansas City Streetcar Starter Line is a two-mile, north-south line that will travel along Main Street and connect the City Market to Union Station, serving the Central Business District (CBD), the Crossroads Art District and the Power and Light District as well a numerous businesses, restaurants, art galleries, education facilities and residents as shown in the next illustration (map).

The line will be operated by the Kansas City Streetcar Authority, a not-for-profit corporation. The line is scheduled to open to the public in the spring of 2016 using four vehicles. The first vehicle, 801, arrived on November 2, 2015 and has been undergoing testing ever since. First testing under powered catenary was on November 12, 2015. A second car, 802, was delivered on December 9, 2015. Herzog Transit Services, Inc will be handling day-to-day operations and maintenance of the system. Operator training of 14 prospects using car 801 started during the week of January 11 and by now shoppers in downtown Kansas City should be getting used to seeing the cars traversing the entire route. Maintenence technicians are currently also being trained. Three cars should comprise normal service with one held in reserve should there be a problem. Car 803 is expected by the end of January 2016 and car 804 should be on the peoprety in March 2016.

On Monday, KC Streetcar #802, shown below underwent a full day of testing on Main Street and the remainder of the week testing continued at the Kite Singleton Yard and on the "non-revenue" trackage.

Both cities are using the CAF (**C**onstrucciones y **A**uxiliar de **F**errocariles S.A.) USA Urbos 3 Streetcar, a 100%, three-module, low floor vehicle. Both cities numbered their cars in tribute to their last PCC cars with Cincinnati starting with 1175 and Kansas City starting with 801. The last highest numbered streetcars, both all-electric PCC cars, that operated in both cities were 1174 and 799 respectively. After being banished from the streets of both cities in the 1950s, Cincinnati 1174 finished its service life as Toronto 4574 and Kansas City 799 finished its life as Philadelphia 2287. The streetcars are being produced at CAF's plant in Elmira, NY. A drawing of the car is shown next.



Both cities are using colors somewhat similar to the colors of the last streetcars that ran in both cities. The word streetcar is no longer a 'dirty' word and the fact that the city had streetcars at one time is no longer something of which to be ashamed. The streetcar revival is well underway with similar cars being planned for use or already in use in Portland, OR; Seattle, WA; Tucson, AZ; Tacoma, WA and Washington, D.C.! The following chart was publicehd in the July 2014 issue of Trains Magazine. The chart overlooks the 18 PCCII cars of Philadelphia while listing the Canal Street replicas ion New Orleans, but it does show the overall activity at that time.

Providence Streetcar Plan Killed but Elsewhere Light Rail Projects Advance!

***

by Edward B. Havens

The U.S. Northeast has become a burial ground for modern streetcar plans. First, New Haven, Conn., ditched a proposed car line and now Providence, the Rhode Island state capital, has followed suit, opting instead for "enhanced bus" over the same route as the Providence Journal reported on January 6. The downtown bus service linking the train station and a hospital complex would cost $20 million, a fraction of streetcar costs, but Federal Transit Administration [FTA] would have to approve transfer of a $13 million streetcar study grant to bus purposes.

The 1.6-mile streetcar line would have cost an estimated $100 million.

On the other side the country, Seattle's Sound Transit plans to start building its downtown to upscale suburban Bellevue light rail route in March, KIRO radio reported. The line will continue eastward from Bellevue to Overlake Transit Center at Redmond, the home of Microsoft's international headquarters:

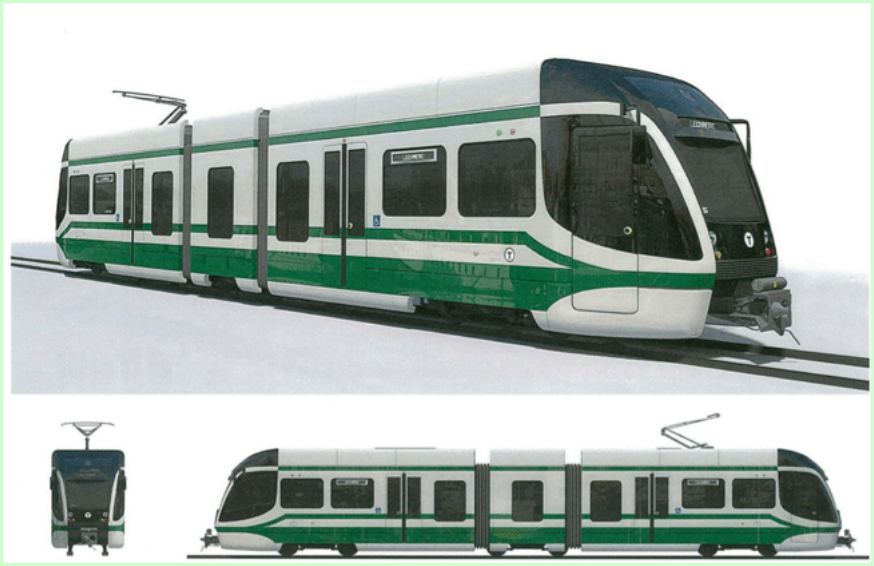
Sound Transit operates Kinkisharyo LRVs:

Rolling stock disposition is taking place in Seattle where KIRO-TV reports that the the five stored ex-Melbourne "W" clas trams that were used on the abandoned tourist-oriented waterfront line will get new homes. Two will stay in Seattle where a nonprofit hopes to refurbish themn for a heritage service along a proposed First Avenue streetcar line that would link the South Lake Union and First Hill modern routes. And three are being sold for $200,000 to the St. Louis Delmar Loop heritage line under construction at the inner ring suburb of University City.

Seattle, Washington, Department of Transportation held a "soft opening" January 23 for its 2.5-mile, $134 million First Hill modern streetcar line, various media reports said. The line uses dual-mode Inekon streetcars with batteries and pantographs because part of the line is wire free to avoid conflict on a downhill section with dual wire electric trolley buses [ETBs]. A half-mile, two stop extension on the northern end is planned for a 2017 opening.

Another light rail system -- Port Authority of Allegheny County's "T" system at Pittsburgh, Pa., will shut down its southside Red Line route at Beechview in March for six months to rebuild the only on-street track on the system, according to an agency news release. The track is deteriorated and needs replacement.

Also needing replacement, according to Boston-based Massachusetts Bay Transportation Authority [MBTA] is the entire fleet of Green Line network LRVs -- comprised of three different types of varying ages, State House News Service reported Jan. 12. C.A.F. already has been tapped to build LRVs for the planned west of Lechmere extension to Somerville and Medford: Replacing the entire fleet over the next decade could cost $1 billion, MBTA estimates.



Elsewhere, Phoenix Valley Metro, the light rail operator in Arizona's capital city, is recommending one of three LRT routes from downtown Phoenix northwest to the suburban city of Glendale, which had Phoenix Street Railway interurban service into the 1920s.

In West Texas, utility relocation work began in El Paso in January for construction of the 4.8 mile, $97 million heritage PCC car line that will use ex-El Paso City Lines PCC cars rehabilitated by Brookville Equipment Corporation of Pennsylvania, the El Paso Herald-Post reported. El Paso had acquired the PCCs secondhand from San Diego. The car line across the international border to the Mexican city of Juarez ended in 1973 and a truncated version on the US side was abandoned in 1974. The new car line is being built by Granite Construction and RailWorks the same firm that built the 4.9 mile modern streetcar line in Tucson, Arizona.

In the Pacific Northwest, Portland Streetcar plans a trial starting February 1 to close five car stops that are within two or three blocks of other stations, KGW-TV reported. The intent of the platform closures is to speed up rail service.

In the U.S., Southeast, Memphis Area Transit Authority [MATA] sought City Council approval in January to buy a refurbished streetcar from Gomaco Trolley of Iowa for $950,000, the Memphis Commercial Appeal reported. The MATA three-line network -- closed since 2014 because of fires that destroyed two ex-Melbourne "W" class trams -- owns one Gomaco pantograph equipped replica Birney. No date has been set for a resumption of service but upgrades are being made based on safety and maintenance recommendations by experts from the American Public Transportation Association Streetcar Committee.

On the other side of the world, the Southeast Asia nation of Myanmar, known as Burma in colonial days, opened a streetcar line January 10 using a refurbished ex-Hiroshima, Japan, tramcar set, the "railway gazette international" site reported. The service was inaugurated under a USD $3.6 million deal with a Japan-based development corporation. The three-mile street railway journey at Yangon (formerly named Rangoon) costs USD seven cents and the tram runs six times a day. If ridership exceeds expectations, a second but smaller tram will be ordered.

TECHNICAL ACTIVITY .....

Not Your Grandpa's DCC Anymore!

***

by John McWhirter

In the October 2015 issue of the Trolleyville Times, I began to introduce you to three of the more sophisticated digital control systems designed for model railroading. Included were the Roco/Fleischmann Z21, the ESU ECoS II, and the Marklin Central Station 2. In the December 2015 issue, I covered the Z21 in more depth. In the January 2016 issue I explored the many features of the ESU ECoS II. This month we will take a look at the Marklin CS2.

Marklin has been a pioneer in digital controls for model trains. Their initial system was introduced to the public at the 1979 Nurnberg International Toy Fair. The system was made available to the European market in 1985 and to the USA in 1986. That system was known as Digital HO. In 2004 a new Marklin digital control system was introduced. They introduced a new two-way protocol that allows for control of up to 65,000 devices. Locos can have up to 128 speeds and 16 functions. This system was further enhanced in 2013 adding virtual fuel levels of each loco equipped with the latest mfx+ decoders. The system is now known simply as Marklin Digital.

The setup of the CS2 is much like any other system. The rear apron contains a myriad of ports for the various connections that are possible. To get started, you attach your power supply to the main unit. Mine is a model 60065 rated at 50VA. There are terminals for both the Main and Program tracks. My system came

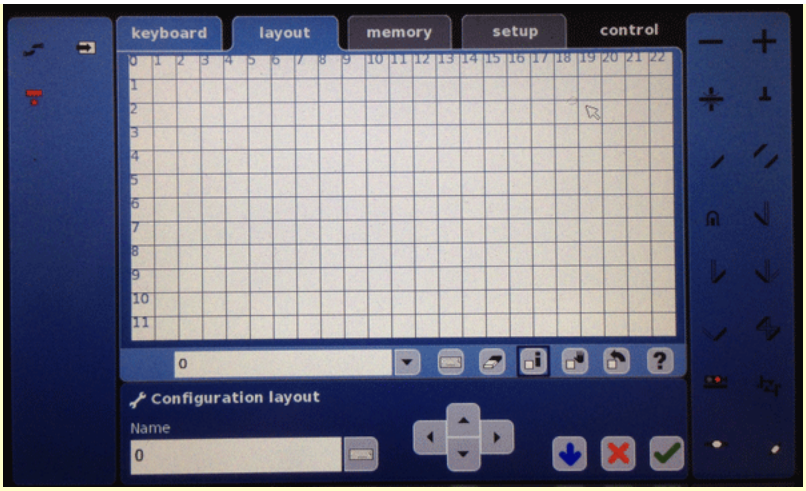
with a filter box to be placed in the circuit between the CS2 and the track. The manual does not show this filter so it may not be that necessary. Once you plug it in, the 7 inch color touch screen comes to life.

Once the system boots up, the control screen comes up with the last two locos that were called up from the library. The active functions are shown. The throttle knobs are now active and the speed and direction can be changed. Since the screen is touch sensitive, changes can be made with your finger or the included stylus. There is a calibration procedure for the stylus when you turn the CS2 on for the first time.

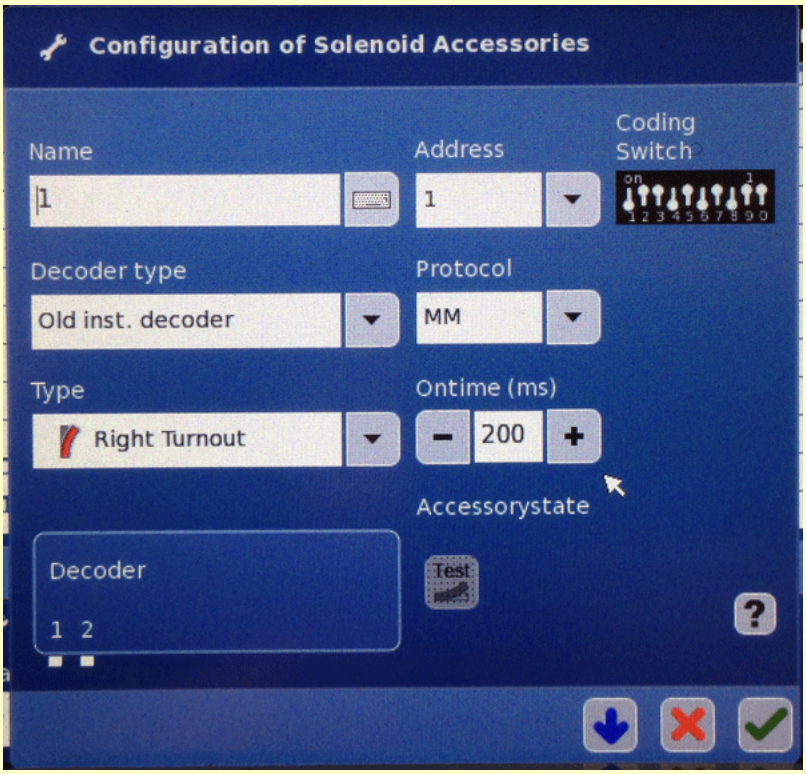
To add a new loco your library, you navigate to the loco configuration screen.

Here you enter the parameters of this loco. The protocols supported are, Motorola, mfx, and DCC. The CS2 has a built-in Marklin Digital loco database as well as 2 loco card readers. Some of the latest Marlkin locos come with loco cards containing all the necessary data. Mfx locos are automatically recognized and taken into the loco list with all of their characteristics when they are placed on the track. Up to 16 functions are supported.

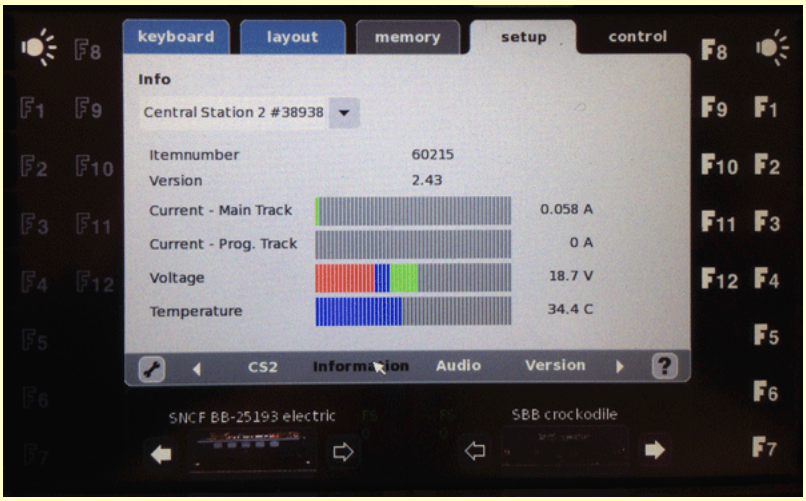
Your layout can be represented by the use of drawing tools by accessing the Layout tab. You start with an empty pallet and build up a diagram including turnouts, signals, and other configurable items.



Using the control tab, all of your solenoid devices can be configured.

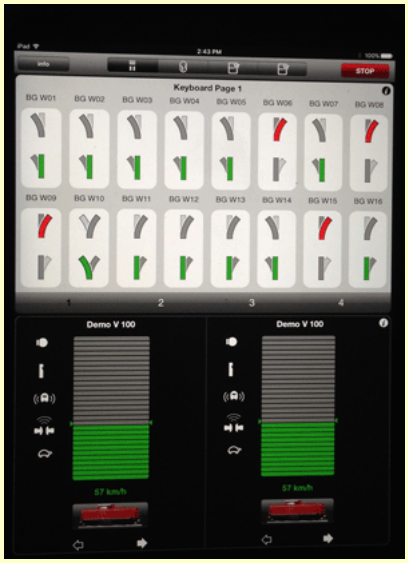


Once set up you can program routes and shuttles. The CS2 can support up to 2048 DCC solenoid devices. S88 feedback module connectors are located on the bottom of the case.The CS2 can be used in multiples with an optional cable. In addition to the rear connections, there are two front ports for Marklin Mobile Station controllers. The CS2 provides for the use of an external keyboard and mouse via a USB host. The parameters of your system can be accessed and monitored on the info screen.



The CS2 can also be connected to a Wi-Fi network via an inexpensive router. Once configured, you can run your layout from the available Marklin Digital Main Station aps. These aren't free but are well worth a few bucks to embrace Wi-Fi technology. On this system, all of your loco library and layout configurations are

stored in your CS2 and not on your phone or tablet. The full features of the CS2 are available using Wi-Fi



Once you are connected to the CS2 via the router, all of your loco library and track layout become available. I've found that this works well in a modular group environment where lots of members have uploaded their locos to the club's CS2. Just find it in the list and you can run your buddies train. When you're through running your trains, holding down the large STOP button will begin an animated shutdown sequence with a steam loco returning to the loco house.

A newer version of the Central Station is now being marketed. The 60216 Central Station 3 plus supports mfx+ protocol in addition to the others. Other features include up to 32 functions, SD card slot, 2 USB ports, a built in speaker, and a new higher resolution color touch screen. From what I've seen from some of the internet retailers, the pricing on the CS3+ may be a few dollars less than the CS2. Some of this difference may be due to fluctuations in the dollar/euro exchange rate. If you're lucky enough to have a local hobby shop that carries Marklin products, be sure to patronize them.

The Marklin Central Stations are very capable digital control systems that offer the beginner as well as the expert modeler the latest word in high tech railroad fun. If you are into keeping up with the leading edge of technology in model railroading and are looking for something a little beyond your grandfather's DCC, check these systems out. Innovation is the future of model railroading. Hope this article helps to keep the ball moving forward.
