

# MainLine



**The Journal of NMRA Australasian Region**

**Vol 33 No 3 July August 2016**

# NMRA Australasian Region Directory

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All members of Australasian Region are invited to submit articles of a railway nature for publication in Mainline. Submissions in Word or JPG format can be Emailed to

editor@nmra.org.au. or to my home Email address rjtonkin@inet.net.au . Original uncropped photo files would be preferred.

Please ensure any contributions of copyrighted material have written approval from the copyright holder.

## **Disclaimer**

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Articles are provided by members in good faith and the views expressed therein are not necessarily those of NMRA AR

## **Target dates for future issues**

### **September October**

**Content submissions**

**10 October 2016**

**Publish date on web**

**31 October 2016**

### **November December**

**Content submissions**

**10 December 2016**

**Publish date on web**

**20 December 2016**

## **Cover photo**

A scene on Gavin Hince's On3 layout

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### **Regular features**

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- Pacific directors report
- Editorial musings
- Divisional round up
- Convention news
- Achievement program awards.
- Australasian Region directory
- Coming events
- Prototype observations

# President's Thoughts

Welcome to this edition of the electronic MainLine.

In a month's time we will have our one day mini-Convention at Berowra in Sydney. If you cannot be at that convention, we have the 2017 convention in Adelaide, the 2018 convention in Southern Queensland and the 2019 convention is in Canberra. With such advance notice, I encourage all members to get along to a convention close to them and gain this great experience.

As well as conventions, another great benefit of membership is the wealth of information contained on both the Australian NMRA web site ([www.nmra.org.au](http://www.nmra.org.au)) and the US National website ([www.nmra.org](http://www.nmra.org)). On the US web site there is a members-only section that contains lots of really useful information. There are hundreds of clinic videos recorded at past National Conventions. There are web-based chat forums on numerous hobby and NMRA topics, there are pdf versions of old NMRA Bulletins and e-Bulletins and there is the ability to view your membership details held on file by the NMRA.

How do you access the members-only area? You need to register for the latest web site for access. To register, you go the NMRA.Org home page and click on "Member Login/Registration" on the right side of the red bar at the top of the page. This will open a new page called "Members Only". Next click on the blue bar that says "Need a User name? Register Now?" This will take you to a page called "User Account". Enter a username and your email address, then click on the blue bar that says "Create New Account". You'll see a message that says an email confirmation has been sent to your inbox. Follow the instructions in that email to set your new password. That's it!

Now, whenever you go to the NMRA web page, you can access the Members Only content you want. Just click the "Member Log-In/Registration" heading on the red bar, enter your User Name and Password and click "Log In" and you're there!

Once in the Members-Only area, try clicking on the NMRA@HOME blue box. This will lead you to a number of really great articles, including layout tours of Gerry Hopkins' and John Saxon's home layouts.

Have some fun on a quiet evening when the TV has nothing on and do some web surfing and explore the power your NMRA membership gives you in accessing great model railroad information.

Until next time,  
enjoy your modeling.

David O'Hearn

AR President

15 August 2016



A couple of scenes  
of John Saxon's  
home layout



## Editor's note

Our standards and recommended practises provide a sound basis for your modelling. Most of these documents were written many years ago. The curve radius recommendation RP 11 (last revised in 1990) when it was written gave a good guide to curve radius for the models of the day for both appearance and reliable operation. RP11 still provides a reliable guide for curve radius for appearance purposes. Those clever designers at Hornby, Bachmann etc. have improved the agility of their models without compromising prototypical appearance while operating on curve radii recommended by RP11.

The capability of some rather large models to negotiate considerably sharper curves than those recommended by RP11 was brought home to me during track testing of my new display layout. The layout's width meant the maximum curve radius I could use was 438 mm. Light hearted trials showed this curve radius was negotiable by most OO and HO scale model mainline diesel locomotives. The curve radius was no bar to operating models of large OO scale British mainline steam locomotives. The final trial involved large HO scale mainline steam locomotives. Both my Santa Fe steamers 3776 class 4-8-4 3784 and 5011 class 2-10-4 5018 sailed around the 438 mm curves. 3784 was even able to creep around the passing tracks 371 mm radius curves.



Apart from a bit of fun, the trials provided food for thought. The ability of these models to negotiate curves sharper than laid down by RP11 can be used to save space in out of sight parts of a layout, freeing up space to model a more spacious arrangement on the visible sections of the layout.

Your comments appreciated

Rod Tonkin Editor



**The National Model Railroad Association**

**Australasian Region**

**Presents the**

**32nd Annual Convention**

**"Modelling the Perway"**

**9am ~ 4pm 11th September 2016**

**Berowra Community Centre**

**1 The Gully rd, Berowra NSW**

**Clinics, Bring and Buy**

<http://www.nmra.org.au/>

<http://www.nmra.org.au/Convention16/convention16.html>



# **Pacific Director's Report**

Mike Bartlett

The main item of interest of the Yearly meeting held in Indianapolis in July was the allocation of the venue for the 2022 Annual Meeting and Convention.

There were two bids, one from Australia and the other from England. The Australian bid was presented by the Pacific Director. The equipment for the presentation was provided by the Association but, unfortunately, the sound quality was inferior and did not match the excellent power point presentation. The brochure provided by Martyn Jenkins was of excellent quality and was highly commended by all.

The event was given to England based on costs and the distance people had to travel to Birmingham. The bid was based on 300 people attending. If more than 300 people attended, more accommodation would be found. The English presentation was by power point and voice only and no paperwork was handed out. The result was not good for us especially when considering the amount of quality work that Martyn had applied to the project. Thank you Martyn for all your hard work.

The NMRA Magazine was discussed at length. Should the magazine be digital or print? According to the experts, there were two main reasons for staying with the printed magazine. Firstly, it was felt that the Association would lose most of its advertisers if it changed. The other objection was that if the mag-

azine went digital control, could be lost in terms of where the magazine might end up. Also, not all devices would be able to receive the magazine. So, for the time being, the printed magazine will remain.

The exhibition the NMRA has been planning for some years at the California State Railway Museum in Sacramento now seems to be back on track. I know I have reported this before but there seems to be a light at the end of the tunnel. The problem at present is in the higher management of the State of California and the decision-making process within the Museum itself.

A model railway registry of those who would like their layouts open to visitors is under way and will, when completed, be useful to people travelling to the States.

More improved ties are being progressed with Europe which may improve the further use of standards.

I attended a very interesting clinic given by a 14 year old member by the name of McKeegan Curran. His topic was how to obtain and retain young members. He came up with some of the usual ideas but he also suggested that older members might like to help the younger ones by giving them some of their excess equipment, especially to those who do not have the funds to buy all they need. But his main focus was on mentoring. He stressed the need for mentoring, not parenting. He also suggested a change in the fees structure. If there was enough interest among the younger members, have "younger members only" meetings.

# Waitemata and Chelsea Railroad

Philip Sharp and Mark Jackson

## Introduction

The North Shore Model Railway Club in Auckland is one of the longest running and largest model railway clubs in New Zealand. The club was founded in 1965 and has over 60 members, two of whom are NMRA members. The club has sections for New Zealand (Sn3.5), American (HO) and British (OO) modellers. Each section looks after one-third of the layout.



Figure 1; An undated photograph. The original clubroom being raised to give a two-storied building.

The original clubroom was a small house donated to the club. The house was shifted to its present site and raised to give a two-storied building (Figure 1). The clubroom has been extended twice. The first extension added over three metres to the width of the building, the full length of the clubroom. The flatter part of the red barge board in Figure 2 shows the roof of this extension. The more recent extension added a lounge at one end at a level intermediate to the existing levels, creating a building with two storeys and a split level.

Upstairs now consists of a 11.6 metre by 9.2 metre room for the main layout and a small room about seven metres by a little over one metre for staging. Staging extends over two metres out into the ceiling cavity above the lounge. Downstairs has the dispatcher's office, a workroom, a kitchen and other facilities. Communication between the dispatcher and yardmasters is by landline.

The club's layout is the Waitemata and Chelsea Railroad (W&C), named after one of Auckland's two harbours and a local sugar refinery. The layout is a two-level single deck that goes around the walls of the large room upstairs. Parts of the lower level are enclosed in the benchwork and have no stations, industries or scenery. There are two long peninsulas that jut out from the opposite ends of the room and extend to within a metre and a half of the far wall. Both peninsulas have a full-length divider that extends to the ceiling. The dividers mean the operators in different aisles receive no visual cues from one another, making operating sessions more realistic. The bench work varies in width from less than 0.5 metres to 1.3 metres. The maximum width occurs where there is a one and a third turn helix. Some newcomers find the aisles narrow, particularly in the British part. The trackwork on the upper level is mostly 1.1 metres high.

The W&C has a mainline and a branch line in HO scale, both single track, and a short unfinished single track branch line in N scale that will be a narrow gauge track serving a mine. Twice around the room is one trip from staging to staging on the mainline. This is a distance of 153 metres, equivalent to 13.3 kilometres of prototypical track. The mainline has two subdivisional points, four major stations, three minor stations, and one named passing siding. The HO branch line has one station and a coal mine depot. There are 25 industrial spurs on the layout. This number can be increased by using other spurs as team tracks. Trains typically take 60 to 90 minutes to go from staging to staging.

The design of the yards among the stations varies considerably. Santel, an American station, has a near prototypical yard that includes an A/D track, caboose and engineer tracks, a run-around, a six track classification yard and tracks for storage. Amberley, a British station, is less prototypical. This has the merit of adding to the challenge of switching, a challenge that is occasionally enhanced by loss of power to a crucial turnout.



Figure 2: The 2013 North Shore MRC model train show.

Figure 3

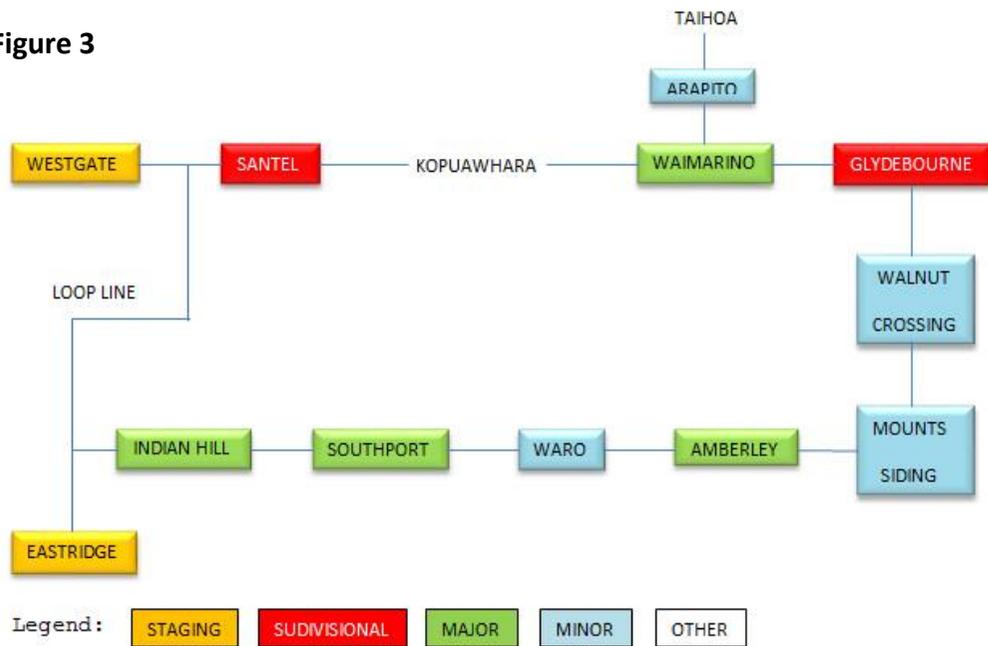


Figure 3 is a schematic of the logical network of the stations and staging areas on the W&C. The layout is intended as point-to-point. There is a loop line that creates a circuit if required. The stations on the mainline from west to east are Santel, Waimarino ('Y-mah-reen-o'), Glydebourne, Walnut Crossing, Amberley, Waro, Southport and Indian Hill. Glydebourne and Santel are sub divisional points, Amberley, Indian Hill, Southport and Waimarino major stations, and Mounts Siding, Walnut Crossing and Waro minor stations. The mainline also has a passing siding in the middle of nowhere at Kopuawhara ('KO-po-a-far-a'). The branchline has the minor station Arapito and the coal mine depot Taihoa.

While logically separate, the two staging areas Westgate and Eastridge are physically together in the small room upstairs. This room is entered by ladder from the split level or by a two metre crawl under Indian Hill and through a hole in a wall. Both authors prefer the ladder. As the names suggest, Westgate and Eastridge represent the rest of the world to the west and east respectively. Between them, Westgate and Eastridge have eleven tracks arranged as a compound ladder. These tracks are at a lower elevation than the tracks at Santel and Indian Hill. This elevation difference is overcome using a single turn helix which extends out into the ceiling cavity above the lounge. There is a turnout at the exit to the helix to direct eastbound and westbound trains to Santel and Indian Hill respectively. Staging is entered by reversing the route.

The two subdivision points Santel and Glydebourne (Figure 4) are operationally very different. The yard space at Glydebourne is half that of Santel. This and Glydebourne's central position on the layout means Glydebourne can be a bottleneck, necessitating the holding of trains at Waimarino or Mounts Siding. Santel is rarely a bottleneck.

The major station Indian Hill is still being built and is scheduled for completion late 2017. The long-term plan is to use the yard space at Indian Hill to reduce the load on Glydebourne. Southport (Figure 5), landlocked by cliffs to the north and east and a river to the west, has short sidings and spurs, making switching difficult at times. Amberley, second only to Glydebourne in congestion, has the major industry of the Amberley Sugar Refinery. The refinery receives regular shipments of coal from the Taihoa Mine. Waimarino (Figure 6) is set in iconic New Zealand countryside and is the signature station on the W&C. After leaving Waimarino, westbound trains traverse the locally famous Waimarino spiral. This spiral has one and a third turns that include straight sections of track to reduce the effective ruling gradient. Figure 7 shows a westbound NZR railcar entering the top of the spiral. In the background is the bush-clad hill with the line between Arapito and Taihoa mine.

Walnut Crossing has two short industrial spurs and is often worked as part of Glydebourne's yard. Mounts Siding has a long passing siding and an industrial spur off the siding. As well as permitting train meets, the passing siding is used to hold trains for Glydebourne. Waro has one industrial spur and is often worked as part of Southport's yard. Arapito's main role is handling coal shipments from the Taihoa Mine. W&C does not run trains between Arapito and Taihoa and leases the Arapito-Taihoa line to the Taihoa Coal Co. Figure 8 shows the company's number 5 shunter taking empties from Arapito to the mine.

The use of two levels on one deck and the need to go around the room twice to complete one trip between staging areas makes the physical network more complicated than the logical network. This was illustrated in Figure 5 and further illustrated in Figures 9 and 10. Figure 9 shows part of the area around the entrance to staging. When travelling right to left, the near track is the loop line that re-connects with the mainline between Eastridge and Indian Hill. The middle track goes into Westgate after leaving Santel to the right of the photograph, and the far track goes to Walnut Crossing after leaving Mounts Siding, also to the right of the photograph.

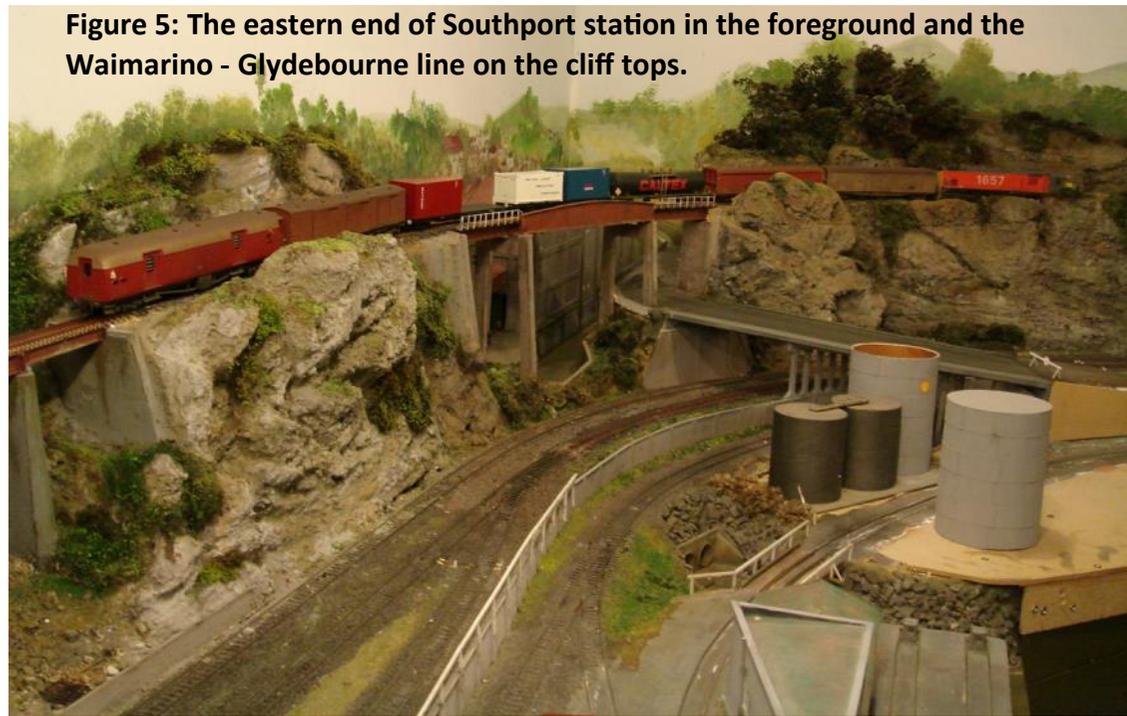
Figure 10 is an aerial view of the eastern end of Waro station and part of the Waimarino spiral. The coaling spur is in Waro. The track with the passenger train is the mainline through Waro. This line enters the tunnel at the top of the photograph, goes under part of the bench work for Waimarino and on to Southport. The curved track in the right foreground and the track that goes over the passenger train are part of the Waimarino spiral. The curved track runs besides Waro's mainline but operationally, the spiral is more than four stations from Waro.

**Figure 4: Looking east from the central part of Glydebourne Station**



driver as an assistant. A newcomer can observe in the dispatcher's office and gain practice at using a train graph. Newcomers typically prefer the layout to the dispatcher's office.

**Figure 5: The eastern end of Southport station in the foreground and the Waimarino - Glydebourne line on the cliff tops.**



### Operating sessions

In most months the club runs two operating sessions in the evening. The motto for the sessions is: *Participation brings learning, experience and satisfaction*. Early in the month there is a session of scheduled running that typically involves eight drivers, a train controller and assistant, and yardmasters. The work required of yardmasters varies markedly among the stations. The yardmaster for Waimarino usually has time to drive trains to and from the branchline station Arapito and be the yardmaster for Kopuawhara. In contrast, the yardmasters at Amberley and Glydebourne are rarely idle. If enough operators are available, these two stations are assigned an assistant yardmaster. The other type of operating session is car card. This is held late in the month and typically has fewer trains than scheduled running. An assistant train controller is not used.

Both types of sessions include trains that take about one hour to complete their journey. These trains permit club members to finish early or to run a second train once their first train has finished. If there are insufficient operators, the appropriate number of yardmasters are dispensed with. Switching is then done by the road crews.

The sessions were designed so that newcomers can have a guided introduction to realistic operations. They can be a yardmaster at Mounts Siding or Kopuawhara under the watchful eye of the yardmaster at a nearby station. They can be a driver and have an experienced

**Figure 6: A step back in time at Waimarino Station.**

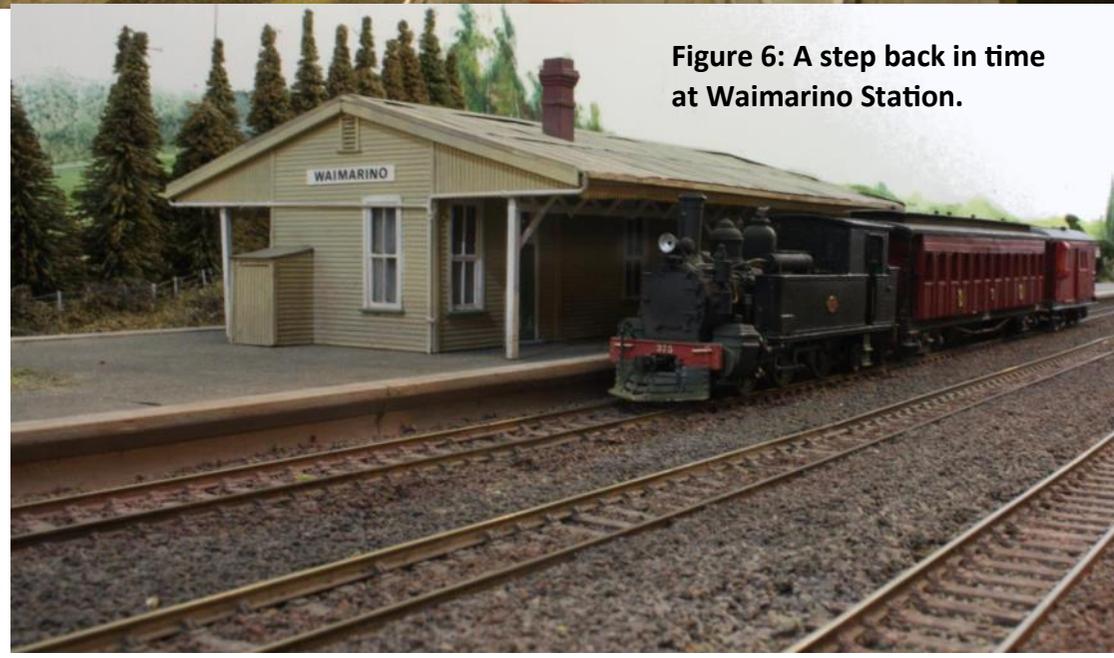
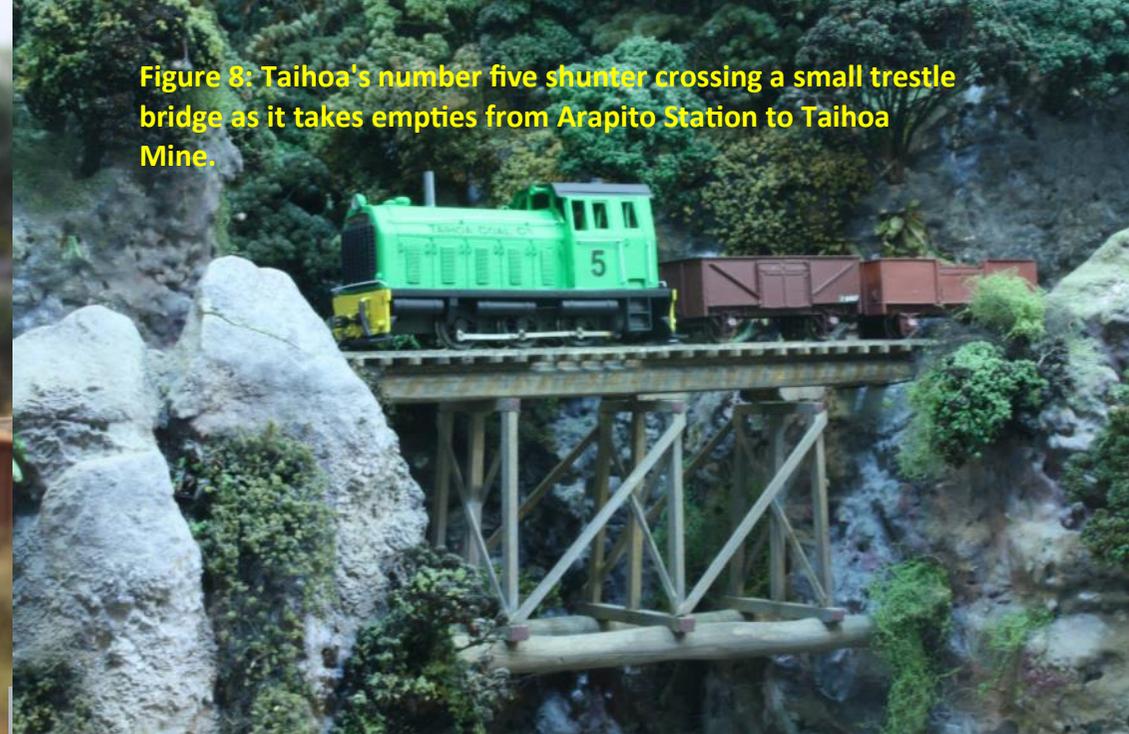


Figure 7: A westbound NZR railcar at the top of the Waimarino Spiral.



Figure 8: Taihoa's number five shunter crossing a small trestle bridge as it takes empties from Arapito Station to Taihoa Mine.

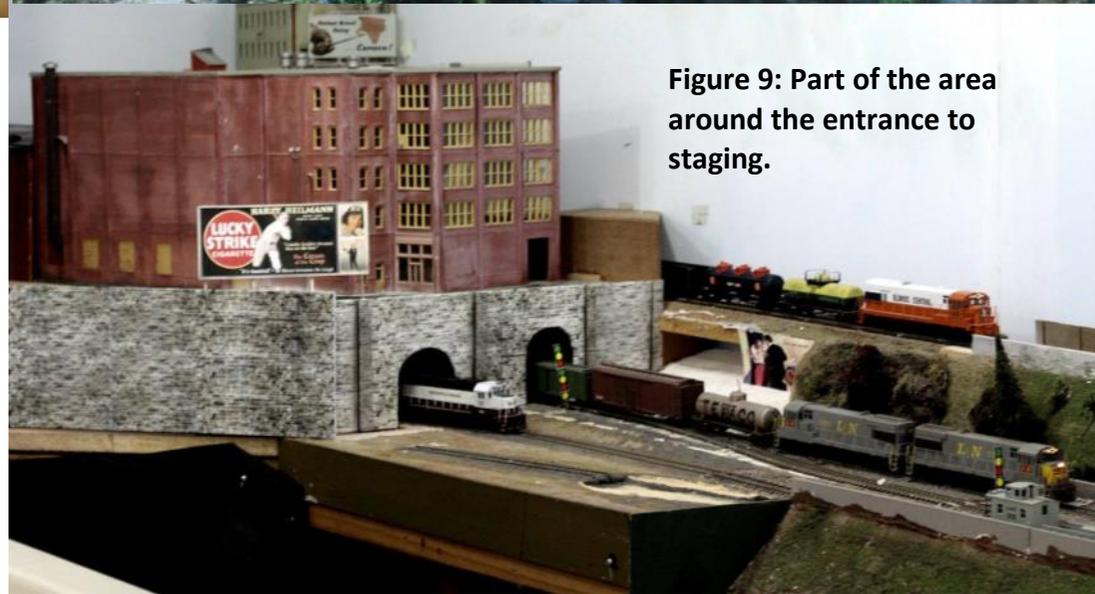


### Club competitions

Each year the club runs a good selection of standard and non-standard competitions for its members. The standard competitions, such as those for the best scenery or rolling stock, are held in three grades from novice to expert to enthruse members to participate.

The non-standard competitions include the pullers, crawlers and runners competition held one club night late in the year. In the pullers competition, a locomotive pulls a rake of gondolas containing lead weights as far as possible up a grade. The total load is around 10 kilograms. A noticeable fraction of the locomotives fail to get across the start line. The creepers competition is the forte of Shays. The winner is the person whose locomotive takes the longest time to cover a specific distance, typically 10 centimetres. In the runners competition, a car is released from the top of the Waimarino Spiral. The winner is the person whose car travels the farthest along the layout. The rules for this competition have a liberal definition of a car. Last year, the winning car was a short wagon that had a flywheel and a detachable lead weight. As the car rolled down the spiral, some potential energy of the car was stored as kinetic energy in the flywheel. This slowed the car, reducing the energy lost to friction on the curves of the spiral. When the car reached the bottom of the spiral and started up the grade on the other side of the valley, the lead weight fell off the back of the car and energy from the flywheel was converted into kinetic energy of the car. Not prototypical but a clear winner.

Figure 9: Part of the area around the entrance to staging.



Another competition is the 100 x 100 diorama. Each competitor is given a 100 millimetre by 100 millimetre block of wood and has several weeks to create a scene on one side of the block. The winner is decided by popular vote and official judges.

Figure 10: An aerial view of the eastern end of Waro Station and part of the Waimarino Spiral.

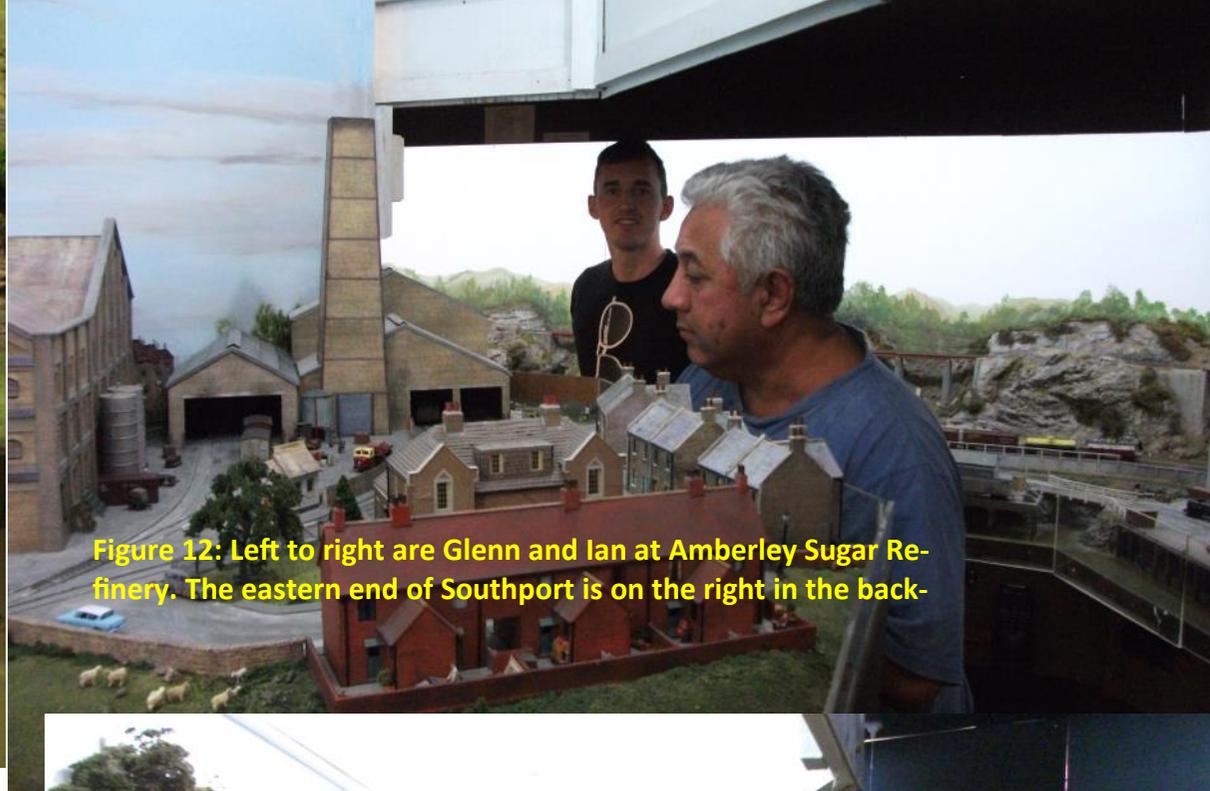
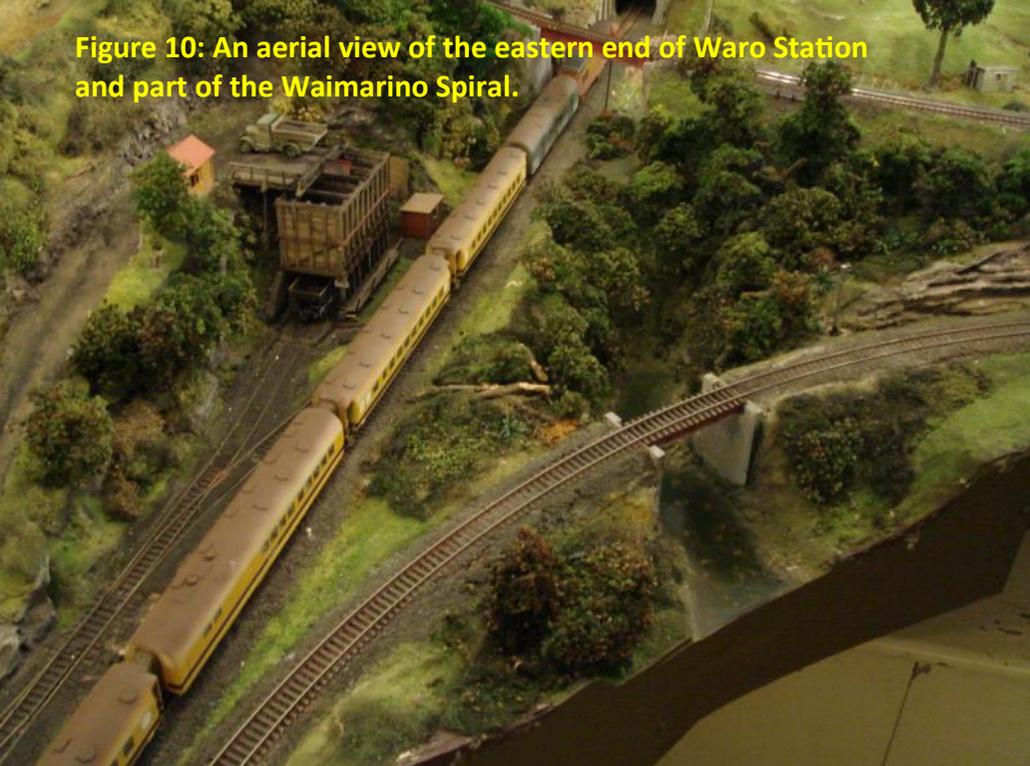


Figure 12: Left to right are Glenn and Ian at Amberley Sugar Refinery. The eastern end of Southport is on the right in the back-

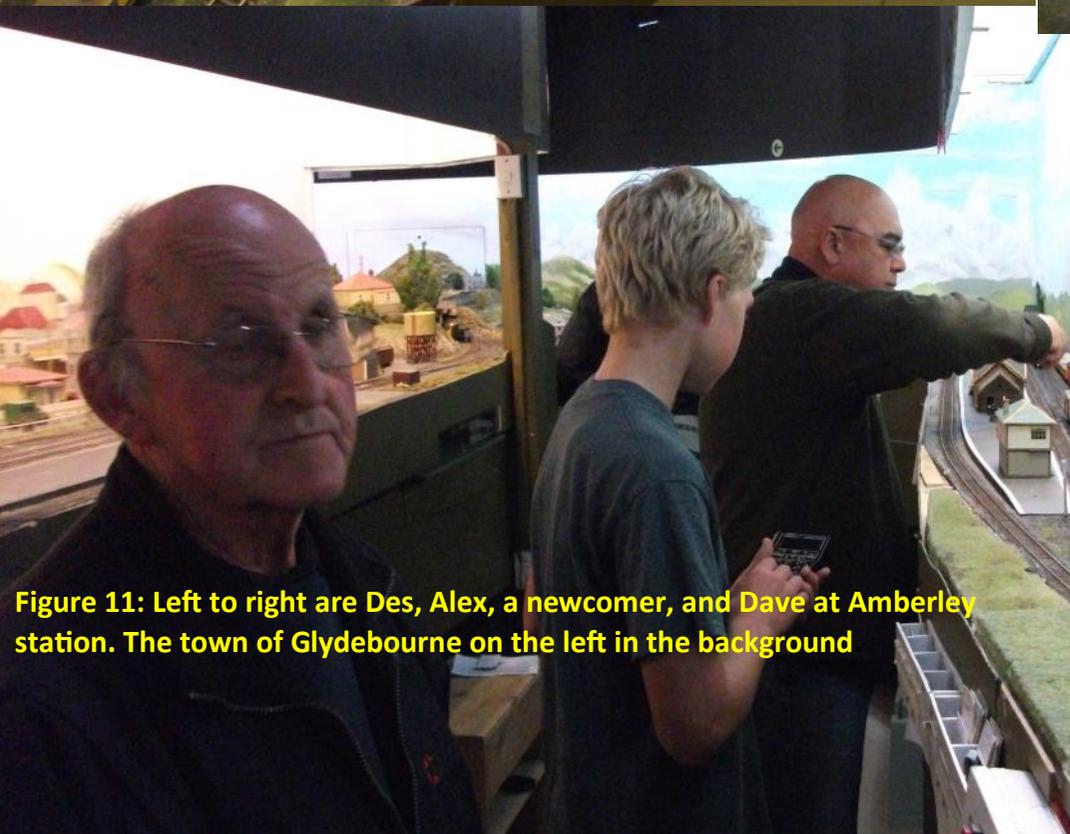


Figure 11: Left to right are Des, Alex, a newcomer, and Dave at Amberley station. The town of Glydebourne on the left in the background

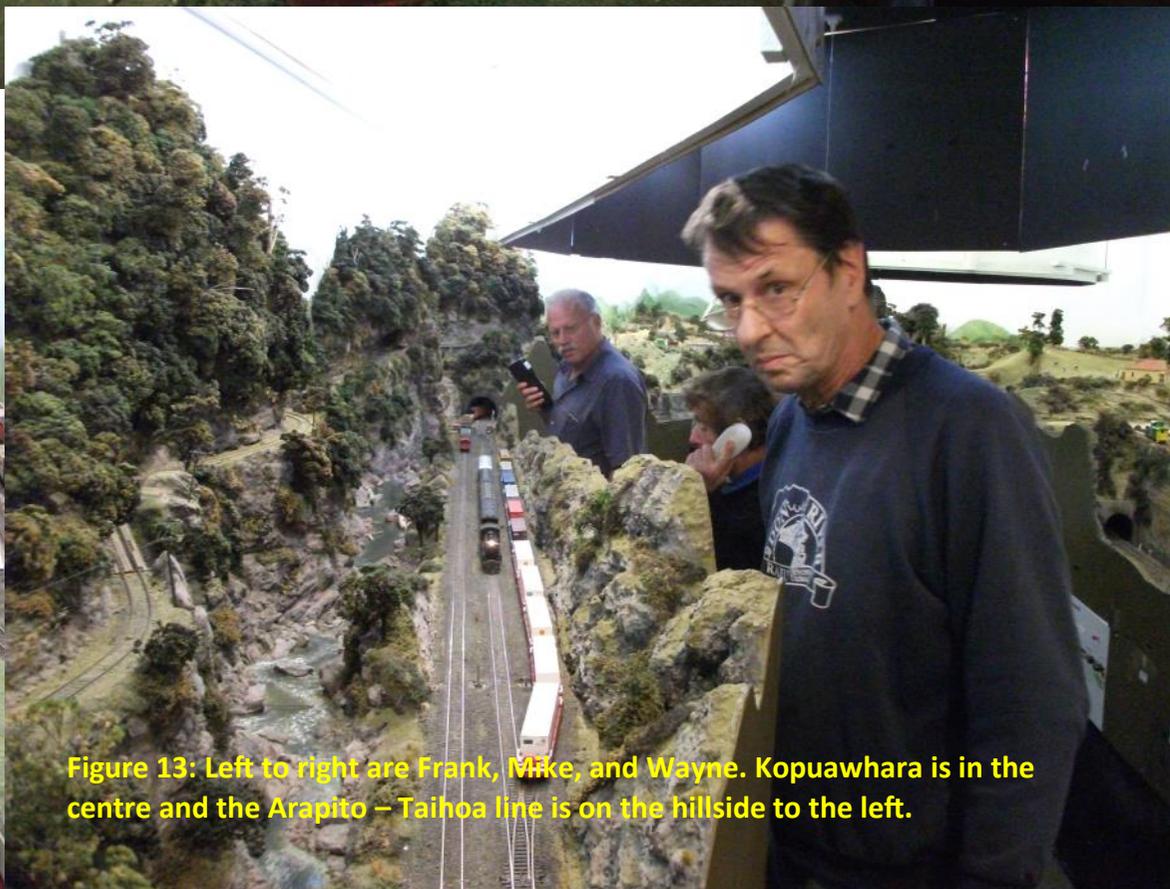


Figure 13: Left to right are Frank, Mike, and Wayne. Kopuawhara is in the centre and the Arapito – Taihoa line is on the hillside to the left.

### Promoting the hobby

The club has enough members that each year it can run several activities to promote the hobby and the club without demanding too much time of each member. The regular activities include an annual model train day (Figure 2), and the exhibiting of a modular layout at other model train shows. Last year, the club ran a very popular display at the Auckland Museum on Father's Day, and hosted the national convention of the American Model Railroaders Association of New Zealand.

The club will be hosting the biennial national convention of the New Zealand Association of Model Railway Clubs in 2018. This convention was first held in 1966 and attracts over 100 modellers. The emphasis is on New Zealand Railways but modellers of UK and American railways are encouraged to attend.

The club actively inspires teenagers to take up the hobby by running a youth membership scheme. This scheme has been very successful and the club has seven youth members, aged 12 to 16. There are four women who are enthusiastic members including one who is on the committee.

### Current projects

The current projects include the completion of the yards and scenery at Indian Hill, and the installation of track detection circuitry and coupling this with JMRI applications. The club is experimenting with switch lists, and with new schedules to reduce the congestion at Glydebourne. An extension to the club building is being considered. The adage that a layout is never complete certainly applies to the W&C.

### About the authors

Philip has been interested in model railways since playing with a friend's electric train set one afternoon many years ago. This interest remained latent until the middle of last year when he joined the NMRA and the North Shore MRC. Philip is a senior lecturer in mathematics at the University of Auckland.

Mark has been railway modelling since he was 12. He is a member of the NMRA, a long-time member of the North Shore MRC, and is in his first year as the club's president. He is building a new, larger home layout. Mark works in the marine industry.

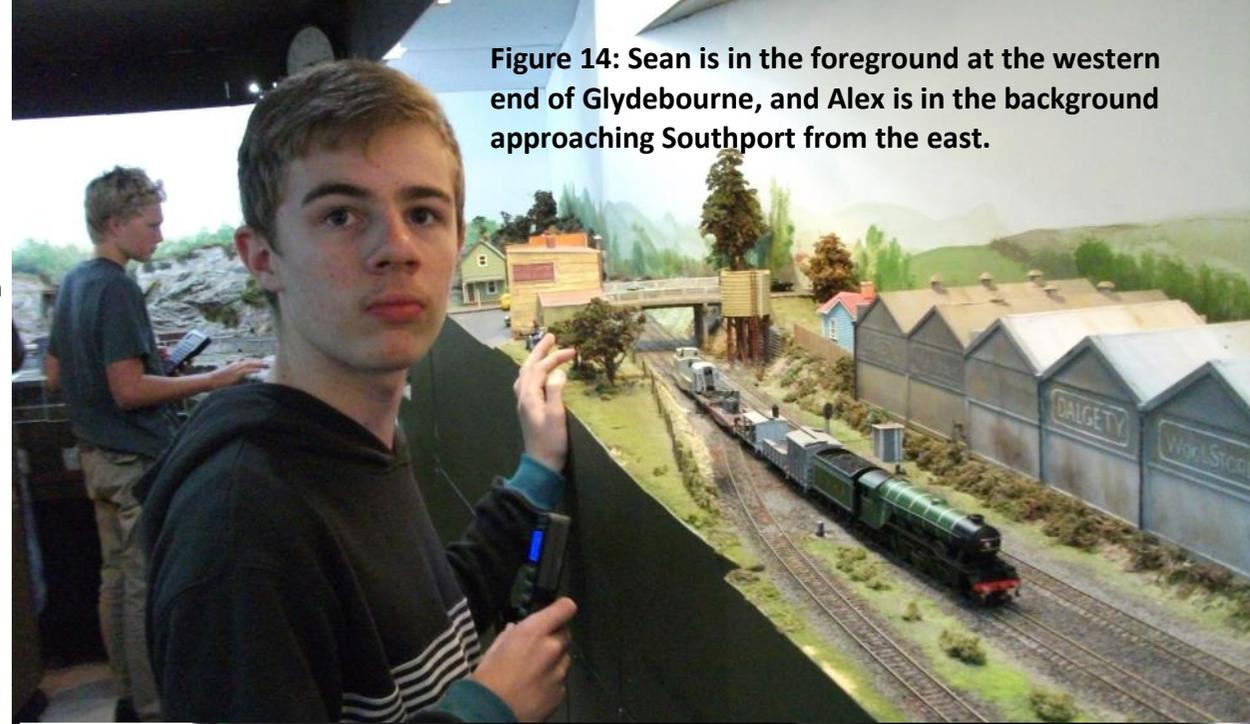


Figure 14: Sean is in the foreground at the western end of Glydebourne, and Alex is in the background approaching Southport from the east.

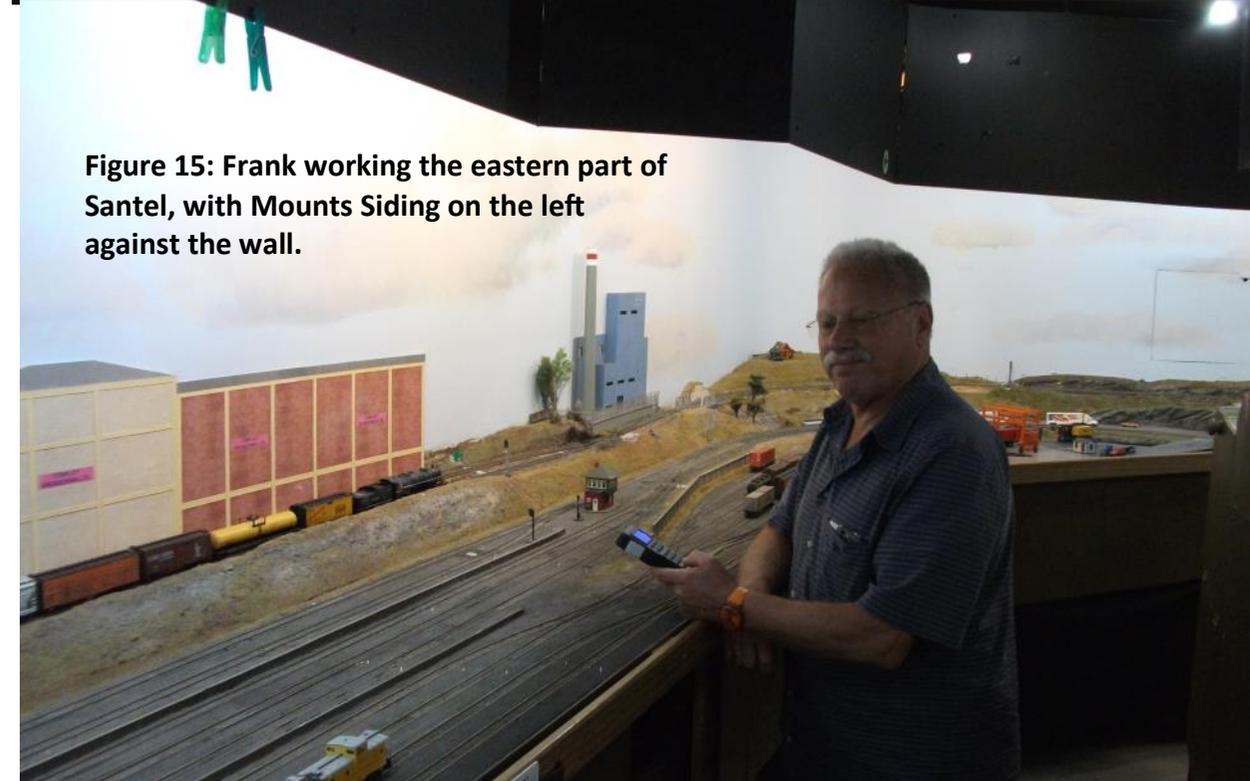


Figure 15: Frank working the eastern part of Santel, with Mounts Siding on the left against the wall.



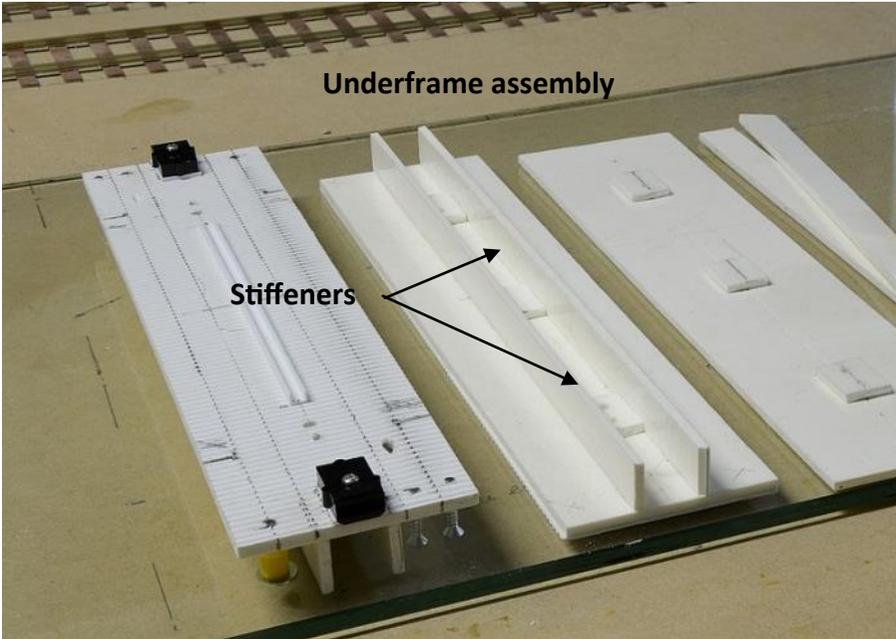
# DCC operated couplers using Muscle Wire.

By Max Wright MMR

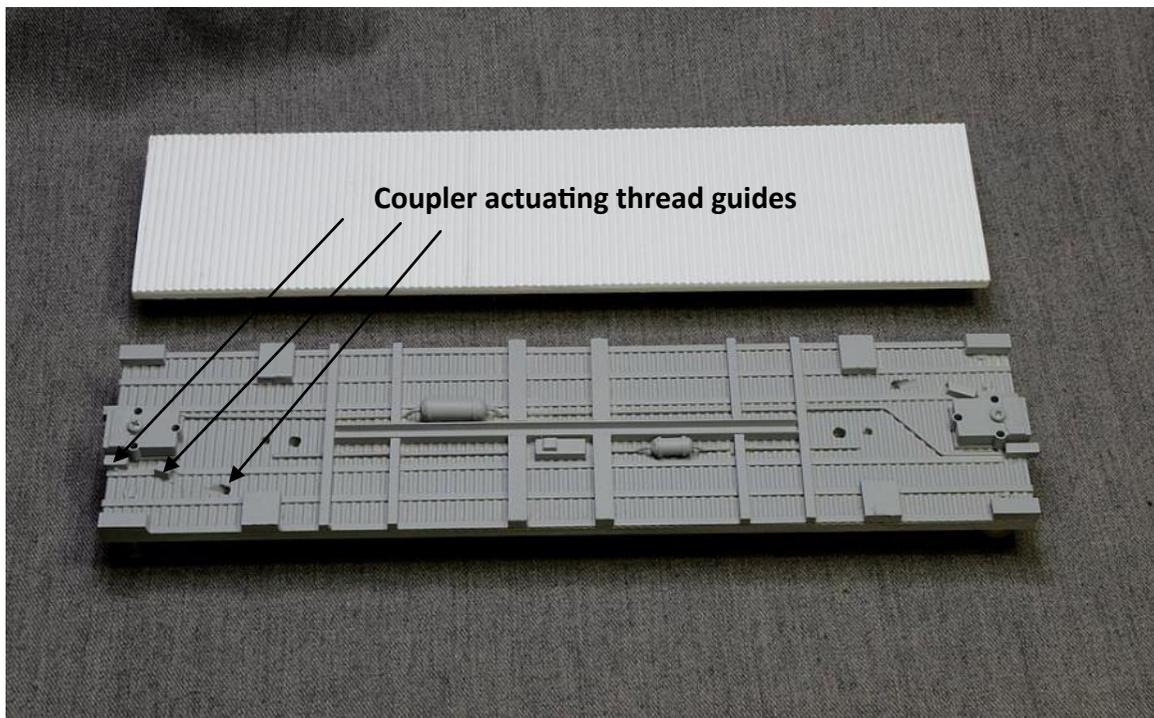
We all hate leaning over the layout, fiddling with a kebab skewer – or trying to locate your uncoupling magnets in just the right place for your operations.

The prototype doesn't operate like that. They can uncouple anywhere; any time. You can do it too. Here's how I fitted up my O scale cars to uncouple anywhere on the layout – at the press of a button; using Muscle Wire. Now I'm talking to O scalers here, but it should be possible is HO scale as well.

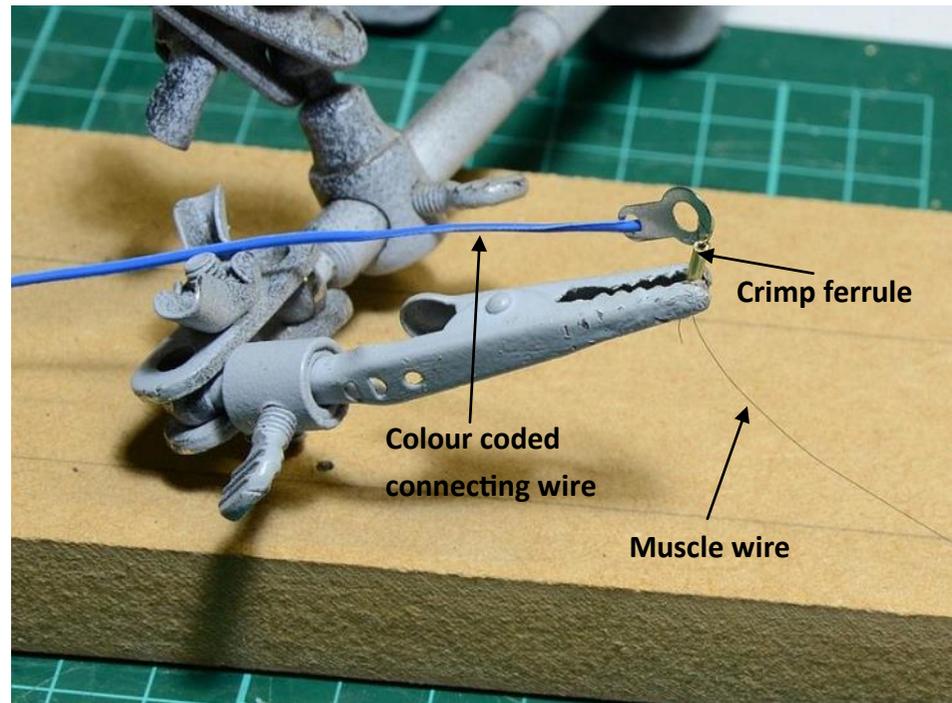
What is Muscle wire? It's a 50/50 mix of nickel and titanium, and it has an amazing property. If you place it in hot water, or heat it by passing a current through it – *it shrinks!* Being 50% titanium, it's incredibly strong; so it will pull thousands of times its own weight. It also blunts your scissors eventually. Anyway, I decided to pass a current through it to make it shrink. I used a DCC decoder to trigger it, so the DCC track current was readily at hand. It's nominally 14 Volts AC on my layout, so 22 Ohms resistance will heat the wire without burning it out. I needed a high Wattage rated resistor, so the ceramic 5 Watt ones were perfect. The decoder output can't handle that sort of current, so I used a relay. The primary circuit of my relays is rated at 16 Amps 30 Volts DC; while the switching side is rated at 16 Amps 250 Volts AC. Ideal!



When I started building my cars, I made a stiffened back chassis, with the stiffeners placed far enough apart to accommodate the resistors and the relays. .



Muscle wire cannot tolerate being soldered, so it has to be crimp joints. Brass ferrules are used to anchor the wire. The ferrules are made from 8 mm of 1.57 mm x 0.355 mm brass tube. The tube is crimped half-way using multi-grips. A solder tag with a pre-soldered length of colour coded wire is captured in the loop of muscle wire.



Blue is the (+) wire, while green is the Aux 1 (-) and purple is the Aux 2 (-);

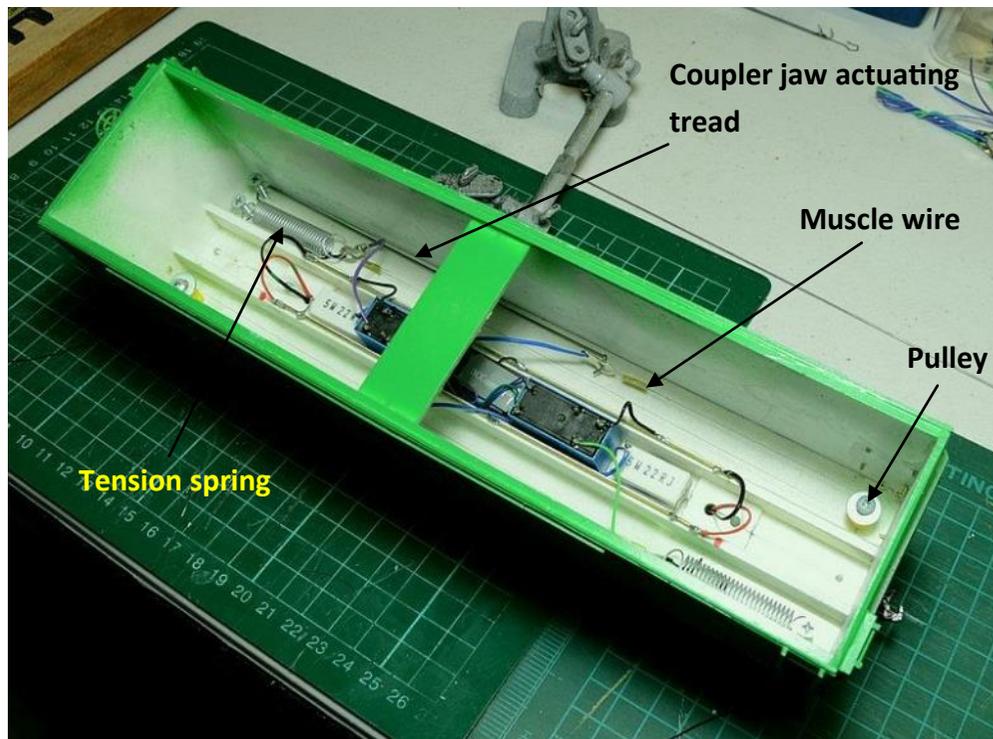


Here's a box car with the resistors and relays flanking the 4 function decoder and its stay alive capacitor; ready for installation of the harnesses.

First I feed the thread down through the aperture in the floor, then I connect the harnesses to the relays. Then I stretch the blue wire end of the muscle wire until the spring is slightly loaded and mark the position of the wire anchor hook, which was made from 1 mm piano wire.

When the static (blue wire), end of the harness is hooked on, the muscle wire has enough tension to keep it in place.

I turn the car over and feed the thread through the guides. I have already cut a groove in the back of the coupler jaw with my Dremel, deep enough to take the diameter of the

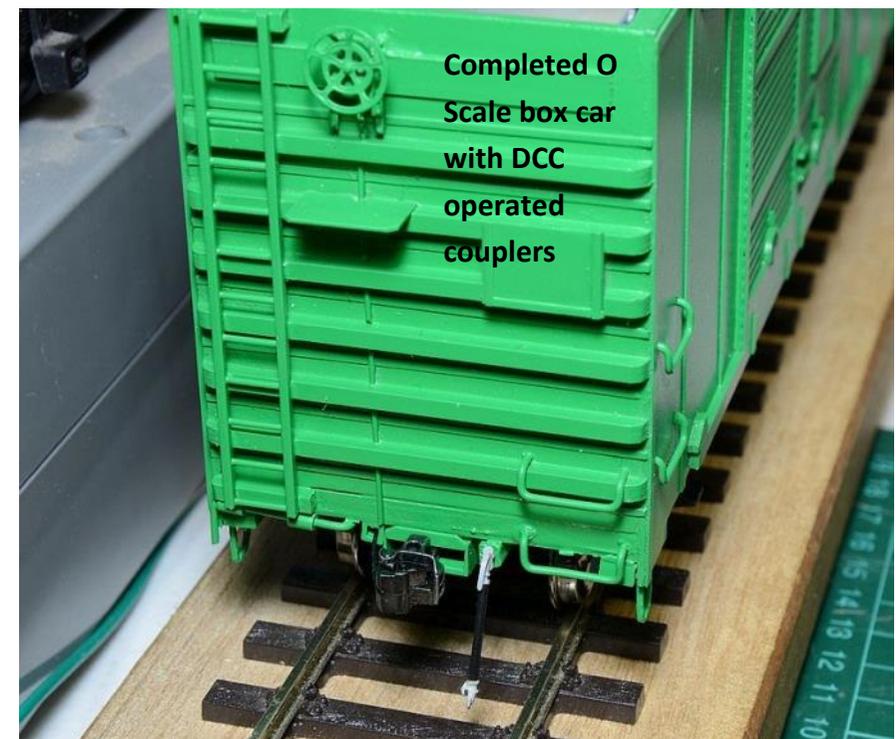


thread. A "helping hand" holds the thread in the groove with just enough tension to keep it in place, but not enough to pull on the spring.

A tiny spot of CA glue was applied to the thread over the groove. It's very important not to put too much CA on, as it will wick into the hinge of the jaw and lock it. How do I know this? The same way that I know that removing the coupler and soaking it overnight in acetone will dissolve the CA and save the life of the coupler. J



I have made a short movie of the coupler in action. It can be seen at ...<https://www.youtube.com/watch?v=nl6xwQ4jaF8>



# NMRA Indianapolis ID July 3<sup>rd</sup> to 10<sup>th</sup>.

Chris Hitchins

I was fortunate to be able to attend this convention and as per the usual USA practice gets off to a non gathering start. So first up after checking into the Westin in downtown Indi, and finding some warm clothes as was only about 17 C, was into the first clinics on Sunday afternoon, 3<sup>rd</sup>.

The clinic list is long enough to keep any picky person content for days so it's a case of sort out a few that really interest you. The hotel has a more than enough rooms for clinics and SIG groups so that makes seeing everything quick and easy. Met up most of the ANZAC's here over the week. Next door is the huge Convention Centre where the National Train Show is held on the last weekend.

I gather some of the down under contingent were at the Santa Fa and N gauge conventions in the last week.

Monday was Independence Day. Not much to show within the hotel, so clinic time.

If are you interested in DCC control of switch machines then a clinic via The Tillamook and Astoria RR Company was very thought provoking. More info can be found at: [szapytowski@neo.rr.com](mailto:szapytowski@neo.rr.com) and <http://www.berretthillshop.com>, using the Cobalt IP Digital Point Motors from Aus.

Another of the clinics I attended called "spinning trees" was very inventive and for sure can make many a tree at a low investment and not too much time. Ideal for those in the background and with some added worked, using a dowel to create trunks, for the foreground.

I took to getting some ideas for my possible layout, via LDSIG. Looking at what one can do in a 40 ft container with On30??

Tuesday and I was off on full day bus trip to Cincinnati. After an hour and half the 40 or so on the bus were able to enjoy 5 very good layouts including: John Burchnall, of Easter Loggers fame, Curt Larue and his Pennsy Layout, Bob Lawson's Southern RR, Gerry Albers Virginian and Jerry Strangarity's Reading. All of them were a credit to their owners, though Gerry Albers was the most inspiring with so many well designed and highly detailed scenes. It was in the 2014 Great Model Railroads.

Wednesday saw me heading off on a self-drive day out to the north and around to Lafayette where some 13 layouts were available to view. Distances and time kept them to only 5 and the most impressive was Tim Kerkhoff's Salt Creek and Eastern with backdrops so skilfully



Part of John Burchnall's logging layout

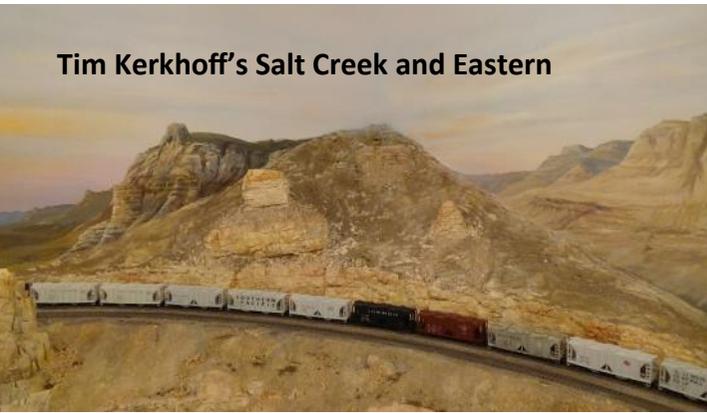
crafted you cannot tell where the scenery stops and the back drop begins. WY and UT, so the scenery is dramatic to start with.

Wednesday night was an operations primer on the Wabash Railroad, a Rails on Wheels 50 x 22 ft layout set up in the hotel. We had guides to help us though the 3 hour session and it gave a good indication of how addictive TT / TO operations can become. The fact it's demountable and taken to numerous shows was proven to be very popular. There were 12 sessions here with 12 persons per session. <http://www.railsonwheels.com/ors/>



The saw mill on John Burchnall's logging layout

## Tim Kerkhoff's Salt Creek and Eastern



Thursday was a clinic day and managed to enjoy clinics ranging from creating 3D back drops, (very effective and not so hard), Alco sounds and decoders, what's new at MR mag, LDSIG and what would you do differently next time, and engineering secrets of the Eastern Loggers, and lastly constructing Realistic City

Scenes in small spaces with Bar Mills, were but a small sample of the many clinics on offer.

Friday was the traditional National Train Show with free access and there were a good selection of display layouts on show. Coupled with more than enough stores selling everything you need for your layout and more.

In the afternoon I got to learn about Layout Command Control, (LCC) and what's the current status and where is it going. It's like DCC but for all not on track actions and looks like being a very user friendly way to get more out of your layout without added wires and general complexity. So look out for more to come.

The Layout Design Special Interest Group (LDSIG) dinner with Tony Koester as guest speaker was held on the Friday night in the "German House", a former impressive club for the many German settlers around Indianapolis. The 90 who attended heard Tony speak to his usual

amusing standard.

On Saturday afternoon I attended one of the last clinics put on by a 14 year old enthusiastic modeller. He described his efforts to establish a MR club at Junior High school. His trials and tribulations, the need for understanding by MR Clubs to mentor young men and en-

courage them into the hobby. Given he is one of the new modellers, I and many others in the room including Charlie Getz were impressed. There will be more in the future I'm sure on this subject.

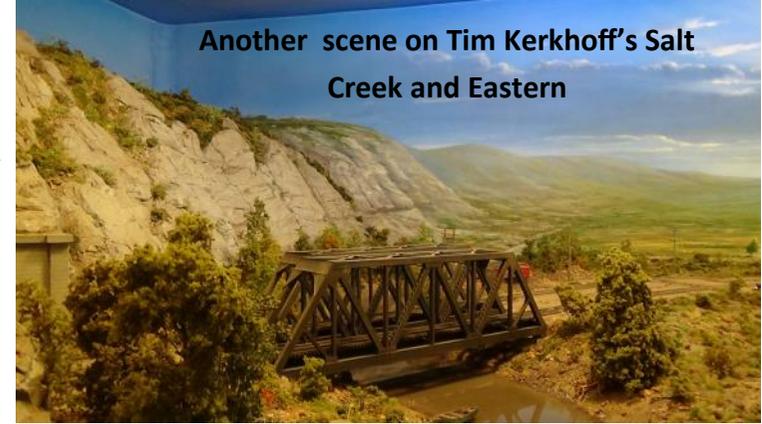
Lastly the dinner was held in the former station buildings of the Union Terminal in Indianapolis, but is now part of the Crowne Plaza. A moving dinner speech from the founder of Scale Trains and the issues of setting it up and making it happen.

There will be coverage in the Bulletin for sure however the 2022 National Convention was awarded to Birmingham in UK.

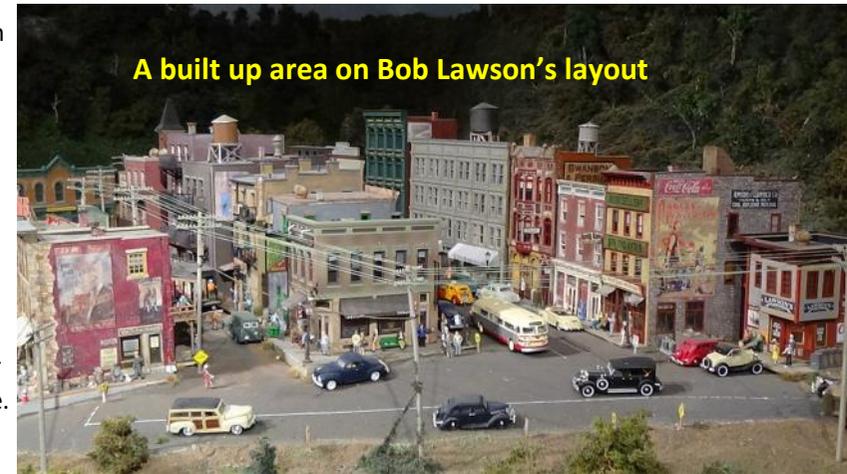
The competition was also well attended though to my mind Portland was more extensive. The silent auction seemed to offer a few bargains, older brass locos being one of them.

All in all a well organised and run convention, with too much to see and do and not enough time to see everything on offer.

## Another scene on Tim Kerkhoff's Salt Creek and Eastern



## A built up area on Bob Lawson's layout



## The refrigerating facility on Bob Lawson's layout



## Jerry Strangarity's Reading



# Observations on Layout Framing

Rod Tonkin CPEng

Many years ago as a student exercise I designed the framing for a model railway layout. Martindale Creek, the layout built to that frame design, was built in 1977. The layout was retired in 1996 to make way for its larger radius curved successor Martindale Creek-2. Martindale Creek-2 built in 1996 to a similar framing design as the original layout is still in service. My indoor layout Wombat Gully built in 2007 used the same design principles. To date neither Martindale Creek-2 nor Wombat Gully's framing has sagged or deteriorated in any way. The frames of both Martindale Creek-2 and Wombat Gully pass my benchmark test. You can drive a one inch nail into the decking with a claw hammer without the frame bouncing around.

My layout framing designs were based on calculations using the then current timber engineering Code AS 1720 and the CSIRO Handbook of Structural Timber Design (1948 edition). I've revisited that analysis to see if I could establish layout framing design guidelines for general use.

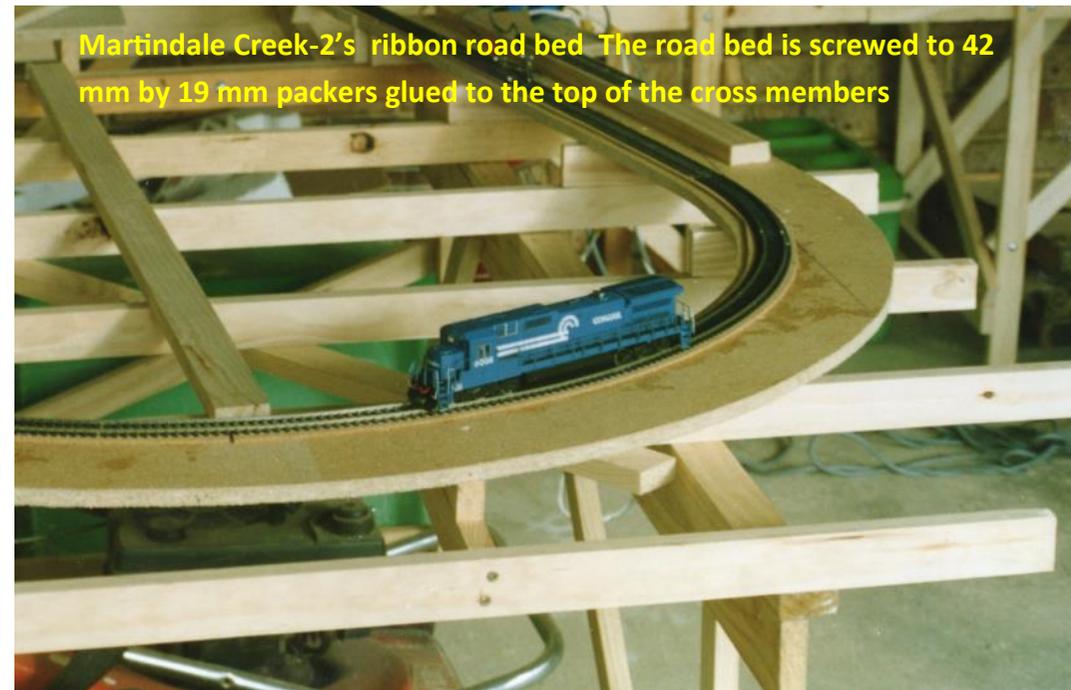
The loadings I used in my analysis are the weight of the layout decking and scenery, an allowance for modellers leaning on the layout and the weight of the rolling stock on the layout. The weight I used for the layout structure was a 12 millimetre chip board (plywood) deck on cross members at 300 millimetre spacing with thin shell plaster scenery over Styrofoam or hard shell plaster/paper terrain. The loading due to visitors leaning on the layout was taken as the AS 1170 (Safe loads on buildings) non trafficable roof loading. (Standing on my layout is a guaranteed health hazard). The weight of the rolling stock on the layout was taken as a line of HO scale 40 foot box cars weighted to NMRA RP 20.1 on each track and a line of Proto 2000 SD45s on the main line. These loadings worked out to be;

- 12 mm chip board/plywood decking (12 kilograms /sq metre)
- 6 mm thick scenery plaster (11 kilograms/sq metre)
- AS1170 non trafficable roof loading (25 kilograms/sq metre)
- HO scale rolling stock (1 kilogram per metre of track)
- HO scale locomotives (4 kilograms per metre of track)

The allowance for leaning visitors may seem large but it would be imprudent to leave it out of the design analysis.

The material I selected for the framing in the design is radiata pine. I selected radiata pine as it is inexpensive, ready available and easy to work. Most other timbers are stronger than radiata pine. If you have some other timber available using the timber sizes designed for radiata pine will simply provide a more robust layout frame.

It is little use building a layout you can't readily access. The maximum reach across a model railway by a typical modeller is around 750 mm. On this basis it is pointless building single side access layouts (around the wall arrangement) any wider than 750 mm. The maximum reach limitation limits a layout with access both sides to a practical maximum width of 1,500 mm. The longest timber sections readily transported with a typical car are around 2,400 mm. I've analysed rectangular and L girder framing members suitable for supporting layout sections up to the size of the largest easily handle able sheet of plywood or chipboard (1,200 millimetres wide by 2,400 millimetres long). The choice of rectangular frame or L girder depends on the track work planned for that section of your layout and your personal preference. Perimeter framed, fully decked layout panels are ideal for supporting yards. The decking secured directly to the framing acts as part of the framing, increasing the strength and stiffness of your layout. L girder framing gives you freedom to develop below track scenery and easily curve the edge of the layout.



The capacity of a layout framing member is determined by the stress and deflection of the member under load. The stress criteria I adopted was the AS 1720 maximum allowable bending stress for radiata pine. The deflection criteria I selected was the AS 1720 recommended deflection of one three hundredth of the span. The factor limiting the capacity of any one member depends on the loading and member layout. In most cases deflection was the factor determining layout frame main member capacity.

bers in the table are built up from readily available rectangular sections. The 42 by 61 is a 42 by 19 screwed to the top of a 42 by 19. The 42 by 86 section is a 42 by 19 screwed to the top of a 67 by 19. The 112 by 42 is a 42 by 19 screwed to the top of a 92 by 19.

The analysis gives a span of twenty times the section depth for plain rectangular sections. An L girder will span twenty five percent further than a rectangular member of equivalent depth due to the additional strength provided by the top flange. The span is the distance between supports. An overhang beyond the support of up to fifteen percent of the span will not affect the stress or deflection of the frame member.

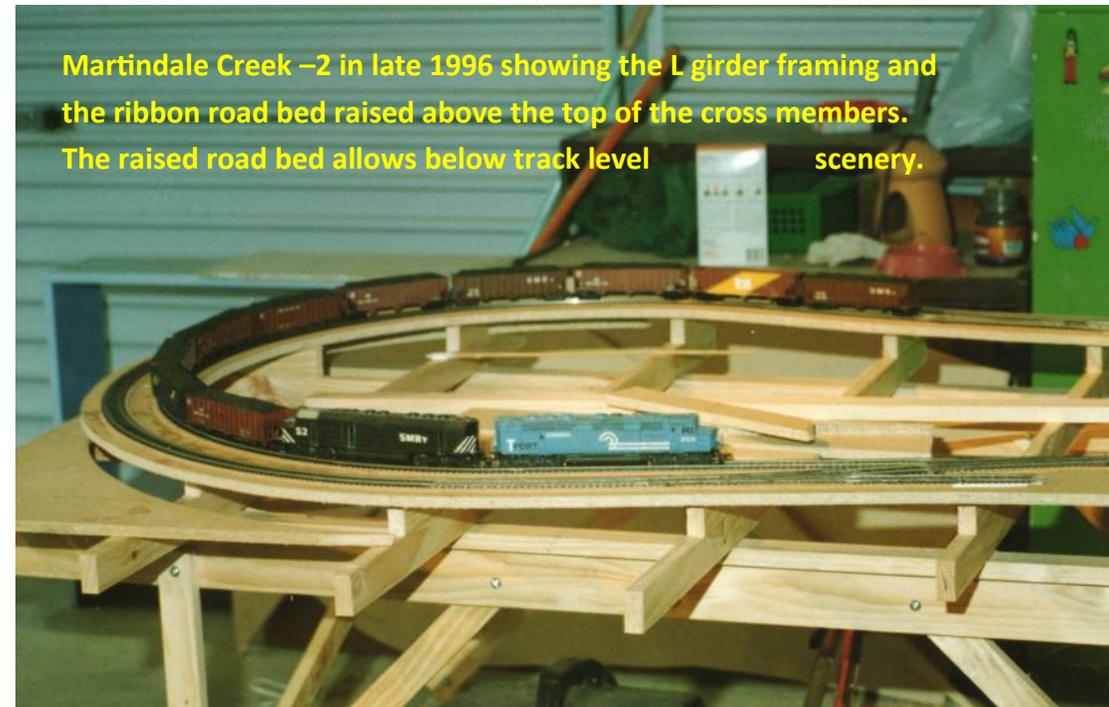
The analysis showed the 42 mm cross members at 300 mm centres I've been using on layout frames for the past forty years are adequate for layout sections up to 1,200 mm span (It's reassuring when the calculations back up observed performance) .

Layout legs need to provide vertical and lateral support for a layout. The lazy mans (i.e. mechanical engineers) approach mounts the layout on pieces of furniture. Wombat Gully uses this approach. It is supported on two chests of drawers and a tower of storage cubes. When suitable furniture is not available you need to build legs for your layout.

Framing member size	Depth mm	Width mm	Span to depth ratio	Recommended maximum span mm
	Main members			
Rectangular sections				
42*19	42	19	20	840
68*19	68	19.00	20	1360
92*19	92	19.00	20	1840
L girders				
62*42	62	42	25	1550
87*42	87	42	25	2175
112*42	112	42	25	2800
Cross members			Spacing mm	
42*19	42	19	300	1200
			450	1000
68*19	68	19.00	450	1200

I've had good results using 12 mm chipboard layout decking on 300 mm centres cross members for many years both in Sydney and Perth. Other modellers have had good service from 12 mm plywood on 450 mm cross member centres. I analysed the loading on layout frame cross members at both 300 mm and 450 mm spacing. The factor limiting cross member capacity was bending stress.

My analysis resulted in the attached table of maximum spans for layout framing members using readily available timber sections. These framing sections are suitable for layout framing on layouts or layout sections up to 1,200 mm wide by 2,400 mm long. The rectangular sections are readily available from hardware stores. The longitudinal L girder frame mem-

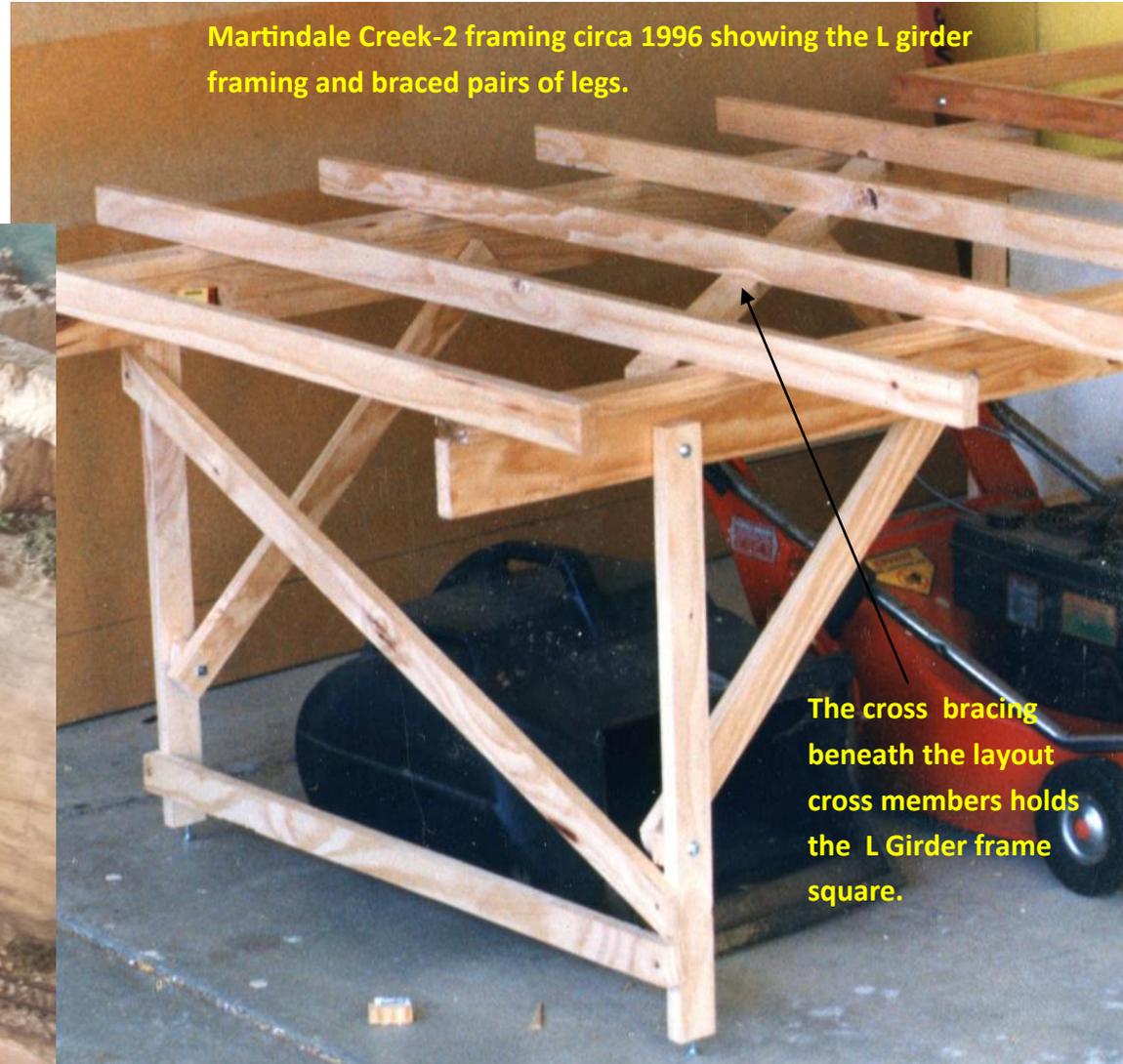


The limiting factor in the design of layout legs is stability, not the load on the leg. AS 1720 allows a timber strut to be 50 times the narrowest dimension of the section long for steady loads. Struts resisting occasional loadings may be 85 times the narrowest dimension of the section long. For 42 mm by 19 mm sections this means a leg length of up to 950 mm from the layout to the cross bracing and then up to 450 mm from the cross bracing to the end of the leg. 42 mm by 19 mm longitudinal and lateral bracing can be up to 1600 mm long. On this basis fully braced leg designs of 42 mm by 19 mm timbers can provide adequate support for layout panels up to 1,400 millimetres tall. I build my layout legs as pairs of legs. Each pair of legs is laterally braced. The two legs and the lateral bracing are screwed together as a unit and bolted to the layout frame. Each pair of legs is braced along the length of the layout section with bolted on braces on each leg. This leg design has been used on Leaffield with 1,200 mm tall legs. The legs support the layout without wobble and have

proven able to resist individuals accidentally bumping into the layout without noticeable effect.

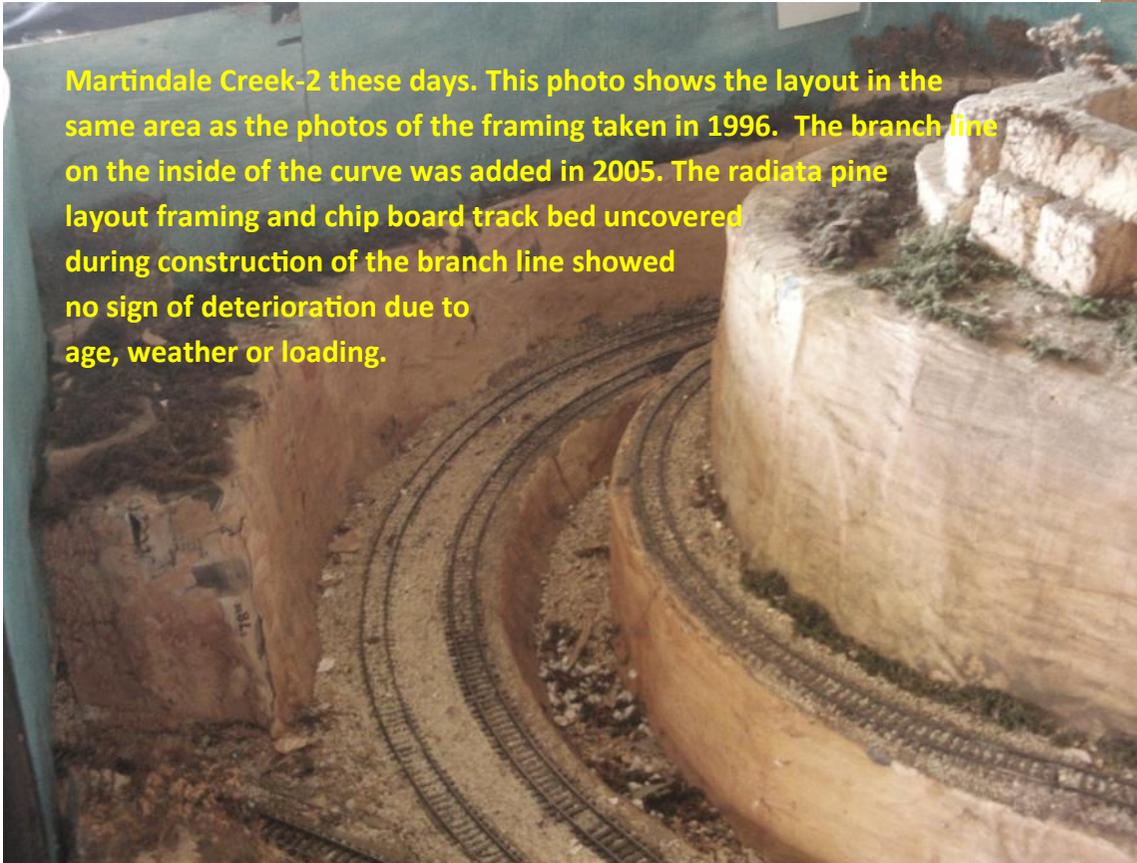
Based on the long term performance of Martindale Creek-2's framing, members can confidently use the sections and spans shown in the table presented in this article to design their layout support framing.

**Martindale Creek-2 framing circa 1996 showing the L girder framing and braced pairs of legs.**



**The cross bracing beneath the layout cross members holds the L Girder frame square.**

**Martindale Creek-2 these days. This photo shows the layout in the same area as the photos of the framing taken in 1996. The branch line on the inside of the curve was added in 2005. The radiata pine layout framing and chip board track bed uncovered during construction of the branch line showed no sign of deterioration due to age, weather or loading.**



Some views of Arthur Hayes Westgate  
HO/HOn3.5 layout

## Division One Highlights

On Saturday 18th June approx 36 NMRA members attended the home of Arthur and Kerry Hayes in Sunnybank Hills. Arthur has an extensive dual gauge Queensland based layout called Westgate. Some of you may have seen Arthur's work in some of the articles he has had published in MainLine. Notwithstanding Arthur is getting close to obtaining his MMR status.



Peter Kendall's HO scale Store



### Division Three Highlights

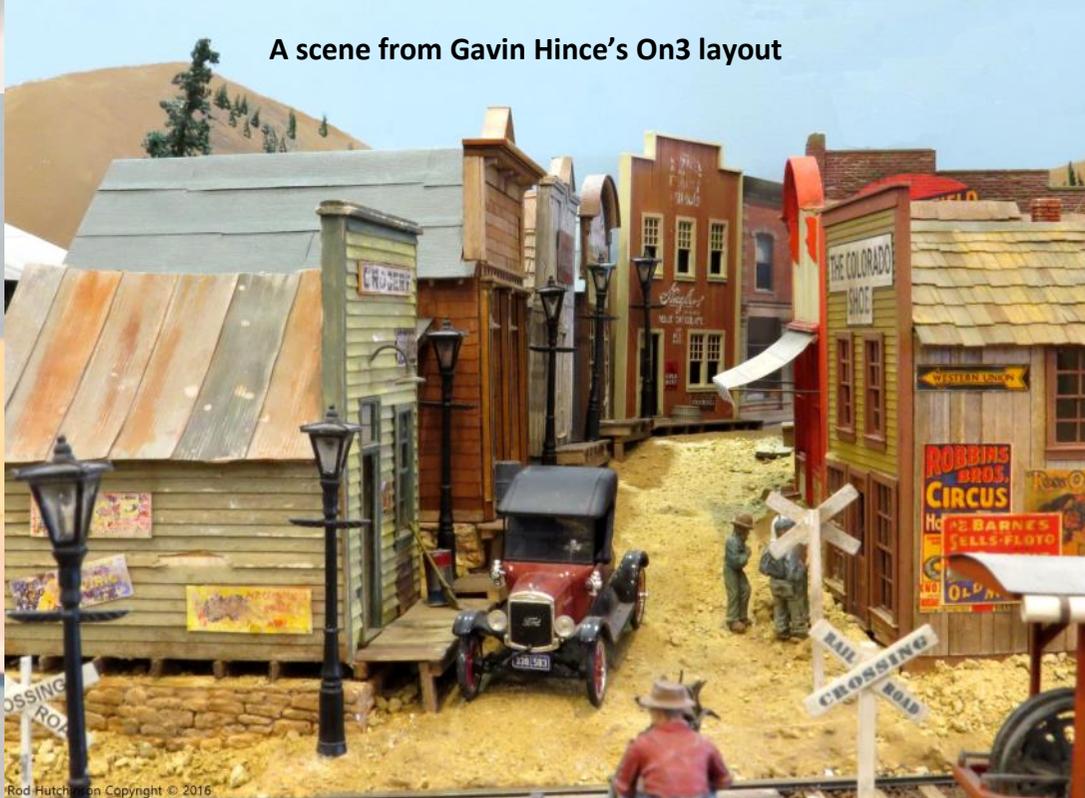
Copyright © 2016

A Scene from Allan Ogden's On30 sparrow Hill



Rod Hutchinson Copyright © 2016

A scene from Gavin Hince's On3 layout



Rod Hutchinson Copyright © 2016



Grant Mc Adam's O scale Gladston bag

Copyright © 2016

# Division Four Highlights



Alan and Peter enjoying the afternoon sun at the June meeting

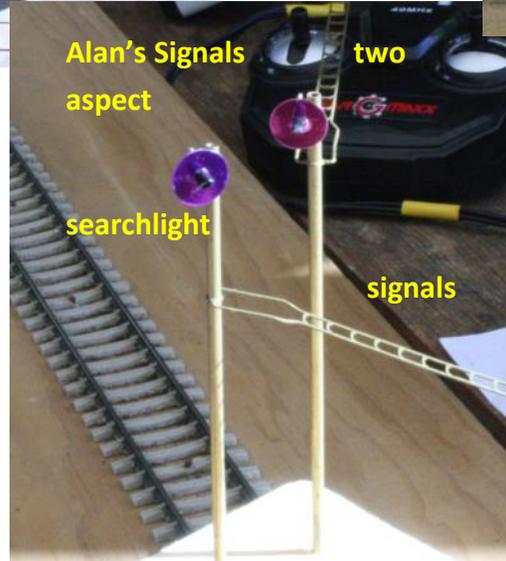
The June Division Four meeting was held at Rod Tonkin's place in the wilds of Perth's northern suburbs. The rather cold afternoon was offset by welcome cups of coffee and an afternoon tea of party pies and sausage rolls.



One of Alan's open platform coaches

Peter told us of his recent trip to Idaho and showed off his new railway motif shirt. Alan showed us progress on the searchlight signals he is building for the Valentine Run layout. Rod showed us the Joueff BR 40 class diesel (Yet another one!) he acquired at the AMRA WA exhibition earlier that month and the stock cars he is lettering for an industry on his layout.

The Division four loco testing facility was employed to measure the tractive effort of Rod's Joueff built model of BR's 40 class. On the scales



Alan's Signals aspect

searchlight signals

Our July meeting was held at AMRA WA's Clubrooms. Alan showed us the coaches he has acquired to operate behind his 4-4-0, a lit multi mode advertising display and progress on multiple control points to control the point motors on the Valentine Run layout.

We've decided to run a locomotive performance competition at next year's AMRA Exhibition using our existing locomotive test rig.

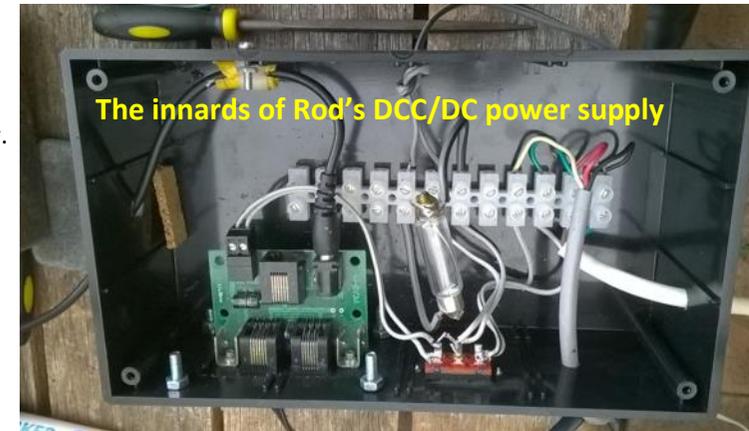


Alan's advertising display

Joueff built OO Scale BR D210 "Empress of Britain" on the test track



To enhance the test rig Rod has built it a DCC/DC power supply.



The innards of Rod's DCC/DC power supply

# Division Six Highlights

The Division 6 members were hosted by NMRA members Ken House and John Prattis at the Adelaide Model Railroaders Clubrooms at Outer Harbour. They were welcomed by President Jeff and the meeting ensued.

Ray Brownbill the AP Manager, presented Certificates to Ron Solly and DS Max. Convention Coordinator John Prattis gave a progress report. All is proceeding according to plan.

Show and tell was next. Vern showed some useful items and some progress photos of the figures he made at the meeting hosted at his home. John Prattis had a bag full of goodies from his recent trip to the US, where he attended conventions and other interesting events.

Jeff, Ken and John supplied a lavish afternoon tea/coffee; and then members repaired to the layout, which must surely be one of the longest club layouts around. It's built in the old Outer Harbour Railway Station building, which by nature is long and thin - ideal for a model rail layout. Oh, yes. Ray Brownbill won the raffle. About time, he reckons.

Max Wright MMR 578

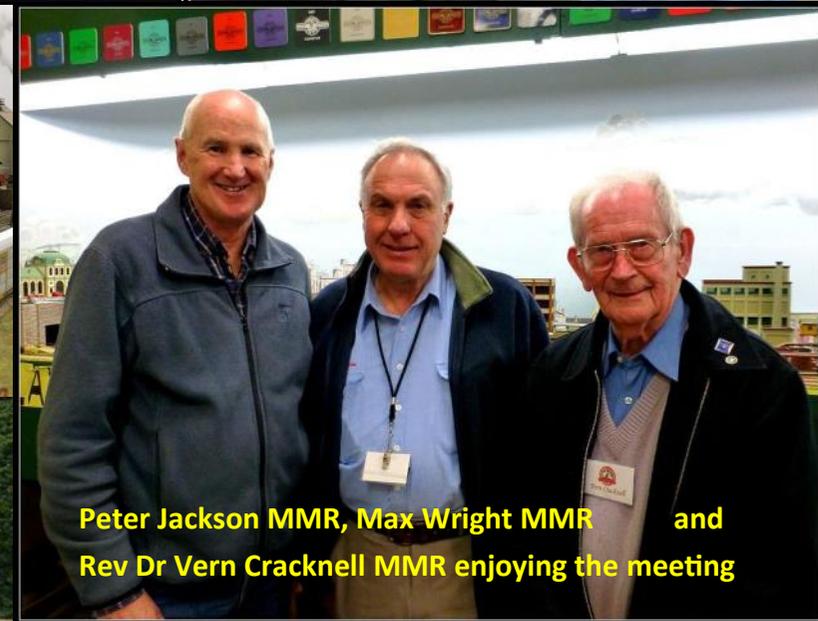
Division 6 Superintendent



Ray Brownbill presenting Ron Solly his AP Award



Ray Brownbill presenting Max Wright his AP Award



Peter Jackson MMR, Max Wright MMR and Rev Dr Vern Cracknell MMR enjoying the meeting

Views of Adelaide Model Railroader's layout



## Division Seven

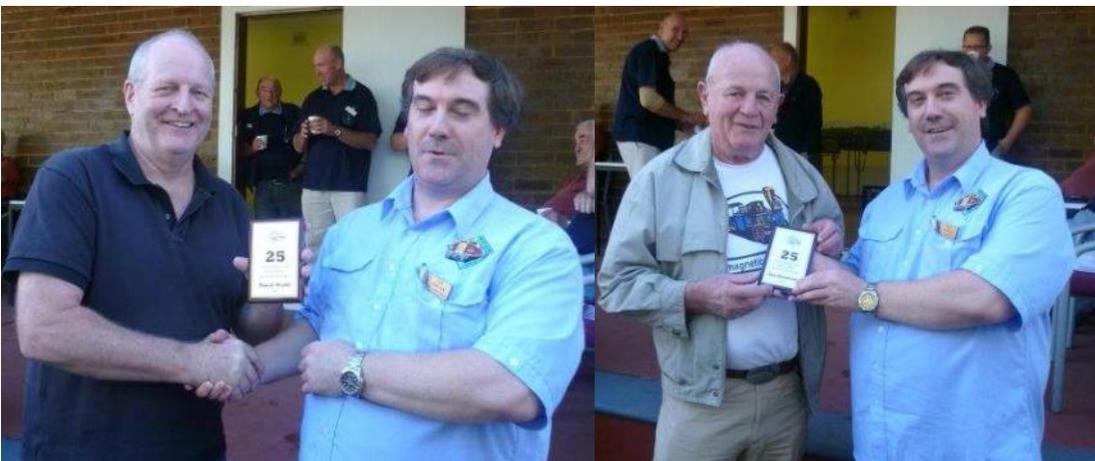
The Division 7 Meeting for May was hosted by the Hills Model Railway Society (HMRS) at their club rooms at Baulkham Hills on Saturday 14th May. The weather was perfect with a bright, sunny autumn day. The HMRS had their many layouts operating which included HO and N scales using DC and DCC control systems.

At the business stage of the meeting, Les Fowler thanked the HMRS for hosting the meeting at comparatively short notice as the May meeting was to originally be hosted by the late Donald Davis. The HMRS also supplied a lovely afternoon tea and provided the tea and coffee for the afternoon. This generosity was greatly appreciated by the NMRA members present.

Les presented 25 year plaques to Ian Henderson and David North.



Ron Sneddon receiving the host plaque on behalf of the HMRS



Everyone then dived into the lovely afternoon tea and enjoyed watching trains operating on the various layouts.

The June 2016 Division 7 Meeting was hosted by John and Natalie Montgomery at their home at Shalvey. The weather was perfect with a bright, sunny winter afternoon.

Les Fowler reminded everyone that annual membership fees are now due. Also, the early bird discount rate for the 2016 Mini-convention has now expired so the full rate is now applicable.

Les welcomed two new members to the Division; namely Steven Bean and Nick Sheridan.

John Montgomery welcomed the new members and visitors. John then challenged everyone present to look at volunteering to assist the Association. John said everyone should consider stepping up and carrying their share of the Association's activities as the current group of volunteers are ageing and some will need to stand-down in the near future for various reasons.

At the business stage of the June Division Seven Meeting, Kelly Loyd presented APs as follows:

- Lachlan Maguire—Chief Dispatcher
- Stephen Chapman—Master Builder-Structures
- Spencer McCormick—Master Builder-Scenery
- Jack Parker—Master Builder-Scenery
- David O'Hearn—Association Official



John Montgomery addressing the meeting on volunteering to assist the Association



Lachlan Maguire receiving his Dispatcher AP



Jack Parker receiving his Master Builder—Scenery AP



Stephen Chapman receiving his Master Builder—Structures AP



David O'Hearn receiving his Association Official AP



Spencer Mc Cormick receiving his Master Builder Scenery AP

## Narrow Gauge SIG Meeting

The June Narrow Gauge SIG Meeting was hosted by Ray Walters at his Toongabbie home on Saturday, 25th June 2016. There was a good rollup for the meeting on a cool but sunny winter's day. Ray had on display a module from the old Red Stag layout, a Cuban Railways On30 layout and in his garage, a large HO Scale us layout.

For "show and tell", Phil Galloway brought along a 3'6"



Members admiring Phil Galloway's Sn3.5 WAGR Models



Ken Scales O scale buildings getting the once over

gauge S Scale WA G Class locomotive and wagons. Michael Nott demonstrated how to motor a shay motor assembly, Alex Danilov brought a small steam loco, Ken Scales brought along three O scale structures and Ray Walters showed off some handmade points that had been soldered by Alex Danelov.



Red Stag Module



Michael Nott's Shay drive



Ray Walters Cuban Railways On30 layout

## Upcoming Events

### Model Railway Discussion Group

Meets at Whitfords Library, corner of Marmion Ave & Whitfords Ave,  
 Hillarys WA 6025 at 2.00 pm on the first Tuesday of the month, facilitated  
 by NMRA AR Division Four



### Modelling the Railways of Queensland Convention

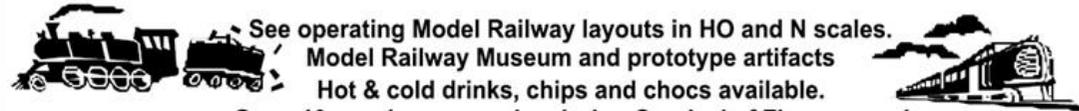
17/18th September 2016. Presentations, Demo, Displays, Trade and Layout Tour.  
 Information can be found on the convention Website [www.qldrailheritage.com/mrqc/](http://www.qldrailheritage.com/mrqc/)  
 Information Packs available from Arthur Hayes, [mrqc2012@optusnet.com.au](mailto:mrqc2012@optusnet.com.au)

## CARNIVAL OF FLOWERS WEEK Toowoomba Model Railway Club Inc. presents

# CARNIVAL OF TRAINS MODEL RAILWAY OPEN HOUSE

Saturday 17th to Sunday 24th September 2016  
 Museum & Display Venue, Toowoomba Showgrounds  
 Admission: GOLD COIN DONATION

See operating Model Railway layouts in HO and N scales.  
 Model Railway Museum and prototype artifacts  
 Hot & cold drinks, chips and chocs available.  
 Open 10am - 4pm every day during Carnival of Flowers week.



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AUSTRALIAN MODEL RAILWAY ASSOCIATION (NSW) INC presents...

# 2016 SYDNEY MODEL RAILWAY EXHIBITION

## TICKETS

Adults.....	\$15
Children.....	\$8
Seniors.....	\$11
Family (2 adults/2 children).....	\$38
Multi-Day Pass.....	\$30

*Tickets may be purchased from the  
 AMRA Clubrooms any Saturday in September.*

- More than 70 layouts and trade stands
- Parking by gold coin donation to Liverpool Lions Club
- FREE buses from Liverpool Station



**OCTOBER LONG WEEKEND**  
 1st, 2nd & 3rd October  
 Sat & Sun 9am-5pm • Mon 9am-4pm  
**WHITLAM LEISURE CENTRE**  
 Memorial Avenue, Liverpool

Exhibition details at.... [www.sydneymodelrailwayexhibition.com](http://www.sydneymodelrailwayexhibition.com) or [exhibman@inet.net.au](mailto:exhibman@inet.net.au)

Rail Heritage WA's vision is:  
 To facilitate access for present and future generations to  
 the history of railways in Western Australia



## Railfest 2016!!

Mark your diary or calendar now!  
 it's on again this year, Sunday, 9th October.



**AUSTRALIAN MODEL RAILWAY  
 ASSOCIATION WA BRANCH (INC)**

## ModelRail

SUNDAY 8 NOVEMBER 2015: 10AM TO 4PM

AMRA Clubrooms,

24 Moojebing Street Bayswater

Entry by gold coin donation. Sausage sizzle and cool drinks available

# Transport Heritage Expo 2016

Arthur Hayes

The Transport Heritage Expo was held over the four days of the Queen's Birthday weekend holiday at Sydney Central Station.

The displays covered 4 platforms. 3642 was running trips to Hurstville and back, vintage electric trains rides on a red rattler, Devonshire Tea in the Dining Car, Vintage bus rides around the CBD.



The dual cab 44 class such as 4490 were the back bone of the early NSWGR diesel locomotive roster



A contrast in styling; EMD styled 42101 versus Alco styled 4490



Preserved 3642 in pre rebuild colour scheme