

7th Heaven

Journal of the Aus7 Modellers Group Inc.
No 49

\$7.70 inc GST
Autumn 2016



Albury Loco
Sound and Lights for the PSM 38 Class
For The Grandchildren - of course
Commercial News
Useful Tools: End Mills



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Straight Down the Line - Opinion

by Trevor Hodges

A Pie Without Sauce!

As I sat listening to the "Prof" (John to his friends) give a talk at the recent April Forum about the use of sound to create ambience and enhance the operating experience of a layout, a recent experience of my partner's 13-year-old son came to mind. The Prof was postulating that the use of sound, beyond the use of on-board sound decoders in locomotives, should not be viewed as an "optional extra" but should form a central facet of making the experience of operating a layout a more realistic, and therefore a more enjoyable. He will probably cringe when he reads this but I'd summarize his argument by saying that a layout without "ambient" sound is like eating a meat pie with no tomato sauce.

The Prof and I might have some slight disagreements regarding this thesis, especially in the area of the level of volume needed in an exhibition hall, but generally speaking I wholeheartedly agree with his argument that sound is an integral part of an experience. We build the visual element with our modelling and this probably covers 60% of the sensory experience; adding sound possibly takes care of another 20%. If you can think of a way of covering smell then you're well ahead of me but I do remember the scratch and sniff craze late last century and I'm pretty sure a few modelling applications of this were tried out. I can live with 80% of an experience, I'm not going to put a throttle down so I can scratch and sniff a card with locomotive smoke or the smell of brakes being applied.

However just how much we rely on sound to provide a full sensory experience was brought home to me recently when we had guests staying with us. They arrived in a Tesla motor car: one of those fancy US jobs with no petrol motor which run entirely off electricity. My partner's 13-year-old son got a ride to the beach in this pile of cutting edge technology and when his mother asked him what it was like he told her it made him "sick". Evidently it makes almost no noise as it moves along and the lack of this sensory feedback had a very disconcerting effect on him producing a queasy tummy and nausea. We have a lot of push bike riders go past our place every day and the lack of sound from the car caused them some problems too. They rely on hearing a car approach from behind to ensure they move to the edge of the tar so the effect of the Tesla was something similar to a mouse being swooped upon silently by an owl.

My response to this? They need a big sound decoder in the bloody machine. That'll fix the problem!

In the end the level of "detail" you apply to your models and layouts is up to you. Most of us get by without ambient sound but I suspect this had less to do with a lack of interest and a lot to do with limited time and lots of tasks crowding out such features. Eating a meat pie with no sauce may be a lesser experience but until I've got the pie to put it on the sauce will sit in the bottle unused. "I'll install the sound system when I'm finished building my layout" which can be translated as "when I'm 90 and have nothing left I want to build, run and tinker with".

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On The Cover

A glimpse inside the shed on John Reid's Albury diorama/layout. More detail is still to be added. In John's own words "I had planned from the start to be able to take photos inside the running shed but if I had known how much detail a small digital camera could capture I would have taken more care with the shed roof. With a little luck I will be able to improve its appearance without a total rebuild."

ALBURY LOCO - A Work In Progress

John Reid

A few years ago a long dormant interest in modelling the NSWGR in 7mm scale was rekindled when Peter Krause exhibited his O-Aust kits at Caulfield in Melbourne. I was impressed by the completed models on display and was interested in having a closer look at one of his loco kits. Seeing all the bits of a 32 class kit spread over the kitchen table was all it took – I was hooked and Peter had a little less baggage to take home. I had built a few HO loco kits over the years but none provided the level of satisfaction I obtained from building 3204 in O scale.

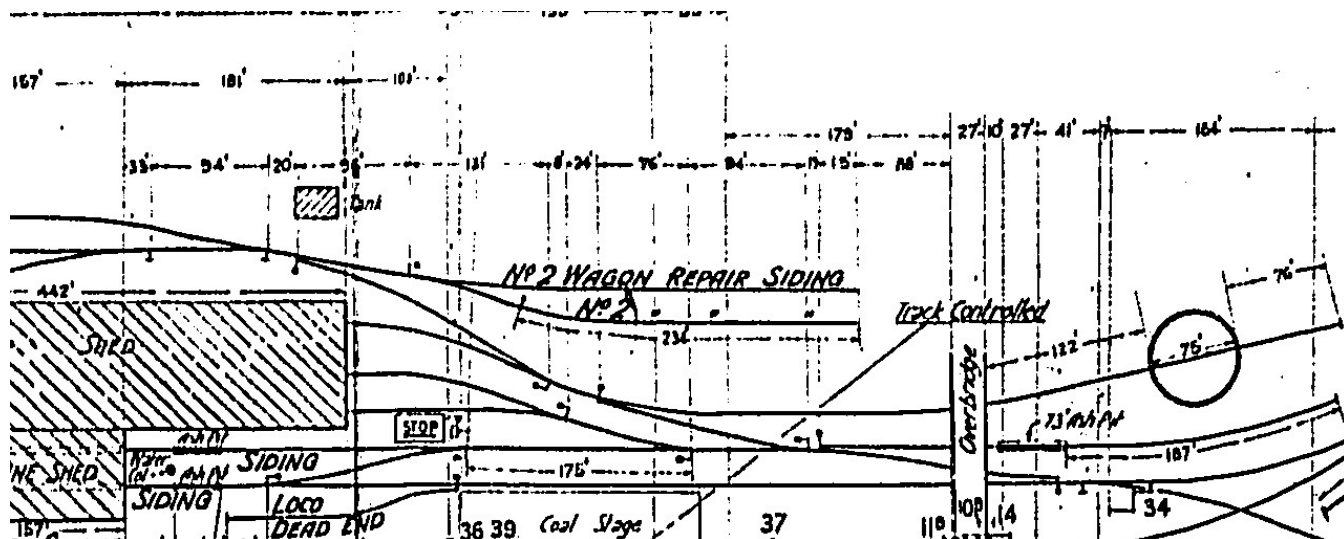
Having completed 3204, an O-Aust 'S' truck and another 'S' truck that I had been scratch building for longer than I care to remember, thoughts inevitably turned to a layout of some sort. I have a reasonably sized train room but most of the space is occupied a HO scale layout which I had spent over twenty years building and could not contemplate disturbing. The only practical solution I could come up with was to use some of the space between the front of the existing layout and the train room wall. This space was about 7.5 metres long but only 1.3 metres wide. I was happy with the length but the new layout could not be much more than 600mm wide for most of its length and little more than 900mm at its widest. One end of the layout,

or shunting plank if you are unkind, would butt up to an external brick wall but the other would end against an internal stud wall which offered some prospect for staging – in the unlikely event that I obtained planning permission to encroach on the laundry. I was happy that I had found a reasonable amount of space for a small 7mm scale layout but I still had no idea what to do with it. At about that time I came across Gordon Gravett's '7mm Modelling' published by Wild Swan in the UK. These two volumes provided some very useful advice on how to get the best out of limited spaces, layout and baseboard design and 7mm modelling in general.

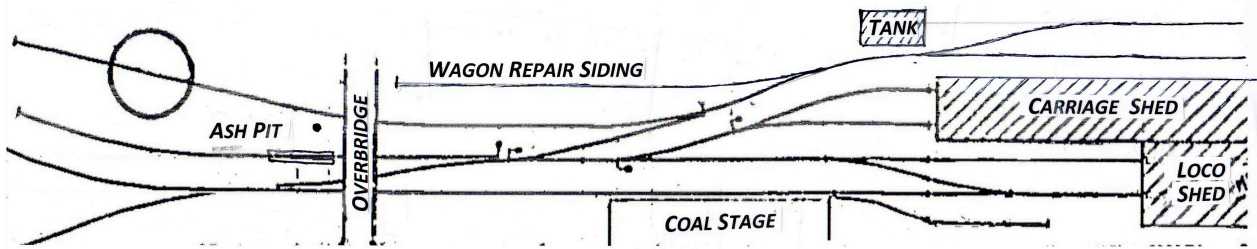
I spent many enjoyable hours looking at NSWGR track diagrams hoping to find a suitable branch line terminus that would make an interesting model and could be adapted to fit into the available space. I found a number of possibilities but eventually came to the conclusion that any prototypical arrangement small enough to fit would not maintain my interest for very long and would not be able to accommodate the additional locomotives I was already thinking about. As my overriding interest in railways has always been steam locomotives I thought a model of a loco depot might be the way to go. Quickly realising that neither

Eveleigh nor Enfield would fit, I looked at plans for some of the smaller depots. Valley Heights and Binnaway were considered but had to be discarded because of the space required by even the smallest sector shed. I then confined my search to smaller depots with straight sheds. I don't recall why I looked at Albury but when I did I realized that it would be possible to model the depot from halfway along the running shed to just beyond the turntable with very little compression. Although a surprisingly modest loco depot given its location, Albury also had a substantial carriage shed, wagon repair facilities, diesel refuelling facilities and other unusual structures such as the pneumatic sand plant and a very short elevated coal siding. Another unusual but interesting aspect of Albury Loco was the awkward layout that required engines to change direction several times to get to the turntable and ash pit before being stabled on a shed road. This inefficient but compact layout seems to have been created when the original loco depot was altered to make way for additional goods yards. I thought the facilities and layout of Albury Loco offered plenty of scope for an interesting model and even a little shunting. Any lingering doubts about its suitability as a modelling project were dispelled when PSM announced their C38 model.

An extract of a signalling diagram of Albury. Although a diagram rather than a plan the dimensions shown were very useful.



The simplified and flipped track diagram.



In spite of its relatively compact layout modelling Albury would still require some significant compromises. Width, as previously mentioned, was one of the major issues. To fit within the available space it would be necessary to dispense with the lean-to-covered third carriage shed siding and reduce the two wagon repair sidings to one. The other issue was that the 75' turntable, the ash siding and the arrival and departure road would only fit on the wider left hand end of the layout. Placing the turntable in this position, while retaining the most interesting features of the depot at the front of the layout, required the track plan to be 'flipped' as shown in the following diagrams.

I will admit that calling the layout Albury Loco is a bit of a stretch but I have not been able to come up with a meaningful alternative name and, in any case, I still intend to model the features of the place as faithfully as I can and hopefully end up with a model that feels authentic even if it's not quite right.

I did not get to Albury in the steam days but fortunately other enthusiasts did and many of their photographs have appeared in various publications over the years. One of the best sources of images and information I have found on Albury Loco is Volume 11 of the excellent Byways of Steam series published by Eveleigh Press. I scanned all of the relevant photographs I could find in this and other publications and printed flipped versions to match the orientation of the proposed model. Although the arrangement of facilities at Albury Loco was unusual most of the individual structures appear to have been standard NSWGR designs which I thought would make it easier

to find the information necessary to produce reasonably accurate models and increase the likelihood of some items being available commercially. A notable exception was the one of a kind sand plant. This was a distinctive feature which appeared in the background of many photographs of locos on the turntable or over the ash pit. It is unlikely that any official record or drawing of the plant survives but as a wagon body forms a major part of the structure it should not be too hard to prepare a reasonably accurate set of drawings.

Having spent at least a year armchair modelling (my favourite inactivity) it was time to develop a detailed plan. Although I intended to follow the real, albeit reversed, track plan as closely as I could some further adjustments would be unavoidable. With such narrow baseboards I needed to position the track as close to their front edge as possible to leave room at the back of the layout for an embankment to

help merge the 3D scenery with a back scene. Track centres had to be adjusted to allow the width of the loco and car sheds to be reduced slightly and the track alignment at the turntable end had to be altered to suit the shape of the baseboards and maintain adequate, if not by the book, clearances with the road bridge piers. I used some simple formulae, published in the Model Railway Journal some years ago, to plot these curves and to ensure that their radii would not be less than my self-imposed minimum radius of 1800mm. Some adjustment of turnout position was also necessary to ensure that turnouts spanning baseboard joints (six out of twelve) would not be dissected too close to either end of the closure rails.

I now had a plan but because I wanted to hand lay my own track and turnouts, for the first time in any scale, I had a lot to learn before I could start building the layout. With the Editor's permission I will continue the description of my version of Albury Loco in another article.

All sections of the layout are progressing but the shed end is the most advanced. The shed walls were white in 1963, which is the period I am modelling, but they will need to be more heavily weathered to look convincing. The storage building was also white until I repainted it, and some other small sheds, light stone to add a bit of colour and reflect an earlier era.



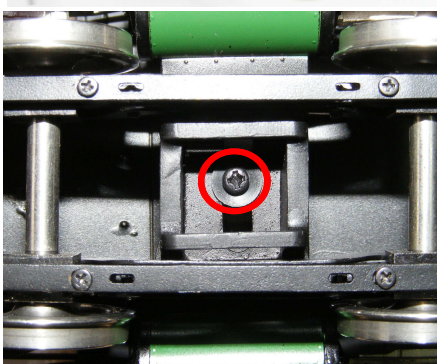
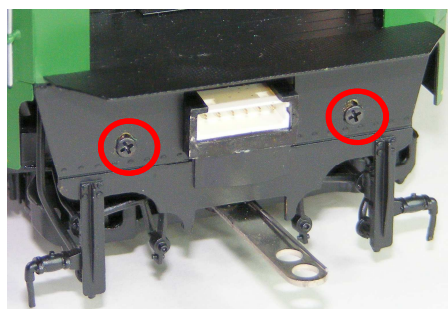
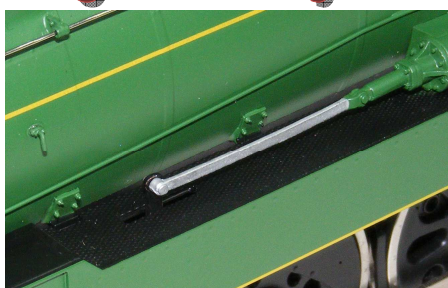


Photographs by the author

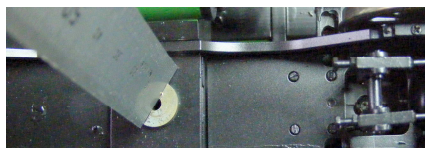
Add Sound and Lights to your PSM 38 class

The latest model to be produced by John Della of Precision Scale Models was the eagerly awaited O scale NSWGR 38 class. John arranged with the Ajin Model Company of South Korea to manufacture a number of different versions of this passenger express locomotive in both the standard and iconic streamlined variants. This was quite a challenge and PSM are to be congratulated on the production of so many variants of the prototype for what is arguably a relatively small market. After unpacking the model from the well designed packaging I was most impressed by this beautiful model complete with its unexpected opening smokebox door and water hatch. Placing it on a short section of track I expected to be rewarded by the sight of 3803 responding smoothly to an old DC controller. Unfortunately my response was similar to that which others have reported, complete disappointment! It didn't move! There were some lights, the headlight was on and 4 white marker lights were glowing brightly when DC power was provided, there was some audible sound from the motor but no actual movement in either direction.

I am aware that a great deal of assistance was provided to PSM and ultimately to the manufacturer to ensure that the models were correct in every detail. I suspect if all you wanted was a model that would sit in a display case you would be well pleased. Now maybe it is just me, but I want my locomotives to not only move but also to look and sound as much as possible like the real thing. I am also more than a little disappointed that it appears that despite what has been said elsewhere none of the suggestions regarding the operation of the model under either DC or DCC have been incorporated. Oh well ... where did I put that screwdriver?



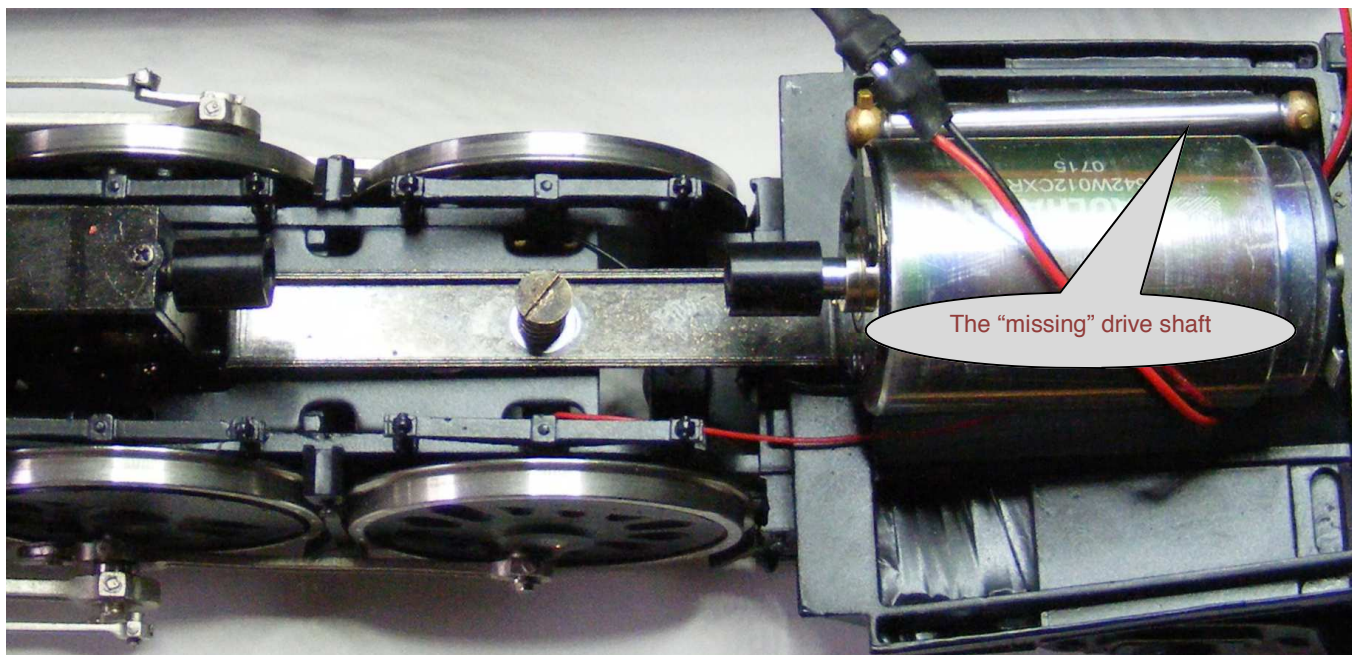
The possibility that the purchaser might need to separate the body of loco from the chassis was clearly given some thought by the design team as this is one of the easiest models to disassemble. The adjacent photos indicate the three steps. Firstly gently separate the reversing rod, shown here in silver from the black section connected to the chassis, use your fingers, no tools are required. The rear of the body is attached with two small Phillip's head screws shown encircled in red. These can be easily removed and stored in a safe place for later re-installation. The third and last screw, complete with washer and spring, attaches both the pony truck and the chassis to the boiler. As you remove it you may find that it comes away complete with spigot which is screwed into the boiler or you may have to remove the spigot separately. The large brass bush shown below under the rule should not be removed.



Breathing life into the 38

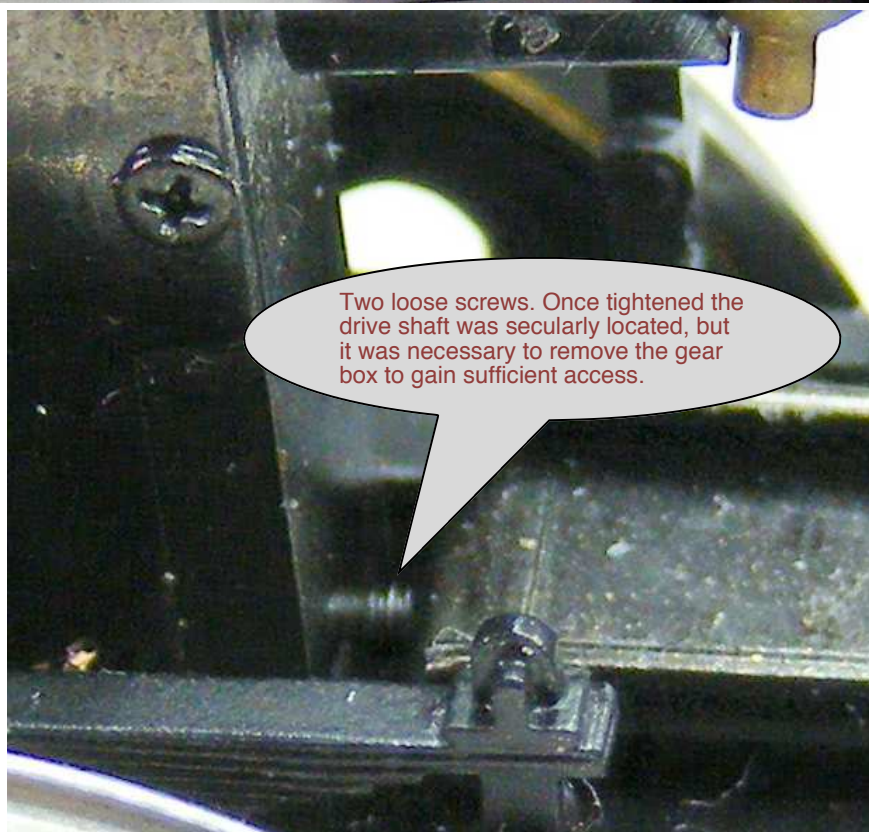
It certainly looks the part and it reflects the considerable amount of research which went into manufacturing this model but how does it run? Regrettably there were some assembly glitches and there is no way that this hand-crafted Ready To Run model could be described as ready for DCC or even as DCC compatible. I am afraid that all of the suggestions were either ignored or considered impractical. There is however much to admire about this attractive DC model complete with its highly respected Faulhaber DC motor. The DCC adaptation, complete with sound and lights does however require some additional effort on your part or the exploitation of a friendship from someone who will do the conversion for you. It is an interesting challenge so why not have a go yourself?

John R B Parker



After separating the body from the chassis it soon became apparent why the model would not move. As can be seen in the photograph above there was no connection between the motor and the gear box. But wait, isn't that a drive-shaft complete with universal joints being held magnetically to the motor?

Surely it wasn't intended to be shipped that way? Closer examination showed that it would fit in place but also that at it would fall out soon after insertion. Why? The enlarged photograph explains it all. The motor mounting bracket is attached to the gear box with two screws. Unfortunately they appear to have never been tightened as there was at least a 3mm gap between the bracket and the gear box! Fortunately this proved to be simple to fix. I removed the cover from the gearbox and the special screw and spring which holds the whole assembly in place. The drive shaft was inserted and the two loose screws tightened and the entire unit re-assembled. I did notice that the gearbox appeared to be a good design and was well lubricated.

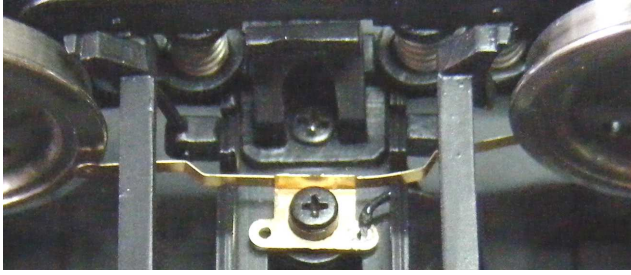


Under DC it now moves! In fact it appears to run very well with no suggestion of some of the spring problems reported by Chris Lord. Maybe we are all going to have a different experience with this hand built model? It is such a pity that PSM seem to have been let down by the manufacturer's lack of adequate quality control and testing.

Next step was the removal of the tender body from its chassis. That proved to be even easier than the engine. Four, very obvious small screws were removed allowing the separation of the two parts. I really wasn't expecting the next surprise. All the lighting is provided

ed by 1.5 volt 1.2mm diameter incandescent lamps! This was totally unexpected, LEDs are more rugged and tend to have a longer life; they are also available in red and white combinations ideal for marker lights. The fitted lamps are surprisingly bright, certainly much brighter than if you power one of them separately from a 1.5 volt battery when it shows a distinctly yellowish hue. Included in the tender is a small circuit board incorporating a bridge rectifier which powers the lighting circuit. Illumination commences when the throttle reaches about 1/3rd of its range, however with a 12 volt DC supply at maxi-

mum speed the lightning circuit reaches 2.09 volts. I wonder how long these incandescent lamps will last. My preference is for correctly operating marker lights so this article covers the replacement of all the lighting. There is an option for those who would like to add DCC sound but retain the incandescent lightning as supplied without any red marker lights. However I do not recommend this option as during testing I managed to destroy 4 lamps. 1.5v lamps are really not compatible with DCC.



The model includes nicely designed wipers intended for power pickup from the rear of all tender wheels. In my case none were correctly positioned resulting in either a short to the frame or no contact at all. Fortunately a little bending and repositioning fixed this problem. A large RTR model such as the 38 class has ample space both in both the boiler and tender to house the decoder and speakers; the modeller has the option of selecting from a number of suitable decoders that will provide sounds with varying degrees of similarity to the prototype. My suggestions have a lot of similarity to the recommendations made for the Model O Kits 36 class. They are based primarily on The ESU Loksound V4.0 sound decoder principally because of its excellent motor control and its ability to be programmed with a model specific sound file. As the model is equipped with the efficient Faulhaber coreless motor and gearbox there is no requirement for the larger Loksound decoders such as the Loksound XL 4.0 or the new Loksound L V4.0.

The Loksound V4.0 is fine but it does have the limitation of only 4 functions, headlights plus Aux 1 and Aux 2. This will be extended to 6 with the addition of the Loksound #51968 adaptor board. This also gives us the additional benefit of making the decoder pluggable. But is six functions enough?

For the 38 class no, let's look at what is required;

Front and rear headlights = 2 (Only 1 on this model as there is no requirement for a rear headlight).

White marker lights = 2

Red marker lights = 2

Simulated firebox, minimum = 1

Cab lighting = 1

That is a total of at least seven functions which can be catered for with the addition of an additional lighting decoder mounted in the tender. The functions can be split between the two decoders so that the only common connection between the locomotive and the tender are the power pickup buses. We will only need to use two of the six pins available on the supplied plug and socket connection to the tender. The decoder in the tender will control the tender lightning, whilst the decoder mounted in the firebox will take care of everything else. This will permit the locomotive to operate on its own without the tender if necessary.

Both decoders will operate under the same number in this case 3805.

As in previous articles Vero style printed circuit board material is used as a basis of each of the three Printed Board Assemblies.

The main loco assembly PBA and speaker enclosures will be located partly in the boiler and above the motor in the firebox. This will include the 21 pin plug-in Loksound V 4.0 decoder and the Loksound #51868 adaptor board.

A second significant Printed Board Assembly is mounted in the tender. This assembly includes a TCS FL4 lighting decoder which controls the rear red and white marker lights.

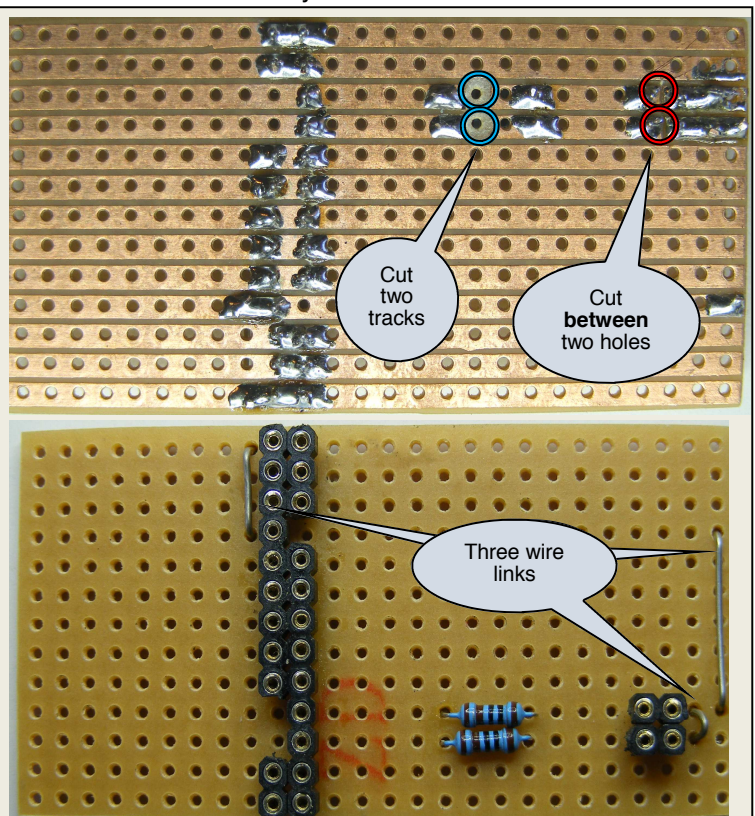
There is also a small PBA mounted in the smokebox to terminate the lightning for the headlamp and front marker lights.

The construction of these assemblies is straightforward, the designs being relatively simple; the enlarged photographs showing both sides of the completed boards should be easy to follow.

The Vero type matrix board is best cut to the desired size with a razor or coping saw. It can also be handled in a similar way to styrene using the score and snap method, provided you score along a line of holes. The rough edges produced by breaking the board can easily be finished off with a file.

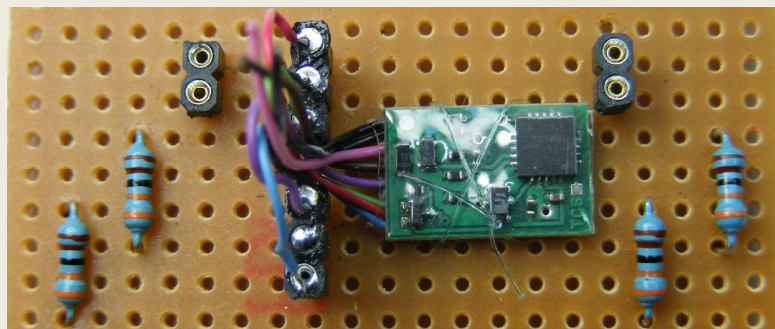
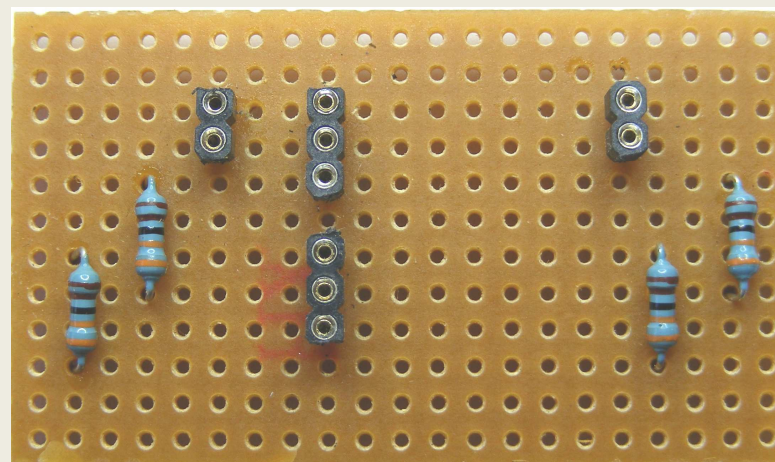
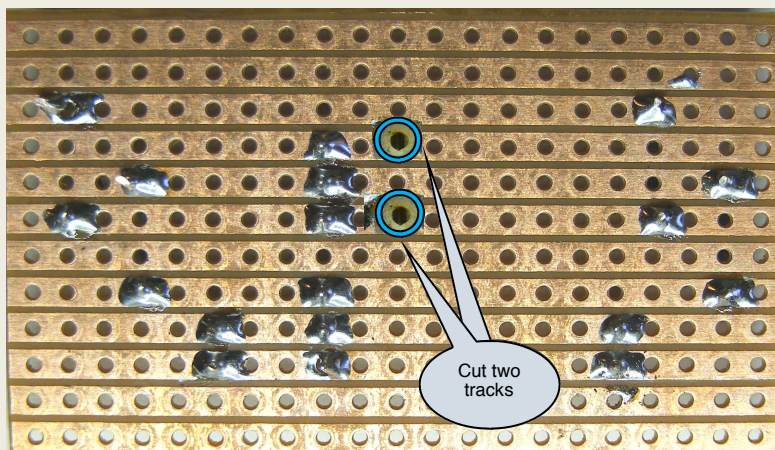
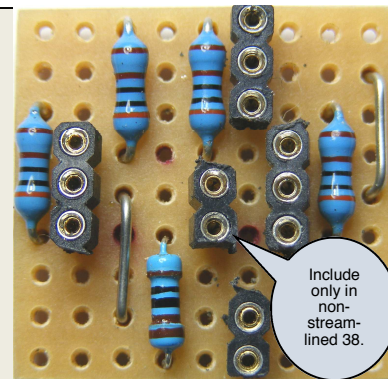
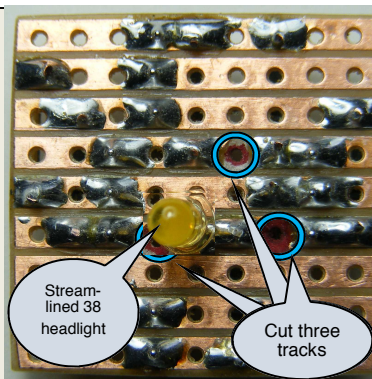
The Main Loco Board is 26 holes wide and 13 holes high (approximately 65 mm x 34 mm). It is generally best to cut the tracks where indicated by the two blue circles before adding any of the components. Check the position, (by counting holes), carefully before using a Spot Face Cutter or a 3mm drill hand turned between the fingers. You only need to ensure that the track is cut, do not drill through the board. This board also requires cuts **between** the holes at the two places encircled in red. Turn the board over to the component side and add the 3 wire links using tinned copper wire. The 2 x 1K ohm ¼ watt resistors can then be soldered in place. The last items to add are the sockets cut from Jaycar PI-6470 I.C. socket strip. The lengths required include 2 x 9 way, 1 x 3 way and 3 x 2 way sockets. They should all be soldered in place. We will return to this PBA later as it also requires the addition of the #51968 adaptor board.

If you are going to convert entirely to LEDs you will also need to make up a small board for the smokebox. This PBA will assist greatly when it comes to terminating the front marker lights.



This small board is 9 holes wide and 9 holes high, approximately 24 mm square. There are three cut tracks and two wire links as shown. The 5 resistors can now be added as shown on the wiring diagram and in the photographs. The current limiting resistor for the headlight is the familiar 1k ohm resistor but the 4 marker lights all need 3.3K ohms resistors rather than the more common 1K ohms, which if used will result in overly bright marker lights. The last items to add are the socket strips, cut as before from PI-6470 I.C. socket strip. This time 3 x 3 way and 2 x 2 way sockets are required, only 1 x 2 way if your model is a streamlined C38.

The Tender Board can now be tackled. It is 21 holes wide and 12 holes high, approximately 55 mm x 32 mm. This larger board also requires two cut tracks, but no wire links. It is probably easiest to solder the 4 x 3.3K ohm resistors in place first, then the 2 x 2 way and the 2 x 3 way sockets. Place two 3 pin plugs into the three pin sockets in the middle of the board, The FL4 decoder can now be soldered in place via these two 3 pin plugs. The wiring is shown in detail on the wiring diagram. It can also be seen in this enlargement showing part of the PBA. Only 5 connections are made, the rest of the wires can be cut short. I tied this small decoder on place using fishing line threaded through holes in the board.



Function Allocations

Functions F4 and F5 operate on both decoders

F0	Headlights + Dynamo sound (directional)
F1	Start sound sequence plus firebox (Aux3) on/off
F2	Whistle
F3	Cylinder cocks
F4	White marker lights on/off (Aux1 & Aux1T) (directional)
F5	Red marker lights on/off (Aux2 & Aux2T) (directional)
F6	Cab lights (Aux4)
F7	Blowdown
F8	Sound fade
F9	Dim cab lights
F10	Coal shoveling
F11	Injector
F12	Water Fill

Decoders

ESU Loksound

1 x Loksound V 4.0 Decoder (21 pin)
1 x #51968 21 pin Adaptor Board

TCS

1 x FL4 Decoder

Model O Kits

2 x AS 3030 Small Speaker Box

Jaycar

2 x AS3030 36mm 8 ohm speakers
1 x HP9544 Vero type PC board
2 x PI6470 32W I.C. Socket strips
1 metre x WM4516 16 way rainbow ribbon cable
1 x pack of 8 3K3 Resistors RR-0584

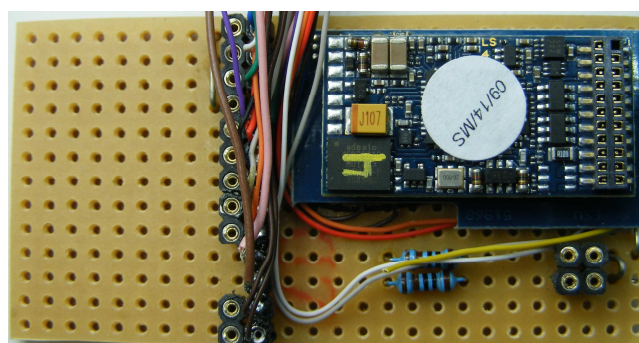
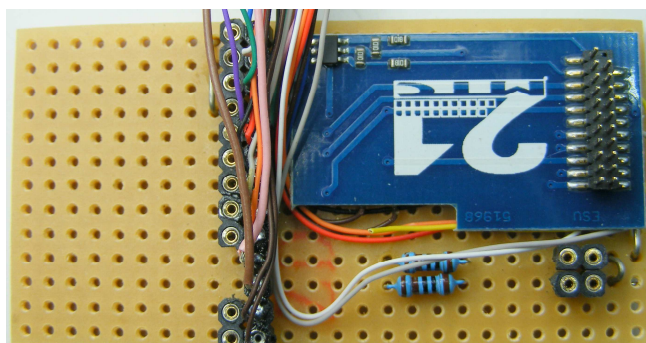
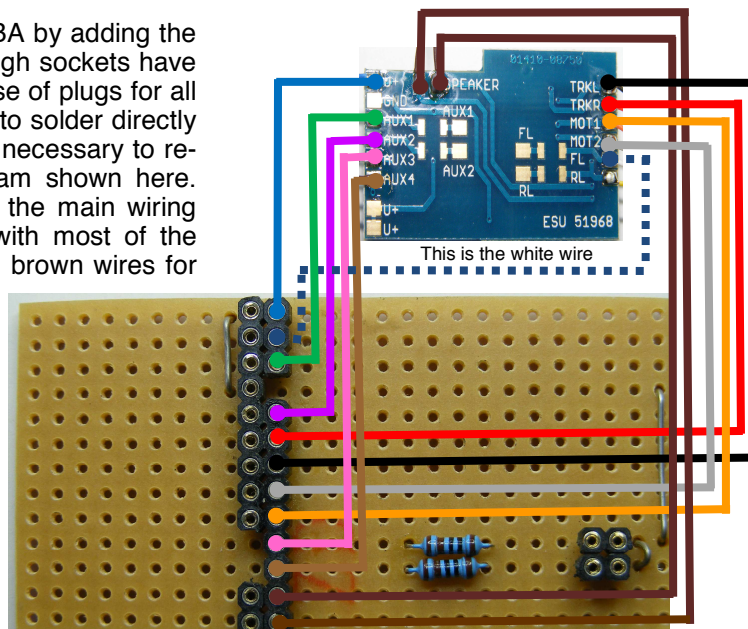
DCC Concepts

1 pack Prototype white Nanolights (6 LEDs in each pack with resistors) or
1 pack Protowhite 3mm LEDs (6 LEDs in each pack with resistors)
1 pack Red/White Nanolights (6 LEDs in pack with resistors)
1 pack Protowhite PanelDot 1.8 mm LED (6 LEDs in each pack with resistors)
1 pack LED-RWT (6 LEDs in each pack with resistors)

Additional Parts Required

We can now return to complete the main loco PBA by adding the connections to the #51968 adaptor board. Although sockets have been provided on the main board to permit the use of plugs for all the connections from the adaptor board, I chose to solder directly to these sockets. It is unlikely that it will ever be necessary to remove the adaptor board. Just follow the diagram shown here. These particular connections are not shown on the main wiring diagram. The adaptor board comes complete with most of the wires but you will have to add both the pink and brown wires for Aux 3 and Aux 4 respectively. The yellow wire, (rear light) is not used on this installation. The two brown speaker wires were cut from the Loksound 4 21-pin decoder and re-connected where shown.

The adaptor board is then turned over and secured in place on this main board with 3M double-sided foam tape. Ultimately the decoder will be plugged in place as shown. This arrangement ensures that the decoder can be easily replaced if necessary without the use of a soldering iron.

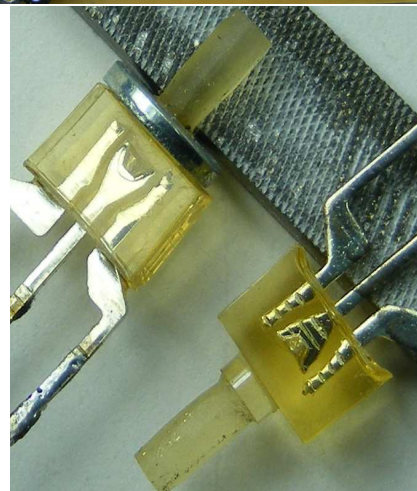


Two small square speaker boxes built from Model O Kits house the two 8 ohm AS3030 speakers. Wired in parallel they provide a 4 ohm load for the Loksound V4.0 decoder. The boxes were assembled with PVA glue and joined together side by side. The existing holes are used for wiring between the boxes but it will be necessary to make a new hole for the two-pin plug ended lead. Glue the speakers in place making sure that the enclosures are airtight by sealing around the protruding rear of the speaker as well as the holes in the front. Acrylic contact adhesive or Microscale Crystal Clear is ideal for this role.

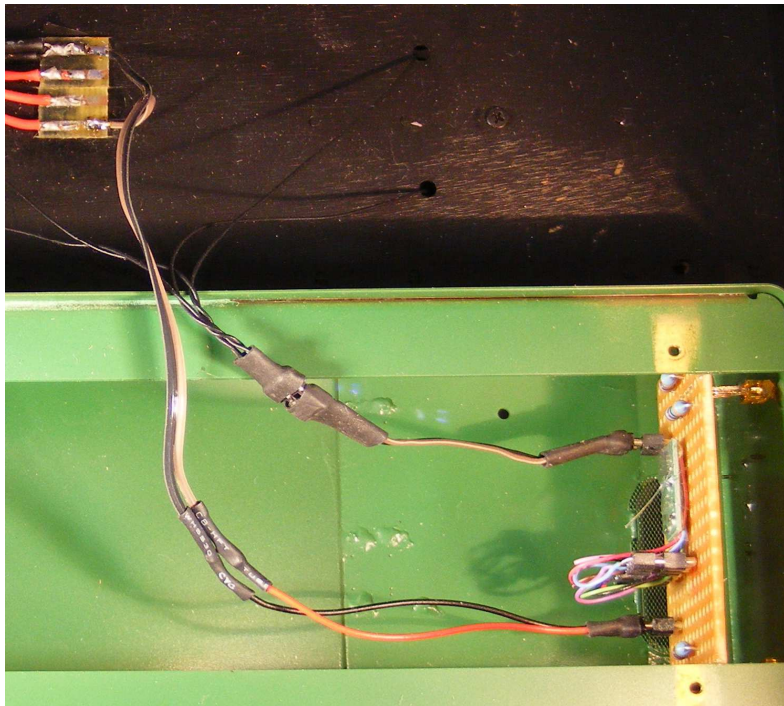


Now all the subassemblies are completed it is time to follow the wiring diagram and put everything together. The tender is a good place to start as it is the most straightforward. Working from inside the tender ease the two micro lamps out of the marker lights and push out the small lenses. They will not be reused so don't worry if

they disappear. All the rest of the wiring including the small board screwed in place can be removed with the exception of the leads from the pickups. It is necessary to enlarge the holes in the marker light castings as much as possible. This is achieved using first, a #52 and then a #51 drill held in a pin vice. Do not be tempted to use a Dremel or similar as it will generate too much heat. I also found a tapered reamer helpful. Unfortunately these holes are still not large enough to take the "tower" portion of the LED. This is resolved by slightly reducing the diameter with a small file. Note particularly the use of the washer to ensure the diameter is not reduced where the "tower" protrudes from the rectangular section. If the file cuts right down to the flat you will almost certainly sacrifice one or both of the LED elements. Once you are satisfied with the fit of the LED into the marker light castings the LEDs can be soldered to the copper side of the tender board. The completed board can then be fixed in place with acrylic glue applied to the LEDs and PBA edges. The small PBA that is screwed to the tender can be removed together with its 4 connections to the PCB



on the floor. The wiring diagram shows the new double plug ended 60mm lead which is required to connect the bogies to the tender board. The two pin red and black lead should be replaced with a new lead at least 100 mm in length which will be plugged into the "From Loco" socket on the new PBA. The other end of this lead is ultimately connected to the two outside pins on the 6 way connector. The easiest approach is to solder the wires at the termination point on the floor of the decoder. The extra wires going to the 4 inside pins of the tender loco connector can be left in place.

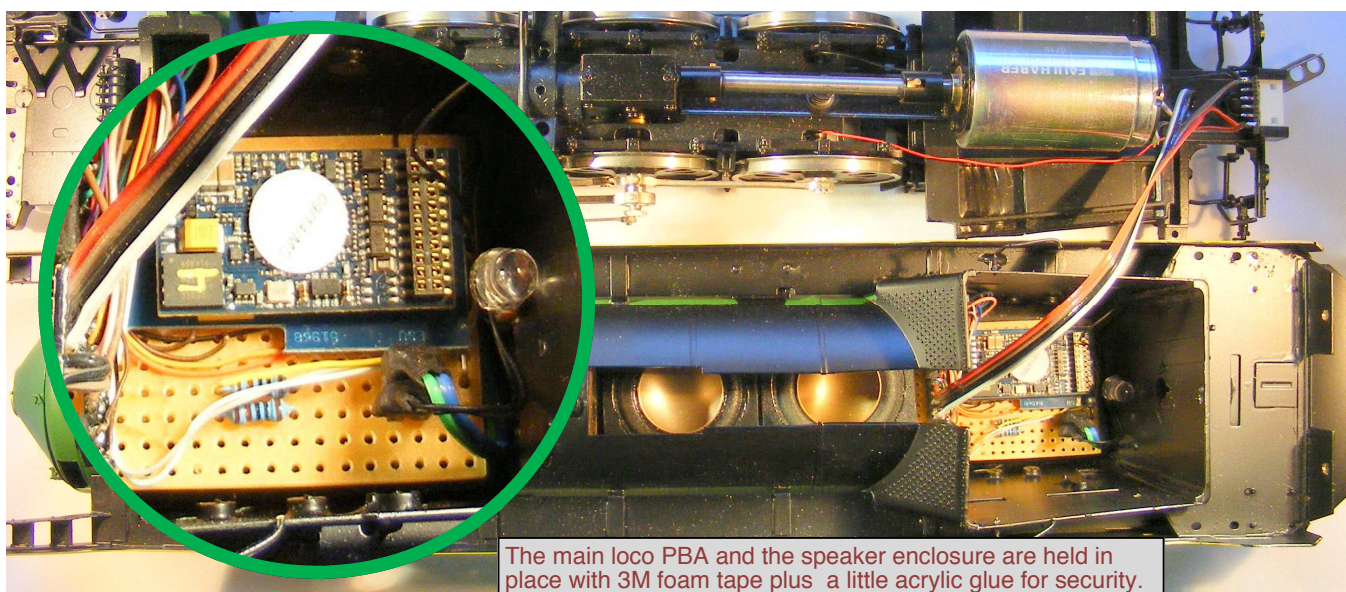
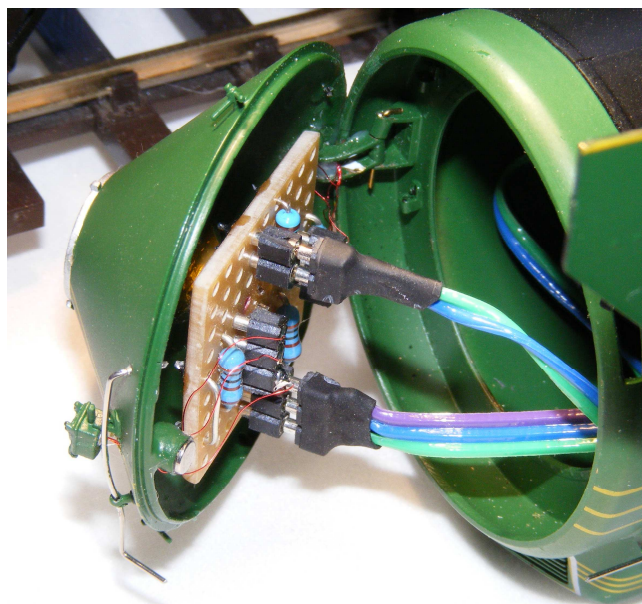


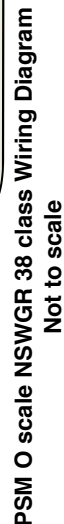
ohms provide by two 1500 ohms ¼ watt resistors in parallel. (This option is not recommended).

The existing wiring within the loco will require replacement or at the very least modification to match the wiring diagram. The new wiring was fabricated from ribbon cable terminated at both ends with either two or three pin plugs. The main board was positioned as shown above the firebox with the speakers mounted alongside covering in part the blank portion of the PBA. All are secured with 3M foam tape and glue. Both the firebox illumination and the cab light can be mounted in a convenient location. Remember that being LEDs, they are polarised so if they do not illuminate try reversing the two pin connection to the main board. Future workshops will provide help with the programming.

A test run on a straight track proved that all functions operate correctly but the first left curve indicated a short circuit. I also noticed a horn block spring was not located correctly. Oh well, it looks like I will need that screwdriver again!

I chose to also add dual colour marker lights to the front of the loco, so those castings received the same hole enlarging process as that carried out on the tender. This is a little more difficult on the streamlined 38 as the "tower" LEDs used in the tender will not fit. I found it easier to remove the cone shaped front for better access. Carefully remove all wiring and lamps and slightly enlarge the marker light castings with a tapered reamer. A liberal coat of white paint was applied to this enlarged hole in an attempt to avoid short circuits. The red/white Nanolights were inserted and glued in place with 5 minute clear epoxy. The Nanolight leads were shortened and soldered directly to the three pin sockets on the smokebox board. (Heat from the soldering iron is used to remove the insulation from the wires.) The hole for the headlight is large enough for a standard 3mm LED. Note that there is slightly different approach with the non streamlined 38 which uses a plug & socket for the Nanolight headlamp. If you would prefer to leave the existing incandescent lamps in place the wiring diagram has the details, the basic board remains the same but each lamp includes a voltage dropping resistance of 750





FOR THE GRANDCHILDREN - OF COURSE!

Jim Longworth



THOMAS and PERCY at work hauling Lego passengers and troublesome S trucks on my imaginary peri-urban layout.

Many railway modellers would like to encourage their children, and some of us grey-haired modellers our grandchildren, to become interested in railway modelling. THOMAS THE TANK ENGINE offers an obvious and universally addictive way. Forget one's own prejudices – see THOMAS from the child's perspective!

THOMAS

Following the birth of our son Michael, thirty years ago, a sky blue, 0-6-0, model side tank steam outline locomotive, built by THE ERTL® Co., Dyersville, Iowa, USA, but made in China, arrived in our family room. Number 1 was painted in yellow prominently on the tank sides. Yes, the locomotive was THOMAS. THOMAS was made of a thin die-cast metal body sitting on a thick plastic footplate and plastic frame underneath. The front two axles had plastic wheels, which were set to a gauge of about 36mm. Rubber traction tyres were fitted to the rear wheels. An inertia motor provided propulsion in the forward direction. He seems to have been based on a London Brighton & South Coast E2. Thirty years later, growth of our grandchildren provided a good excuse to rescue THOMAS from the toy box in our attic and get him working on my 0 scale layout (Praising the Peri-urban, 7th Heaven, No.38).

THOMAS's body was separated from his footplate and motorised chassis. I acquired an Ixion Model Railways Ltd., 0-6-0, Hudswell Clarke model on the cheap, because the plastic body had been damaged; but the motor, chassis, and wheels were fine. The wheel spacing was close enough to THOMAS, and neither grandchild nor I care about whether the wheel diameters match THOMAS's or not.

The Ixion body and footplate were removed from the chassis and scrapped. The replacement bridge was fitted to the Ixion control electrics. Rough testing of relative positions suggested that the THOMAS body and footplate would sit best on the Ixion chassis, if the body and footplate were rotated through 180° so THOMAS's smoke box would face towards the back of the Ixion chassis. Two layers of cling-wrap were wrapped around the chassis block and motor, to keep metal filings out of the mechanism. The new front of the Ixion chassis block was attacked with a hacksaw and files to round the upper edge over so it would fit snugly underneath the front of the THOMAS footplate.

THOMAS's thick plastic footplate was butchered to clear around the Ixion motor and gearbox. The two round cast metal body-chassis retainer posts were cut off. The porthole windows in THOMAS's front spectacle plate were drilled out. Both side entries to the cab were opened out by sawing and filing. The buffers were left as they were, one is missing; but the plastic clip-like couplings were sawn off. Prominent casting join marks around the smokebox and side tanks were smoothed over.

The plastic with which the footplate was made refused to allow superglue to stick to it, but the Ixion chassis would. So to attach the THOMAS footplate to the Ixion chassis I superglued a short scrap of styrene square tube across the back of the rounded upstand on the chassis block on top of the upper surface of the footplate to wedge the back of the footplate in place. To attach the front of the footplate to the chassis I built up a rectangular pedestal of scrap sheet styrene, just in front of the chassis block which cradles the flywheel, with a projecting piece to wedge the front of the footplate in place. To secure the cast metal body to the top of the footplate lengths of brass wire were superglued to the inside of the body, passed down through holes drilled through the footplate, and crimped

over underneath the footplate like forming an L. The original hole through the front part of the footplate below the smokebox was filled with hobby putty and smoothed over.

Kadee 0 scale couplers were fitted front and back, though neither has a coupler-box in which to move sideways. This does not seem to be a problem when pushing or pulling rolling stock through my Peco points or around my curved track.

PERCY

After successfully motorising THOMAS, a similar model of his shed-mate PERCY was retrieved from the attic. Like THOMAS, PERCY had been made by the Ertl Company around the 1980s as a pull-back and release inertia-motored toy with a cast metal body on a cast plastic footplate. His static connecting-cum-coupling rods looked awful to me. Motorising PERCY proved somewhat more difficult than motorising THOMAS. Unable to acquire a running chassis for an Ixion Model Railways' 0-4-0 Manning Wardle or 0-4-0 Peckett on the cheap, I settled on trying to modify another Ixion 0-6-0 Hudswell Clarke chassis. As with THOMAS a chassis was acquired on the cheap from a wrecked model. The wheelbase produced by converting this 0-6-0 chassis into an 0-4-0 would be much shorter than PERCY's. However my grandchildren were unlikely to notice, let alone complain about the difference.

PERCY seems to have had some basis in a GWR Avonside 0-4-0 saddle tank, with the body of a GWR 1340 Trojan, the bunker of a GWR 1361 class, Hunslet underframes and valve gear, with a smokebox protruding from his saddletank, external cylinders and motion, and sandboxes sitting on his footplate underneath the saddle watertank.

Work started by separating the cast metal body from the plastic footplate and everything attached thereto – which were then scrapped.

PERCY's cast metal body is 58mm wide, while the Ixion footplate is only 54mm wide. Rather than building a new footplate 58mm wide, I accepted the discrepancy as being close enough for its intended purpose. The Ixion footplate was separated from its chassis, the three link couplings removed, and the cab side steps cut off. To maximise the space available for fitting the Ixion motor and chassis block into the cast metal body, a Dremel cutting tool was inserted into the chuck of an electric drill and the tall cast metal body-chassis retainer post in the locomotive cab was cut off. The front body-chassis retainer post was left insitu.

The bottom plate was removed from the cast metal chassis block to allow the three wheel sets and coupling rods to be removed. Unlike THOMAS who has inside cylinders and inside connecting rods; PERCY has outside cylinders and outside connecting rods, with the connecting rods connected to the rear wheels. This meant that I would have to fabricate replacement cylinders, slide-rods, and connecting rods.

To convert the 0-6-0 into an 0-4-0 one end of the chassis block would have to be removed. The 0-6-0 Hudswell Clarke chassis uses bearings for the rear axle that are different to the other two axles which are both the same. Cutting off the rear part looked easiest. The purple wires to the speaker enclosure were clipped off, and the electric motor was removed from the block. A double layer of cling-wrap wrapped around the block to keep filings out of the gears. The rear of the block was hacksawed completely through vertically between the back of the rear motor mount and front of the brass flywheel.

Removing the rear wheelset meant that what had been the centre axle of the 0-6-0, which was the driving axle from the electric motor via the gears, would become the rear axle of the 0-4-0. That retained the long coupling rod pins to accept the new additional connecting rods mounted outside of the coupling rod eyes. That meant that the original front wheelset, with its dual diameter pins could not be reused. Another centre wheelset was acquired from yet another wrecked model and fitted. Upon reassembly the coupling rods bound. Deft filing out of the rod eyes converted their circles into slots, giving them enough slack to run easily.

Longitudinal centres for the now 4-wheel chassis, footplate, and body were scribed onto one side of each so they could be aligned as closely as possible. After trialling several arrangements for recombining the body, footplate, and block, the footplate and body were mounted onto the block facing in reverse. What was the Hudswell Clarke's brass flywheel, when mounted into PERCY, fitted neatly inside his coal bunker. Reversing the footplate required some filing out of its inside edges to allow the block to fit into the footplate central void and inserting styrene shims to keep the footplate snugly aligned.

After reinserting the electric motor PERCY was track tested, nothing happened – a complete short. I reckoned that the most likely problem was that the sprung pick-ups had got bent and were touching the cast metal chassis block, so pulled them off. A pair of antediluvian HO locomotive pick-ups were modified and superglued to the underneath of the bottom plate, and PERCY was track tested again – eureka!

To reduce the visually excessive end overhang of the body and footplate, a length of 18mm was cut out of the footplate. The cuts were made underneath the cab so the overhanging sides of the cab would hopefully cast the joint in shadow. The two ends of the footplate, with their attractively detailed buffer stocks, were rejoined, and a couple of styrene splices were glued across the joints underneath the footplate to strengthen it.

To add visual interest the four paper sticker porthole windows in the cab were drilled out, and the cast fillings across both cab entries were hacksawed out. The rather obvious casting join line along the top centre of the metal body casting was filed smooth.

The footplate was secured to the chassis block by supergluing a styrene block to the chassis upstand on top of the top of the footplate. Currently the body just sits on the chassis-footplate unit; but doesn't move around much, while I await inspiration.

Kadee 0 scale coupler-boxes and couplers were fitted front and back. PERCY is running in his inside cylinder configuration until I can find a pair of cylinders with motions to buy, or pluck up the courage to have a go at making them.

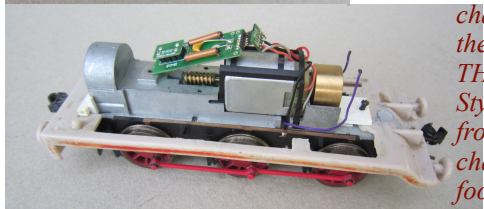
CONCLUSION

The question asked inherently behind the answer given in the title above, is of course something like: *Why bother with these two fanciful conversions?* I can't control the future interests of our grandchildren. They are people who will make their own choices in life. All I can do is show them the fun of playing trains. In addition, I had a lot of fun myself in grappling with and creatively trying to overcome some design and micro engineering problems as they arose.

Potential detailing might include drilling out the solid top of the funnels and installing attractive metallic funnel top rings, and milling out the spaces between the coal bunker railings. However, I am grappling with two philosophical questions. Firstly, would fitting details, such as handrails to the cab-side access-ways, an air pump, filler hatches to the top of THOMAS's water tanks, filler hatches to the tops of PERCY's sand boxes, whistle and safety valve to THOMAS, lamps front and back, electricity generators, etc, compromise their light hearted playful appeal, through trying to make imaginary locomotives look like they are trying to be models of prototype ones? Secondly, would the re-birthed THOMAS and PERCY look better repainted; or left as they are with their patina of age, patches, and design inconsistencies resulting from these recent modifications?



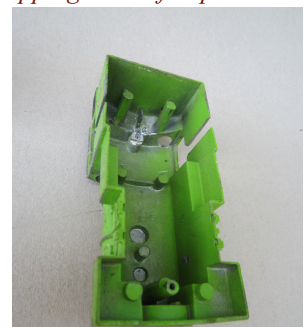
THOMAS's front external body-chassis cast metal retainer post was removed up to the underside of the smokebox, which is in effect THOMAS's chin. The opportunity was taken to smooth over the casting marks along both sides of the smokebox. The rear internal body-chassis retainer post was removed up to the underside of the imitation coal in the rear coal bunker. The infill panels blanking out the cab-side access-ways were cut out and the porthole windows in the front spectacle plate were drilled out.



The original Ixion Hudswell Clarke 0-6-0 chassis block with motor under its reused old THOMAS footplate. The only modification was to cut back and round over the back end of the chassis block to accommodate the underside of the ogee shaped front section of the plastic THOMAS footplate in front of the smokebox door. Styrene holding down brackets were installed front and back to secure the footplate to the chassis block. The small projecting piece of the footplate fills in the void between the back of



Shortened Ixion 0-6-0 chassis block, creating an 0-4-0, and new Ixion footplate. The two white strips of styrene sheet are spacers to align and retain the chassis block symmetrically within the void in the footplate. The sticky tape is intended to prevent short circuits, and keep the circuit board in place while slipping on the footplate.



PERCY reborn, running as an inside cylinder variation. My grandchildren don't mind the misalignment between the front axle and the imitation cast front axle leaf spring suspension.



THOMAS reborn. The Ixion 0-6-0 chassis with the THOMAS footplate fitted back-the-front, so THOMAS running forward is actually the Ixion chassis running in reverse. The front coupler was fitted rigidly underneath the lower portion of the front



Model O Kits

ModelOKits, PO Box 379, Sydney, NSW, 1700, (02) 97073390, 0404935663, <http://www.modelokits.com> & sales@modelokits.com have passed on the following information about their range of products:

O-Aust

LFX and BX Passenger Carriage pilot models were on display at the April Forum. A production run is planned soon but before this occurs confirmations of expressions of interest are being short. Please contact ModelOKits to provide your requirements.

The following kits are being upgraded and therefore are out of stock till further notice: R Cars, MLV, MRC, FME, UME, MHG and BCW. Other kits are either back in stock or will be shortly.

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Waratah

The injection moulded S-truck kit project is underway. First off samples will be available in early May. It is hoped that stock will be available for Epping Exhibition in June 2016 – if not pilot models will be on display and customers can place an order at the show. Price \$85.00 per kit.

HG guards van kits are available now at \$259 each. Three versions are available; single passenger compartment, single passenger compartment with middle window and the twin passenger compartment. Kit is brass etch external sides with laser cut internal walls with brass and white metal detail items.

LHG kit development underway now – kits available July/August 2016.

TRC and FS/BS kits all planned for later in 2016.

New Lineside detail items will be progressively available over the next few months. Items such as a concrete buffer, station lamps, station signs, station scales, station trolleys, banner signal, stationary boilers and pressure vessels are planned.

DJH

36 Class Kits available. There are still kits remaining at \$1,799. 36 Class RTR professionally built models available at \$3700. Painted and numbered. Excludes lights, weathering and DCC. All options available, pricing on application

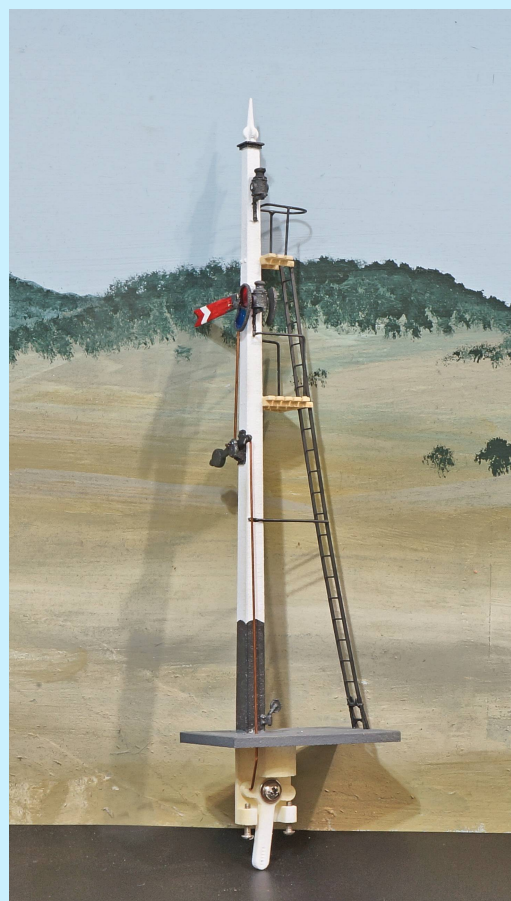
Only a few 60 class Garratt kits still available. 60 Class RTR professionally built models available at \$5700. Painted and numbered. Excludes lights, weathering and DCC. All options available, pricing on application

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New - G2 Goods Shed comprising Card and birch timber decks/frames and our styrene scale corrugated iron. Kits available now at \$185 per kit.

Signals Branch

Signals Branch via its Shapeways shop web site at <https://www.shapeways.com/shops/signalsbranch> and at rpilgrim@bigpond.net.au and by phone at 02 9543 0970 have announced that they have added a range of 7mm scale 3D printed signals in "white strong and flexible" material to his Shapeways shop. The range currently includes a distant signal with 27', 23', 18' and 16' height single arm signals. The signal arm and detail parts are all in the same print. A signal ladder printed in the "Frosted Ultra Detail" acrylic material is available and this needs to be purchased separately. Alternatively etched brass signal ladder (in kit form) is available from Keiran Ryan Models. The 3D printed signal ladder although quite fine is reasonably flexible and will stand normal handling and has the added advantage that it doesn't have to be assembled. Some extra items are required such as a few screws and suitable wire for operating wires and safety cages would need to be sourced by the modeller.



USEFOOL TOOLS: END MILLS

Chris Harris

The problem

Casting, particularly in whitemetal, has some limitations. Undercuts are notoriously difficult to reproduce in a casting, and duplicating voids or hollow sections can also be problematic.

An example of this sort of difficulty is illustrated in photo 1 below, which shows the bogie sideframe and bearings for a wagon I have been building from a kit.

A close examination of the bearings as they sit in the sideframe shows that the holes which were cast in the axleboxes for the bearings have not been cast perpendicularly to the axleboxes, but at an angle. This has probably occurred because the spigots in the mould, which have formed the holes for the bearings, were not sufficiently stiff to prevent “leaning” during the casting process. This is a problem which is difficult to prevent, and is the reason why many manufacturers merely cast dimples where the bearing holes are to be located, leaving it up to the modeler to drill out the holes himself.

Of course even this is not completely foolproof: modelers can always find that the hole they drilled themselves was not completely perpendicular to the sideframe.

Obviously something needed to be done to correct the bearing holes: photo 2 shows the position the bogie components took when dry-fitted together, producing a bogie which would look out of place even on a narrow gauge layout.

The Solution

It would be difficult to “straighten” the hole using a normal HSS drill. They are surprisingly flexible and the drill would merely follow the existing, cock-eyed hole.

However an end mill would have the required stiffness and “bite” to be able to drill a straight hole without following the existing hole.

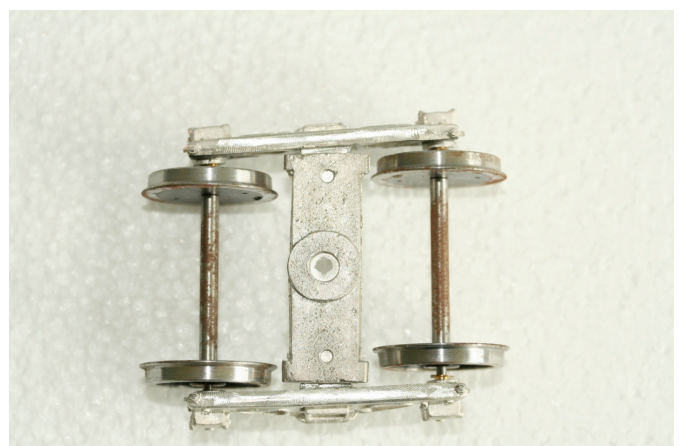
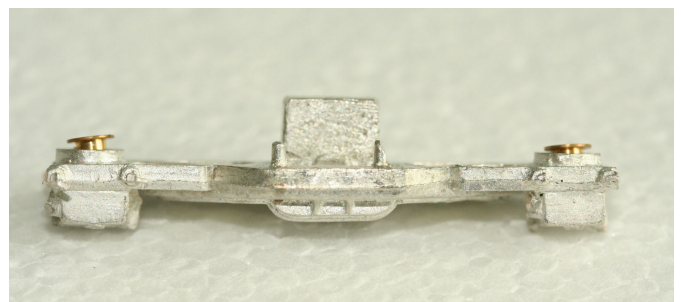
Photos 3 and 4 show an end mill, and a close up of the business end of the mill. The edges of the flutes are extremely sharp because usually a mill is used to shave off the side of a piece of metal by contact between the rotating side flutes and the work, whereas with a drill the contact is between the rotating, sharpened end of the drill and the metal, and the flutes are used mainly to channel the chips or swarf out of the hole. However, and, although it is not easy to see from the photograph, the end of the mill is shaped and sharpened so that it can also drill down into material, that is it is a mill that can make a “plunge cut”, and can therefore be used in substitution to a drill to ensure that the hole which is cut is perpendicular to the sideframe despite the angled hole that starts from the same position on the sideframe.

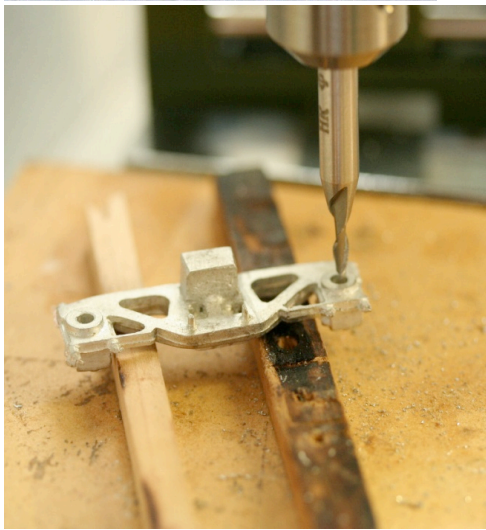
Normally an end mill must be used in a mill: a normal bench or pedestal drill does not have the bearings and other components to cope with the lateral pressure that the use of a mill bit will produce in the drill spindle. While I have a small Sherline mill which is very handy for the odd modeling job, I thought that, because the material here is the rather soft whitemetal, and the hole is only about 3mm deep, a good quality hobby bench drill would probably be able to handle the stresses involved.

I have a Proxxon drill and was fairly confident that it could successfully straighten the holes. Photos 5 shows the drill with the end mill inserted in it, and a close up of the sideframe positioned on two pieces of scrap timber to support the work. I wound the drill spindle down so that the end of the mill bit was just above the surface of the sideframe, set the depth stop to ensure that I did not drill right through the axlebox. I then just held the sideframe loosely in my hand, allowing the mill to find the entrance to the hole and, once that had occurred I tightened my grip on the sideframe and the mill duly created a straight hole and completely ignored the cast, slanted hole. Not good practice I know, and very contrary to good O, H and S practice (or whatever it is called these days), so I am not recommending that you do as I did: clamps etc should have been used of course.

In any event, the problem was fixed easily and photo 6 shows the bogie as finally constructed.

(I purchased the end mill over the internet from the McJing website, ordering it on Sunday and receiving it the following Tuesday!)





GUNNAS and NOVICES WANTED To Form 7mm/O gauge Railway Modellers Interest Group

Where: Premises may become available soon in the St. George and Sutherland area, six minutes walk from the railway station.

When: Daytime either Saturday or Sunday may be one or two times a month or on demand.

It will be all about hands on modelling, wagons, coaches, locomotives, sound, or whatever you like. Maybe a small layout in the pipeline.

If you are a novice, average or experienced modeller I would like to hear from you. All you need is a desktop lamp, tool box and a kit or whatever to work on. We would need about six modellers plus to get up and going.

Interested persons please contact Michael Lane on 02 9580 1383



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Kit builds available for \$3700 (including kit)



Photos of pilot model



See website for more photos!



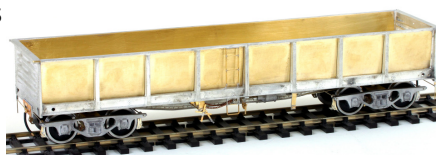
N.S.W.G.R (AD) 60 CLASS BEYER GARRATT

- Price \$2,599
- limited additional kits in stock and available
- Kit builds available \$5700 (including kit)

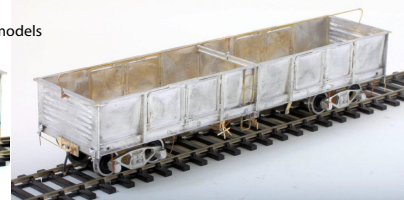


N.S.W.G.R G/GP WAGONS

- GP Wagon includes 2AS bogies with wheels
- G Wagon includes 2BP bogies with wheels & tarp support pole
- Price \$179

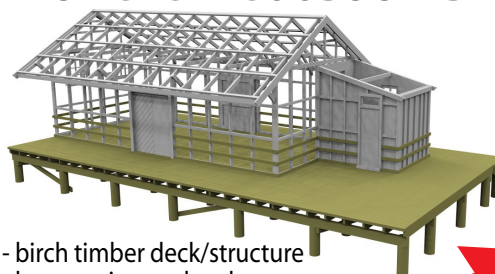


photos of pilot models



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Concrete Signal Box Kit	\$49.00
Ash Timber Buffer Kit	\$19.00
Small Concrete Water Tank Kit	\$12.00
Corrugated Water Tank 1500mm Diameter Kit	\$9.00
Corrugated Water Tank 2700mm Diameter Kit	\$10.00
Corrugated Water Tank 3400mm Diameter Kit	\$12.00
Platform Seat - Version 1 Kit	\$5.00
Platform Seat - Version 2 Kit	\$5.00
"No Way" Sign Pack of 4	\$4.00
Various O Scale Waterslide Decals	\$10.00 - \$12.00

New Products

Petrol Station	\$89.00	Speaker Boxes - To suit Jaycar AS3030, AS3028 speakers	\$6.00
General Store	\$89.00	C2 Toilet Building	\$38.00
Workshop Building	\$79.00	C2 Toilet with Lamp Room	\$49.00
Weatherboard House Front Only	\$59.00	Shop Front	\$49.00

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Fine Scale 1:43.5 (7mm) O Scale kits

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Introducing our high quality, highly detailed S wagon kit with injection moulded body components, our brass and white metal detail items and Waratah prototype wheel sets. Quality, detail and easy to assemble at a reduced price of: \$85.00. (Excludes buffers and couplers)

Price \$85 per kit

Available Q2 2016



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A RANGE OF LINESIDE DETAIL ITEMS

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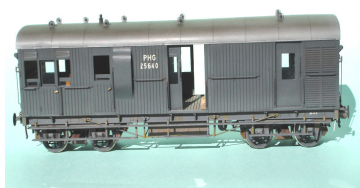
NSWGR BD Wagon

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Price to be confirmed.

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