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RAIL MODELLER AUSTRALIA

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From the editor

This issue marks 12 months from the first instalment which was released in June 2020. To some, this may not seem to be anything substantial but in reality we think it is a milestone. Launching a magazine in a period of global disruption and uncertain economic times was a gamble. The magazine is still funded by one person with support from a limited number of donations and as we move into our second year the future is somewhat fragile.

The team that brings you each issue consists of three volunteers supported by authors who contribute articles for your enjoyment. The magazine has a large readership with thousands of downloads both here in Australia and around the world, so we must be doing something right.

This issue has an additional four pages that contain some amazing layouts. If you enjoy this 'Bumper Issue' please consider making a donation to help us to keep this going.

An evocative view of Jurgen Engel's O Scale layout, 'Down by the Quay' featured in this issue.

Contents

The St Agnes Railway

By Trevor Gibbs

The construction and operation of this little slice of Canadian Railways

The St Agnes Railway is a "starter sized" layout with a lot of potential to duplicate a range of operating scenarios. Trevor leads us through the concepts behind his home layout, which have kept his interest going for over 40 years.

Many articles have been written about building and operating layouts of all sizes. The St. Agnes Railway is intentionally operated in a prototypical manner as a point to point railway. I based the operations on my observations as a lifelong rail fan.

Of course compromises have to be made with a smaller layout and a lot of imagination is use. The experiences simulating various operations and the journey to get there has been fun for a long time.

HOW IT STARTED.

The St Agnes Railway is based on a plan by a Mr. E. E. Seely in a Model Railroader magazine way back in 1973. American magazines took about 2 or 3 months after the cover date, to appear in Australia. At the time, my family was moving house. Model trains were temporarily put on the back burner with packing, moving and settling in when the original article was published.

Eventually, I started building a single station shunting layout. After a little while operating this layout, I really felt I preferred running long trains over long distances, but I needed an inspiration to build something else.

My home built inertia throttle of the time, led to a couple of near disasters in that confined space. Older modellers will remember with some of the early inertia throttles, how long it could be before a train would start to move. The sudden starts with older open frame motors meant you had control problems.

More importantly, the act of stopping the train was not an exact science with that throttle. The brakes had to be fully applied in emergency mode for some time, before the train would slow and stop.

Fig.1 An Eastbound "Canadian" pulls into one of the "intermediate" stations while a Canadian National GP40 awaits a signal to couple up to its train at the Ridgehaven end of the line.

I had scanned through Seely's article when I first read the magazine but did not see all the points he was making. A few months later, I read a couple of "letters to the editor" praising the concepts and ideas. Those letters caused me to revisit the article ... a few times over! The article showed how to grow a layout from an oval shape with one siding. The article was in part, a prod for "armchair modellers" to get going, rather than wait to build their "dream layout".

Seely's plan was inspirational. With imagination, it could be operated as a mainline, a division point, a branchline or a belt line based on the Toledo Terminal Railway, all within the same track plan. The Toledo Terminal was a real loop railway around Toledo in Ohio, so it fitted the plan well.

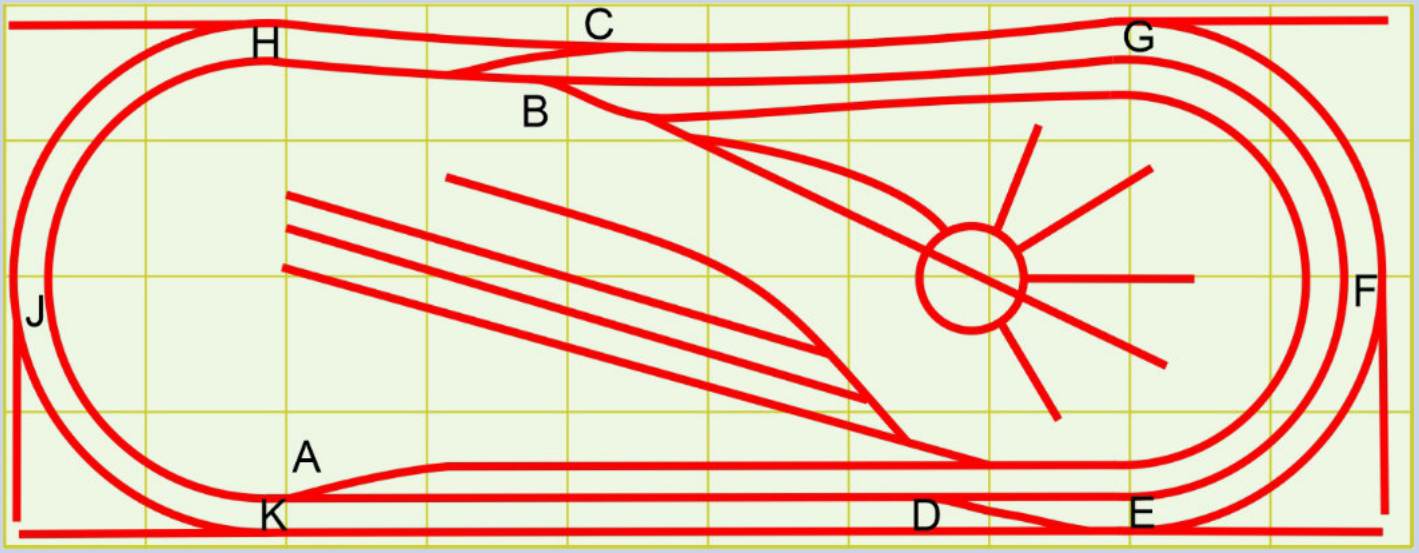

Fig.2 The original plan provided by Mr Seely was stretched to a 10 x 4ft plan. It was only ever scantily scenicked but satisfied a lot of my operational requirements.

I thought that the track plan was so good in its operating possibilities that over the years, I built three layouts to various points to much the same plan. The first was in HO where I extended the plan to a 4 x 10 area, the second in N in 3 x 6, and again in HO to 4 x 8.

The current version has had three different extension staging yards when it was located in my garage. My main limitation was space and my desire to work in HO scale.

Fig.3 SW7 8401 is arriving at "Banksia" on a short transfer train from "Ridgehaven". It will pick up the cars waiting "there" in the background and take them back to "Ridgehaven" where it will cross a west bound train.

The layout was originally in the house in two spare bedrooms. In its current location, it is now the sole occupant of a room, but there is little scope to put in an actual branchline.

I have always enjoyed operations more so than the physical geography of a layout.

Like most modellers, I have never really had a spare aircraft hangar nor the time to build and finance the layout I would ***really*** like to run. However I can replicate the actions of trains, either on a main line or yard, fairly well on my layout. All it requires is imagination on my part to think that I am running through open territory or watching at a busy yard.

My freelance theme is a generic bridge line running Canadian National (CN) and Canadian Pacific (CP or CP Rail) and other Canadian railways. But it could be anything, anywhere or anytime with a change of buildings, cars and rolling stock.

Fig.4 Algoma Central 152 is idling by a coaling tower it will not need. Behind the signal tower, CN 4346 is getting ready to back onto its train in the yard at St Agnes and head East.

In primary school, we learned about Canada and a picture that one classmate had was of Windsor Station in Montreal on a project poster. The scene showed a rush hour with RDC's leaving, obviously the inspiration of the Tri-ang Budd Car. I never did get that picture after the posters were taken down!

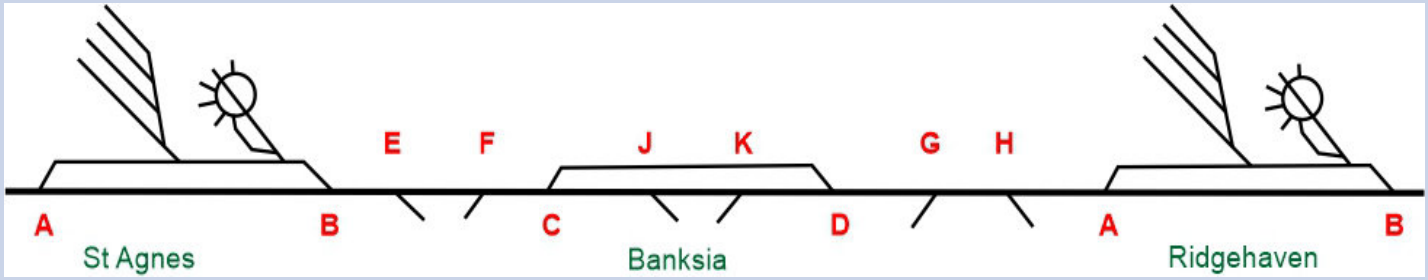

Fig.5 Mr Seely's original operating scheme for the branch or short line operation. The red letters refer to the turnouts in Figure 2.

Now anytime I want to relive being in Canada in 1976, apart from the cold and snow, a few steps into the train room and I am there! I have a lot of generic Australian and US cars as well and always a project or two to do.

Despite its small size , like most layouts it will never be finished and I will probably never have the time needed to "finish" it anyway. However it is a hobby, and the healthy part is that I am able to walk away from it if I need to.

IN THE ORIGINAL ARTICLE...

Mr Seely envisioned growing the layout and gave a treatise about operating and testing trains by starting with an oval, a single siding, a small amount of rolling stock and gradually expanding.

I had nearly enough turnouts/points to make the full layout as depicted. I started with that plan and stretched it to a 10ft x 4ft area using the boards from the single station layout and some additional boards.

A club friend was visiting at the time of finishing the track layout, so we spent an afternoon running a local freight on a short line like Mr Seely's first operating scenario.

We placed freight cars in the different sidings, set out with a train from "St Agnes" at one "end" of the layout to Ridgehaven and back switching at all the sidings en route.

BRANCH OR SHORT LINE OPERATION

Seely's article presented the idea of a layout growing its trackage, which also meant that the rolling stock roster grew over time.

A "short line" is a North American term for a small railway which could easily be operated with one loco, such as a GP9 or SW7 engine and up to a dozen cars. Seely presented the idea that six or seven cars would be taken in one direction, switched into spurs en route and cars picked up.

I did have more freight cars than that so I think my first train was about 12 cars worth, both ways. The train then returned to the starting point.

The station names were those of Adelaide suburbs where I had spent a happy part of my teenage years. Ironically there is no railway line actually near those real life areas!

Fig.6 Canadian Pacific 8411 is ready with her train at "St Agnes" to head East to "Ridgehaven", waiting to cross a west bound freight. This unit is in the classic 1950's paint scheme, which I have always admired, particularly on F units.This loco will return to St Agnes later. In the background, Northern Alberta 206 is stabled but ready to also head east. All locos are turned to face the direction they will next travel. This way, an operator will know "which station" the locos are "at" at a casual glance.

Each of the spurs were spaced with laps to create mileage between stops. Industrial buildings were not then installed on some sidings but were intended to be.

The "non industrial" sidings were deemed to be interchanges with "other railways" and all the spurs were used for picking up or delivering freight cars.

Between the "three stations", which I named St Agnes, Banksia and Ridgehaven, were 10 laps each apart. The spurs were about 3 laps apart and the total distance was about 8 scale miles, before the train reached its destination, shunted, turned and returned to the point of origin.

DIVISION POINT OPERATION
This layout also lends itself to a heavier duty way to run trains as a mainline division point. Seely's article suggested making up a train in the yard area on the inner lap and its passing siding. It could then be sent out to the outer line, say west bound, and staged at the back of the layout.

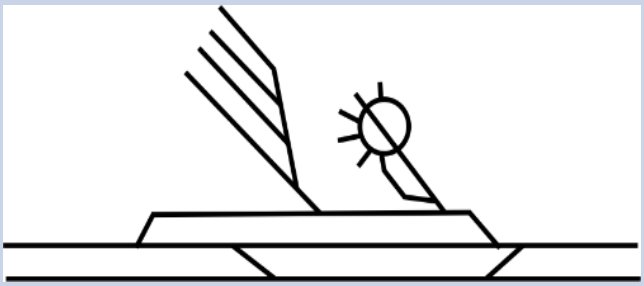

Fig.7 The original operating schematic for the Division point operation.

The task would then be to make up a second train to face East bound. It would then cross the first train which would be brought back into the "yard", pretending it was a different train. The East Bound would then be run to the back of the layout and staged while the previous "West bound" could change locos, add and drop freight cars, then repeating the cycle.

This was a very similar mode of operation to what occurred in Peterborough which was the South Australian Railways division point when I lived there in 1975/76.

In the early years, I would alternate between the branch line mode of operating and the division point style. Or if I felt as though I needed some "railway therapy", I could simply run trains in Test Track mode!

Fig.8 CP 4070 sweeping around the lazy curve at the rear of the layout.

The prototype of this loco was the lead locomotive in the movie "Silver Streak" in a thinly disguised CP Rail Red scheme and survived as a shell until at least 2017.

The railway languished for a while when I moved to Peterborough. It then sat in the background when I returned to Adelaide when I put myself through College and travelled.

BY 1979...
I moved from Adelaide to Melbourne when I married but had no space for a layout. After a few months, I was able to build a lightweight 6 x 3 board shape that could be stowed in our unit.

It was a tight but welcome encroachment on our available space, and consisted of the three outer loops and a couple of the yard sidings complete with the S bend at the back of the layout.

Personally, I found working with N scale too small for me. I did not invest a great deal as my brother had dabbled with N scale so I had added some track, some rolling stock, a Minitrix 0-6-0 and a new motor to replace one of his burnt out diesel motors. But it did allow me to railroad for 3 years of test running when I had time available. To my regret, I never took photos of that layout!

FORWARD TO 1982...
In the process of moving to Victoria, I dismantled the HO layout in Adelaide over a Xmas visit. The rest of our Summer was spent condensing what I had to a 4x8 (1200x2400mm) layout.

One of my"had to haves" was the S bend at the back evident in Figure 8. It made compressing the plan interesting when I relaid the track. One of my regrets of this compression was having a single turntable entry/exit instead of the double one I had. The basic schematic however was unchanged. The results can be seen in Figure 9.

I limited the spurs on the compressed layout to those which I could reach easily. Because the "North West" corner of the layout was not readily accessible, I left the spurs off in that area. The crossover that is shown at H was also not in the original plan but installed afterwards... more on that later!

The void which was created was filled with a mountain spur. This feature from the front of the layout was reminiscent to me of Broken Hill. That station's yard is bounded by a thin hilly spur on the South side. The spur is a scenic divider and blocks the view of whole trains doing laps.

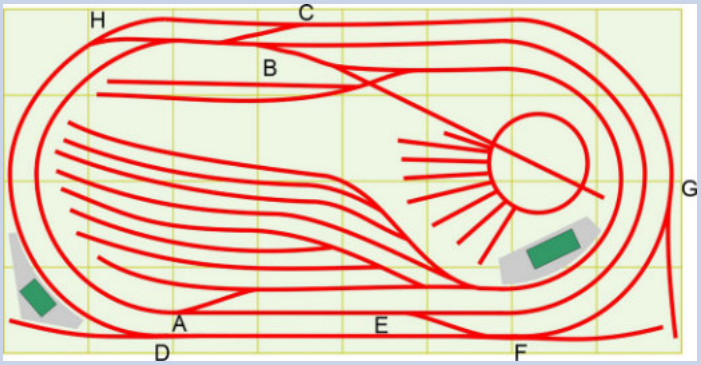

Fig. 9 The current plan of the St Agnes which can be related to the operating pattern shown opposite in Figure 10.

When this layout was set up, I alternated between the two suggested scenarios with the "addition" of a "virtual" station at Redwood, which looked like the one at Banksia but accessing different sidings.

Over a period of time, the layout was oriented more towards a point to point operation which enabled me to run a good length train over a reasonable distance while switching the next train to go in the opposite direction.

Fig. 10 CN4008 is crossing CN4346 at Ridgehaven at the end of its run. While 4346 and its train are doing laps on the outer loop, 4008 will be turned and stabled for its next west bound train while the train will be remarshalled. Some cars will be put in the yard while other freight cars will be part of a new East bound train... with a different loco!

For a number of years, I have been effectively running a hybrid of Mr Seely's two suggested operating schemes.

The railway has two division points and currently three intermediate stations with Banksia, Redwood and Tea Tree sharing the same physical passing siding trackage.

The only limitation has been that I cannot cross trains at the intermediate stations but that is a compromise that I can live with.

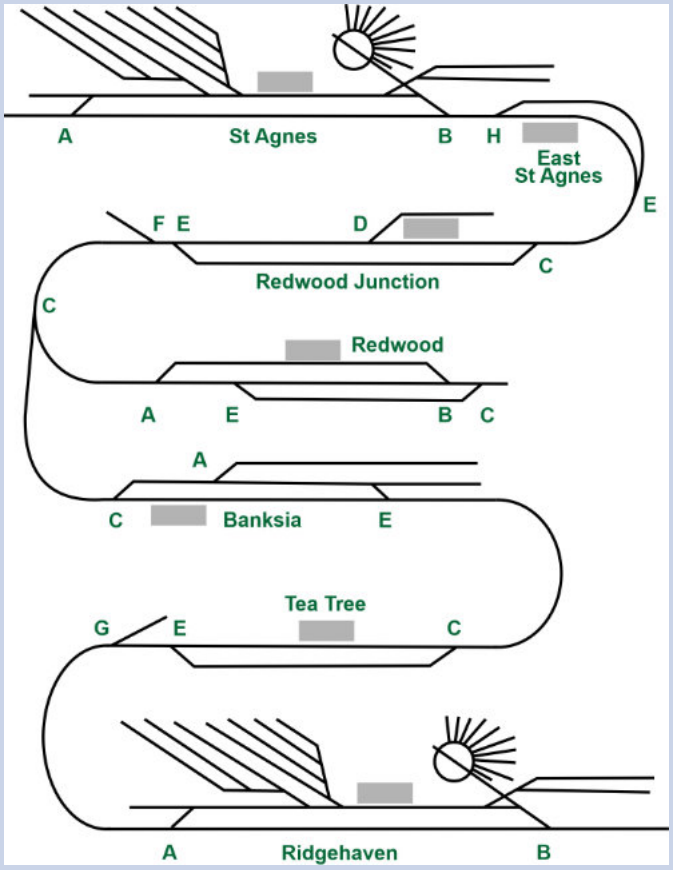

Fig. 11 The imagined schematic plan of the St Agnes. The letters show the position of the turnouts which can be related to the plan in Figure 9.

HOW THE RAILWAY "GREW"

The operating scheme of the St Agnes was originally two "end stations", Ridgehaven and St. Agnes) between A and B, and an intermediate station (Banksia) between C and E. The layout grew with Redwood as an intermediate station with a further 10 laps of travel within the same boundary but different siding accesses as per the track diagram.

Given the operation of the division points and a fast moving train on the main line, I found that I was only just getting my switching done in time even though my passenger trains were limited to 40 scale miles per hour (smph)/65 scale kph and the freights at the time ran up to about 35 smph.

Trains on the outer mainline did (and still do) 10 laps between stops which means they run for about 3 scale miles. However in the "modern age", freights now run up to 40 scale mph and the passenger trains up to 50.

To counter the frenetic pace of preparing a train while a train was running around the main line, I added another virtual station between C and E and called it Tea Tree. The previous branch spur was "added" for Tea Tree at "G" as a siding.

The siding at "G" was the point where the staging yard, Reginald Bridge station, West St Agnes loco depot and Vista were incorporated. Part of this extension is shown in Figure 13. One day, siding G may take on a different role in the running of the railway, but not in the current location of the layout.

Now any train in either direction, runs up to around 40 laps with 3 intermediate stops before being brought in for marshalling. The cars can keep going in their East or West bound directions until they are switched off, either at any intermediate siding or the division point yard, from which they can be used again in either direction.

By the time I have changed the locos and cabooses from trains at the division point and switched cars in and out, the train on the main line is usually at Banksia. The new loco is then attached.

All the while I am operating at scale speeds with inertia throttles. I stop the main line train at each of the "stations" whether it needs to switch cars or not. I usually spend that last series of 10 laps just running the train to the "cross". The newly created East bound train departs and the process continues.

Fig. 12 Peterborough Station in May 1975 sees 2 830 class coming in for servicing at the loco depot a kilometre or so behind the photographer. Engine 600 is on the Indian Pacific heading East. The train left in the yard by the 830's will be taken to Pt. Pirie and beyond, after Adelaide bound loading is shunted off to the bogie exchange. It is this type of operation that my layout is emulating at the two "end stations".

WHY STOP AT EVERY "STATION"?

When I lived in Peterborough in South Australia, part of my job was electrical servicing of locos during the week. On two weeks out of three, from Thursday to Sunday, I rode the Indian Pacific to Sydney and return as a travelling technician.

When travelling through Western New South Wales between Parkes and Broken Hill, the train would come to a halt, often fairly abruptly, at every station. The abrupt halt occurred because the train control telephone/ staff cabin box was where the fireman would alight, change the staff for each section and update train orders. Keeping to the timetable was essential so stops had to be close. At the time, this section was traversed at night in both directions, so sleep in the dormitory car was of the interrupted variety.

About that time, I rode in many loco cabs both for work and for pleasure. I would closely watch and admire some master classes in air brake operation. Under supervision, I have also run both steam and diesel hauled trains.

With simulated inertia throttles, I get my chance to emulate what I saw back then with emphasis on prototypical and smooth operation. The two I built in the 1980's perform far better than my original unit in the mid 1970's. A "regret" with these throttles is that I have not perfected a design for a two stage brake with independent and automatic (loco and train) brake functions, although I have made brake handles ready for when I do!

From an operating point of view, playing with "air brakes" stops monotony creeping into just running trains around, simply doing loops. There is quite a challenge to build up speed, and more importantly to stop trains smoothly, using my system.

A lap of the layout is about one third of a scale mile or about 500 scale metres, so brakes are applied during the latter parts of the eighth lap. The brakes need to be tweaked as the slowing occurs by applying, easing off and releasing the brakes when necessary to stop at the required points.

Fig. 13 Part of the staging yard/ loco depot/ western most station known as West St Agnes, Reginald Bridge or Vista. This area was never scenicked beyond basic flat fronted buildings. The blue backdrop is immediately in front of a brick wall in this view. The loco depot was for diesels only at West St Agnes, and in recognising Figure 12, emulating the trip to the freight yard east of town.

A STAGING YARD

Over the years when the layout lived in a garage, there was a spur of sorts with a 4 track staging yard. The spur was expanded a bit further to a branchline terminal that came off at "D" on the map in Figure 11 but the positioning made it a maintenance and operating "Frankenstein".

Later on with another repositioning of the layout, the spur was moved to come off the mainline at "G". This became a diesel shed, a terminal station and a staging yard using an 0-5-0 switcher in one. The "stations" are named after areas in Adelaide which do not actualy have a nearby rail line. "Vista" is one of those suburbs and the staging yard was called "Vista" because there was nothing extra to see!

With the move to a new house, and a location back inside, I took the opportunity to make repairs and renovate the layout. Alas, I could not install that extra track in the available space.

Fig. 14 A Canadian National SW9 and BC Hydro 152 share the Coach Yard on the other side of the spur. Switchers use this area as a lead track/ head shunt for the yard.

The "Coal Office"and the black hut are the first Airfix (now Dapol) kit buildings I put together and painted myself at age 10. They are over 55 years old now! Glazing the windows is the only "upgrade" both buildings have had in that time. The windows were made with PVA glue to make them opaque.

Fig. 15 The view of the freight yard with the Rail Car siding. The slight "S" shape of the yard trackage gives more of an illusion of depth. The spur side was a reminder of Broken Hill in NSW except for the pine trees at the top of my spur.

KEEPING TRACK OF THE TRAINS.

I do not have much of a problem remembering what I did between sessions and what does it matter if I do not get it right... it is my railway! With guests, I did use a magnetic board with the map of the operating scheme shown in Figure 11, with tags labelled with each loco's number.

The tags were moved on that map to show the trains' position on the railway. I intend to make another board because the original was damaged in the house move. While I do this for locos, I do not concern myself with freight cars too much. Rather I think of them as "extra cast members of the show". Maybe I can try waybills and switch lists in the future.

As it is, there is enough variety and I keep interested in exploring slight variations in operations, as long as there is a prototype example that I am familiar with.

Fig. 16 CN 6516 is running off the turntable ready to take a west bound train. This scene reminds me of a happy afternoon near the CN tower in Toronto. I was standng on the Spadina Ave bridge watching trains through Union Station and the round house activity there.

VARIETY IN THE THEME

The hobby has shown there is more than one way to run a layout. One approach I am impressed with is by a modeller in Melbourne who has the same basic layout but models a range of 10 year periods.

With appropriate different autos, carriages, wagons, figurines, buildings and locos, he could change his era from the 1930's to the 1970's and keep up interest in the layout... which did not change!

Up to one month of any given year, he would change his layout to suit the chosen era, then operate that stock until the next holiday season. He would then go through the routine for the next 10 year modelled period.

Fig. 17 An 0-6-0 is being held waiting for the 0-8-0 at the left to leave and attach to its train at St Agnes. Meanwhile a Toronto, Hamilton and Buffalo 2-8-4 thunders past on the main line towards St Agnes.

A simple change to steam locomotives, switches the apparent era to pre 1960. The Stainless Steel passenger cars for the Canadian date from 1955 so a period is set.

Like many modellers, I have more locos and cars than I have room for. I thought I would use a similar idea with different eras and possibly even different railways. I can run different eras, revert to a shortline theme and substitute different industries.

As part of the variety that the hobby offers, I have built or helped build at least 7 club layouts, 5 or 6 for friends and carried out numerous small projects on other layouts. I also spent over four years as the president of two clubs, not at the same time. This, as well as editing work year books and other inputs to the hobby, consumed some of my personal hobby time.

However in promoting the hobby, I could never regret that aspect of time spent!

Fig. 18 An aerial view of the engines in Figure 17. The "spoiler" to the era swap is the CN freight cars behind the 2-8-4 in the modern "wet noodle" scheme. These cars did not appear until January 1961, a full year afer the last steamers ran in regular service on that system.

Other cars in the train are more modern again . The "S" curve changes the apparent length which is only about 1.7 metres /5 ft 6" in this view.

THE OPERATING TABLE

The next page has a possible operating scenario which you can follow using the map in Figure 11.

I do not have a paper time table or running sequence as such for the railway but the actual actions outlined in the table are fairly closely followed.

Some variations occur when I run the RDCs out and back to destinations. A director's special may make an appearance or a light engine may run the length of the railway between St Agnes and Ridgehaven. Perhaps it will pick up a train because of an imaginary breakdown at that end of the line. There are many prototypical events that can be simulated... and that makes it fun!

SO IN SHORT

Mr Seely, I am grateful for the ride. I could not have imagined way back in mid 1974 that the essence of your layout idea would still be running. There will still be many different things to do.

Of course I enjoy making a building, assembling kits and adding a few details but all the details in the world do not make a good operating model railway on their own.

The St Agnes in its various guises has provided much more operating variety and scenarios than I could have reasonably hoped for in a modest size layout!

TRN N0	Loco	From	To	NOTES
1	CN 6516 plus up to 12 cars + van	St Agnes	Ridgehaven	Previously crossed freight at St Agnes is switched and sorted and a new consist started tp be made up. Loco from freight stabled. Train 1 can switch any or all stations en route. Crosses Trn 2 at Ridgehaven
2	4070 (FP7) plus Canadian Cars	Ridgehaven	St Agnes	Crosses Train 1 and proceeds to St Agnes, stopping all stations Crosses Train 3 at St Agnes
3	CN 1366 (SW7) Plus up to 10 cars	St Agnes	Redwood	Can switch cars at Redwood Junction, pulls into 1 road at Redwood, runs around train and picks up cars in second road which are placed when Canadian cars are switched away.
4	CN 1366 (SW7) Plus up to 10 cars	Redwood	St Agnes	After departure, eastbound cars brought in by Train 3 are added to and new loco and van added for train 5. Crosses Train 5 at St Agnes
5	9652 (GP40L) Plus up to 13 cars	St Agnes	Ridgehaven	Through freight. Can cross Train 4 at East St Agnes. Train 4 loco to Roundhouse and extra cars added for Train 6 Crosses Train 6 at Ridgehaven
6	9162/9168 (F7) Plus up to 13 cars	Ridgehaven	St Agnes	Through freight. to cross Train 7 at St Agnes Train 5 switched to Yard and Railcars to St Agnes platform.
7	*6326/6112 (CN RDC1/3)*	St Agnes	Ridgehaven	Crosses *Train 8 at* Ridgehaven Cars cut from Trn 6's consist and loco and van changed
8	BCH 151 (SW1500) Plus up to 10 cars	Ridgehaven	Banksia	Train runs to Banksia. RDCs stabled and freight cars placed in siding. Train 8 switches Tea Tree if necessary. Places cars in exchange sidings at Banksia, picks up cars from siding. Forms train 9.
9	BCH 151 Plus up to 10 cars	Banksia	Ridgehaven	Train runs to Ridgehaven. RDCs stabled and freight cars placed in siding. Train 9 switches Tea Tree if necessary. Crosses Train 10
10	ACR 152 (GP9)	Ridgehaven	St Agnes	Can be through or roadside. After departure, eastbound cars brought in by Train 9 are added to and new loco and van added for train 11. Crosses Train 11 at St Agnes
11	BN 6615 (F45) plus up to 14 cars.	St Agnes	Ridgehaven	Through freight. Train 10 stabled, Train 12 prepared. Crosses Train 12 at Ridgehaven.
12	6326/6112 (CN RDC1/3)	Ridgehaven	St Agnes	And there are many further elements to this...


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PUZZLE COVE

An Automated 016.5 Exhibition Shunting Puzzle Layout

by Robert Partington

Over more than 20 years, my brother Michael and I have built several 'exhibition' layouts. One of the layouts that still holds the interest of exhibition goers is the 'Hump Shunt' layout. It demonstrates hump shunting by automatically reversing a group of eight trucks into a small yard.

When Michael and I were thinking about a new layout, we wanted it to fill our set criteria. It had to hold the viewers attention and we wanted it to be automated.

Automation meant that the audience would be able to interact with the operator and not require constant supervision.
However another requirement was that it should not require concentration on the layout to the exclusion of interacting with the audience, hence the need for automation.

After some research I came across a web site of shunting puzzles. I found a puzzle involving two trains travelling in opposite directions on a single line needing to cross each other by shunting using a short siding. The siding would only be long enough for either a loco or a single truck but not both.

The idea for the setting of Puzzle Cove came from an account of a track washaway in 1855 on the South Devon Railway at Dawlish. The line comes out of tunnels at either end and crosses the cove on a causeway.

The railway is still damaged and washed away occasionally in heavy weather situations. The illustration shown in Figure 1 gave me the inspiration for the setting to have single track working and only provide a very short siding for passing, thus setting up the 'shunting puzzle'.

I am a user of electronics with a basic understanding of the principles but I am certainly not an electronics "expert".

Whenever Michael and I have built automated layouts, we have had to plan and discuss what we have wanted to achieve. My wife Jan, Mike and I all enjoy exhibitiing, as long as I am nearby to answer technical questions or correct any hiccups with the operation.

Fig. 1 The drawing that started it all – the 1855 collapse of the Dawlish (England) sea wall.

Our train control uses DCC and the automation CTI-Electronics hardware and software. I did not initially intend to fit sound chips to the locos as they came factory fitted with a 'non sound' decoder.

I initially added sound from within the CTI code and played it through computer speakers, however sound decoders have since added to the locos.

Using modeller's licence, the scene is my interpretation of a "Welsh coast area" with inspiration from seeing various scenes on the Internet.

The operation is focused on two trains which emerge from tunnels each side of the cove to cross the wooden causeway. The seafront has been eroded over the years leaving very little "flat ground" for a siding, thus providing the scenario for the puzzle, which is how to get the trains to cross each other.

SOME CONSTRAINTS

Puzzle Cove could not be built in an unlimited space. The new layout had to fit into my trailer along with my wife Jan's display diorama of the 'Enchanted Wood'.

It also had to be light enough to be handled by Jan or Mike and I.

The track plan was set out to allow the trains to pass by shunting at the front and passing again at the back. using the hidden passing siding. The trains then reappear “On Stage” at the front ready to cross each other again.

Because of the narrow width (max 910mm wide or just under 3ft) the curves are tight, so I chose On30/16.5 scale which was a challenge as I had not modelled in that scale before.

THE LAYOUT

The layout was planned using SCARM (Simple Computer AIded Railway Modeller), a free downloadable program. This program enabled the track plan to be printed off full size and test the dimensions and logic of what we were trying to achieve.

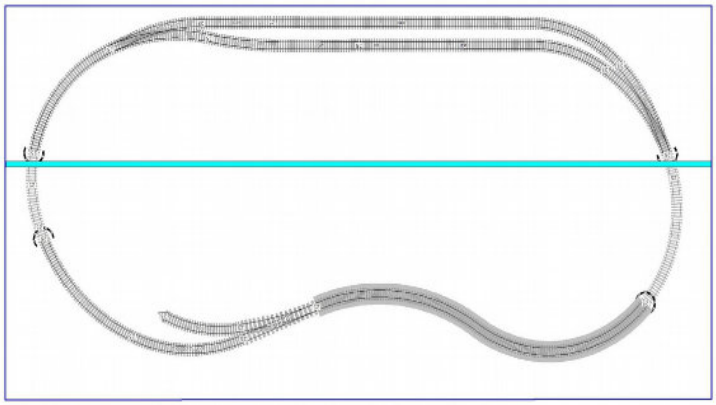


Fig 2 The track plan. The Green line is the backdrop area with the passing siding at the top and the causeway at the bottom.

The biggest single feature of the layout scene is the wooden causeway. I had never tried to build a trestle or bridge before so armed with the printed track plan, the causeway was built first. If I could not get this right, our project was going nowhere.

The causeway is a freelance design based on pictures of similar structures and was made from strips of timber glued together in a jig.

The dimensions of the timbers were taken from a technical manual called “Carpenter.pdf” produced by the US army as a technical manual for carpentry trainees. That manual has everything from building a house to a wharf or, in this case, a wooden causeway.

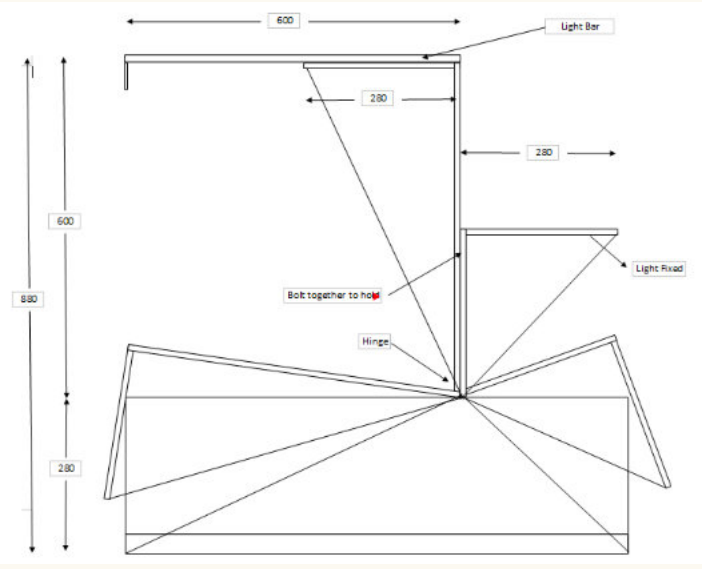
CONSTRUCTION

The layout was constructed as a ‘box’ 1800mm long, 910mm wide and 290mm high. When closed, the box protects the display from damage when in the trailer. At a show the ‘lid’ folds open and becomes the backboard.

The frame for the layout shown in Figure 3 was made out of metal ‘stud wall’ components, as it needed to be both light and strong.

Fig. 3 The metal stud frame work

Around this frame, a ‘box’ was constructed out of MDF board. The lid of the ‘box’ was split, so when opened it forms the ‘back drop’ for the scene as well as a base for the lighting.



Fig, 4 Showing the outline of the box and how the backdrop is positioned as the box folds out from its transportation mode to a display mode.

The ‘hills’ had to be made lower than the hinge line of the lid, to allow space for the field fencing when the lid is closed. This meant that the backboard could not be fixed directly onto the lid.

Fig, 5 Complete with hinging, the box is taking shape on the frame.

Fig. 6 The box in transport mode.

To overcome this, a removable backboard was made onto which the back scene banner was glued. The trees are also removable for transport.

Fig. 7 The hill scene is taking shape with layered white foam in the stage of being weighted and glued. With white glue, you need to allow a couple of days drying time .

The hills were made from layers of white packing foam obtained for free from a couple of electrical retailers. It was otherwise waste material that was used for packing refrigerators and air conditioners.

The foam was shaped with a rasp file into the desired contour, and covered in a green 'polo fleece' material to form the base for the landscape. The rock faces were formed from tree bark covered with a 'watered down' coat of 'No More Gaps', then painted to look like rocks.

Fig. 8 With the causeway and track in place, the base of the scenery and the "sea" is taking shape.

The "sea" was made by painting the base to the desired colour, then covered by a layer of water based silicon.

As the silicon dried the 'waves' were formed by using a paint brush to 'push' the surface into the desired pattern. The causeway was added while the silicon was still wet to allow it to 'bed' into the ocean.

Fig.9 Nearly there! The green fleecy material and cliff faces are in place.

Some readers and exhibition patrons will recognise the backboard photo shown in Figure 9 as a view of Port Isaac in Cornwall. This location is otherwise known as 'Portwenn' in the Doc Martin series. I found the picture on the 'net' and with the owner's permission, it was made into a banner.

Jan took on the task of painting the bridge and rock face of the cove then added the ground cover.

Fig. 10 Jan doing her artistic best on the scenic wall and it looks fantastic… but I would say that!

Jan advised on colour choices as I have a partial colour blindness. This was the first time that she scenicked a complete scale model area.

Fig. 11 The finished area with the causeway in place. Note the lights.

The presented layout is shown in Figure 12 with the computer on the table at the side.

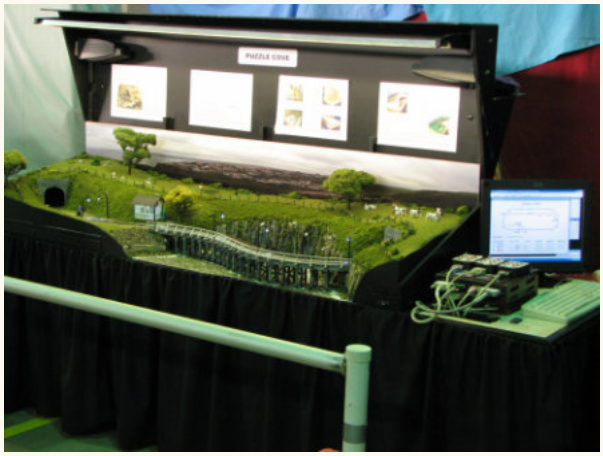


Fig. 12 The layout complete with the box painted black and the light shield in place. A description is provided explaining the project.

LOCOMOTIVES AND ROLLINGSTOCK

With the exception of the flat wagon and box van which are Peco kits, the rolling stock and locomotive bodies were 3D printed, mainly from Alan Beaumont's designs available on Shapeways.

I started with two 3D printed diesel bodies each fitted to Bachmann GE Centre Cab 44 Tonner Switcher chassis. These chassis were factory fitted with DCC non sound chips. The two four wheeled coaches were also an Alan Beaumont product.

Fig. 13 One of the diesels in the middle of the shunting puzzle. The other loco would be out of sight to our right.

The locos and rolling stock are fitted with standard Bachmann tension-lock couplers and these seem to be the most reliable coupler, especially for coupling and uncoupling on curves.

After a few shows, we thought the scene would be enhanced if the steam locos had sound chips. Two 16.5 printed side tank loco shells were fitted to Hornby "Smoky Joe" chassis. It should have been easier than it turned out to be!

Fig. 14 Engine number 1. The capacitors are disguised as an air tank under the cab floor and level with the rear buffer and an oil tank below the stack in front of the water tank.

The Hornby locos struggled on the tight curves, where they kept losing contact on the wheel 'pickups'.

To solve this problem, 50 grams of lead was added to the loco weight. Additional pickups on the wheels made from KS .025 brass wire and 4 x 470 micro farad capacitors connected in parallel to the LokSound decoders.

How to fit these capacitors is described in the LokSound manual. There was no room to add these capacitors within the loco body, so they were added as 'Oil drums" on the front and 'Air tanks' under the cab. You can see one just to the right of the driver under the floor level in Figure 14.

Once the locos were running reliably during testing, the first carriage behind the loco would constantly derail on the causeway. The problem was the 'hook' of the couplers binding as the train negotiated the 'S' curve on the right hand side of the causeway.

The diesel locos never had this issue as their small wheelbase bogies easily negotiated the curves. The 0-4-0 rigid chassis of the steam locos created a lot of overhang of the couplings.

The problem was fixed by removing the 'hook' from one of the couplers, so every 'joint' has only one 'hook'. This has made the couplers operate very reliably.

POINTS AND UNCOUPLER OPERATION

To operate the points and uncouplers, cheap model aircraft servo motors were used to provide the mechanical action. A small circuit was designed using two 555 timers to control them.

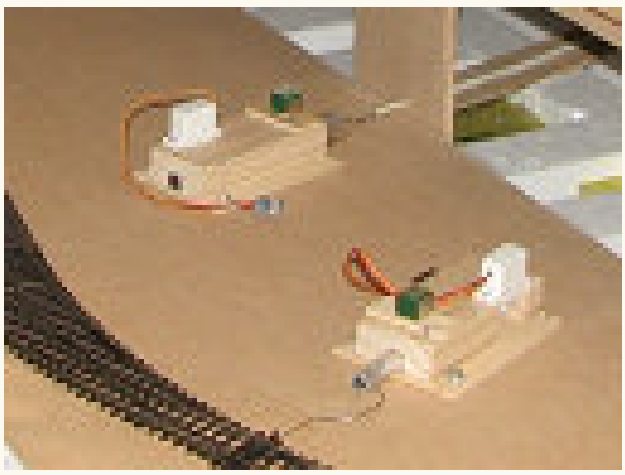


Fig. 15 The model aircraft servo motors coupled to the points

The timers generate two different frequencies which are fed into the control terminal of the servo. The servo was mounted on a wooden block with a hole in it to take a small length of aluminium tube.

For point motors, a hole was drilled in one side of the tube to take the arm of the servo and a smaller hole in the other end of the tube to take a piece of piano wire which connected it to the arm of a Peco point.

When applied to uncouplers, the same tube and piano wire arrangement was attached to a plate between the tracks. The plates lift to uncouple the tension lock couplers.

The control line of the servo was connected to the centre pin of a relay and the output of the 'frequency' circuit to the other pins of the relay.

When the relay is activated, it changes the frequency of the control line from low to high or vice versa causing the servo arm to rotate and move the aluminium tube back or forward which changes the point or raises or lowers the uncoupler plate.

If servos were to used again in a future layout, they would be controlled using Arduino modules as they are cheap and very versatile.

Fig. 16 Prior to painting, one of the printed coaches was used to check the trackwork and clearance. Note the OO point which will be covered by ballast and the lamp post.

This was my first layout in O16.5 and we are happy with the result. Puzzle Cove has been displayed at Exhibitions and Conventions in South Australia, New South Wales and Victoria and we hope to be back on the circuit soon.

DOWN BY THE QUAY

Jurgen Engel describes his harbour side O Scale micro layout featuring detailed buildings and rolling stock.

Layout: Down by the Quay

Builder: Jurgen Engel, Sydney, Australia

Scale: 7mm/O 1:43.5

Era: Any, depending on rolling stock used. 1950's and onwards.

Layout style: Micro/diorama.

Introduction:

Down by the Quay is an attempt at showing you don't need a huge space to build something in O Scale. For years I have been interested in minimal style model railways, yet no attempt at having a go myself until a recent home repair project provided some very square pieces of ply left over. With no excuses now having most of the materials for the base laying around, plenty of spare O scale track at hand, and enough parts, scenery, and an idea in my head, off I went.

Initial idea and construction:

I knew straight away I wanted to incorporate a simple traverser to save space. A set of Y points from Marcway on hand gave me a third siding to the front of the layout. That would be enough to shunt a wagon into a couple of sidings and provide a few minutes of fun now and then. There are only so many ways you can arrange tracks in a 50cm x 115cms space in O, so it all came together almost instantly.

I always wanted a harbour/industrial/city setting, and the track was laid straight onto the ply base; most of it was going to be covered in cobbles and street anyway. There isn't much involved in test running a little diorama such as this. A quick check that the traverser pivot operates smoothly and the one set of points operate coupled to a Tortoise switch machine was about it. I fitted Kadee uncoupling magnets as most of my rollingstock is so fitted. My patience doesn't extend to lifting links every time I move a wagon, and along with the aesthetics of a hand from above, diving into the scene constantly confirmed my choice of coupling. Kadee couplers, when installed and lubricated with dry graphite, are bulletproof in my experience.

Let's get building:

Building a city scene needs lots of bricks and mortar. It had not even occurred to me until I was writing this article how many different manufacturers and methods I had managed to use in such a small layout, styrene, plaster, and timber are all used. I had not given any thought to this; I use what appears to work at the time. The pair of sizeable low relief warehouses at the rear of the layout are from L Cut. I found the finished models needed a lot of finishing and weathering, some extra details, and some signs that added "life" to the models. The flats along the waterfront are plaster castings from Rue35 (As I am a Rue35 reseller, I would like to disclose these were

A class J68 just a day or two away from retirement simmers quietly awaiting it's final duties

paid for by myself. The dock walls are resin castings from Skytrex. The large bridge cutting through the centre of the layout is a kit from ModelOKits and finished as a rail bridge so I could display a couple of wagons.

Detailing:

Isn't this the fun bit that most modellers enjoy? I could easily spend hours placing details. A layout like this could easily absorb many more details, and I will add more over time. For now, the layout is detailed enough to reinforce the setting, and most who see the layout instantly recognise the type of scene I am trying to recreate, and that is good enough for me. Something that has grown on me lately is lighting. Most of the buildings have some sort of interior light. There are a couple of working wall lamps and the phone box also.

I like the idea of having the tide out in waterfront scenes. This was achieved using Tamiya diorama paste and then glossed with varnish; several thin layers of varnish were poured to create depth and extra gloss. The various weeds are Woodland Scenics, and the bits of rubbish and foliage in the bottom of the harbour came from a mixed scatter pack.

Many smaller structures, details, and vehicles all come from the usual sources of PECO, Matchbox, Phoenix Miniatures, and the like. Future projects include adding interior lighting to the row of warehouses along the waterfront, and working port and starboard lanterns would be nice on the fishing trawler. I also have a collection of vehicles; I can't fit them all on the layout at once, so like the rolling stock, they are all rotated when I feel like looking at something different.

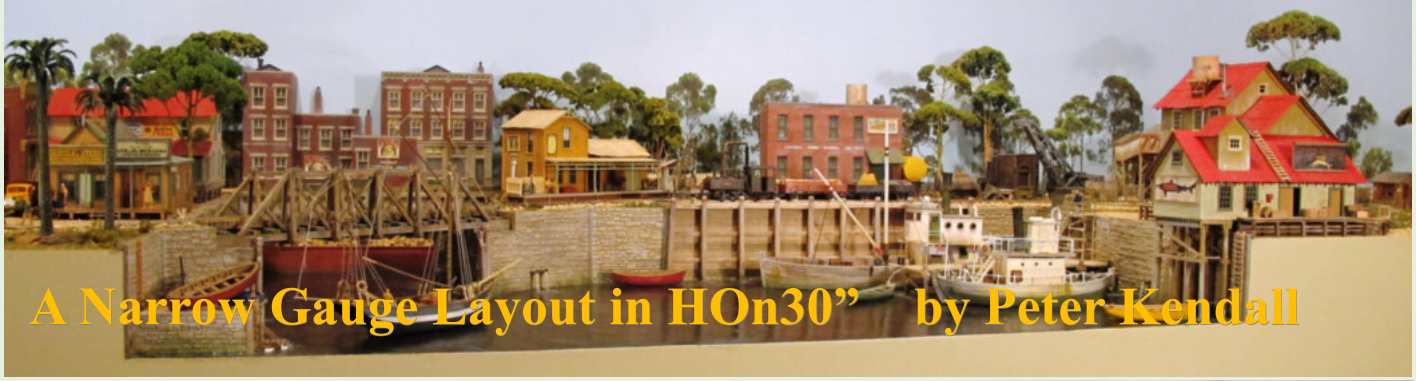
As you may have surmised by now, my approach to this project was quite relaxed and construction and details very much worked out on the go. The finished project was to satisfy my curiosity in building a working micro and an excuse to buy some bits and pieces. I hope you enjoyed visiting my little slice of the World.

A small section of the Quay showing the detailed painting of the stonework.

Covered vehicles form the primary wagon used to deliver and pickup goods at the Quay. These photos highlight the level of detail in O scale models.

Above and Below: The hand painted brick and stone walling add to the overall effect. Detail items such as the freshly caught fish in boxes and carefully placed figures bring the layout to life

SOUTHERN HARBOUR



A Narrow Gauge Layout in HOn30” by Peter Kendall

The Task

This freelance HOn30 narrow gauge layout was inspired by a collection of photos and ideas from waterfront scenes along the coastlines of mainland Australia and Tasmania. The layout was originally completed ten years ago, but it was gathering dust and in desperate need of restoration.

Life has now been returned to Southern Harbour with a focus on adding more colour, a fresh new water surface and extra trees.

Fig. 1 The Baldwin 2-6-0 is passing the passenger station based on a station I saw in New South Wales.

The Background

Southern Harbour is a well sheltered port serving a rich hinterland with an abundant fishery just off the coast. With only a few developed roads, the port has become the hub for all produce and cargo moving in and out of this isolated region.

A busy narrow gauge railway runs inland and has helped develop the emerging forestry and mineral resources of the area. With growing employment opportunities for soldiers returning from World War 1, the town has grown steadily and appears to have a bright future.

Fig. 3 (Right) The Harbour scenes and the miniscenes are hives of activity with strategic placement of figurines.

Fig. 2 The Wool store and Fish Cannery are standing just a bit taller than the masts of the boats.

The Details

The water front module is approximately two metres long and is connected to a larger section of hinterland, yet to be restored. The total layout fits into a small room half the size of a small bed room. The layout uses Peco OO9 flextrack and points laid on a cork road bed with mostly 18 inch radius curves.

The brick buildings are mostly kit-bashed *DPM* brand kits. The majority of timber structures are scratch built. The water line ships combine kit bashed plastic kits with freelance super structures made using scraps from my modelling box. The water surface was completed on a flat-black base, then textured with numerous coats of acrylic gloss medium tinted with blues, greens and tans. White highlights were then added to the wave caps.

Fig. 4 The overall view of the layout showing the two wharf areas. Eucalypts in the background and the buildings give this a distinctive Australian feel.

Locos & Rolling Stock

My freelance approach means that HOn30 and OO9 locomotives are both on the roster. The pride of the fleet are two *JoeWorks* Shays picked up secondhand many years ago, along with a new Baldwin from *Bachmann*.

Like nearly all narrow gauge operations, the rolling stock is a mix of anything available. I even included some N-Scale log cars which seem to fit in nicely.

Finally

This layout was my first effort with narrow gauge modelling. Over the years it has been steadily upgraded as my knowledge and skills improved. My relaxed approach to "scale" and "prototype" means that I am not too restricted when it comes to the layout design.

My main focus has been the building of the layout, the buildings, wharves and bridges rather than train operations. I try to capture the atmosphere of the times with weathering and appropriate posters.

Fig. 6 The 2-6-0 arrives from the hinterland area with another train laden with produce. In the background, one of the Shays is offloading rock into the barge just visible behind the bridge. The hinterland area on the layout is my next part of the renovation.

HOn30 or OO9 has been a great choice for me, having a limited space while still being able to use commercial HO scale products. Happy modelling!

Fig. 5 The left wharf area with the 2-6-0 shunting a vinegar tank freight car. Loads are being delivered to boats at the wharf. The scene would be typical of an isolated port like Lorne in Victoria in the early 1920's or in Juneau in Alaska today, except for the presence of a railway and a steam loco!

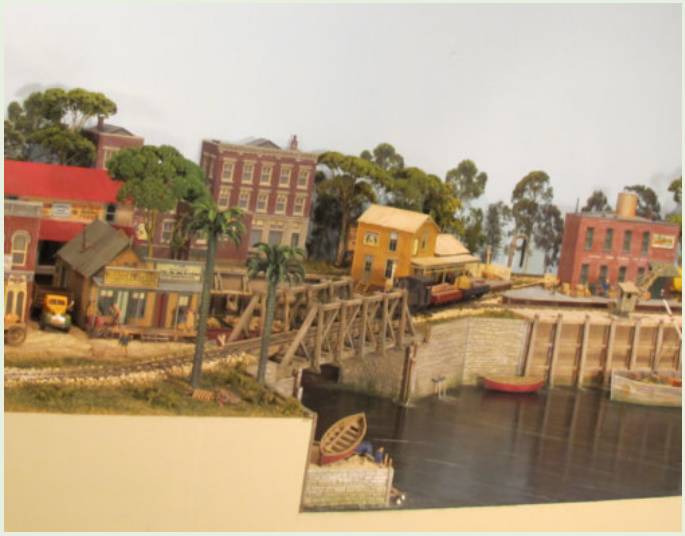


Fig. 7 Another view of the station area. A short train is about to cross the timber girder bridge, and head to the left wharf area in Figure 5. The weathered structures show a lot of wear based on the effects of salt air

TOWARDS ZERO DERAILMENTS

By Trevor Gibbs

Derailments in Model Railroading are frustrating when they recur in the same area but you cannot always find the cause. Nature seems to dictate that a derailment will occur at the worst possible time in the most inaccessible area of your layout!

Derailments can be spectacular in their own way but they are not fun and they detract from the overall operation. Regardless of how large or small your layout is, it will always be a representative of a railway and we hope that real railways do not have derailments!

Derailments have multiple causes. We dealt with some of the track and wheel issues that can occur in "Towards More Reliable Track". This article should assist your understanding what is happening with your trains and give you strategies to reduce the instances of derailments even further.

A LITTLE BIT OF HISTORY

Depending on your rolling stock, most wheel sets are of the National Model Railroaders Association "RP25" (Recommended Practice 25) Standard. The RP25 was so named because of the depth of the flanges (.025"). The standard was developed in the late 1950's to circa 1962 and redefined the profile of the wheel shape recommended to manufacturers

The move to finer wheels took a while to catch on with retailers and manufacturers. The general feeling was that deeper flanges were necessary for children to place and keep their trains on the track.

The European manufacturers mostly stuck to the deeper flanges defined by NEM (Normal European Modelling) standards. Hence there are still many examples of thick or deep wheels primarily on European origin brand trains.

Most trains of these brands are able to operate on Code 100 rail. The depth of the RP25 flange at .025" and the tread still scale to about twice the size of the flange and tread of prototype wheels.

Some modellers do use exact scale wheels and track profiles under the EM, NEM, P4, Proto 87 and other well defined fine scale standards, but we are not trying to convert you to fine scale models… yet!!!

Fig. 1 An older MDC/Roundhouse truck/bogie fitted with North Yard RP25 metal wheels alongside a deep flanged wheel set. Note the difference with the appearance of the flanges. The operation of the truck is a lot smoother than this example of a European wheel. The sharp edges will pick at faults.

HOW TRACK IS SUPPOSED TO WORK...

Knowing the science behind full sized railways will aid our understanding of what may be going on with our models causing derailments.

As an analogy. you may have tried to walk "tight rope style" on a train track, safely on a siding on an old branch line rather than a busy mainline. You can stay on for a distance but it does not take long for you to tip off. In part, it is because of how the rail head is rounded and because the base plates also have an almost imperceptible slope of 3 degrees canting inwards.

While you might have walked along the track, you are probably a bit less likely to have balanced and run a beach ball between two broom handles. If you have tried this, you will have found that the ball will run between the two handles perfectly well at all sorts of angles, as long as the handles are kept fairly parallel.

The logic in this explanation is again in the shape of the railway wheel. Railway wheels are not flat but tapered inwards.

Imagine that you are able look at the sections of the wheel in contact with the rail, and draw an imaginary arc to join them. The profile of the wheel is actually part of the shape of a very large ball or barrel with a taper which runs between the rails. If the shape was perfectly flat, it would indeed run off the rails in very short order.

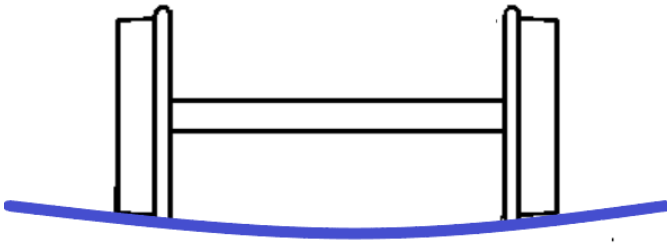


Fig.2 The effect of a wheel set superimposed on the "huge ball" blue outline. The wheels only make contact with the top running surface of the rails, unlike a tyre on a road vehicle which flexes to grip the road at full width.

Going around a curve, the outer wheel is going to always travel slightly further than the inner wheel. The slight difference with the wheel diameter, with the wheel riding up on the rail, is very similar to the differential effect your car will have when travelling around corners. A railway axle cannot disconnect a wheel like the differential of a car but the curves on a railway track are far broader than those we use even in the smaller scales.

With the thicker part of the wheel profile on the outside rail, the outer tread will ride up on the rail and travel a slightly longer distance than the tread on the inner rail. This way, ideally neither tread will be "skating" along the rail top on a curve.

When talking of the prototype, curves are generally very broad. Using the older measurements of chains, Queensland Railways (42"/1067mm) sharpest curves of 4 chains evident today on the Kuranda line would scale to about 32" or about 800mm radius. This is about 22 degrees for our North American readers.

The South Australian line through the Adelaide Hills has curves of 10 chains (660ft / 200m/ 8.5 degrees) measurement. Even these sharp curves are equal to over 91 inch (2300mm) ***radius*** in HO scale which is far more than most of us have room for! Wheels will slip over the rails and flanges will squeal, creating both tread and flange wear.

A "Chain" is an old English measurement equal to 66 ft or 20m approximately. It used 100 even sized links in a standard metal chain as a portable measure as we use tape measures today. It was a standard here in Australia, not only for radii but also for miles and chains to specify distances.

The "Degrees" of a curve refers to the offset that a curve will be from any point 100 feet / 30.5 metres further down the track. The minimum radius standard of HO at 18" would be the equivalent of 130Ft / 40 metres or 45 degrees!

The purpose of the flange is to assist the wheel to stay on the rail. On the prototype, it is not actually always necessary but it is a safety measure. Some locomotives such as Union Pacific's 4-12-2's had flangeless wheels. Australian Standard Garratts and South Australian Railways Rx class steam locos were designed with ***leading*** flangeless driving wheels. On model railways, flanges are ***very*** essential to keeping trains on the rails, particularly on sharp curves. The shape of more modern model railway wheels is such that they emulate real railway wheels with the differential effect.

However with our much sharper curves, the outer wheels on a curve will still "skate" ever so slightly which creates drag. Enough drag will cause locos to lose traction and slip. With the much lighter weight of our models and the forces being miniscule, model wheels do not wear like full sized train wheels.

Fig. 3 The effect of taking a curve towards your left with the gap shown here between the wheels suitably shortened for space. The left wheel is riding on a smaller diameter part of wheel than the wheel on the same axle on the right. The wheel on the right is therefore not so prone to skidding or skating over the top of the rail.

On our models, the effect of skating or skidding is not directly observable by the naked eye, apart from a dramatic slowdown on curves.

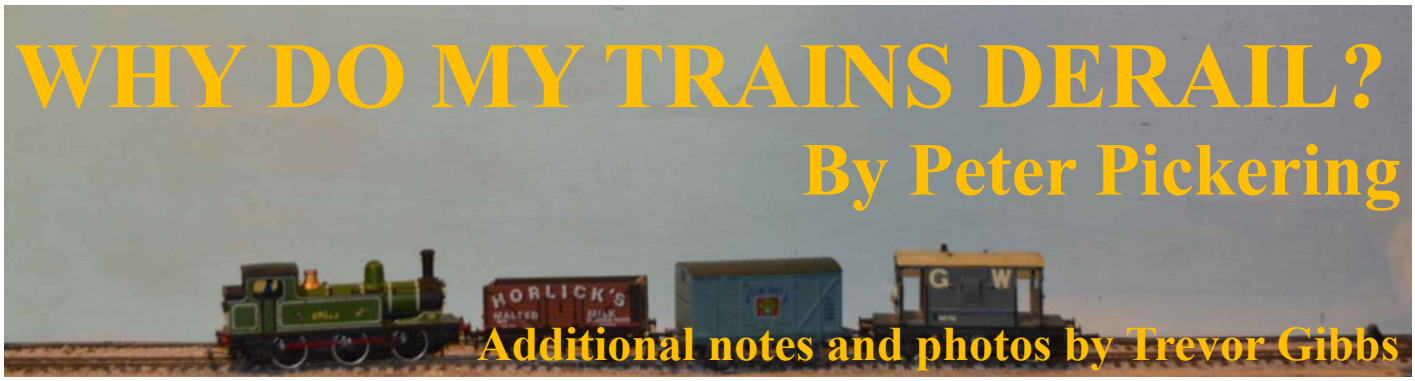
WITH THIS INFORMATION IN MIND...

Peter Pickering, in the next article, will lead us through a number of mechanical causes of derailments and how to fix those problems.

For the most part, solutions are not hard to implement and your running of trains will become far more enjoyable as a result.

WHY DO MY TRAINS DERAIL?

By Peter Pickering



Additional notes and photos by Trevor Gibbs

Following on from the "Towards More Reliable Track" article in RMA October/November 2020, Peter Pickering sent in the main text of this article. He also inspired the previous article.

Peter is the Editor of the South Australian Railway Modellers Assn (SARMA) magazine "Buffer Stop". The original article was printed in the January 2021 edition of Buffer Stop and is published here with his kind permission and assistance with the additional notes written by Trevor.

The reasons for model train derailments are many and varied. In this article, I will try to cover most of the more common ones.

1. The wheel set dimensions do not match the track dimensions, mainly through turnouts.
The basic dimensions of wheel sets and track need to be in gauge and ***central*** on the axle.

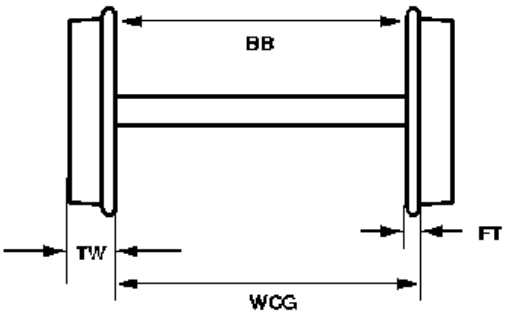


Fig. 1 Showing the critical measurements of wheels and axles.

The "back-to-back" (BB) dimension shown in Fig. 1 should be 14.4mm for OO and HO gauges and 7.6mm for N scale.

Most American and Australian modellers simply set the position of their wheels on the axles using an NMRA gauge. This gauge also has the provision for checking clearances, track and point work.

It is important that you understand the various dimensions provided by the NMRA gauge, and is probably best learned about on a one-to-one basis. However, I hope that the included pictures in this article will clarify some uses of this particular tool.

Many British and European modellers prefer to use the back-to-back dimension as their basis. This has the advantage that measuring this dimension appears to be simpler; just take an appropriately sized block and slide it between the wheels.

Fig.2 An Alternative Back to Back measuring tool. This tool could also be made using a thick metal or styrene block, accurately machined or filed to the back to back measurement.

You could also make your own version from a bar of metal or a thick piece of plastic. Just take the finished sized block and slide it between the wheels. With improved wheel standards and finer flanges, this method works well.

The purpose of the check rail is to stop the opposite wheel from striking and riding up over the crossing nose. The whole area is often called the "frog".

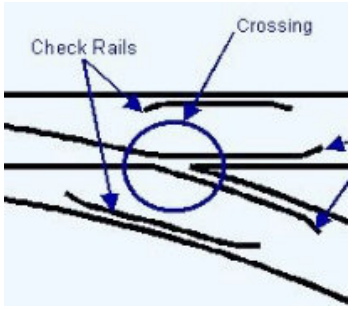


Fig.3 The area known as the "Frog" with the circle highlighting the "Crossing".

A "Frog" shown in Figure 3, is so named because from a top view, with imagination, it resembles a Frog stretching and leaping.

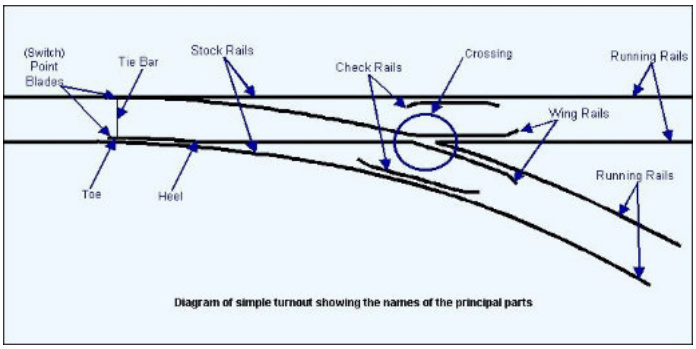


Fig.4 This is showing the positions of various rails in the construction of turnouts/points. The NMRA gauge can be used to check the FLANGEWAYS between the outer running rails and the check rails as well as the inner running rails and the wing rails.

The FLANGEWAYS pegs on the NMRA gauge set the track dimensions, and the WHEELS are correctly set when the flanges are centrally positioned in the wheels notches.

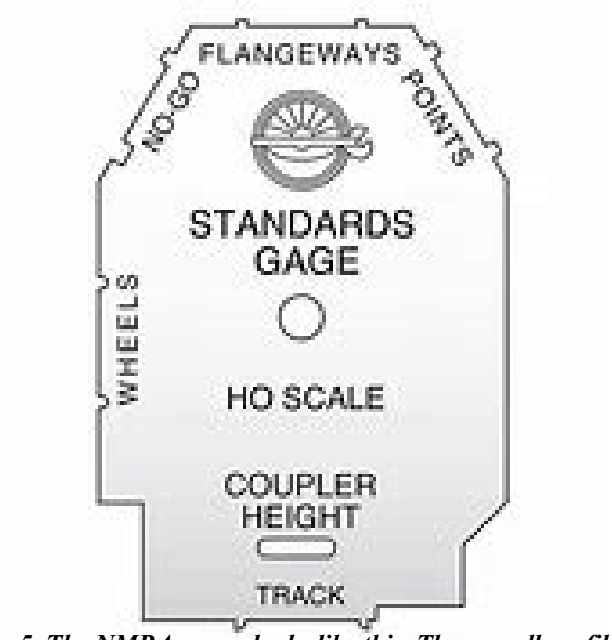


Fig. 5 The NMRA gauge looks like this. The overall profile is to allow for clearances at the side of the track including bridge height clearance and platform clearance.

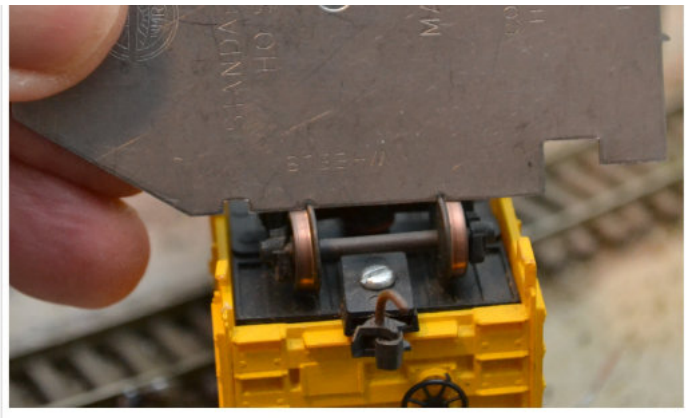


Fig. 6 Checking the gauge of the wheels in situ. The notches are set for the correct spacing of wheels and are the depth of the RP25 flange size.

2. Not all wheels are firmly planted on the track. This can be because there is not enough weight (downward force) on every wheel. It is not enough to adequately weight your rolling stock, although that is a start. Every wheel must be firmly on the track.

If the wheels are not in a flat plane, one wheel could effectively be waving around in the air. The wheel flange is ready to wander across the rail surface. A dip or hump in the track has a similar effect, particularly if it is in just one rail.

You can test your vehicle on a flat surface such as a glass plate or a short off cut of MDF, which should be dimensionally stable enough to act as a test plate.

Many "Ready To Run" models such as Athearn freight cars in particular, often come with the bogies or trucks tightened to the point that there is little or no lateral movement. Loosening off the screws for the trucks as little as a quarter to a third of a turn will help to remedy this and enable the wheels to maintain contact with the rails.

Fig.7 Loosening a truck on an Athearn Box Car. A Quarter to Half turn should ease the movement of the truck considerably.

Other brands of freight cars and passenger cars have a pivot pin holding the truck. Loosening it very slightly by prying that pivot pin upwards will also enable better tracking of the wheels.

The NMRA standard for weighting rolling stock is one ounce plus half an ounce per inch length. This equates to about 3½ ounces or 100g for shorter bogie wagons (12.5g per wheel). British and European Four wheeled goods wagons (known as "four wheelers") need to weigh at least 50g for sure footed tracking.

Not many commercial models have compensated wheel sets, where the bogie is able to flex to spread the weight between all the wheels.

Some fine scale modellers who do use very fine flanges, build in a pivoting arrangement at one end of their four-wheelers, effectively turning them into three-point suspension vehicles. They feel the need for this, despite having near-perfect trackwork.

One of the most difficult situations is when the lead bogie of a steam loco (known as the "pony truck") such as a 2-8-0 is on the light side. Pony trucks will find minor track faults. Very often, the same loco will play up at the same place. Just because other locos manage to negotiate that area without a problem, does not mean there is not a fault in the track.

The person who built the track will more than likely tell you that your loco is at fault. However there could well be a track fault which, combined with a light bogie, shows up as a problem. Pony trucks are often sprung and tight. The spring can actually work against the track alignment and cause derailments. Many modellers remove the springs for this reason.

Similarly to the freight cars previously mentioned, the screws can also be done up too tightly for the wheels to negotiate the track freely or the truck to rotate freely. A quarter turn of the screw to very slightly loosen it will assist lateral movement. If the derailments continue, check the wheel gauge of the pony truck and for faults in the track area.

3. There is misalignment between sections of rail. This can mean that a wheel flange can catch on the rail and ride up.

The problem is aggravated if the wheel flanges are sharp instead of being rounded and filleted or the situations outlined in parts 4 and 5 are applied.

Fig.8 It may be difficult to pick up at first glance but the wheels to the right are not central on the axles and slightly out of gauge. The truck sides are then not travelling squarely on the rails, and that becomes a potential problem.

4. The wheels are not perfectly in line with each other. The flanges are pointing towards the rail join instead of being parallel with the rail.

With four wheel goods wagons, the problem may occur if the axle boxes are not perfectly aligned perhaps because the frame has warped with age. Sharp flanges will tend to aggravate any problem as will wheel alignment (See Figure 8) picking at joins in otherwise well laid track.

A potential cure for a bent frame would be to try to straighten the frame of the vehicle with warm – ***not*** boiling hot – water and using a flat surface to cool it down on with mild pressure to straighten it. This is not exactly an operation to be undertaken lightly and checking for the wagon sitting evenly on the rails as outlined in section 2 of this article is highly recommended first.

5. A sideways (twisting) force is being applied to the wheels. This often happens when couplers are "truck mounted" and a train is being pushed rather than pulled. The force to push the train is being transmitted through the coupler to the wheels and bogie frame, to the body of the vehicle through a pivot pin, then back to a pivot pin to the bogie frame and then the couplers.

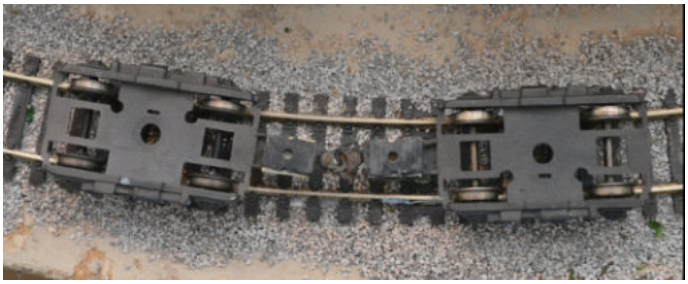


Fig. 9 These are passenger car trucks with the one on the right in "push" mode from the right hand side. With truck mounted couplers, there is very little performance difference in "pull" mode.

Note that the far left wheel set is hard pressed against the inner rail while the second wheel set from the left is hard pressed against the outer rail. This movement would be exaggerated with the extra weight of the whole vehicle. Because passenger cars are mainly pulled, this is usually not a problem. However with freight cars that can be pushed much more with longer consists, the forces multiply causing derailments.

If any other faults are present, they have a greater effect with bogie mounted couplers. There is only a fraction of a millimetre of pin-point bearing movement to allow a minute amount of play with bogie movement.

Tightness in the bogie pivot, or something fouling the bogie can also impede free movement.

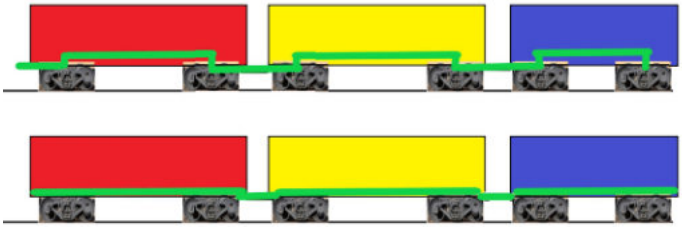


Fig. 10 The Green line is showing the transmission of force between truck mounted (upper) and body mounted couplers.

With a body mounted coupler, the forces are straight through the body of the vehicle. The wheels are free to literally "find their own feet" on the rails because the truck frames and thus the wheels themselves are not being forced to move sideways under the pressure of a pushing motion.

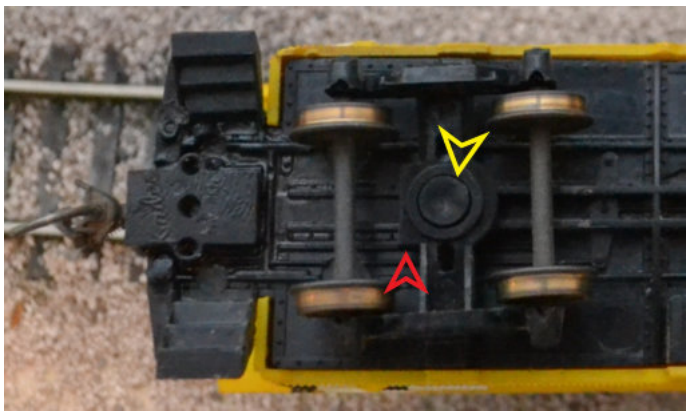


Fig. 11 An early Bachmann Caboose with the original truck mounted coupler cut off at the red arrow point. A Kadee coupler glued in at proper height and this car becomes a body mounted coupler vehicle. A very easy conversion and results in far better performance!

The pivot pin (yellow arrow) was also slightly loosened.

6. Physical obstruction. A piece of ballast where the wheel-flange is passing, particularly between the running rail and check rail can also cause a derailment. See Figure 12

Parts of a coupler (the glad hand, air hose or hook drop bar depending on the coupler type), truck frame sides or under carriage detail can foul a number of obstructions.

A rail, an uncoupling ramp, magnet, platform or line side scenic item such as a tree or hedge if they dislodge can all clip an unusual feature on a loco or piece of rolling stock. These and similar obstructions are usually easy to find.

Just take note of problems arising with the same item or at the same place and clear the area.

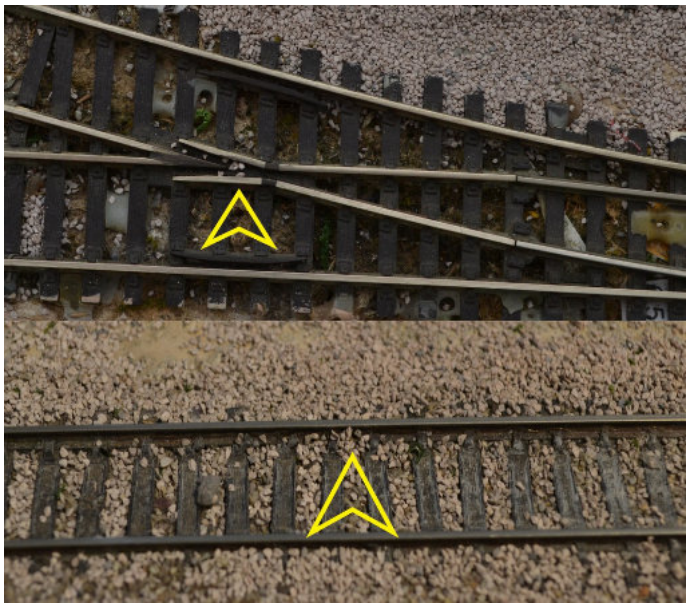


Fig. 12 The arrows point to an exaggerated misplacement of ballast that has worked loose and is a common derailment cause. Simply scrape the ballast away from the offending area.

Over the years, standards of both wheels and track have improved. However, if you are using older equipment (and who among us does not buy older items of rolling stock at some stage), you could be run into a couple of compatibility issues.

One of the first steps for you may be to replace your wheel sets. If your wheels have deep flanges, you should be able to run them on code 100 track (0.100 inch high). A number of modellers layouts have codes 83 (.083" high rail), 70 (.070") or even smaller rail sizes and deep flanged rolling stock could bounce along on the chairs or sleepers. Apart from the sound being unprototypical, a train trying to run that way is not a pretty sight!

Older plastic wheel sets can cause trouble for a number of reasons. They do pickup up dirt and build crud on the treads far more readily than metal wheels. This will reduce the amount of flange to guide the wheel, You would well be advised to replace any pizza cutter or plastic wheel sets gradually but the pizza cutter wheels should more often than not be the first priority!

ABOUT SARMA

The South Australian Railway Modellers Assn meet on Tuesdays (9am - 4pm) and Wednesdays (7:30 – 10pm) at the clubrooms at the corner of Balmoral and Lyons Rds in Dernancourt, Adelaide. All levels of modellers and all prototypes are welcome to come, learn and participate.
Website http://www.sarma.asn.au/

Trevor's Workshop

Some More Simple Detailing Projects

In the last issue, we showed how to made a track side signs. These are useful as details to give the appearance of a real railway. We will now explore how to make more details using sticky paper printouts..

WHAT YOU WILL NEED

Apart from the tools and consumables we itemised last issue, we will also need a few sheets of A4 paper and a colour printer. I prefer to use single sheet A4 sticker paper to print on rather than gluing paper onto surfaces, but either will work well.

Tthink "Green" and try to minimise your use of paper by maximising the signs that you place on your sheet. I have made a number of buildings for myself and others with paper and foamcore or card. There is always space available for extra signs on the printed sheets.

We will also make a few of our own signs for Station names, street names and custom business signs. You may well be surprised what you can use and how much detail you can create!

BILLBOARD SIGNS

One of the telltales on a layout of any era is the signage. Older American billboard signs up to about the late 1960's or so have been covered and are freely available from here.

The creator of these images with the user name "Tomkat" also created a number of vintage Australian signs including Ampol and Golden Fleece. Many U.S. signs that Tom, his real first name, has done are also applicable to Australian layouts of the era.

There are many other signs which you can copy from the internet or you can take some pictures of posters yourself if you model the present day. If you are modelling French, German or other foreign railway systems, using internet graphics may be your only viable alternative unless you already have photos of these in your personal library. If you happen to have some, please share them with us all!

MAKING A BILLBOARD … ONE OF THE EASIEST MODELS YOU'LL EVER MAKE

… depending on where you place it and how far away it is. Think about what you see from track side and detail at the rear may not be a problem.

My own Billboard back is shown in Figure 1. It is simply a sheet of styrene which could be cut from a plastic yoghurt lid or similar to the dimensions of the printed billboard, glued to two "Chuppa Chup" sticks.

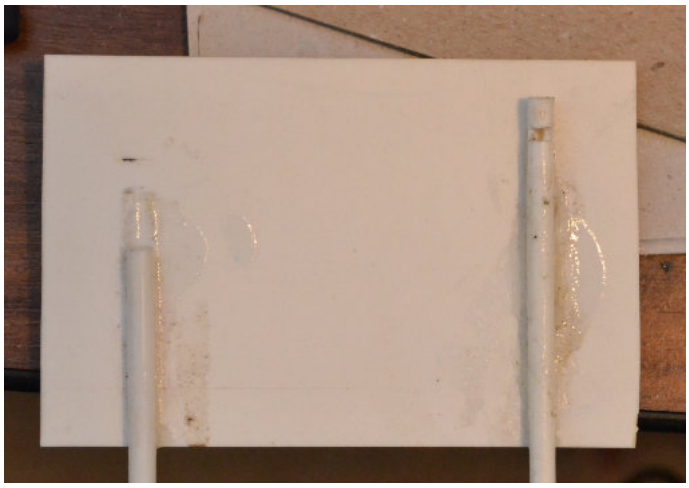


Fig. 1 The basic construction of the Billboard from the rear.

Planted into the side of the hill, the billboards rear supporting struts, will not be seen so you have a choice with putting in the supporting frames or not. Regardless of the size of your billboard, you will need to ensure that the sides are as close to perfectly square as you can get them.

Fig 2. The Billboard in position on the layout. Because there is a reasonable amount of foliage behind the board, the details of the support frame are not visible at all.

EASY MANHOLES

This is more of a Detail than a model strictly speaking and you always need details.

Manhole covers are part of virtually every street scape. I live in what looks like suburbia but in a regional town. In my street of thirty houses, there are 32 access points of manholes and access and inspection covers.

The accompanying graphics are of some of those access points, but typical of many. I have also added a “concrete” base which these covers would fit into.

As they can be inlaid in a street over a number of years, the bases will have weathered differently hence the slightly different tones of the concrete in the images.

Fig. 3 Typical man hole and Inspection covers for both HO and N scale. If you happen to model in OO, the HO sizes should be satisfactory but you could enlarge the image by 10% to be closer to scale.

When you have printed your manholes and inspection covers, you will need to cut a styrene circle or rectangle for each one. Or you can cut out the cover only and paint your own concrete tones to reflect those in your area.

It will then be up to you to supply “utilities” to any of your houses and businesses and provide “access” for the model maintenance people.

TIMBER WALKWAYS

Railways often have track access for pedestrians by laying timber planks between the rails. The timbers can be often asphalted over the top to smooth the walkway. However, over a period of time, cracks will appear in the crevices between the planks as the asphalt wears.

Fig. 4 A typical walk way of planks on the Bellarine Peninsula Railway in Victoria.

Fig 5. HO and N scale timber and asphalt walkways. Simply cut out the size you require from your printed sheet.

Regardless of whether you mount the walkways on styrene or card, cut the base to size and test fit the surface you use on your track first. Hold the base material in place with some Blu-Tack or similar and test run a few trains first to ensure there are no snags or derailment possibilities.

If all is OK, glue the printout to your base. Attach your section of walkway to the track preferably with PVA glue to enable easier removal and when it is dry, test run your trains again.

The walkways will only need to be across the points of access necessary for the railway to function safely.

You do not want to over populate your layout with a singular detail download.

RELAY AND BATTERY BOXES

Relay and Battery boxes are those boxes at the sides of railway lines that you will see wherever there are signals and level crossings with lights and bells.

The cables for these electrical devices are not immediately obvious on the prototype and even less so on our models, but the obvious presence of these boxes are an easy detail to model.

There is no such thing as a "typical" relay box as there seems to be many minor variations of the basic shape. If you are following a particular prototype, then you need to do some research for both your railway and the era you want to model.

Below we see a couple of generic boxes in place below with the measurements you need to cut them at.

Fig. 6 These relay and battery boxes are generic shapes and sizes but will be suitable on most railway systems.

Snow bound and heavy rainfall areas will most likely dictate that relay boxes have a gabled roof to deflect the elements. Some newer Relay and Battery boxes were cut from left over Foam core pieces. This and other Searchlight Signals and similar ground signals can be made fairly cheaply and will be shown as a "how to" in a future issue of Rail Modeller Australia

Modelling the battery boxes is fairly simple with off cuts of styrene for the roof of the battery box and 5mm foam core in HO or 3mm MDF for the box itself in N scale. The boxes will be an 11mm square with a 12mm square from paper, card or styrene sheet glued to the top in HO scale.

In N scale, the box would be 7mm and the cover 8mm square. The thickness of the lid being a small object in HO or N should not be a problem.

For my first Relay boxes shown in Figure 6, I used two thicknesses of 60 thou (1.5mm) styrene for the box itself 22mm x 12mm. In N Scale, they would have been 12mm x 7mm. I then scribed a groove in the middle of one face to give the impression of sheet metal doors for maintenance access. The scribing itself could be done with the point of a 100mm nail against a steel rule.

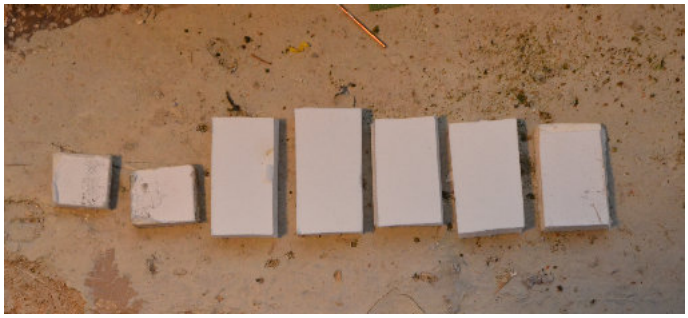


Fig. 7 These relay and battery boxes are made from 5mm Foam Core. The two battery boxes will have a weather lid made from a thin piece of card. The relay boxes with be scribed with an indented line to represent inspection doors and mounted on a a rigid wire or two.

Again this comes into the category of very easy detailing, at virtually no cost.

Making them now without the 60 thou styrene on hand, I could also use 6mm MDF placing a layer of styrene scribed for the doors. I also tried laminating some white card from a tea packet 7 layers thick as an experiment which worked satisfactorily.

If you are in N scale, 4 layers of paper or a 3mm thick piece of MDF will do. While MDF is heavy, the amount you would be using will not affect your layout's weight.

VENDING MACHINES

Vending Machines are ubiquitous, particularly where a railway kiosk once may have graced a station. Or they may be part of a kiosk outside on the station platform. It is a touch of detail, very minor in size but important.

The shape of a vending machine is literally a block and they are close to each other in sizes, especially where refrigeration is involved.

Because machines are usually owned by companies and either leased to the shop or a rent is paid for the machine to be on site. They are either in corporate colours or in simple colour or metal tones with the front effectively advertising the vendor.

Fig. 8 A number of vending machine fronts for you to copy, print and stick on to your blocks in both HO and N scales.

The Blocks on which the stickers will be mounted to represent these machines can be made similarly to the relay boxes with 6mm (for HO) or 3mm (for N scale) MDF, styrene, laminated card or Foam Core. If you use whatever you have available differently from here, please let us know!

BRIDGE SIDES

Many model railways use a narrow plywood support on a frame for the track to allow for undulating territory when it comes to scenery.

A friend of mine with whom I had many enjoyable operating sessions sadly passed about 20 years ago. When his widow decided it was time to move some 5 years later, myself and two other friends dismantled the layout.

Reg had a bridge on part of that layout not quite within easy reach that I admired. However in the dismantling, we found it was made from CARD!

The rivets were drawn on the painted sides and gussets of the bridge and looked very effective in its place.

Using our materials, we can also replicate such a bridge and using our computers. Those of you who are getting started can make a simple version of this bridge and place it where an area will need to be bridged when the "gap between level tracks" would eventually be placed!

I did just that as a 12 or 13 year old with a tinplate girder bridge. It did not actually bridge anything but showed part of the planned empire at the time!

A Playcraft tunnel similarly designated the site of the never built high mountain that existed in my imagination.

BRIDGING THE GAP

Many model bridges are virtually add-ons rather than structural. The easiest is a simple girder bridge which you could make from foam core or card or thin styrene sheet.

The material will designate the thickness of the walls. Card and Styrene will represent steel plate amd strips could be used for reinforcement of the panels. You can also use up flexible rail offcuts for the vertical members of a plate girder bridge.

Foam core can be painted to represent a concrete of varying age - the lighter the grey the older it is – especially in the smaller scales. Three millimetre foam core would scale to 18 inch thick in N scale, 5 mm in HO about the same scale thickness.

If you do use Foam Core or Card, be wary that painting with an acrylic paint may cause the material to swell and/or warp which is not a good look on a bridge.

TUNNEL MOUTHS

Brick, Concrete and Stone Tunnel Mouths can be expensive to buy so why not make your own? The NMRA gauge is a good tool for getting the standard clearance right for single track but it largely relies on where you want it to go.

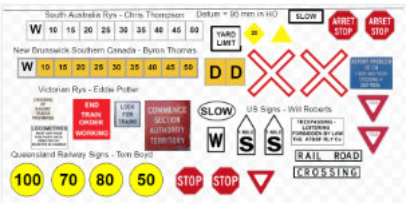
Regardless of which material you use, tunnel mouths are usually very heavily weathered simply because they have been there for a long time! So a very light grey or even a yellowing colour could be appropriate rather than a freshly cast deep grey colour.

The abutments for the tunnel mouth could also be made from foam core and the plaster or hills can be merged into the mouths. Then you might need to start your scenery!

In the mean time, the next page has images from this and January's workshops which should enable you to print some signs and details for yourself,

See you next issue

Trevor



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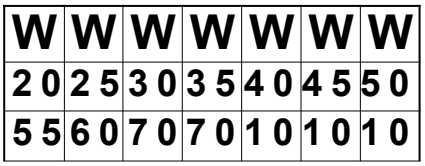

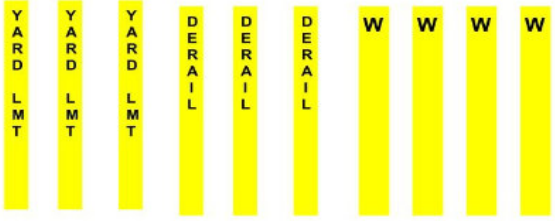

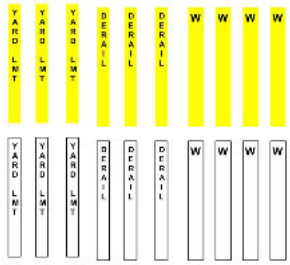

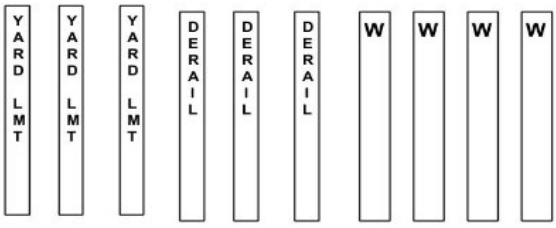

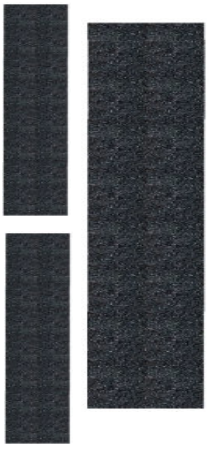

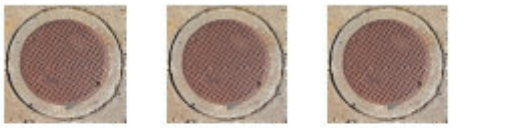

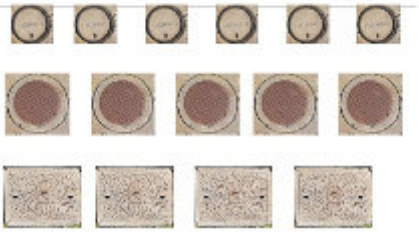

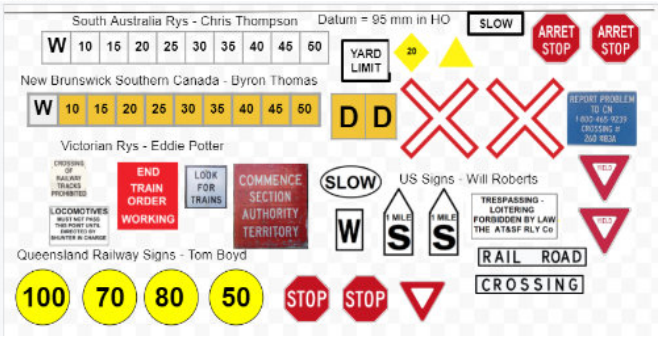

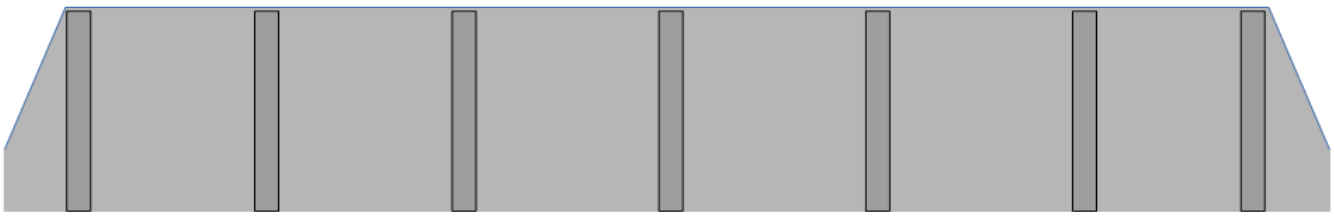

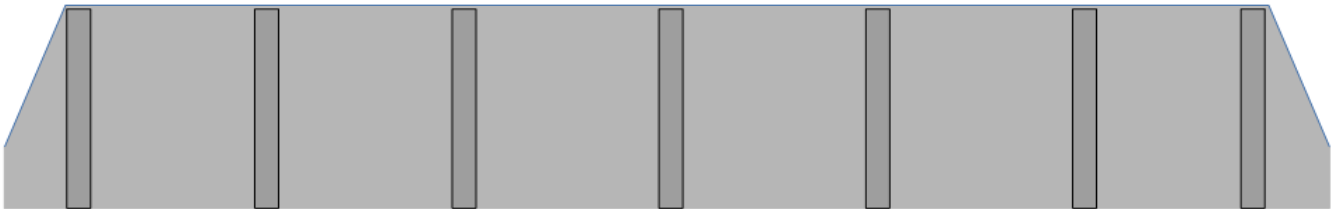

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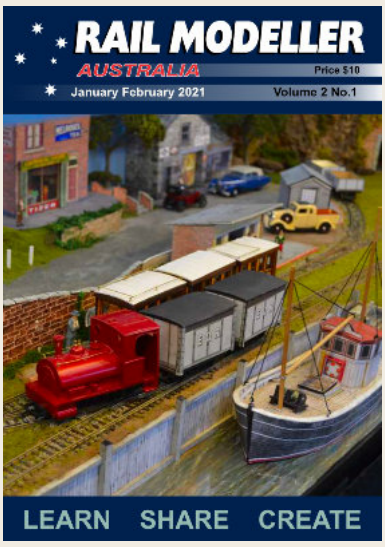

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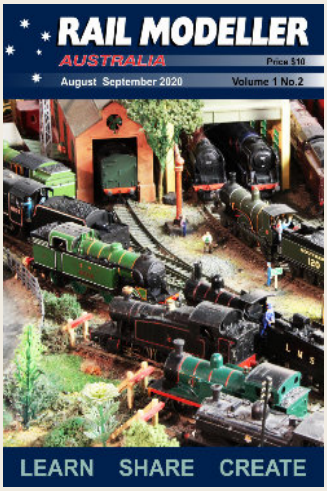

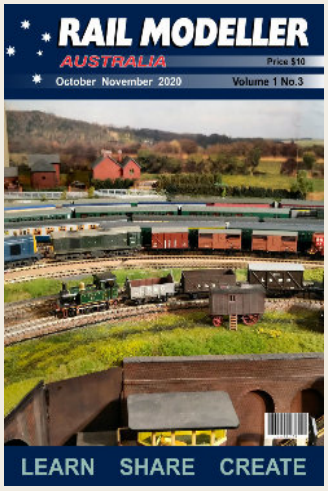

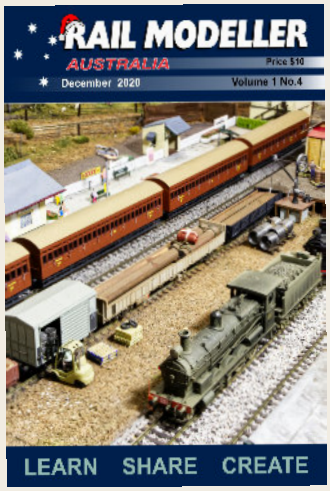

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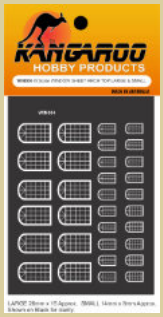
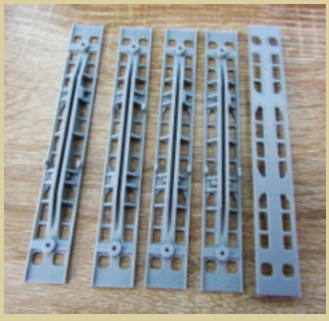
Most of our products are Australian Made, using Australian products where possible.

A large range of our items are available in HO and N scales.

3D printed items are from our drawings and are printed using Australian Made filament.





N Scale Container Kits

Proudly designed and printed in Oxley, Brisbane Australia