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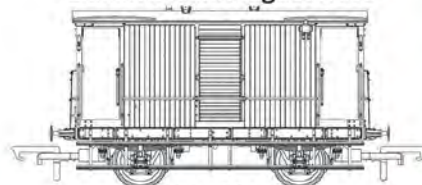
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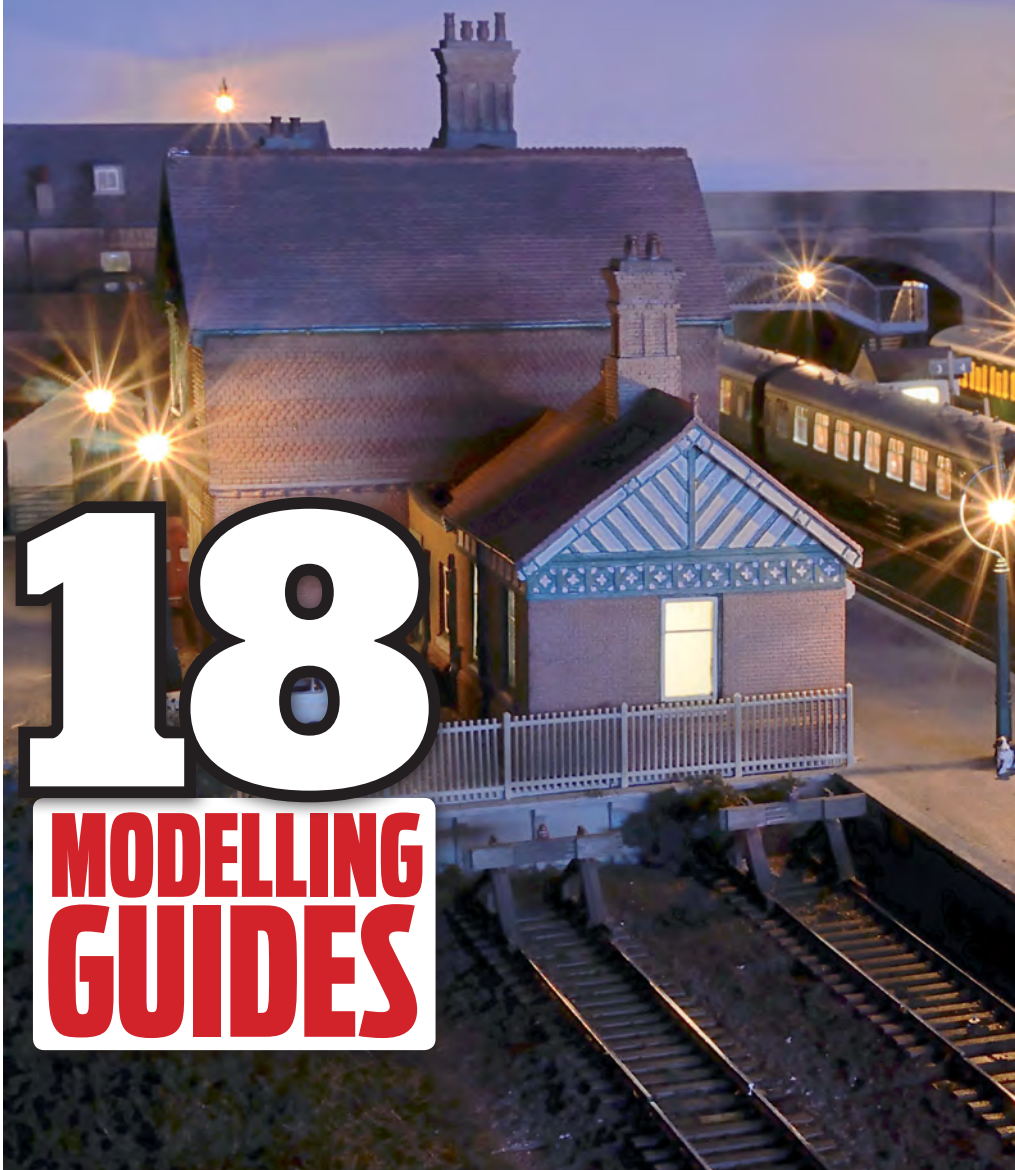
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Starting

WELCOME to the wonderful world of model railways. Your journey into this fascinating, enthralling and creative hobby

begins here. It combines a rich tapestry of skills from designing and planning through woodwork to laying track and the ultimate creativity of modelling the real world in miniature.

The chances are, though, that you are here for the trains – and from that perspective you couldn't have picked a better time to start building a model railway. The support for product development and the availability of

new locomotives, rolling stock and accessories is more buoyant than any time before. Plus, the standard of today's products – in everything from locomotives to accessories – means it is now simpler than ever to build your dream model railway. Add to this options for digital control and sound and we are now more able to get even closer to reality.

There are three main reasons that you are likely to be reading this. You might be brand new to the world of modelmaking with no previous experience. You could be returning to the hobby like scores of others having had a break from modelling or you could already be in the process of building your layout and looking for advice and inspiration to take

the next turn. You might have found an old collection in the loft and want to bring it back to life or it could be that you've seen the latest adverts for new products which sparked your imagination. Whichever reason it is, you are in the right place.

Model railway construction is at the very heart of what we do here at *Hornby Magazine*. It keeps us close to the hobby and helps us to fulfil the needs of modellers new and established. And we are proud to say that we really enjoy the challenge of building a new layout. All this means we are well versed in the skills required and we want to pass that information on to you.

This Skills Guide from the team at *Hornby*



out...

Magazine is a one-stop shop for all the information you need to get started in railway modelling. Consider the contents of these 132 pages a starting point as we show how to develop and improve your model railway in *Hornby Magazine* every month.

Here you can learn the basics: starting out with choosing the scale and era to suit you, we explain where you can locate a model railway and the positives and pitfalls of each, how to design your layout, provide examples of trackplans and, even more importantly, provide practical guides to the actual processes involved in making a layout of your own.

We've steered away from talking about locomotives and rolling stock directly here

to keep the focus on layout construction. We explore building baseboards from scratch and with kits, explain the basics of model railway electrics, provide an introduction to digital control, reveal how to lay track for the best running, show you how to add realistic ballast, point motors, signals, roads, the basics of scenery, detail and even maintenance.

Added to this we have also profiled three of the layouts built by *Hornby Magazine* – all of which have a story to tell. Significantly, all three follow the line 'a model railway is never finished' as each has been dramatically modified from its original creation as our ideas, space and designs have grown. That is all part of the fun – developing a model railway from

its original concept and taking it further than you ever imagined you could!

We hope you enjoy this Skills Guide on Layout Construction and that it inspires your project and its development. Let us know what you are building by writing to hornbymagazine@keypublishing.com - we really enjoy seeing modellers' creations at any stage of their lifetime.

Happy modelling!



Mike Wild
Editor, *Hornby Magazine*.

Building a scenic model railway is a brilliant experience, taking it through from concept to creation to capture a small slice of the world in miniature. At Shortley Bridge a Bachmann 'OO' gauge 'WD' 2-8-0 is about to depart with a mixed goods at this country station while the goods yard on the left bustles with activity. In this Skills Guide we will arm you with the basics to be able create scenes like this. Mike Wild/*Hornby Magazine*.



Gauging interest

There were once only two primary choices for the ready-to-run layout builder; today we have four to choose from. **MIKE WILD** looks into the options offering advice and guidance for the budding modeller.

NOT SO LONG AGO we were faced with only two obvious choices when it came to building a model railway with ready-to-run rolling stock – ‘OO’ and ‘N’ gauges. Offering models in 4mm:1ft and 2mm:1ft scale, these two scales were well supported with locomotives, carriages, wagons and an array of smaller suppliers which produced everything from building kits down to the smallest street details.

Today though the choice has doubled. ‘OO’ gauge is still king when it comes to availability and popularity, but alongside ‘N’ gauge it has been joined by an increasing portfolio of ready-to-run products for ‘O’ gauge (7mm scale) and, most recently, an influx of ‘OO9’ narrow gauge models from Bachmann, Heljan and Peco.

There are many other choices beyond the main four, but ‘OO’, ‘N’, ‘O’ and ‘OO9’ are the most accessible for all. Alternatives include finescale

versions of ‘OO’ gauge – ‘EM’ and ‘P4’ which use 18.2mm and 18.83mm gauge track respectively – while there is also a finescale equivalent of ‘N’ gauge in 2mm scale which uses 9.42mm gauge track. You will also find reference to ‘HO’ scale for European outline models, as well as specialist British outline products, which are produced to 3.5mm:1ft. Overseas modellers also have access to a wider range of narrow gauge tracks and models including ‘HOe’ (the same as ‘OO9’ using 9mm gauge track) and ‘HOM’ which is used to represent metre-gauge lines using 12mm gauge track. Europe also still models extensively in 3mm:1ft scale, ‘TT’, using locomotives and rolling stock running on 12mm gauge track, a gauge which lost its place in the British ready-to-run market in the mid-1960s.

There is an extensive choice and we have listed all the readily available popular scales and gauges in Table 1, but for now we will concentrate on the ‘big four’...

‘OO’ GAUGE

- **Track gauge:** 16.5mm
- **Scale:** 4mm:1ft
- **Association:** www.doubleogauge.com

‘OO’ gauge has its origins in the 1920s when Bing introduced its first clockwork models to 16.5mm gauge and scaled to 4mm:1ft. However, it really took off from 1938 when Meccano launched its Hornby Dublo range and the scale and gauge combination has dominated British outline modelling ever since.

Today ‘OO’ gauge is by far the best supported and most popular of all the model railway scales in Britain. Locomotives, carriages and wagons are readily available as out of the box products and a constant stream of new releases are delivered on a regular basis from big names including Bachmann, Dapol, Heljan and Hornby. In recent years these have been joined by an increasing number of smaller ready-to-run manufacturers including DJ Models, Rapido Trains, Revolution Trains and Oxford Rail while retailers including Hatton’s of Liverpool, Kernow Model Rail Centre, Rails of Sheffield and The Model Centre have taken on production of exclusive products, further extending the range of products available.

Beyond ready-to-run there is an extensive array of kit manufacturers producing models in mediums including injection moulded plastic, resin, white metal and brass. Combined they offer something to suit every railway situation and suiting a range of skill levels from beginner to advanced.

However, it isn’t just rolling stock which keeps ‘OO’ gauge going. There are large ranges of ready made buildings from Bachmann Scenecraft and Hornby Skaledale while Oxford



Right: Narrow gauge modelling is set to take flight in ready-to-run with the arrival of new models from Bachmann, Heljan and Peco. However, until now it has been the preserve of kit and scratch building for an accurate scene. This is Charles Insley's Maesog modelling Welsh slate railway operations in 'OO'.

has introduced a new Oxford Structures section to its portfolio. There is also a huge diversity of kits available for buildings and structures while many overseas 'HO' scale buildings will look perfectly at home on a 'OO' gauge model railway too.

Figures, lineside details, road vehicles, lighting, signals, level crossings and every other accessory you can think of are available. A quick internet search or visit to your local model shop will soon present you with an extensive range of product choices - whether you are looking for a new locomotive or just a simple sign to finish off a station scene.

Track, a bone of contention as 16.5mm gauge track doesn't represent an accurate gauge for 4mm:1ft scale models, is readily available with a choice of code 100 and code 75 flat bottom rail and, more recently, the addition of bullhead rail track and points from Peco which are ready to lay. There are other track choices too with C&L Finescale, DCC Concepts and others producing scale sleeper 16.5mm gauge track.

So long as you can live with the track gauge compromise - and the vast majority accept this quite readily, 'OO' gauge is usually the first choice for a new modeller because it has so much support in both modelling communities and products. >>



MANUFACTURER LINKS

BRAND	SCALES	WEBSITE
Bachmann	'OO', 'N', 'OO9' and 'O'	www.bachmann.co.uk
Dapol	'OO', 'N' and 'O'	www.dapol.co.uk
Hornby	'OO'	www.hornby.com
Heljan	'OO', 'OO9' and 'O'	www.heljan.dk
Rapido Trains	'OO'	www.rapidouk.com
Revolution Trains	'N' and 'OO'	www.revolutiontrains.com
DJ Models	'OO', 'N' and 'O'	www.djmodels.co.uk
Oxford Rail	'OO'	www.oxfordrail.com
Peco/Ratio/Wills/Parkside Models	'OO', 'N', 'OO9' and 'O'	www.peco-uk.com
Little Loco Company	'O'	www.littleloco.co.uk
Minerva Model Railways	'O'	www.minervamodelrailways.co.uk
Hatton's of Liverpool	'OO' and 'O'	www.hattons.co.uk
Kernow Model Rail Centre	'OO'	www.kernowmodelrailcentre.com
Rails of Sheffield	'OO'	www.railsofsheffield.com
The Model Centre (TMC)	'OO'	www.themodelcentre.com

'OO' gauge is the most popular scale in British modelling - it has an incredible variety of locomotives and rolling stock as well as all manner of accessories. A Heljan 'Western' hydraulic stands in the stabling siding next to a roundhouse assembled from ready made Kernow Model Rail Centre buildings which house a Bachmann '57XX' 0-6-0PT, Collett '2251' 0-6-0, Hornby '2884' 2-8-0 and a Heljan 'Hymek' in the distance.





A Class 56 draws into West Riding Power Station on Hornby Magazine's 1980s set exhibition model built in 'N' gauge. The Dapol model is dwarfed by the Bachmann Scenecraft cooling towers, a scene which would be difficult to replicate in 'OO' gauge on space grounds.

'N' GAUGE

- **Track gauge:** 9mm
- **Scale:** 2mm:1ft
- **Association:** www.ngaugesociety.com

'N' gauge took off in the 1960s and offers a scale which requires a quarter of the space of 'OO' gauge and is modelled at 2mm:1ft scale. British outline rolling stock is made to 1:148 scale and runs on 9mm gauge track which is available in code 80 and code 55 rail profiles – the lower the number, the finer the rail.

The scale has great support from the N Gauge Society, established in 1967, and in the past decade has seen great advances in the standard of detail and performance that its models are capable of. Two manufacturers lead the charge in ready-to-run – Graham Farish as part of the Bachmann portfolio and Dapol. They are supported by Revolution Trains, DJ Models and Union Mills in production of out of the box locomotives and rolling stock and an increasing variety is being made available with regular new releases each year. The N Gauge Society has been prolific in supporting the scale, first with its own range of exclusive wagon kits but more recently in commissioning its own series of ready-to-run models through Dapol and Graham Farish.

Like 'OO' gauge there is an extensive range of suppliers for buildings, structures and detailing components while a number of manufacturers also develop kits in a variety of materials to allow more unusual items of rolling stock to be built.

What was once the underdog is now a viable alternative to 'OO' gauge for the space-restricted modeller. For example, a main line scene with scale length trains can, with some compromises, be built in as little as 6ft x 2ft while if you have more space the grandeur of a railway in the landscape is perfectly possible without the need to buy a barn. There are a great number of high profile 'N' gauge exhibition layouts on the circuit and this scale is well worth investigating as it continues to develop.

'O' GAUGE

- **Track gauge:** 32mm
- **Scale:** 7mm:1ft
- **Association:** www.gauge0guild.com

'O' gauge has been around since the earliest days of clockwork model railways, but in the past five years it has begun making great strides in ready-to-run. This began in 2005 when Heljan released its first ready-to-run locomotive for the scale – the Class 35 'Hymek' – and since then an impressive number of ready-to-run diesel locomotives together with carriages and wagons have been released too.

However, it is the introduction to 'O' gauge of Dapol, Minerva Model Railways and the Little Loco Company in the past few years which have really set the wheels in motion for the growth in the scale's popularity with ready-to-run modellers. Products have become readily available and at prices which more can afford. Plus we have also seen the likes of Hatton's commissioning its own products in the form of the 'Warwell' bogie wagon and, through Heljan, the Gresley 'A3' and 'A4' 4-6-2s.

The scale continues to have tremendous support from kit manufacturers with a number of lineside building and structures becoming available as laser cut wood kits. Detail is key in 7mm scale and again there is a wide range of suppliers producing everything from nameplates to transfers, lineside details, track, buildings, road vehicles and more.

Peco produces a range of ready made track and points with code 124 bullhead rail and

this now includes curves for second radius set track making a simple circuit an easier prospect than before. Flexible track is sold in yard lengths, as per 'OO' and 'N', and consists of a plastic sleeper web with bullhead fed into it which can be shaped into gentle curves or used for straights.

The only downside of 'O' gauge is the amount of space required for a layout. Compact shunting layouts can be built in 8ft or less, but a basic circuit of Peco second radius track will require at least 9ft x 9ft to allow it to be joined together. *Hornby Magazine's* double track 'O' gauge test track occupies 16ft x 10ft and includes a reasonable space to host a five coach train behind a locomotive with compromises in the curve radius.

Still, there is something really quite special about 'O' gauge and its imposing locomotives and rolling stock and, as the range of products continues to increase, it becomes ever more enticing and popular.

'O' gauge is gaining ground at present with the regular release and announcement of new locomotives, carriages and wagons – the only downside is it needs more space than any of the other scales discussed here. A Heljan Class 37/0, modified, repainted and detailed, arrives at Wick End – an 18ft long Scottish Region terminus built by Chris and Dave Warner.



TABLE 1 – POPULAR SCALES AND GAUGES

NAME	SCALE	RATIO	TRACK GAUGE	OUTLINE	ASSOCIATION	NOTES
'OO'	4mm:1ft	1:76	16.5mm	British	www.doubleogauge.com	Standard gauge
'EM'	4mm:1ft	1:76	18.2mm	British	www.emgs.org	Standard gauge
'P4'	4mm:1ft	1:76	18.83mm	British	www.scalefour.org	Standard gauge
'OO9'/'HOe'	4mm:1ft	1:76	9mm	British and overseas	www.009society.com	Narrow gauge
'N'	2mm:1ft	1:148	9mm	British and overseas	www.ngaugesociety.com	Standard gauge
2mm FS	2mm:1ft	1:148	9.42mm	British	www.2mm.org.uk	Standard gauge
'O'	7mm:1ft	1:43.5	32mm	British and overseas	www.gauge0guild.com	Standard gauge
Scale 7	7mm:1ft	1:43.5	33mm	British	www.scaleseven.org.uk	Standard gauge
O-16.5	7mm:1ft	1:43.5	16.5mm	British	www.7mmnga.org.uk	Narrow gauge
'HO'	3.5mm:1ft	1:87	16.5mm	Overseas/British	www.british-ho.com	Standard gauge
'TT'	3mm:1ft	1:102	12mm	Overseas/British	www.3smr.co.uk	Standard gauge
Gauge 1	10mm:1ft	1:32	44.45mm	British	www.g1mra.com	Standard gauge

'OO9' GAUGE

- **Track gauge:** 9mm
- **Scale:** 4mm:1ft
- **Association:** www.009society.com

'OO9' isn't new to British outline modelling, but it is in the world of ready-to-run products. It started with Peco's development of ready-to-run carriages and wagons for the scale alongside Heljan's announcement of the Lynton & Barnstaple Railway Manning Wardle 2-6-2Ts for the scale – the latter being expected in the shops during 2018.

Now Bachmann has joined the scale too with its first releases comprising a Baldwin 4-6-0T, bogie box and open wagons in early 2018

which are set to be joined by models of the Quarry Hunslet 0-4-0ST, slate wagons, Ashover Light Railway carriage and more.

Narrow gauge modelling to 'OO9' standards has always been popular in the UK, partly for its ability to fit into compact spaces. However, modellers had to rely on kits and overseas models to develop the rolling stock side of a layout. Happily, being modelled to 4mm:1ft scale, all the accessories available for 'OO' gauge including buildings, road vehicles, people, animals and lineside fixtures are all well suited to a narrow gauge scene in 'OO9'.

As things stand 'OO9' looks set for a big boost with the arrival of the new locomotives from Bachmann and Heljan while these are already

supported by an extensive range of narrow gauge track products from Peco. Plus, if you look a little further, Roco and Minitrains – available through Gaugemaster – produce collections of overseas prototype rolling stock, much of which can be used on British outline narrow gauge layouts too. The Bachmann Scenecraft range includes a collection of ready made resin buildings which take inspiration from the Lynton & Barnstaple Railway and there are sure to be more in the future. It's all making 'OO9' much more available to the masses.

As they say, the choice is yours and, as we will explain in the following pages, choosing the scale is just one step towards building your dream model railway. ■



Designing *a model railway*

Designing your layout requires more than simply building the baseboards and adding track.

MARK CHIVERS explains the process from choosing a scale and era through to finding a location to build your dream railway.

DECISIONS, decisions, decisions. You will quickly come to realise that before you can lay a single piece of track that you need to give much thought to a combination of factors such as the type of layout you'd like to build, the era, scale, size of baseboards and where to house it.

Layouts can be designed in all manner of shapes and sizes from simple continuous loops to figure-of-eight and multiple loop combinations, as well as end-to-end station and yard schemes in straight, 'L' shaped or 'U' shaped configurations. Will it be a simple out and back scheme or perhaps a through station with storage yard to storage yard operation? Factor in multiple-level layout designs and before you know it you are going to need quite a large space to house the finished article. If space is a major issue, you could consider a micro-layout, small shunting plank or depot scheme to fill a corner.

Scale

As already established in this guide, there are plenty of scale options to choose from when considering your layout design with 'N', 'OO9', 'OO' and 'O' gauges amongst the most popular. An 'O' gauge layout will require considerably more space than its 'N' gauge equivalent, and the smaller scale will allow more scope for adding extra trackwork, buildings and features, which is ideal if you have limited space in which to house your new creation. However, it is also worth considering the 'less is more' mantra too, in which case 'O' gauge may be just the ticket for your modelling skills, by taking a less extensive, but more detailed, approach.

Interest in 'O' gauge modelling has been steadily on the rise, due in part to the availability of ready-to-run locomotives and rolling stock from the likes of Heljan, Dapol, Little Loco Company and Minerva Models together with a supporting cast of kits and growing selection of accessories and ready-built structures.

'OO' gauge, as outlined in our guide to scales and gauges, is by far the most popular and traditional choice, with a seemingly endless supply of products and scenic accessories, which also helps when it comes to decision making. 'OO9' modelling may also offer an interesting alternative, given recent ready-to-run introductions from Bachmann, Heljan and Peco.

Some quite involved designs could be developed in a small space in this scale.

Era

Next, you will need to think about the period you wish to model. Some of the major manufacturers including Bachmann and Hornby use an era system to define specific periods of railway history which incorporates pre-grouping, the Big Four era, British Railways (early and late periods), BR pre-TOPs, BRTOPs, BR sectorisation, privatisation and the contemporary scene. Each era is defined by years, with overlap between periods, where appropriate. This system really comes into its own when choosing appropriate rolling stock for motive power, enabling matching passenger and goods trains to be assembled easily. 'OO' and 'N' gauges are certainly well represented in terms of available motive power and rolling stock through the eras, together with extensive ranges of accessories and ready-to-plant cast resin buildings and laser-cut kits to help populate a layout. Selecting an era is really a personal choice. We all have our own preferences – multiples in some cases – but often layout design is swayed by memories of the past or recent adventures on the real railway. This will also be affected by the area of the country you want to model – Scottish Highlands are very different in their terrain to the Southern Region of BR, but even within regions the terrain and railway style have great variety.

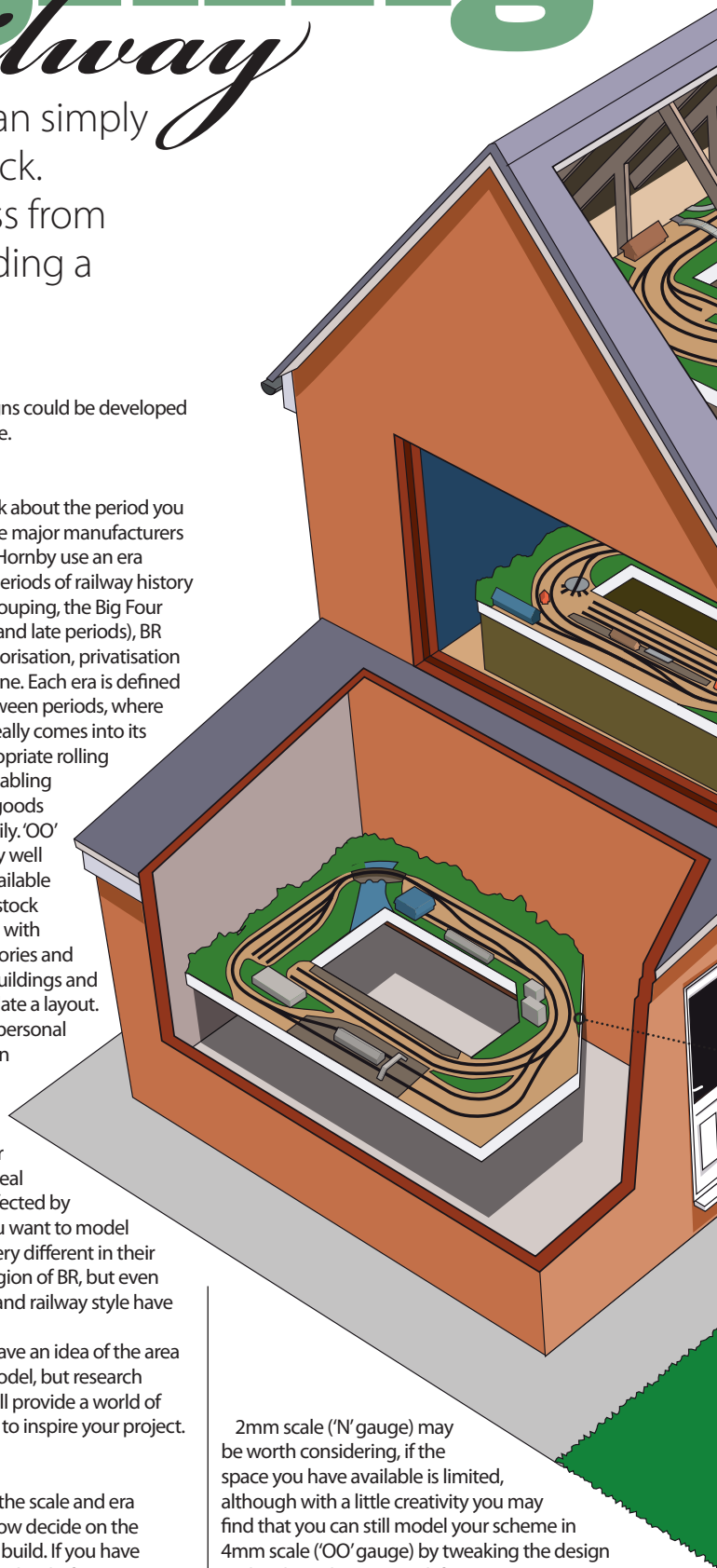
Chances are you already have an idea of the area and period you want to model, but research through pictorial books will provide a world of photographic information to inspire your project.

Format

Once you have agreed on the scale and era to be modelled, you can now decide on the type of layout you'd like to build. If you have grand designs on a large multi-platform station arrangement, with a locomotive depot, carriage sidings, goods yard and a series of fast and slow continuous loop lines, clearly you will need plenty of space to allow your scheme to breathe.

2mm scale ('N' gauge) may be worth considering, if the space you have available is limited, although with a little creativity you may find that you can still model your scheme in 4mm scale ('OO' gauge) by tweaking the design and making the area work for you.

If a large continuous loop layout is not possible, you may wish to consider an 'L' shaped end-to-end scheme that runs along two walls, or 'U' shape design across three walls. These styles of »





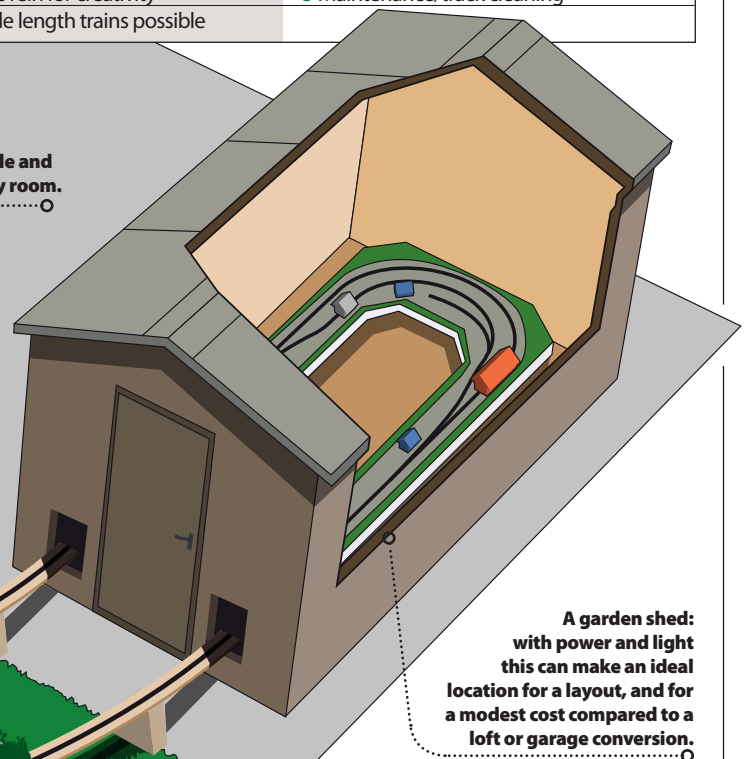
LOFT	
PROS	CONS
● Large dedicated layout space	● Subject to temperature variations
● Secure area	● Limited standing room and access
● Out of normal view	● Costly conversion
● Workbench area	● Building regulations

SPARE ROOM	
PROS	CONS
● Dedicated room	● Limited space/shape of room
● Temperature controlled	● Could be reclaimed for family use in future
● Secure storage	
● Power and lighting	

GARDEN SHED/OUTBUILDING	
PROS	CONS
● Dedicated hobby space	● Potential damp conditions
● Workshop area	● Building costs/lining out
● Ample storage space	● Planning permission, depending on building size
● Conveniently located	● Temperature control/heating
● Bespoke space to suit needs	● Power and lighting required

GARAGE	
PROS	CONS
● Large covered space	● Can get dusty, cold and damp
● Workshop area	● Not always level
● Huge potential	● Security
● Substantial airy structure	● Shared environment with car

GARDEN RAILWAY	
PROS	CONS
● Large open space	● Seasonal
● Relaxing environment	● Inclement weather
● Will blend in amongst garden flora	● Debris clearance
● Free rein for creativity	● Maintenance/track cleaning
● Scale length trains possible	



Garden railway: a great way to spend the summer, but not so good in winter.

layout can still be exciting and engaging if you factor in plenty of operational interest. You might opt for a large terminus station and goods yard at one end, while incorporating a small industrial concern at the other, or even a smaller station halt together with some off-scene storage. Perhaps a traditional country branch line terminus scene may be more in keeping with the space available. Alternatively, you may opt to model a busy locomotive depot or freight yard, with a constant stream of traffic fed from the off-scene storage area.

This design stage is the time to unleash your imagination. Equally, a small micro-layout with enough space to shunt a few wagons in a yard may suffice or even provide a test bed to learn new skills in track laying, electrics and scenic development. With the latter you could develop a shunting sequence to help keep the layout exciting to operate.

Location

You may already have noticed a common thread – space. Where do you house your new layout? Once you have an indicator of the size and scale of your layout, you can then assess the options in terms of where to build it. A spare room within the house is often preferable, as it provides a secure and temperature-controlled environment to work on and store your layout, as well as the motive power, rolling stock, buildings and accessories. It is also often the most cost-effective option, with fewer associated startup costs.

In an ideal world, the room would be a straightforward box-shape enabling you to build the layout using uniform-sized baseboards around the edge. However, in the real world, this isn't always the case as wardrobes, alcoves, doorways and more, seemingly conspire to make the job that little bit more difficult.

In a spare room an 'L' or 'U' shaped layout can be built around the walls where it is perfectly possible to recreate realistic branch line operations in 'OO' gauge. This is Axe Regis, a 7ft 6in x 2ft Southern Region branch line terminus created by the Hornby Magazine team. Mike Wild/Hornby Magazine team.



It could be that you don't have a room spare, but there may be space in a bedroom or living space for an 'L' shaped or 'U' shaped layout along the walls, perhaps located above chests of drawers or cupboards, making good use of the available space.

Another alternative within the house is to be a form of portable layout which can be stored when not in use and assembled promptly when required. Typically a railway of this nature

would either be on a single board, such as a traditional 6ft x 4ft train set style, or on a small group of smaller boards which can be accessed and bolted together quickly and simply. As you will see on pages 24-27 there are now laser cut baseboard options which take all the hassle out of building boards. With alignment dowels assembly of a pair of baseboards can be as quick as a few minutes. It's all in the planning and design.



Lofty ideas

An alternative is the loft area, which could be ideal for housing a layout, although it may require a considerable amount of conversion work before it is suitable to use. Given this space houses beams that are fundamental to the structural integrity of your house, you should always seek professional advice before embarking on any work or conversion of the loft area.

Not all lofts are suitable, but if the space can be professionally converted it will transform the area and open up a useable space in which to house a layout. This area of space would enable a large scheme to be built with all manner of features included too, such as extra loops, hidden storage areas, tunnels, multiple stations, depots, goods yards, scenic vistas and more. You may even find a workbench could also be accommodated.

Whilst a professional conversion should include it, bear in mind that the loft will require insulating and lining to mitigate against extremes of temperature, while floorboards will need installing between the joists as well as extra timbers to support the roof, electrics and lighting too. It is also important to make sure you can stand upright whilst constructing and operating the layout, otherwise you may find it becomes a chore every time you head to the loft. Access, too, can be problematic, as it is often via a ladder, unless you can incorporate this into the overall conversion project.

Garage solution

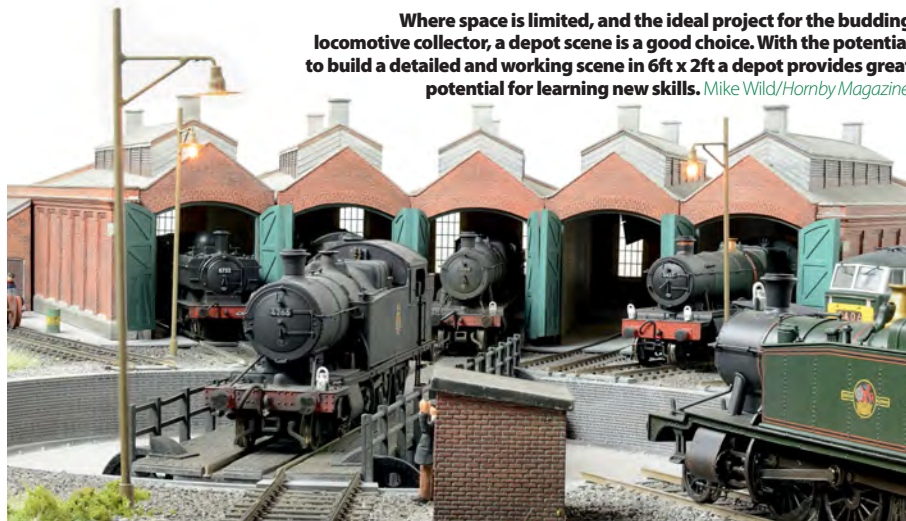
If indoors is a problem, the garage offers a sheltered outdoor alternative. It may be part of the house with direct access or separate with an access door in addition to the usual large opening door/doors. Typically, single garages can measure anywhere between 16ft x 8ft to 20ft x 10ft while a double garage may offer up to a 20ft x 20ft space – each scenario ideal for hosting a model railway layout. What's more, they are usually effectively rectangular boxes, which certainly helps when it comes to baseboard construction and mounting.

Often, modern garages feature a power supply and light socket, which is a bonus – although these may need upgrading, while older structures may require the attention of a professional electrician before you can get things up and running. However, once you have the space available, you can build an impressive model railway in the space available.



The loft space of a home can make a brilliant space for a model railway, but it takes time and investment requiring professional work to bring it up to a standard where it can be used as additional space. This is Andrew Armitage's stunning 'N' gauge West Coast Main Line layout based on Watford Junction. It shows the true potential of loft spaces and 'N' gauge modelling. Trevor Jones/Hornby Magazine.

Where space is limited, and the ideal project for the budding locomotive collector, a depot scene is a good choice. With the potential to build a detailed and working scene in 6ft x 2ft a depot provides great potential for learning new skills. Mike Wild/Hornby Magazine.



If you still require the garage for its original purpose, the layout could be attached to a pulley system to allow it to be stored out of the way while a car is parked within. Of course, not all layouts need to be large, and a smaller scheme might be accommodated at one end of the garage, clear of the car. Whilst the garage may feature a modicum of lining in the roof space, it will still be subject to extremes of temperature and possibly damp conditions, so would no doubt benefit from some insulation/lining and a heat source to keep you warm whilst operating the layout through the autumn and winter. You may also wish to add draught excluders to the large garage doors.

Outdoor options

Alternative outdoor solutions include off-the-shelf or bespoke wooden/metal garden sheds and perhaps even brick buildings designed specifically for your model railway requirements. Whilst the former may be available ready-to-build, the latter will usually require professional design work and, if above a certain size, planning permission may be required.

Sheds and outdoor buildings in general offer an ideal environment for building layouts and pursuing the hobby, with workshop/workbench space as well. Clearly, there are costs associated with having a bespoke building, ranging from levelling of the ground in preparation for the structure, through to electrics and heating arrangements within the finished building, but the resulting hobby space will be worth it.

Given the UK weather patterns, it is advisable to insulate and line the shed interior and source adequate heating to maintain a consistent temperature that will protect the layout and associated stock from potentially damp or extreme conditions. Security could also be an issue, so it is worth considering your options such as window bars, a heavy-duty lock and alarm system.

Staying outdoors, you could also develop a garden layout. Suited to 'OO' gauge applications and above, rails can be incorporated within the »

ERA SYSTEM		
ERA	DESCRIPTION	YEARS
1	Pioneering	1804-1869
2	Pre-Grouping	1870-1922
3	Grouping	1923-1947
4	Early British Railways	1948-1956
5	Late British Railways	1957-1968
6	British Rail pre-TOPS	1957-1971
7	British Rail TOPS	1971-1986
8	BR Sectorisation	1982-1997
9	Privatisation	1996-2008
10	Network Franchising	2006-2017
11	Present Day	2014-on

The garden holds great potential for a model railway, especially where space is available for a shed building. Installing a shed requires ground to be levelled, a concrete or slab base and assembly of the building including insulation, power and lighting. The results speak for themselves in Philip Goodwin's Acol Pier (HM118) which uses the full length of the shed together with an additional outside running line for the return curve. Trevor Jones/Hornby Magazine.



general layout of the garden running along specially built track bases amongst flower beds, plants, water features, rockeries and more. What better way to relax and watch your trains run by?

While care will be needed in wiring the layout track sections and any accessories, the outcome will reap benefits especially with scale-length train formations possible, thanks to the extra space an outdoor layout affords. Tunnels and bridges can be developed using suitable outdoor materials, while off-the-shelf resin cast models, such as those in Bachmann's Scenecraft and Hornby's Skaledale ranges, could be utilised. These are remarkably resilient outdoors, especially when treated with a sealing varnish over the factory paint finish.

You could also combine an outdoor layout with a shed, which would also offer somewhere to store the stock when not in use. The shed could house the main station complex and depots, while the garden layout hosts a few smaller calling points and yards along the way.

Garden layouts are, by their nature, seasonal and do require a high degree of maintenance ahead of any running sessions, due to the weather, plant detritus and animal/insect activity.

Track will need a rigorous cleaning regime to ensure electrical continuity, while any tunnels and bridges will require clearance of any obstructions before trains can run. It will also be necessary to ensure all track connections are still as they should be, especially on warm days when the sun can cause expansion issues. Also, consider carefully the track you are planning to use outdoors – the more delicate it is, the more chance there is of it distorting in direct sunlight or extreme cold.

A sizeable question

Having identified potential locations for your layout, the next task is to decide on the overall dimensions of your layout and whether it is to be a permanent or mobile structure. Are you planning to build it in place and leave it there, or will it be easily dismantled? Can it fill a whole room permanently, or does it need space around the edges? These factors will determine how the layout is secured and stored within a room.

Baseboard size is important, particularly if there's a chance you may need to transport it



A garage can be a very useable space for a model railway, but sometimes a railway might have to share space with a car. Garages can be cold in winter and it is well worth investing in good quality lighting as well as painting the walls white to provide a clean and comfortable environment. Heating will be necessary in winter too, but the upshot is that a garage provides a sizeable space for a main line model railway ranging from 16ft x 8ft for a single through to 20ft x 20ft for a double. This is Hornby Magazine's Topley Dale which now measures 16ft x 10ft with the 'O' gauge test track below.

Mike Wild/Hornby Magazine.



Where space is at a premium in the home a compact shunting layout can provide the solution. With careful track planning an interesting layout can be built with plenty of operational potential. This is Paul Marshall-Potter's Shelfie which measures just over 4ft x 1ft for the scenic area with an additional 2ft long off scene storage plank. *Mike Wild/Hornby Magazine.*

in the future. You may decide on conventional 4ft x 2ft boards amalgamated to create an 8ft x 4ft layout space in the centre of the room or perhaps utilise each individual board along one wall, or around the entire room – there are many permutations and the choice is yours. Boards over 4ft long can be cumbersome when moving or transporting them, while equally any board over 3ft wide will also prove difficult to reach across in a permanent layout situation.

At this design stage, also think about the additional features you may wish to incorporate. Will all track be on plain baseboards, or are you intending to add scenic structures such as viaducts or bridges or multi-level scenery? If so, you may need to build some open baseboards, which allows you to add extra visual interest to the overall design.

For something a little more involved, you may wish to include a multi-level baseboard design, with the upper board appearing fully scenic, while the lower example may feature storage lines and plain track, with a helix track formation at each end to enable trains to rise and fall to the relevant baseboards.



If you intend to include gradients, ideally these should not exceed 1-in-30, so that trains maintain traction, and even then restrictions for the load may be necessary. There are products available to help with gradients including DCC Concepts' Powerbase range of metal baseplates and neo magnets. The baseplates sit beneath the track sleepers and the magnets are fixed to the base of the locomotives, which helps improve adhesion.

Storage options

Remember to design in your storage requirements, whether as part of the overall scenic section, or a separate 'off-scene' area. You may wish to incorporate them into your continuous loop scheme at strategic locations with carriage sidings, goods yards and locomotive depots. They could be sandwiched 'off-scene' between two tunnel sections, for example, or as a separate series of dead-end sidings. If you are planning an end-to-end scenario, you may wish to include a storage yard board at one or both ends.

These storage yards also provide your trains with added purpose in our virtual model railway reality, as they offer an origin and destination

point to/from the perceived rail network. Each of these storage boards can be as simple as a fan of sidings fed by a series of turnouts, such as a three-way point, for example, or maybe a rotating sector plate that swivels to allow trains to be selected and stored without the need for any points. In addition, this style of storage board can be further developed to rotate so that any locomotive hauled trains can be turned for their return journey, if space allows.

One thing to bear in mind if you opt for this latter design of storage yard - you will need to consider the overhang of the board itself, as it rotates. This could be a good use for an alcove area in a room. Alternatively, you could opt for a sliding traverser style of storage yard, where the board features a series of plain storage lines and can be slid into position via a set of below board runners to select each track.

Whilst a permanent layout isn't necessarily constrained by convention when track laying and wiring, it is worth considering placement of track across baseboard joins, particularly turnouts, so the layout can be dismantled easily should it be necessary in the future. Turnouts should be kept

away from baseboard joins and strengthening battens, where possible, to aid installation of point motors below the baseboard. Also, remember to allow for access to your layout. If your scheme is designed to run in a circle along four walls of a room, for example, don't forget to leave space for any doors that open into the room or shed, and perhaps incorporate a lift-out or hinged section which will allow you to enter and exit the hobby room without having to bend down, otherwise it will quickly become a chore and also difficult to manoeuvre objects/furniture/boxes.

So, with all these factors considered, we can progress to drawing up a plan... ■

USEFUL LINKS

- www.bachmann.co.uk
- www.dapol.co.uk
- www.dccconcepts.com
- www.heljan.dk
- www.hornby.com
- www.littleloco.co.uk
- www.minervamodelrailways.co.uk
- www.peco-uk.com

DIY BASE

made simple



Building your own baseboards can be a straightforward process with the right method and materials. **MIKE WILD** explains how standard baseboards can be built using timber from your local DIY store.

BASEBOARD CONSTRUCTION is a subject which many approach with trepidation, but if you have basic wood working skills – the ability to use a saw and an electric screwdriver – making your own boards is well within reach.

Getting this part of a model railway build right is important. A firm, stable and level board will make all the following stages of layout construction straightforward and will contribute greatly to a smooth running railway capable of being used to its best.

When it comes to building baseboards there are several options both in how to build them and what to build them from. For starters there are three primary choices: build your own, buy kits or have boards built for you. In this guide we'll be exploring all three options starting with the DIY board. Next comes materials. Each has its own positives and negatives but in most cases board tops are made from either plywood or MDF while framing can either be planed softwood or plywood strips with softwood blocks between.

There are also different styles of baseboard to consider including solid top and open frame. Solid top boards give a level surface across the length and width and are ideal for building up the scenery above the level of the railway. However, it does preclude adding scenery below the level of the railway whereas an

WHAT WE USED
● 9mm plywood
● 18mm x 69mm planed softwood
● 4.0 x 30mm twin thread wood screws
● No More Nails type adhesive

open frame design will allow the trackbed to be set above the level of the baseboard frame allowing scenery to rise and fall more naturally above and below the line. We wouldn't recommend an open frame design for a first DIY baseboard project unless you are proficient with timberwork, so here we are going to focus on a simple solid top design to explain the principals.

Hornby Magazine uses a standard construction method for all its baseboards, many of which have seen years of service on exhibition layouts as well as on our test track. These layouts are all portable which means building baseboards in manageable sizes, but the methods we are going to illustrate here can easily be transposed to baseboards of any size with a few modifications. If you plan on creating boards wider than 2ft then extra lengthways supports will be needed to keep the baseboard surface flat and true.

The main ingredients for our boards are 9mm plywood, 18mm x 69mm softwood and 4.0 x 30mm wood screws. All these items are readily available from DIY stores and we highly recommend visiting a store which can cut 8ft x

4ft (2,440mm x 1,220mm) sheets, as this is the most cost-effective way of buying sheet materials.

For this guide we are assembling the first of six new baseboards to expand our office test track Topley Dale. Three are the same size, 4ft x 2ft, while two further boards will measure 3ft 8in in length, 4ft wide at one end and 2ft wide at the other. The final component is a made to measure board 2ft x 2ft to join the end boards together. Only basic tools are required for the job consisting of a saw, electric screwdriver (a very worthy investment for layout construction), pencil, tape measure and tri-square. You will also need either sandpaper or an electric sander to clean up the cuts.

The golden rule of woodwork is "measure twice, cut once" and using this will keep you out of the worst risk of timber work which is cutting the material short – you can trim over-length timber but not extend under-length cuts!

With baseboard construction it is generally recommended that boards are glued and screwed together, as we are illustrating here. You can use PVA wood glue or a No More Nails adhesive. Both will provide a strong and longstanding joint between the plywood surface and its frame.

So, if you haven't made your own baseboard before, take a look at this guide. You will be surprised how simple it can be. ■

BOARDS

TOOLS

- » Hand saw
- » Electric screwdriver
- » Pencil
- » Tape measure
- » Tri-square
- » 3mm drill bit
- » Sandpaper or electric sander

The expansion of Topley Dale begins with the addition of six new baseboards to extend the layout's length and operational potential. Here a Stanier '8F' 2-8-0 poses next to the trial positioned bridge on one of the new boards. The storage yard boards at the rear have been painted grey to seal the surface and the scenic boards will have the same treatment before work begins.



STEP BY STEP DIY BASEBOARDS MADE SIMPLE



The raw ingredients for a simple 4ft x 2ft (1,220mm x 610mm) baseboard: a pack of 18mm x 69mm planed softwood in 2,440mm lengths and a cut to size piece of 9mm plywood.



The top surface for all of *Hornby Magazine's* exhibition layouts is 9mm plywood – and it has been since our second magazine project. The first was built on 6mm plywood which, while lighter, wasn't as strong.



Begin by checking the measurements of the baseboard top – just because the DIY store said it was the size you wanted doesn't mean it will be exact on all four sides. In this case the length was identical on both sides at 1,220mm (4ft).



Repeating the process for the width showed that the panel was slightly wider than we had expected. This isn't a problem for this project, but it does mean we need to accommodate this in the cross-members underneath the board.



Having confirmed the baseboard top size, we can prepare the timber for the frame. To mark the lengths, use a tri-square and a tape measure for accurate measurements. We set out measurements for the long sides at 1,220mm.



Mark the cut position with a pencil using the tri-square then, for future reference, note the length of the cut section on the timber. This helps to ensure the right sections are used for the right area of the board frame.



We can now move to cut the long sides using a handsaw. If you are confident with cutting timber you can do it freehand as here or alternatively use a mitre box to ensure a consistent 90 degree angle in each cut.



Using the same process the cross-member timbers were cut to size, 576mm, to fit between the outer frame members leading to a 'kit' of components to assemble.



Laying the framework out dry means we can check that everything will fit together as planned. This is how the baseboard will look from underneath. Once complete it will be turned over to reveal its smooth and level plywood surface.



To ensure a strong and consistent joint between the baseboard frame and the plywood surface, No More Nails type adhesive was added to the top edge of each frame member. The baseboard surface was then lowered on top of this.



Having positioned the first long side timber under the baseboard top, it was then screwed in place with 4.0 x 30mm twin thread wood screws as well as the adhesive.



12 Turning the baseboard over again we can now see the two main frame members in place. The next step is to fit the cross-members which will give the surface full support.



With the same adhesive applied to its upper edge and ends, the first cross-member is inserted into position and then screwed in place at the corners through the plywood.



We then need to set the positions of the middle two cross members. We standardise on 16in from the outer edge for each of these as we know we can get a drill between the frame should further holes for electrical wiring be needed. Use a tri-square and tape measure for accurate alignment and mark the positions with a pencil.



15 The cross-members can then be put in place using adhesive and screws through the outside face of the main timber using the pencil marks as a guide.



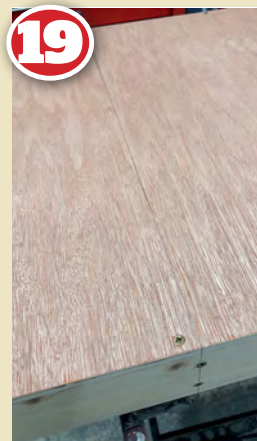
To hold the cross-members in place, add a pair of 4.0 x 30mm wood screws on a pencil mark drawn from the original using a tri-square. We will use this pencil mark again when it comes to screwing the top down onto the cross members.



17 To secure the end timbers in place without splitting the wood, drill a pilot hole first with a 3mm drill bit.



18 4.0 x 30mm twin thread wood screws can then be driven in to hold the sides and ends together firmly.



Next, using the pencil marks for the cross-members, add a line across the width of the baseboard to denote the position of the cross-member below. Wood screws can then be driven in on this line to screw the baseboard surface to the softwood timber below.



Finish off by adding further screws to the end timbers from above and you have finished your first baseboard. While this board measures 1,220mm x 610mm, the same methods can be used for larger or smaller baseboards, but bear in mind that for a wider board an additional brace will be needed in line with the long sides between the cross-members and the outer ends.



To join baseboards together we use M6 bolts, 30mm M6 washers and M6 wing nuts. Drill two 7mm diameter holes through the end timbers first to create an opening for the bolts to slot through.



Finally insert the bolts with a washer on each side and tighten up with the wing nut ensuring that the baseboard surfaces are aligned above.



TRADITIONAL BASEBOARD assembly calls for a number of tools and, most importantly, an ability to accurately measure and cut timbers. Not everyone feels able to build their own baseboards, as cutting straight edges with a hand or power saw isn't always as simple as we would like.

There is a growing number of options to take the hard work out of building baseboards with a number of kits coming to market which do all the complex measuring and marking for you. Baseboard kits aren't new, but laser cut designs are becoming increasingly popular. Here we are building one of Tim Horn's laser cut plywood baseboard kits for a 5ft x 1ft board.

Tim's range of baseboard kits includes photographic modules, boards with pelmets, a range of sizes and a choice of MDF or plywood finish. Multiple packs are also available and time spent browsing his online catalogue is well worthwhile.

Like flatpack furniture, all the parts arrive neatly packaged in a sturdy cardboard box. Inspection reveals that everything is cut straight and true – better than we ever could with a handsaw – while the actual parts are cut from 6mm plywood offering a strong and light baseboard which would be difficult to make to the standard and rigidity from scratch.

Instructions are available online at www.timhorn.co.uk but most of the process is quite intuitive. You get two sides, four centre cross-braces, two outer and two inner ends, diagonal cross-braces, a top, side covers and packs

of screws, bolts and dowels to complete the boards.

We can't emphasise enough here the accuracy of the cut on the parts – everything is precise showing the primary advantage of laser cutting. The parts are all annotated for their inner faces as the cuts are angled for a tight fit so it is important to get the parts the right way round.

So what do you need to assemble one of these boards? Nothing more than PVA wood glue, a screwdriver and a hammer. That's it. Everything else is done for you, so we will let the step by step guide do the talking... ■

Laser cut BASEBOARD

TOOLS

- » PVA wood glue
- » Screwdriver
- » Hammer

THE ALTERNATIVES

If the thought of building a baseboard still brings you out in cold sweats, don't worry, there are more options available. A number of manufacturers exist that will build baseboards for you including standard designs as well as bespoke products. Take a look at the following websites for inspiration and advice:

B&R Model Railways	www.bandmodelrailways.co.uk
Digitrains	www.digitrains.co.uk
Elite Baseboards	www.elitebaseboards.co.uk
Model Layout Services	www.modellayoutservices.co.uk
Model Rail Baseboards	www.modelrailbaseboards.com
Model Railway Baseboards	www.model-railway-baseboards.co.uk
Model Railway Solutions	www.modelrailwaysolutions.co.uk
Modula Layouts	www.modulalayouts.co.uk
Platform 3 Models	www.platform3models.co.uk
Scale Model Scenery	www.scalemodels scenery.co.uk
The Goods Yard	www.thegoodsyards.co.uk
White Rose Model Works	www.whiterosemodelworks.co.uk

WHAT WE USED

PRODUCT	SUPPLIER	PRICE
5ft x 1ft birch plywood laser cut baseboard kit	www.timhorn.co.uk	£55.00

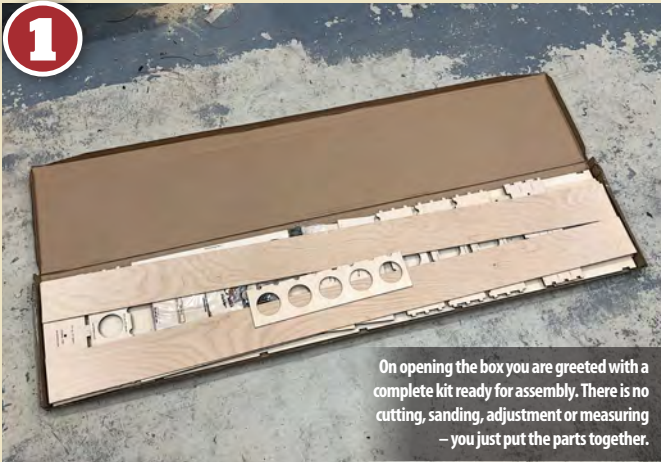
Laser cut baseboards take the hassle out of building your own boards. Assembling this Tim Horn kit took under 30 minutes from start to finish with a little extra time needed for the glue to cure thoroughly following construction. It is now ready to become the basis for a new project layout.

BASEBOARDS

The use of laser cut timber is increasing in popularity in model railways as its precision alignment makes assembly as simple as possible. **MIKE WILD** builds a Tim Horn laser cut baseboard kit and discovers just how easy it is.

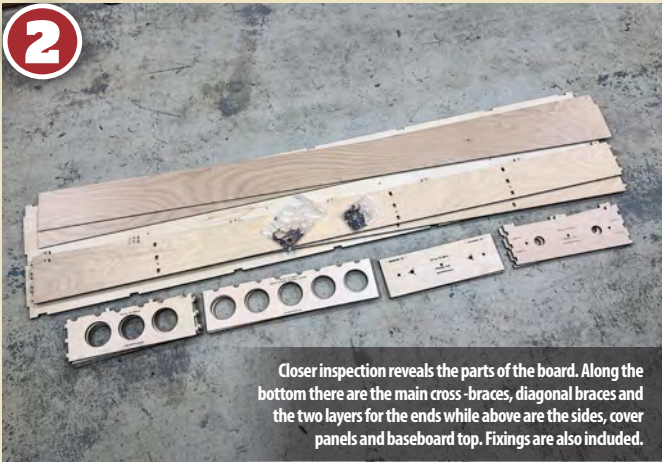
STEP BY STEP ASSEMBLING A LASER CUT BASEBOARD

1



On opening the box you are greeted with a complete kit ready for assembly. There is no cutting, sanding, adjustment or measuring – you just put the parts together.

2



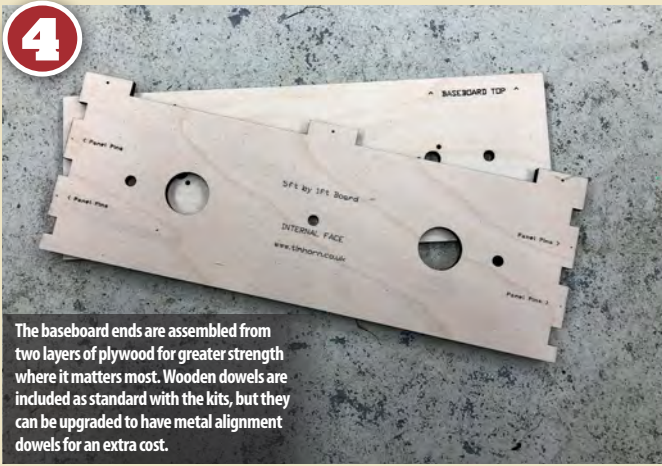
Closer inspection reveals the parts of the board. Along the bottom there are the main cross-braces, diagonal braces and the two layers for the ends while above are the sides, cover panels and baseboard top. Fixings are also included.

3



This kit is made from 6mm plywood, but it is also available in Medium Density Fibreboard for a lower price. All of the cross-braces are pre-cut to accommodate wiring at the top through the half-round cuts as well as having large open circles cut in the cross-braces for wiring to pass through.

4



The baseboard ends are assembled from two layers of plywood for greater strength where it matters most. Wooden dowels are included as standard with the kits, but they can be upgraded to have metal alignment dowels for an extra cost.

5



The kit parts are designed to slot together, but it is important to ensure that the parts are fitted with the internal faces (marked on each piece) facing the right way for the best fit. All screw holes are countersunk and where nails are required alignment holes are pre-drilled too.

6



Assembly starts with the cross-braces. Run a bead of PVA glue along the top edge and position the tabs into the slots on the underside of the baseboard surface. Repeat for the other cross-braces, working from the centre outwards then join one of the side panels to them.

7

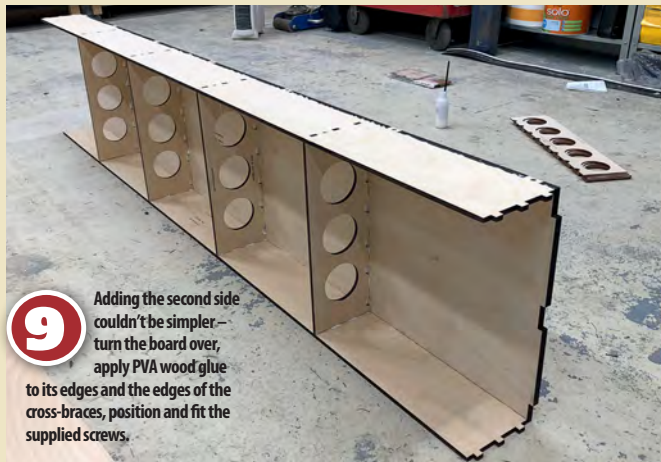


To ensure consistent joints, a single screw goes through the baseboard side panel into the cross-brace. This is pre-drilled and countersunk, as can be seen by the joining point to the baseboard top.

8



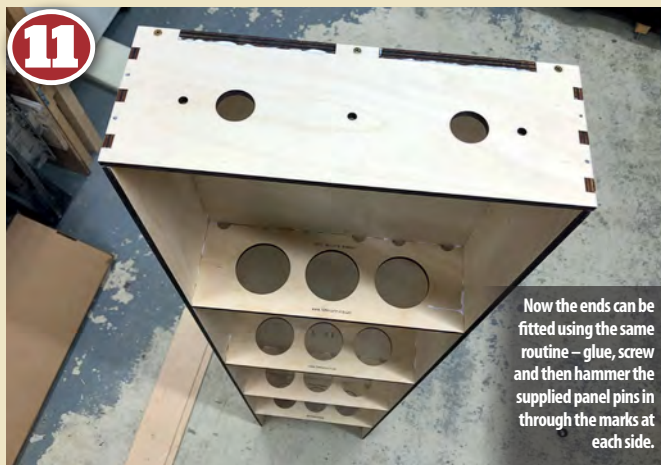
After a few minutes of assembly you will end up with all the cross-braces in position and joined to one of the sides. Put in all the screws and you are ready to proceed to the other side.



9 Adding the second side couldn't be simpler – turn the board over, apply PVA wood glue to its edges and the edges of the cross-braces, position and fit the supplied screws.



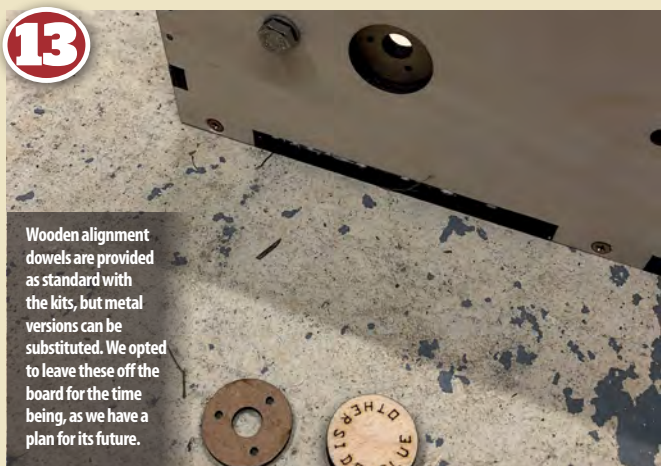
10 Screws are also provided for the centreline of the baseboard surface to screw down into the cross-braces.



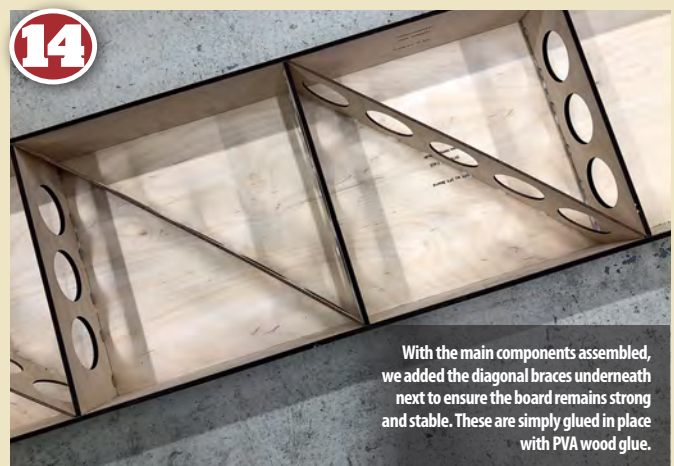
11 Now the ends can be fitted using the same routine – glue, screw and then hammer the supplied panel pins in through the marks at each side.



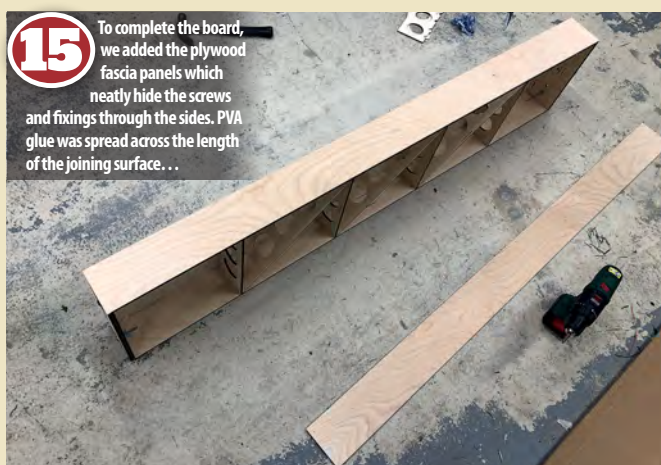
12 Adding the inner layer of the ends is simple. Apply PVA glue to the joining surface, position behind the outer layer then insert the supplied M6 bolts to help the glue bond fully. Repeat at the other end.



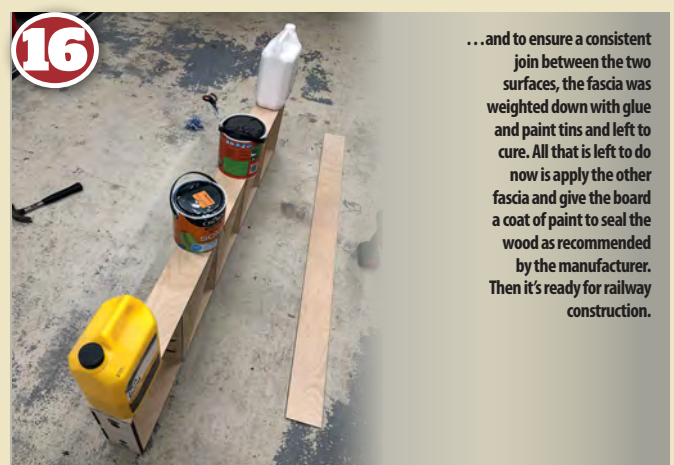
13 Wooden alignment dowels are provided as standard with the kits, but metal versions can be substituted. We opted to leave these off the board for the time being, as we have a plan for its future.



14 With the main components assembled, we added the diagonal braces underneath next to ensure the board remains strong and stable. These are simply glued in place with PVA wood glue.



15 To complete the board, we added the plywood fascia panels which neatly hide the screws and fixings through the sides. PVA glue was spread across the length of the joining surface...



16 ...and to ensure a consistent join between the two surfaces, the fascia was weighted down with glue and paint tins and left to cure. All that is left to do now is apply the other fascia and give the board a coat of paint to seal the wood as recommended by the manufacturer. Then it's ready for railway construction.

Twelve Trees JUNCTION

The flagship of *Hornby Magazine's* exhibition layout roster has seen dramatic changes through its six-year lifetime. **MIKE WILD** goes back to the beginning to explain the genesis of this BR Southern Region main line scene.

EVERY LAYOUT we build has a goal, but sometimes it takes a bit longer to achieve what we set out to than we first envisaged. Right from the start, in early 2012, Twelve Trees Junction – or Project 12 as it was first known – was planned to be the magazine's biggest and best exhibition layout, but really it took until October 2017 to reach a level where it was meeting all of its original requirements. The plan started with a 16ft long scenic

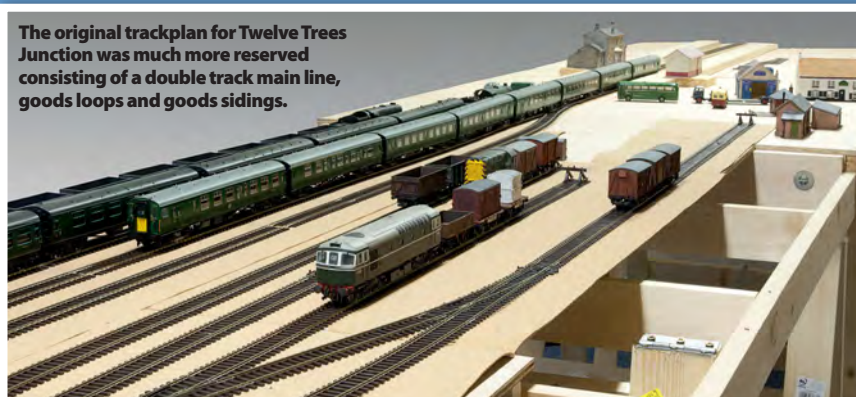
section. The idea was that by building a standard storage yard we could regularly build new scenic sections to go in between. Track laying was completed on the scenic boards – four of them, measuring 4ft x 3ft each – and we even got as far as completing the platforms, but through a number of circumstances its construction was halted and it went into storage for over a year. Fast forward to the summer of 2013 and the layout was dusted off and reassembled so work could begin where we had reached. The four

baseboards bolted together easily and it still met the aims of having open frame baseboards for one half and solid top for the other. But it was now clear that the track plan just didn't cut it. There wasn't enough operation and there wasn't enough Southern Region to it. It was too rural and, without the third-rail in place it could quite easily have been modified to represent anywhere on the British Railways network with a double track main line. What we had was a double track main line running from one end to the other combined



THE DETAILS	
Name:	Twelve Trees Junction
Scale:	'OO' gauge
Size:	24ft x 10ft
Track:	Peco code 75
Control:	DCC, Gaugemaster Prodigy and Hornby RailMaster/Elite
Period:	Southern Region, 1960s

The original trackplan for Twelve Trees Junction was much more reserved consisting of a double track main line, goods loops and goods sidings.



The original platforms were built with Peco concrete edging. They are one of the few remaining original features on the layout.

with a pair of goods loops and a goods yard to the rear of the latter. It was okay, but we knew that with a 16ft x 3ft footprint we could do more. Plus with the storage yard still being on the drawing board we had free reign to redevelop what we had already started. Most of the layouts built for the magazine up until this point had been country scenes, with the exception of Bay Street Shed (which really focused on the shed with two scenes at each end). The grey matter started ticking and new ideas formed.

Double junction

One feature which has become favoured for our layout plans is a double track junction. It makes operation much more interesting as trains can diverge as if they are heading to different locations and they help to break up the layout plan to give it more character.

With thoughts of Earlswood in Surrey, where the 'Quarry Line' diverges from the Brighton Main Line, combined with the built-up nature of areas around East Croydon and Clapham Junction we had an idea to take the track plan in completely

new directions to make it interesting, busy and one which would obviously be Southern Region from the start.

The original station layout was kept together with the goods loops, although the right-hand end pointwork was removed so that a four-track main line would run through the scenic break. At the centre a double junction was added and from there we were able to introduce a relief line for freight traffic, a set of carriage sidings with a four-track carriage shed to service multiple units, a goods loop at the back of the station and even »

Twelve Trees Junction's final format offers maximum operational potential and multiple train movements. A BR '9F' 2-10-0 approaches the signals with an Esso oil train as a Maunsell 'Lord Nelson' 4-6-0 races through on the fast with a BR '4MT' 4-6-0 on a van train and the carriage sheds behind.





An eight-car formation of two Bachmann 4-CEP EMUs races along the fast line towards London between an engineers train in the hands of a Dapol Class 73 and an Esso oil train double-headed by Heljan Class 33s.

a bay platform to the front. Suddenly we had gone from basic to complex, but the operational potential the plan held, even at this early stage, was quite outstanding.

Through the summer of 2013 we beavered away on the scenic boards bringing it to completion for the annual *Hornby Magazine Yearbook*, but there was still a long way to go. It had no storage yards and while it was all live and operational for Digital Command Control (DCC), trains couldn't actually go anywhere. Circumstances again meant that the layout went into storage for another period, but six months later it was back in the workshop for preparations for its first exhibition.

One of the biggest challenges which faced the team at this point was what to do with the storage yards. Building a continuous run was too complex and expensive at the time while the idea of return loop storage yards was appealing but also potentially costly and restrictive in the operational potential and the number of trains the layout could host. In the end we opted for a stop-gap solution by building three cassette storage yards – one at each end of the main through line with a third set to connect to the junction route, referred to as the branch.

A build programme was set in motion to create 7ft long cassettes for the full-length trains which would run together with separate shorter cassettes to hold locomotives. This reduced the direct handling of stock and meant that trains could always go 'somewhere' and come back from 'somewhere' with the locomotive facing the right way.

The system worked well and proved remarkably robust considering the connections between the cassettes and the layout were made with standard rail joiners. However, it was something of a challenging and intensive layout to run as each yard required an operator to change trains over while drivers would set their routes and drive trains via the Gaugemaster Prodigy handsets that ran the railway. Moreover, we now had a 34ft long, 8ft wide layout, but less than half of that space was taken up by scenery. >>

The increasing selection of ready-to-run Southern Region locomotives and rolling stock have been a great inspiration to the layout. A Hornby Class 71 leads a block working of BR 45ton ferry vans through the station.

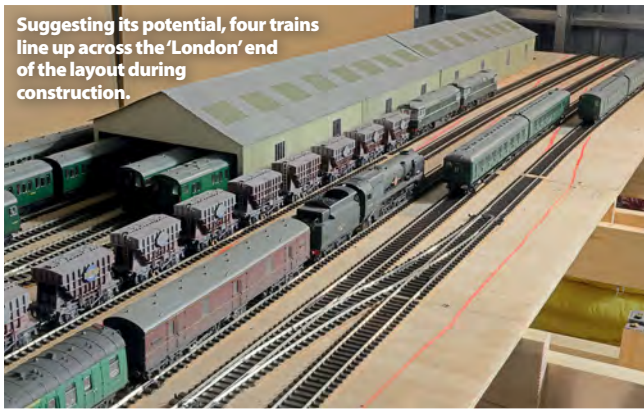




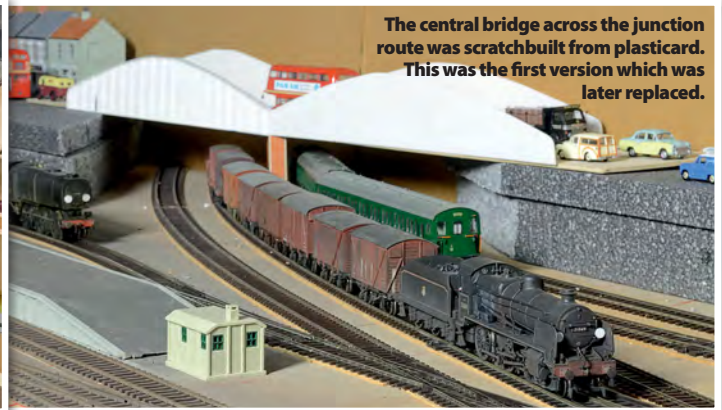
18 months later the layout was back in the workshop for an redesign. Here the new double junctions are being installed.



The station is taking shape in this summer 2013 view with a 'Brighton Belle' unit in attendance.

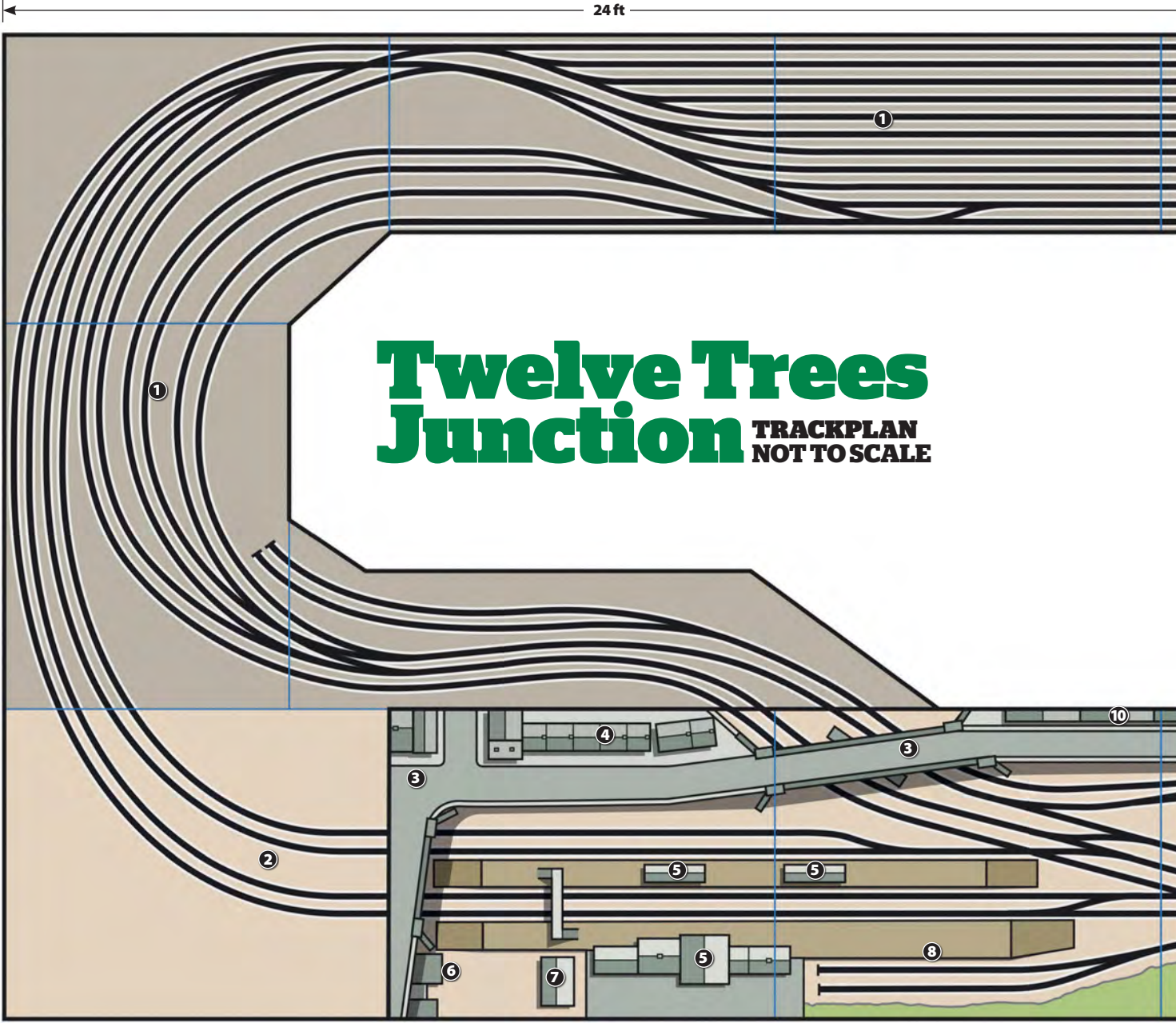


Suggesting its potential, four trains line up across the 'London' end of the layout during construction.



The central bridge across the junction route was scratchbuilt from plasticard. This was the first version which was later replaced.





In its cassette yard format Twelve Trees went to the Great Electric Train Show, Spalding Model Railway Exhibition and the Great Central Railway Model Event across 2014-2015, but then went into its third period in storage taking it away from the exhibition circuit for another two years.

Back on track

Eventually conversations in the office turned to when we could take the layout out on show again

and we set a target of the Great Electric Train Show in 2017. This was in the spring when the show seemed a lifetime away and we didn't have a clear plan of how it would make its return.

Going back to the drawing board, a new scheme was developed to take the layout into a continuous run format, partly in line with the original concept of building a reusable storage yard, and with the aim of reusing as much as possible of what had already been built. By this

time Grosvenor Square, our Western Region terminus layout, was on the scene and that required one of the cassette storage yards from Twelve Trees, but we were still able to reuse the other two to build the straight 16ft x 2ft rear storage yard boards to get the project moving. The project to make Twelve Trees the layout it always should have been was on, but time was against us.

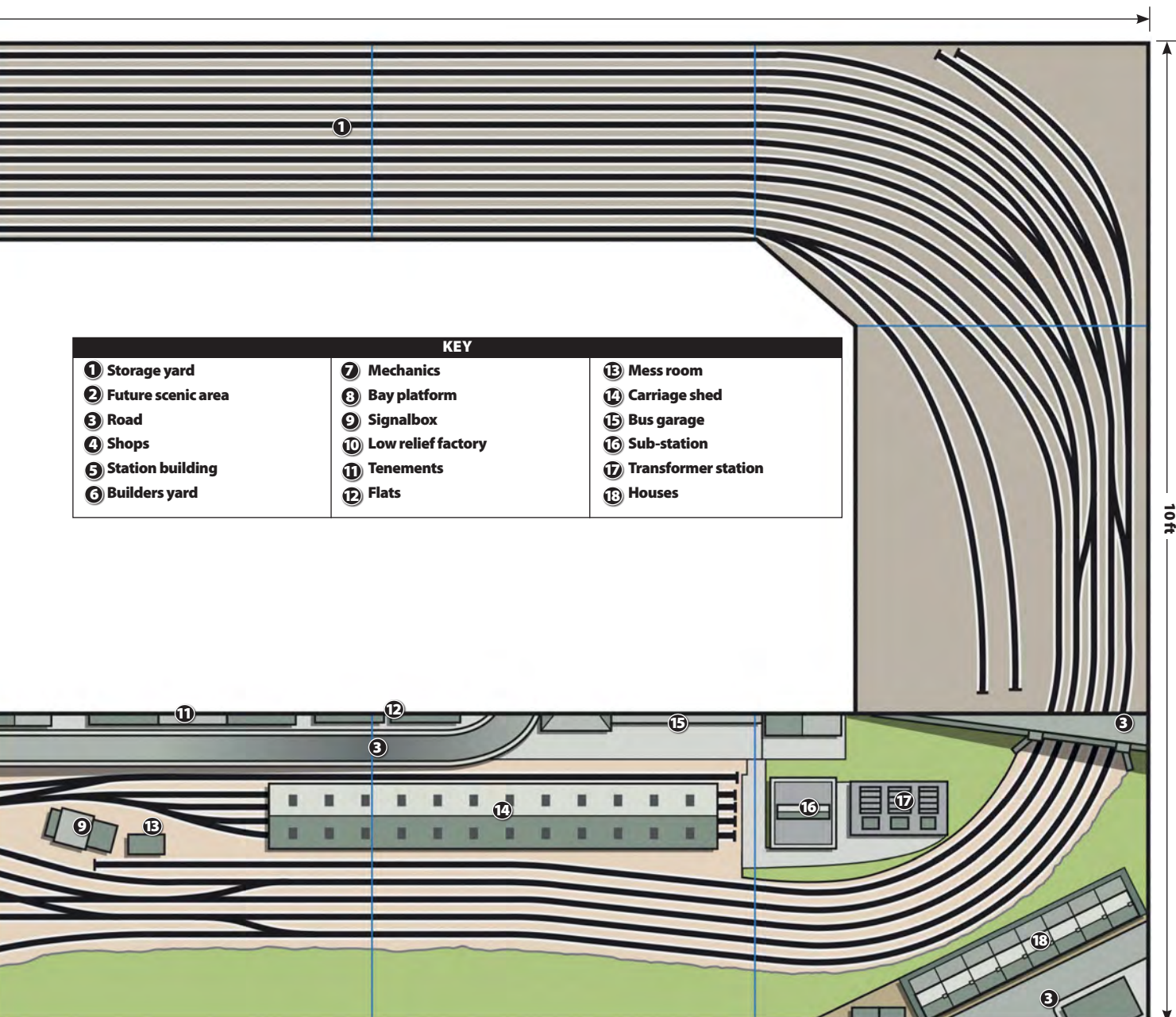
The Great Electric Train Show remained as the layout's return date, but it was now July and

The baseboard tops are made from plywood while the backscene boards are 6mm MDF.



A Bachmann 'C' 0-6-0 heads an engineers train through the developing scene. Greenery and weathering were the main missing elements by now.





Twelve Trees was still in its original state. Quickly the planned reuse of the original cassette yard boards was put in motion while we also recovered 25 points from another out of service layout together with more than 40 yards of track from cassettes which were no longer required, all helping to get construction underway.

Just three months stood between this point and the layout's return and, having made modifications to the storage boards, there was no

turning back. Throughout August progress was made on the rear yard boards, but it wasn't until September that time became available to push on with the new baseboards which were required to join the new straight 16ft section of the storage yard to the original 16ft of scenic area. Six new 4ft x 3ft baseboards were built in an afternoon and the next day all were assembled to the original scenic section to check that everything fitted together as planned. Bolt holes were drilled,

alignment dowels fitted and then half of it was packed away so that we could concentrate work on one area at a time.

A complex series of pointwork and junctions was required at one end of the yard to connect both the main line and the diverging route back together while we also made the most of the space available in the off-scene yard by adding extra loops to service the junction route and goods relief line independently. It was all go to >>

To prepare the layout for its exhibition debut cassette storage yards were built. These could accommodate seven carriage trains plus locomotive – or an eight-car 4-CEP formation.



The cassette yards were 9ft long each. This end was later widened by a further 6in to increase its capacity.





Modifications to take the layout into a continuous run were extensive outside of the original scenic area. This is the start of work at the 'London' end.



At the country end a complex web of track and point work allows trains from the junction to return to the storage yard. Additional loops were also installed to fund operation on the relief line.

get this done, but we had also set the task of expanding the scenic area by 4ft at each end of the layout. With time against us, it was clear that we weren't going to get both ends completed in time, so we focused our energy on the 'London' end of the layout where a five-track main line now swept around a curve into the storage yard. Work on this area started less than four weeks before the Great Electric Train Show. Track was laid for the storage yard and expansion of the main line, it was ballasted, roads were added, a

transformer station by Faller built, painted and detailed and then the final phase of finishing took place including the addition of 20ft of cosmetic third-rail and weathering of the track to match the original parts of the layout.

Continued development

The Great Electric Train Show saw Twelve Trees take to the stage once more and it worked superbly throughout the weekend. The new storage yard offered a much greater flow of

trains, but it also introduced significant changes to the way everything was controlled.

Through its days as a cassette storage yard layout we only had 20 points to control, but now there were 58 connecting more than 150 yards of track together for the complete layout. The Gaugemaster Prodigy controllers we used would be difficult to operate the points with as well as the intensive train service so, during the final phases of the layout's construction, modifications were made to the wiring to separate the power feeds for the points and track. This meant we could set the Prodigy controllers up specifically to drive the trains while point operation was to be in the hands of Hornby's *RailMaster* software which allowed a mimic diagram to be completed in an evening which would operate the DCC Concepts Cobalt IP digital point motors positioned around the layout. This plan worked better than we could have hoped for and while there were a couple of technical issues to iron out – like a point missing from the computer plan at the Great Electric Train Show! – the principle proved itself.

USEFUL LINKS	
DCC Concepts	www.dccconcepts.com
Gaugemaster/Eckon/Berko/Viessman/Faller	www.gaugemaster.com
Green Scene	www.green-scenes.co.uk
Peco/Ratio/Wills	www.peco-uk.com
Redutex (UK)	www.dccsupplies.com
Scenecraft/Woodland Scenics	www.bachmann.co.uk
Tam Valley	www.digitrains.co.uk
Train-Tech	www.train-tech.com
TMC	www.themodelcentre.com
Skytrex	www.skytrexmodelrailways.com

Overlooking the complex junction, Bulleid 'Q1' 0-6-0 33005 moves onto the relief line as Billinton 'E4' 0-6-2T 32556 departs with an empty stock working formed of a three-car BR Mk 1 set. The tenements on the backdrop are Skytrex resin kits while the factory frontage is scratchbuilt.



The layout's next outing was booked to be at the Warley National Model Railway Exhibition on the *Hornby Magazine* stand where it would have the Bluebell Railway's Wainwright 'H' 0-4-4T as its backdrop as part of Hornby Hobbies' outstanding display. But, being as we are, we weren't prepared to let the layout go out in exactly the same way as it did at the previous show.

Behind the scenes, the *RailMaster* plan was updated while we also modified a table for the control desk to make the layout more comfortable to operate. More obvious to the visiting public were the additions to the scenic area including the animated figures on the station and in the garage together with the first working signals for the layout. These consisted of a Dapol semaphore for the bay platform together with a pair of Berko three aspect colour lights operated by Heathcote electronics automatic sequencers. These use infrared sensors which are positioned in the track to detect a passing train and set the signal passed to danger before switching to yellow and back to green in a set time. It all added to the operation of the layout giving way to the next grand plan for Twelve Trees – full colour light signalling, but that is a story which is still to come.

Future prospects

Twelve Trees' redevelopment in 2017 took it to a new level of operational potential that we couldn't have envisaged at the start of its journey in 2012. From then the layout is almost unrecognisable unless you look at the track formation closely, but that is part of the beauty of this layout. It will continue to evolve and develop with time as along with the signalling project we will also be completing the sixth scenic baseboard at the front to make the full 24ft long frontage look like the London suburbs. Add to this continual additions and enhancements for the rolling stock fleet and we are sure that Twelve Trees will be *Hornby Magazine's* flagship layout for some years to come. ■



TWELVE TREES PRODUCT LIST

PRODUCT	MANUFACTURER	CAT NO.
Code 75 large radius right point	Peco	SL-E188
Code 75 large radius left point	Peco	SL-E189
Code 75 large radius curved right point	Peco	SL-E186
Code 75 large radius curved left point	Peco	SL-E187
Code 75 medium radius right point	Peco	SL-E195
Code 75 medium radius left point	Peco	SL-E196
Code 75 large diamond crossing	Peco	SL-E194
Code 75 rail joiners, metal	Peco	SL-110F
Code 75 insulated rail joiners	Peco	SL-111F
Code 75 flexible track	Peco	SL-100F
Rail built buffer stops	Peco	SL-40
Rail built buffer stops with lights	DCC Concepts	DML-MBS
Code 60 conductor rail	Peco	IL-1
Conductor rail insulator pots	Peco	IL-120
Pratt truss signal gantry	Ratio	478
Signal arms and supports	Ratio	476
Southern rail built signal	Dapol	4L-003-003
Three-aspect colour lights	Berko	ECKB503
Mas sequencer	Heathcote	MAS-Sequencer
Prodigy Advance Digital Controller	Gaugemaster	DCC02
Elite Digital Controller	Hornby	R8214
RailMaster computer software	Hornby	R8144
Vari-girder bridges	Wills	SS57
Brick sheets	Wills	SSMP213
Double track twin arch bridge	Skytrex	4/020
Flats	Skytrex	4/040
Tenements	Skytrex	4/021
North light low relief buildings	Skytrex	4/001
Ballast bins	Skytrex	4LS/006
Houses and shops	Skaledale	Various
Dummy point motors	DCC Concepts	DCP-WEP-OO
Platform concrete edging	Peco	LK62/LK68
Southern Railway concrete hut	Ratio	518
Carriage cleaning platforms	Ratio	544
Concrete fencing	Ratio	432
Wooden lineside fencing	Ratio	425
Photographer	Viessmann	1519
Welder	Viessmann	1538
Waving lady	Viessmann	5055
Transformer station	Faller	130958
Bluebell Railway Sheffield Park station buildings	Scenecraft	Various
Carriage sheds	Scenecraft	44-083
Fine blended grey ballast	Woodland Scenics	B1393
Medium blended grey ballast	Woodland Scenics	B1394
Blended green fine turf	Woodland Scenics	T1349
Burnt grass coarse turf	Woodland Scenics	T1362
Fine leaf foliage, light green	Woodland Scenics	F1132
Fine leaf foliage, olive green	Woodland Scenics	F1133
Static grass fibres	Green Scene	Various
Platform swan neck lamps	Gaugemaster	GM867
Street swan neck lamps	Gaugemaster	GM866
Street barley twist lamps	Gaugemaster	GM802
Cobalt IP digital point motor	DCC Concepts	DCP-CB1DiP
Hex Frog Juicer	Tam Valley	HFJ003U
Auto frogs	Gaugemaster	DCC80



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Model railway ELECTRICS

Getting the basics of model railway electrics right is essential for a smooth running railway. **MIKE WILD** presents top tips to make your layout work faultlessly every time you turn the power on.

MODEL RAILWAY ELECTRICS are an essential part of a working layout and with a few simple techniques everyone can install wiring to bring their railway to life and keep the wires concealed out of view.

The term 'electrics' scares many modellers, but the simple truth is that all circuits on a

model railway are a repetition of the same basic positive and negative feed. So long as you maintain an air of calm and sense when installing your wiring and keep track of what you have done the process of wiring a railway should be very straightforward.

There are two main types of control system available today – DC (analogue) which uses a 12v DC controller to supply power to the track when the control knob is turned and

DCC (digital) which provides a constant 15v AC current to the track and sends electrical signals to a decoder (a small computer chip) installed inside a locomotive. Both have their merits and cost implications, and you can read our Digital Basics guide on pages 44-49.

What we aim to do here is arm you with the basics and understanding so that you can begin wiring your own layout for either control system with the right methods. ■



Wiring can be a daunting prospect, but it doesn't have to be. Take your time, plan your wire routes accordingly and above all keep it neat with colour coding. These are some of the essentials for wiring a model railway: 7/0.2 equipment wire for track connections, 28/0.2 bell wire for power for power bus feeds, soldering iron, plug-in terminal blocks and wire strippers.

KEEP IT SIMPLE

When it comes to wiring it is easy to get in a mess. However, with a little planning and a 'keep it simple' attitude wiring up a model railway is within the abilities of everyone.

For *Hornby Magazine's* layouts we have a standard scheme of wire colouring to make it easy to follow what we are doing. For an analogue layout the outer main line on a double track circuit is always wired with red and black wire (red to the outer rail and black to the inner) while the inner circuit is wired

with yellow and blue wire (yellow to the outer rail and blue to the inner). Further to this we use green and orange for point motor power feeds and white for the common return feed.

For accessories such as lighting we standardise on brown and white wiring (with the two wires spun together) meaning that we always know which circuit a pair of wires is intended for.

There is also a lot to be said for keeping wiring neat and tidy. A box of cable clips is



a great addition to your toolbox as it means that wiring can be run around the inside of the baseboard framing neatly and without the chance of it snagging after installation.

CHOOSING THE RIGHT WIRE

Sourcing the right type of wire for the job in hand is essential. There are two main groups for electrical wire – single core and multi-core. Single core consists of a single strand of copper wire and while this does have some applications it is susceptible to failure through bending resulting in electrical failures.

By far the best option is multi-core wire which features several strands of copper wire together inside the plastic insulation. This type of wire is much more flexible and long lasting and can be

used for almost any purpose on a model railway. For our track feeds we use 7/0.2mm multi-core wire (seven strands each with a diameter of 0.2mm) which we have always found to be reliable through years of exhibition layout operation.

Wire is available on reels from suppliers such as Rapid Electronics, Squires Tools and others. It is often cheaper to buy in bulk than in short lengths and it is better to have more wire available for future development than be splicing in varied colours to finish a cable.



DIGITAL POWER BUS

Digital layout wiring is a little different to an analogue layout. In the case of the latter each circuit is independent meaning that it needs its own wiring, but when it comes to digital layouts all circuits can operate from the same main circuit – the power bus.

The power bus carries all the signals from the digital controller around the layout and needs to be more substantial than the

7/0.2 strand multi-core wire we used for track connections. In our case we use a 28 strand multi-core cable which is connected to strategic connector blocks to distribute power to individual track sections. The beauty of digital is that no switches are required so you can keep on repeating the same circuit from the power bus to deliver power to the entire track formation.



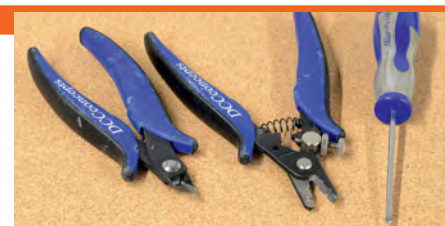
CHOOSING A SOLDERING IRON

A soldering iron is essential for model railway wiring and especially if you wish to install neat and almost invisible wiring on your layout. The best type to go for when starting out is a 25watt soldering iron which will provide plenty of heat to melt solder and fix wires to rails and other components without any fuss. Buy a stand with the iron and a cleaning sponge, as it is essential to keep the iron nib in first rate condition for the best possible joints.



ESSENTIAL TOOLS

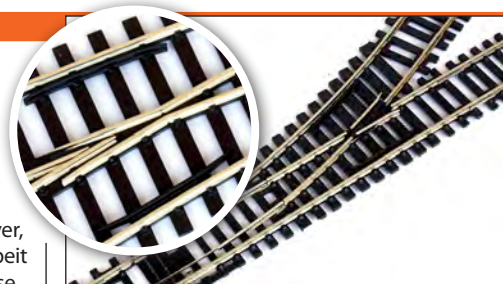
Only a handful of tools are needed for model railway wiring. Our tool box consists of a 25watt soldering iron, a pair of adjustable wire strippers to suit different wire gauges, a pair of side cutters (for cutting wire to length) and a screwdriver. Beyond this all you really need is wire, switches and plug-in terminal blocks!



INSULATED AND LIVE FROG POINTS

When it comes to points and electrics there are two different types commonly available – insulated frog and live frog points. Insulated frog points have an insulated section at the 'V' of the point frog which simplifies them electrically as they require no additional wiring to create a loop. However, because they have an insulated section – albeit only a few millimetres long – short wheelbase locomotives are more prone to stalling as there is an unpowered section in the centre of the point.

Live frog points – often referred to as Electrofrog points – are metal throughout and



remove the chance of locomotives stalling. However, they require a little more planning when it comes to electrical feeds as a loop will require insulated rail joiners in one position along its length to avoid a short circuit.



KNOW YOUR POINT FEEDS

When installing a point it is essential that it is always fed electrically from the toe end. If not it will cause an electrical short. For facing points it is important to separate them electrically at the point that they join to avoid electrical shorts. These basic rules need to be applied to all points to ensure that a model railway works correctly when power is applied.

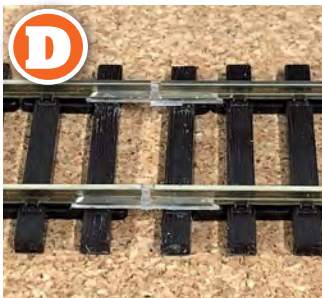


A Points must be fed electrically from the toe end, as indicated on this Peco code 75 medium radius right hand turnout.

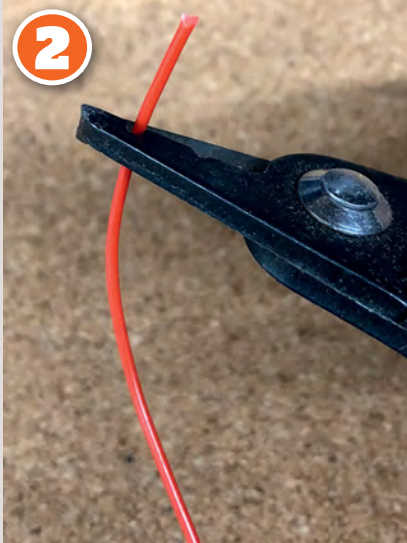
B When creating a crossover the join between the two points must be made with insulated rail joiners to prevent short circuits.

C In this simple fan of sidings, all of the points are fed electrically from the bottom of the image. As the point blades are set for the route, the power is sent to the correct line.

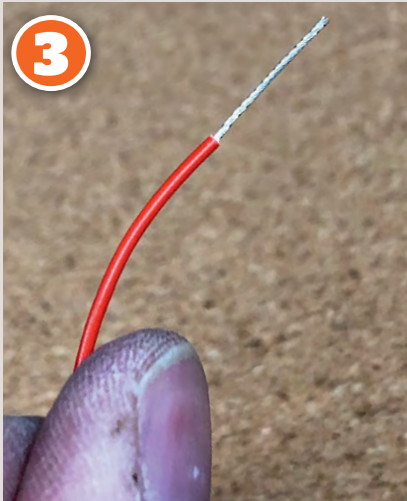
D In the same set of loops, all the lines have double insulated rail joiners part way along as required for the use of live frog points. This is to prevent power from being supplied from both ends of the loop and causing a short circuit at the point frogs.



Drill a 2mm diameter hole for each wire you wish to connect to the track between a pair of sleeper ends.



Using a pair of wire strippers bare the end of the insulation from the wire removing around 15mm-20mm of the plastic covering.



When using multi-core wire twist the newly stripped strands together to create a single cable, otherwise it will be difficult to solder the wire to the rail.

MODEL RAILWAY ELECTRICS RULES

No mains electricity

Buy a professionally-made power supply for your model railway and only use low-voltage (12v to 16v) outputs. Do not be tempted to run a mains cable along your layout. Mains voltage can, and does, kill.

Keep notes

This is all about making it easy for yourself in future. Make sketches of the wiring noting where the wires go and what they do. Ideally you should number each end of each wire with a label so that if they are ever disconnected, either by design or accident, you can establish where they should go.

Use the right tools

Using the correct tool ensures that the task is done effectively and efficiently. As an example, use a wire stripper to strip the insulating sleeve off lengths of wire.

Keep it tidy

Keeping your wiring tidy will help you when it comes to locating faults or making changes.

Colour code your wiring

A simple colour code can make it much easier to work out what wire goes where. If your track feeds are all red for one side and black for the other it makes it much harder to introduce a short circuit.

SOLDERING WIRES ONTO RAILS

Using multi-core wire it is a simple process to solder a wire to a rail to provide an electrical connection. You will need a 25watt soldering iron and stand, electrical solder, an electric drill with a 2mm or 2.5mm drill bit, wire strippers and multi-core wire...



4 Warm up the soldering iron and tin the wire end by applying a small amount of solder to the tip of the soldering iron and heating the wire at the same time. Avoid excessive heat on the wire as it will melt the insulation. This process is called tinning.



5 Tin the side of the rail by using the soldering iron to melt a small amount of solder on the rail side. This completes preparation for the final joint.



6

Above: Hold the wire against the rail in the position you wish to solder it. Apply the soldering iron to the tinned wire and previously tinned rail. Allow the solder to melt and fuse with the rail. Leave to set (a matter of seconds at room temperature) and your connection is done.

7

Left: Once the wire is attached to the rail it can be fed through a 2mm hole in the baseboard ready to be connected to the main circuits.

WIRING A SECTION SWITCH

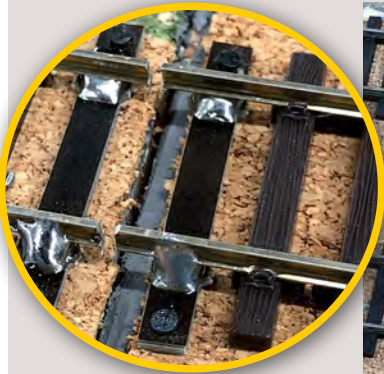
For analogue controlled layouts switches are a great boon as they allow sections of the layout to be isolated from the main line so that locomotives can be parked while other operations continue uninterrupted.

The simplest way to add a switched section of track on a simple analogue layout is to insert an insulated rail joiner on one rail. Solder a wire to the rail either side of the insulated rail joiner then connect those wires to an on/off single pole switch. By extending the wires



the switch can be mounted in a convenient position and once you are proficient at adding switches they can be installed at locations all around a layout.

BASEBOARD CONNECTIONS ABOVE THE BOARD



If you are building a portable layout then a means of securing the ends of the rails to the baseboard will be necessary so they don't become damaged in transit. The simplest and most effective is to use copper clad sleeper which is available in strips. Alternatively DCC Concepts offers packs of pre-cut sleepers with soldering pads which offer a quick and convenient way of making baseboard joints.

To use the DCC Concepts sleepers, cut away one sleeper from the plastic web of the track either side of the baseboard joint. Drill two 1mm holes through each end either



side of the rails on the DCC Concepts sleeper and pin it to the baseboard under the track. Solder the rails to the soldering pads on the sleepers and that's the job done. Repeat on both sides of the baseboard joint then cut the track. You will then need a wired connection to take the power across the baseboard joint.

BASEBOARD CONNECTIONS BELOW THE BOARD

There are several options available when it comes to connecting wires between baseboards, but our preferred method is to use plug-in terminal blocks which have screw fixings to secure wires into the terminals. This method means modifications are very simple to make and that the job can be done quickly without the need for soldering. The plug-in terminal blocks are available from Rapid Electronics and Squires Tools and can be cut to length from the 12-pin strips as required.



Electrical

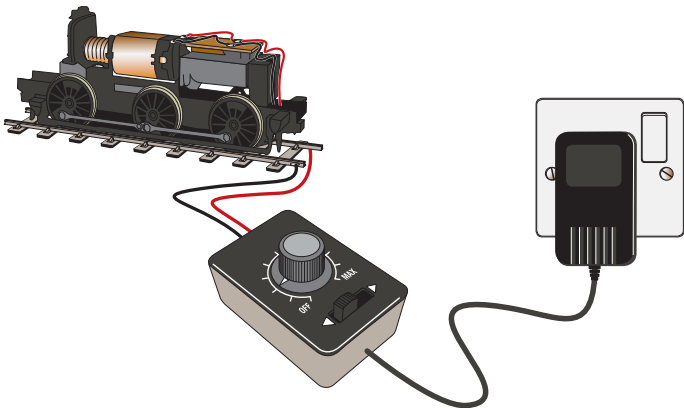


DIAGRAM 1

Above: For analogue control, as we turn the controller from OFF to MAXIMUM the motor in the locomotive will run faster and faster. When we turn the knob back to off the motor stops. If we then change the direction switch and move the knob again the motor runs in the opposite direction.

To do this the controller puts a voltage across the two rails. This is what causes the motor to run. As the voltage increases from 0 (off) to 12 (maximum) the motor goes faster. If we change the direction switch then the voltage is applied the other way around and goes from 0 (off) to 12 (maximum) in reverse. A convention has arisen that the locomotive will move forward if the right-hand rail is positive and backwards if it is negative. This ensures that if two locomotives are being run by one controller they will both travel in the same direction.

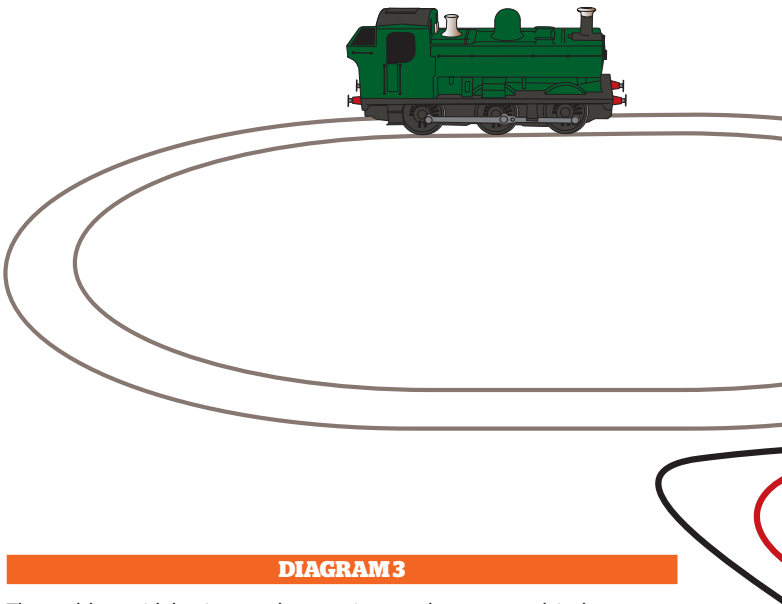


DIAGRAM 3

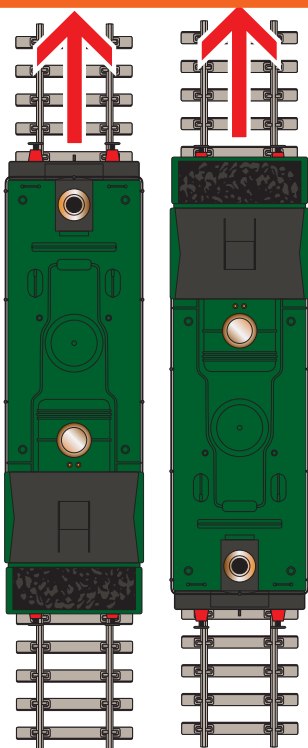
The problem with having two locomotives on the same track is that they both move at once and probably at different speeds. A common requirement on model railways is the ability to stop a locomotive responding to the controller. To do this we need to use a switch. These are just like light switches; they can stop the electricity flowing to part of the layout and stop any locomotives on that section responding to the controller.

Let's assume we now have two ovals of track, with a locomotive on each. Both ovals are connected to the controller and both locomotives run at the same time. If we put a switch in the red wire leading to the left-hand oval we can have both trains running if the switch is on, or just the right-hand train running if the switch is off. If we were to put another switch in the red wire leading to the right hand oval we could then choose to have either of the trains running on their own, both running at the same time or both stopped no matter how much we turn the controller.

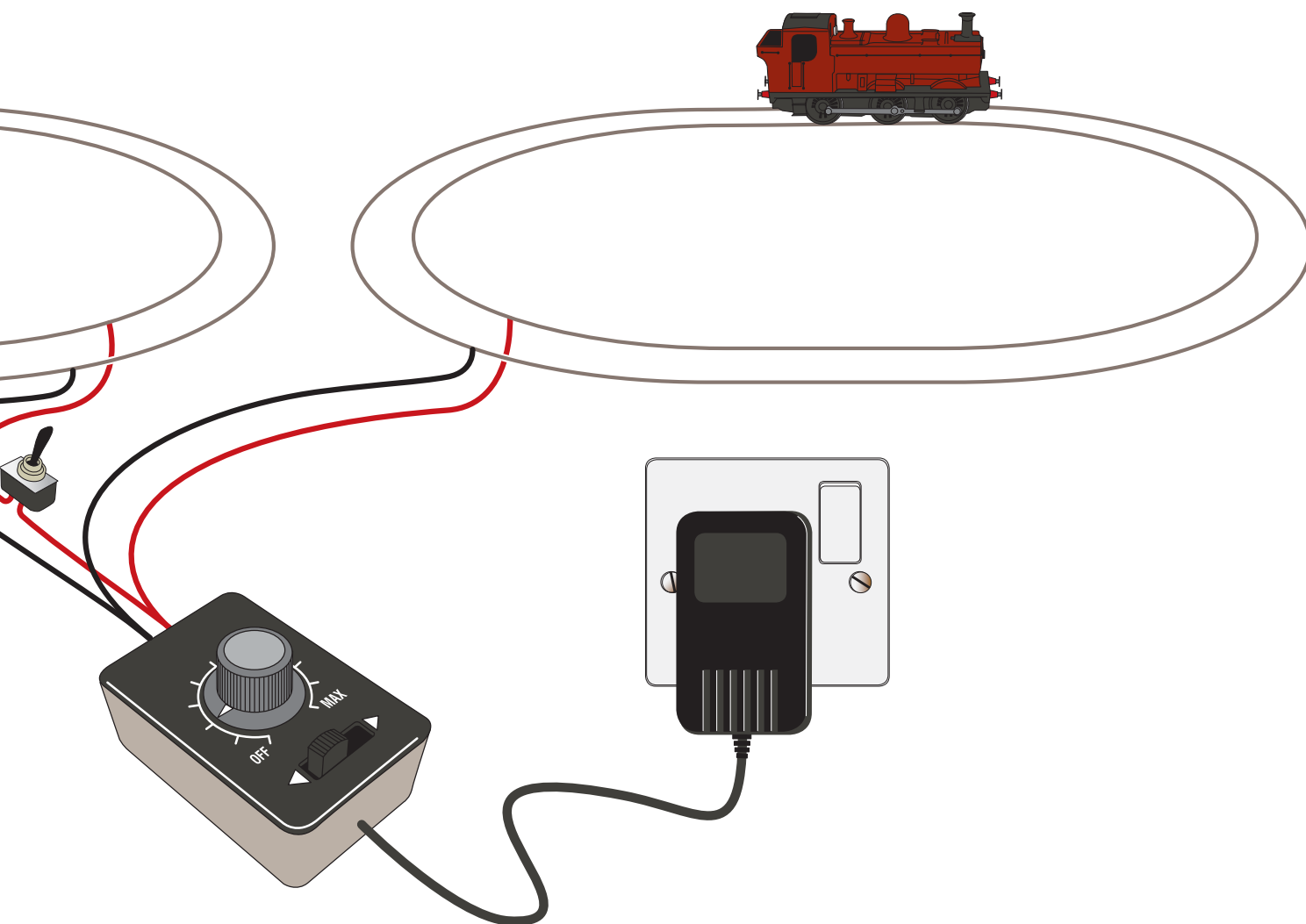
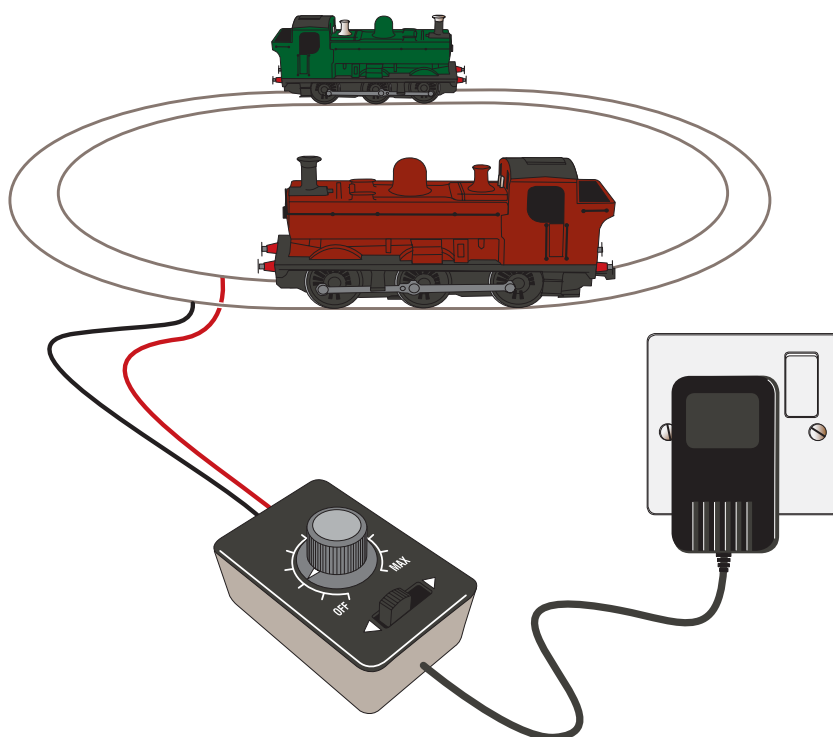
principles

For this example of how model railway electrics work we will assume we are looking at a standard 12v DCC ready analogue locomotive; it can be any scale or gauge. Inside is an electric motor connected to the track.

DIAGRAM 2



If you lift the locomotive travelling 'up the page' off the track, turn it around and replace it, it will carry on moving 'up the page'. So if we have a controller connected to an oval of track and we put two locomotives on the track they will both run clockwise, or anti-clockwise, at the same time and at roughly similar speeds depending on their wheel size and gearing.



Going Digital

Advances in technology and increased manufacturer take-up have seen Digital Command Control (DCC) gain significant popularity. **MARK CHIVERS** highlights just some of the benefits of going digital.

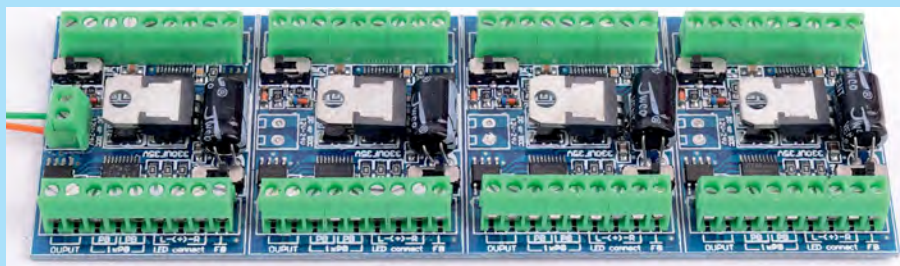
WITHOUT DOUBT, going digital introduces a new way of operating a model railway, but is the time and investment required to convert your control system and locomotives really worth it? For the *Hornby Magazine* team, the answer is a resounding YES! The flexibility to control your entire layout from one handset and ability to select your choice of locomotive without affecting others on the track at the push of a few buttons is very exciting. Factor in the options to turn lights on and off, select digital sound functions and add smoke generator effects to your locomotives as well, and you have the makings of an exhilarating and realistic experience which puts you firmly in the driving seat.

That said, it can appear quite daunting at first, not just in terms of time and finances to make the conversion from analogue control, but also in getting to grips with the terminology and technology itself. Digital Command Control (DCC) needn't be scary. If you wish to simply place a decoder into a compatible locomotive



and operate it using the pre-set default values, this is usually sufficient. However, as you become more adept and confident with your digital setup, you can begin to tweak settings known as Configuration Variables (CVs) to enhance the overall operation yet further, such as slower acceleration and deceleration rates, set the maximum speed and even alter lighting settings to suit your needs.

You can keep things as simple as you feel comfortable with and enjoy the experience of going digital by taking a methodical and considered approach to the transition. Choose a few key locomotives from your collection to convert and consider the layout's future control requirements to get you up and running. Give thought to your current track plan, as well as your aspirations for something larger and more involved in the future. This will help when it comes to sourcing a suitable Digital Command Station (controller), which are available to suit all pockets from budget handheld controllers to top-end high specification systems. Keeping things simple initially will ensure the changeover is manageable and cost-effective without breaking the bank.



Accessory decoders, like this DCC Concepts AD series board for Cobalt motors, are used to power equipment such as point motors. These sophisticated boards offer feedback for control panels as well as frog polarity switching. They are available for solenoid point motors as well.

Fundamentals

Digital operation is fundamentally different from analogue control in that the former controls the locomotive while the latter controls the track. To put this into context, analogue control relies on a user-determined Direct Current (DC) power feed to the rails, through a traditional power controller, which in turn sets a locomotive in motion. As the control throttle is increased, more power is supplied to the track enabling the locomotive to pick up speed, and vice versa. Of course, in

this instance all locomotives on that section of track will move in the same direction and at a similar speed, unless you have installed isolating sections. Direction is determined by simply changing the polarity, most commonly via a switch on the controller.

Digital control takes an altogether different approach and supplies a constant Alternating Current (AC) power feed to the rails, which results in the track being permanently 'live'. Data is then transmitted from the digital power controller through the rails to a specific

Digital control allows multiple train movements to be handled through one controller and the addition of more user controlled accessories. At Topley Dale a Heljan Gresley 'O2' 2-8-0, fitted with a Zimo MX644 sound decoder, 'sugar cube' speaker and decoder controlled Seuthe smoke generator, heads a coal train through the station while a Bachmann Fowler 'Jinty' 0-6-0T with a Zimo 8-pin decoder shunts in the yard.





Computer control is increasing in popularity for British model railways with Bachmann and Hornby both offering their own solutions bespoke to their controllers while aftermarket suppliers, such as iTrain, have developed more flexible systems to operate with a wide range of digital controllers.

onboard locomotive digital decoder which converts the data into actions, allowing the engine to move off, pick up speed, slow down or simply switch direction. Each decoder-fitted locomotive has its own unique address, which means you can have multiple locomotives sat on the same stretch of track, but only the selected locomotive will take notice of the commands. Taking things further, you can then select additional addresses and set the models to operate at different speeds or opposing directions on the same stretch, if you like, simultaneously! This is particularly useful if you are modelling a steam or diesel locomotive depot, with multiple movements in a limited space. The system can also be fine-tuned to suit your needs, so it is worth doing your homework and comparing specifications between systems and decoder types. For example, you will find that some locomotive decoders offer more customisation options than others through their onboard CVs which enable you to adjust individual settings to enhance running characteristics further.

Digital conversion

To make the switch to digital all you really need is a control system, a handful of decoders and a circuit of track to get you up and running. Nothing more. To convert a layout to digital operation, it can be as simple as swapping the two wires from the analogue controller to the replacement digital command centre. If the layout features a series of isolated section switches, these can be switched to be permanently 'live' and the layout should operate as intended.

For Hornby Magazine's 'OO' gauge office test layout Topley Dale, we opted for the flexibility of analogue and digital operation. Whilst this may seem at odds with the spirit of digital control, it was imperative that we maintained the flexibility so that we can test review models under analogue and digital conditions. To achieve this, we can split out one circuit for analogue control whilst also operating the other digitally. Simple plug-in terminals allow different controllers to be plugged in to each circuit, plus with matching

DIGITAL TERMINOLOGY	
Accessory decoder	Fixed location digital decoder that can control signals, point motors and other accessories.
Address	Identifying number for a DCC fitted locomotive or accessory decoder.
Command station	Control hub of a DCC operated layout.
Consisting	Two or more locomotives operating together using the same DCC address.
CVs	Configuration Variable. Programmable DCC decoder settings.
DCC	Digital Command Control.
DCC booster	Provides extra power rating to the track to improve DCC signals and allow more locomotives to be operated.
DCC fitted	Model supplied with a factory fitted DCC decoder.
DCC on board	Model supplied with a factory fitted DCC decoder.
DCC ready	Model supplied with a DCC decoder socket only and no decoder.
Decoder	Printed circuit board for operating model railway locomotives and accessories.
Function output	Used to control functions and features on DCC fitted locomotive or carriages such as lights and sounds.
Main track	DCC term for operational railway layout.
Power bus	DCC layout power supply cable with dropper wires feeding the track at regular intervals.
Programming track	DCC term for track which is separate from the main line for programming locomotive CVs.
Route setting	Series of points operating together to form a defined route on a layout.
Speed steps	DCC power control increments. The more steps you have, the smoother the speed transition. Equally divided into 14, 28 and 128 steps depending on controller setting.



Hornby Magazine's Twelve Trees Junction uses two digital system to operate this 24ft x 10ft layout. Gaugemaster's Prodigy drives the trains allowing multiple operators to get involved while Hornby's RailMaster software connected to an Elite controller provides power and control for points and accessories on a separate feed.

plugs to the track feed wiring, any control system can be connected for testing purposes too. All turnouts are controlled digitally via DCC Concepts' ADS series accessory decoders, while the layout's Dapol operating semaphore signals are linked to Train-Tech SC3 digital signal decoders. Obviously, care is required, and it is important not to leave an analogue locomotive on the digitally-controlled circuit. If this does happen, it is usually easy enough to spot as the locomotive in question will emit a buzzing sound. Extended exposure could result in damage, so remove it as quickly as possible. Conversely, you can place and operate a DCC-fitted locomotive on the analogue circuit without problem. It is also worth mentioning at this point that some DCC sound-fitted locomotives will operate with limited sound functions on analogue layouts – check individual decoders for more details.

For larger and more complex situations, additional power bus feeds and development of power districts may be worth considering in the future. There's also an extensive array of add-on equipment which can enhance operations further including power boosters, reverse loop modules, frog-juicers and more. This latter item has proved its worth on Hornby Magazine's 'OO' gauge BR Southern Region exhibition layout Twelve Trees Junction, as it provides effective polarity switching through the complex crossings, reducing potential short-circuit issues. Research is key here and visiting retailers such as Digitrains with specialist knowledge is well worth while.



Control options are varied and designed to suit all pockets, ranging from entry-level and mid-range examples (see *Hornby Magazine* Equipment Guide HM107/HM124) to advanced systems such as ESU's ECoS command station (Cat No: 50210) which comes with 6 Amp output, full colour touch-screen display, dual controllers and built-in booster. No matter which option you choose, at the very least you will enjoy refined throttle control with the ability to control multiple sound functions, turnouts, signals, double-headed consists and more.

Some systems, such as Hornby's RailMaster and Bachmann's RailController software packages, introduce a certain degree of automation into the equation too, offering the spectacle of trains operating remotely on some sections of a layout, whilst close control can be maintained in other areas.

Options

Manufacturers have certainly embraced digital provision in recent times with a rolling programme of chassis upgrades to older models and inclusion of integrated circuitry to newly-tooled models. Most new locomotives and multiple units come DCC ready, which means the model is ready for digital conversion – usually as simple as plugging the pins of a newly-purchased digital decoder into the onboard decoder socket. Increasingly, specific space is provided within the chassis design to house the decoder and any wiring harness. Look for symbols and descriptions on boxes that refer to the model as DCC ready. Other options include DCC fitted/DCC onboard models, which come with a pre-installed DCC decoder and DCC sound-fitted models come with a

A wide range of control stations are available for digital to suit all tastes, budgets and requirements. This is just a small selection including (from left) Bachmann's Dynamis with RailController software, the Roco Z21, Piko's Smart Controller, the Gaugemaster Prodigy and Sig-na Track ACE-2.



10^{top} tips

GOING DIGITAL

1 Keep things simple and move one step at a time

2 Read product reviews, check their purpose and the experience of others before buying

3 When choosing a controller try different types in a shop before committing to a purchase

4 Analogue and digital can be used on the same layout, but they must be kept separate

5 Choose a simple locomotive as your first DCC installation project – 21-pin socket models are easiest

6 Set yourself attainable goals in upgrading a locomotive fleet to digital – doing it 'overnight' will be expensive

7 Plan out an addressing system early – we use the last four digits from each locomotive number as their address – we can't forget them that way

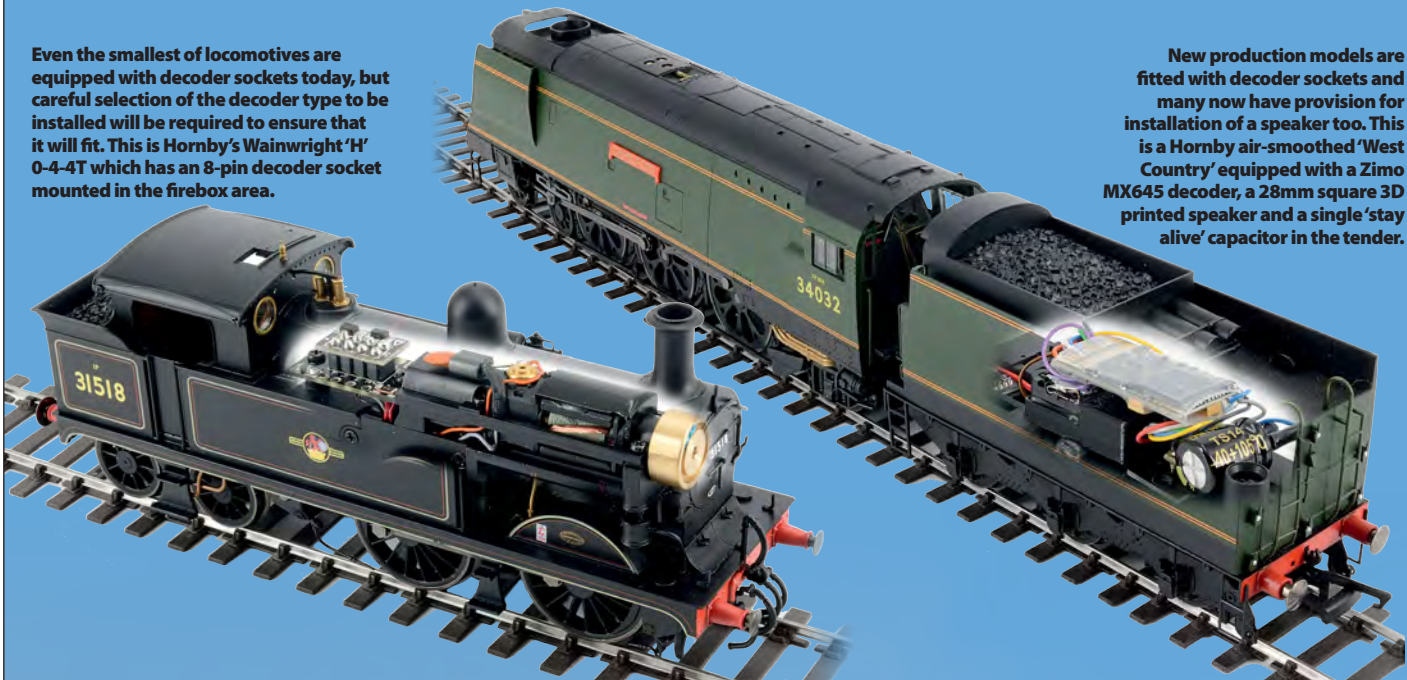
8 When adding accessory decoders select number ranges for certain aspects. For example, on Topley Dale all the points are numbered in the 1-10 range while the signals are numbered in the 20-25 range

9 If you have a big layout consider keeping analogue control for one circuit and introducing DCC control for another

10 Enjoy it! Digital control brings a whole new world of operation to model railways

Even the smallest of locomotives are equipped with decoder sockets today, but careful selection of the decoder type to be installed will be required to ensure that it will fit. This is Hornby's Wainwright 'H' 0-4-4T which has an 8-pin decoder socket mounted in the firebox area.

New production models are fitted with decoder sockets and many now have provision for installation of a speaker too. This is a Hornby air-smoothed 'West Country' equipped with a Zimo MX645 decoder, a 28mm square 3D printed speaker and a single 'stay alive' capacitor in the tender.



digital sound decoder and speaker already fitted. As with the decoder, manufacturers often factor in enclosures for digital speaker mounts too, aiding those wishing to make their own digital sound installations.

Before installing a decoder, you will need to identify what type of socket is fitted to your new model. Options include 6-pin, 8-pin, Next18 and 21-pin decoder sockets, depending on the manufacturer, model, size and available space. 6-pin decoder sockets usually appear on 'N' gauge models and some smaller 'OO' gauge locomotives, although the Next18 decoder socket has recently been adopted by Bachmann and Dapol for many of their new 'N' gauge models. Bachmann's recent 'OO' gauge releases have featured 21-pin decoder sockets, as have Dapol and Heljan's most recent 'OO' products, while Hornby opts for 8-pin decoder sockets as standard for most of its DCC ready locomotives and its Twin Track Sound (TTS) sound-fitted models. Before purchasing decoders, it is certainly worth double-checking the pin type required.

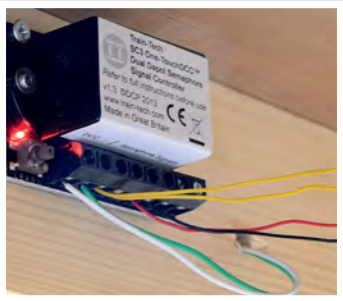
For older models that pre-date digital control and those that have yet to receive a DCC decoder socket upgrade, it is possible to hardwire a decoder by soldering the relevant wires to a suitable plain harness-style decoder, although some models, such as split-chassis examples, can present a major challenge.

Once installed, the decoder will control the locomotive's motor and onboard light functions (if included). Decoders range from basic two-function examples which offer motor control plus two lighting function outputs, for example, to high-end digital sound specimens with the capability to control the motor, sound functions, speaker, lights, a smoke generator, 'stay alive' capacitors and more.

Bear in mind that the more sophisticated the model in terms of lighting options, such as Dapol's recent 'OO' gauge Class 68 diesel locomotive, the more functions that will be required to operate them adequately. Whilst Bachmann, Dapol and Hornby retail digital decoders, further compatible options are also available from the likes of DCC Concepts, ESU, Gaugemaster,

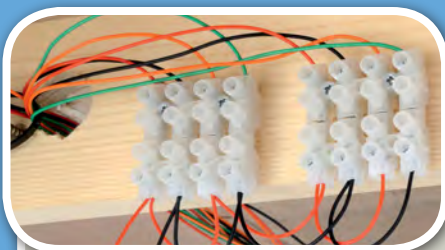
Hatton's, Lenz, TCS, Zimo and more. Some examples come with 'stay alive' capability, which means that they can overcome a short break in electrical continuity, with the motor appearing to continue without interruption.

Digital sound decoders make a world of difference and sound files are available for a wide range of steam, diesel and electric locomotives and multiple units. Bachmann, Dapol, Hornby, Rail Exclusive and RealTrack Models are amongst the manufacturers that have embraced this technology with models available complete with factory-fitted DCC sound installations. You can also install digital sound yourself with an extensive selection of UK diesel and steam projects available through specialist retailers including Coastal DCC, DC Kits/Legomanbiffo, Digitrains, Howes, Locoman Sounds, Mr Sound Guy, Rail Exclusive, South West Digital, You Choos and more. Utilising ESU and Zimo digital sound decoders, these projects offer impressive functionality, realistic sound reproduction and smooth motor control for around £90-£120 per project. Most recently, Hornby has introduced its range of budget Twin Track Sound (TTS) digital sound decoders as standalone items for customer fitment, and at just over £40 each they represent a cost-effective method of adding digital sound to a fleet.



A wide range of specialist products are available for digital including Train-Tech's SC3 signal controller which is designed specifically to operate Dapol semaphore signals.





These are the main track connections on *Hornby Magazine's* 'N' gauge test track which can be operated with analogue control or digital control on the outer circuits. Simply unplugging one of the plugs and replacing it with an analogue controller takes care of the changeover. Digital and analogue must never be connected to the same circuit.



Digital control can be used outside of the lineside fence to operate accessories such as these level crossing lights developed by Train-Tech.

So much more

However, DCC it is not just about locomotive control as it also offers the capability to operate a wide range of accessories including turnouts, signals and lighting as well as introducing levels of automation and train detection, to enhance operations even further. If you wish to add a special lighting effect, with a few tweaks to settings, this is also possible. Train-Tech's extensive range of model railway accessories includes buffer stop lights, colour light signals, operating level crossing lights, traffic lights and a series of lighting effect controllers offering log fire, welding and alternative flashing effects – all of which can be operated digitally. Incidentally, Train-Tech's One Touch system does most of the hard work for you at the programming stage. Just select an accessory address, press the learn button and the digital setup process is done. Meanwhile, DCC Concept's range of station and street lighting comprises classic and modern styles which can also be optimised for digital operation, along with digitally controlled end of train lights, illuminated carriage table lamps, ground signals and much more. Its range of accessory decoders, digital point motors and DCC equipment is extensive too.

Some command centres can also be connected to desktop PCs or laptops through software such as Bachmann's *RailController* and Hornby's *RailMaster*

programmes to create even more elaborate set-ups with on-screen mimic diagrams and touch-screen control. Additional third-party software such as *TrainController*, *RocRail* and *JMRI* can also be utilised to introduce further levels of sophistication to your digital setup in due course. For *Hornby Magazine's* 'OO' gauge Grosvenor Square and Twelve Trees Junction exhibition layouts, we've devised a setup which utilises two digital systems, suitably separated, to create a flexible user-friendly means of control. Whilst retaining Gaugemaster's Prodigy Advance system for locomotive control, we use Hornby's *RailMaster* control software (connected to Hornby's Elite DCC command centre) to provide an operational twin-screen schematic diagram of the layout, used purely for operating turnouts and accessories. This not only provides the added flexibility of reliable point operation on a separate circuit, it also looks the part and attracts many positive comments at exhibitions.

Further technology is available in the form of downloadable mobile applications, turning your mobile device into a handheld DCC controller with full access to function keys and on-screen mimic diagrams, which again adds a new dimension to layout control. This, though, is just a taste of the future, but factor in the ability to control points, signalling, lighting and DCC sound – all from the palm of your hand – and you have a digital experience that is both

USEFUL LINKS

Bachmann	www.bachmann.co.uk
Coastal DCC	www.coastaldcc.co.uk
Dapol	www.dapol.co.uk
DC Kits	www.dckits-devideos.co.uk
DCC Concepts	www.dccconcepts.com
Digitrains	www.digitrains.co.uk
ESU	www.esu.eu
Gaugemaster	www.gaugemaster.com
Hatton's	www.hattons.co.uk
Heljan	www.heljan.dk
Hornby	www.hornby.com
Howes	www.howesmodels.co.uk
Lenz	www.digital-plus.de
Locoman Sounds	www.locomansounds.com
Mr Sound Guy	www.mrsoundguy.co.uk
Rail Exclusive	www.railexclusive.com
Roco	www.gaugemaster.com
South West Digital	www.southwestdigital.co.uk
TCS	www.tcsdcc.com
Train-Tech	www.train-tech.com
YouChoos	www.youchoos.co.uk
Zimo	www.zimo.at

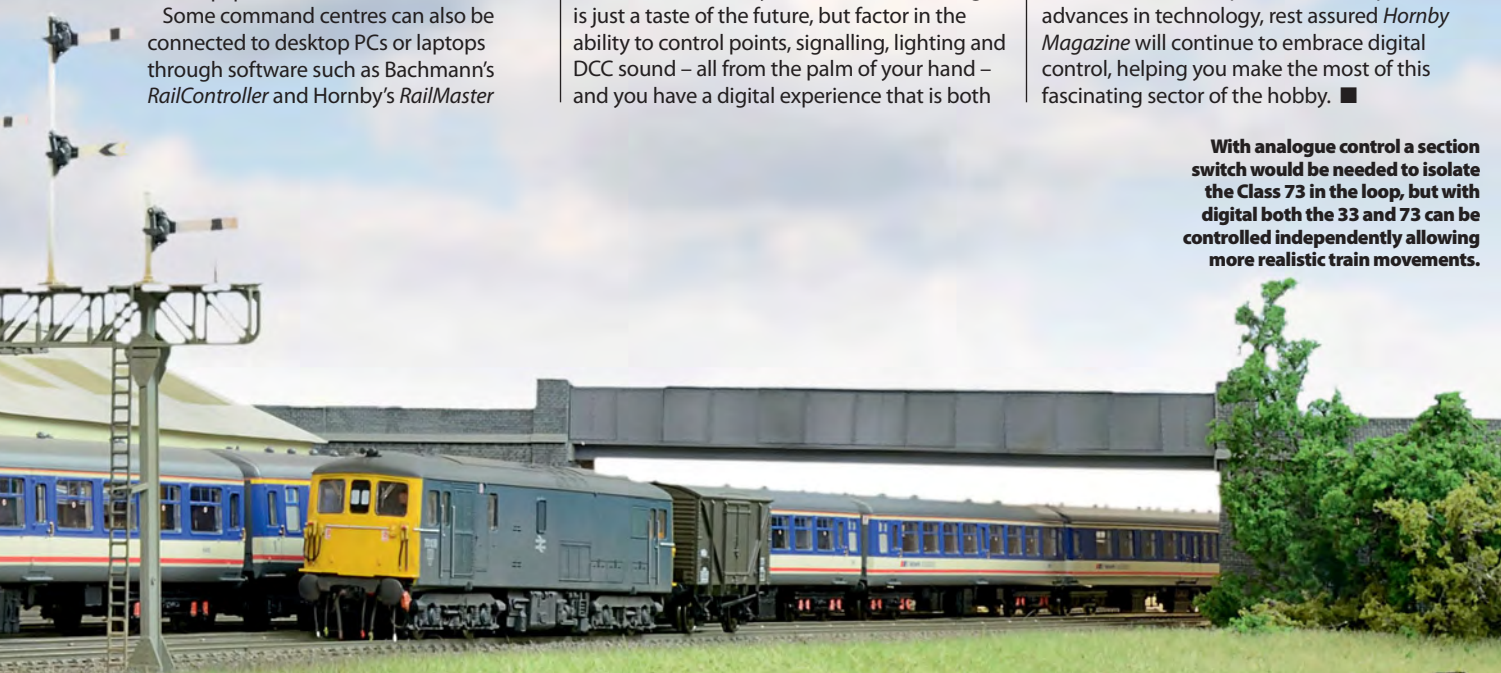


Locomotive sound decoders are available from a number of manufacturers including ESU and Zimo which can have specific sound files loaded onto them by specialist suppliers. This pair of ESU decoders were prepared by DC Kits to add realistic sound into a Class 33/1 and 4-TC combination.

enthralling and exciting.

With no limit to its potential and rapid advances in technology, rest assured *Hornby Magazine* will continue to embrace digital control, helping you make the most of this fascinating sector of the hobby. ■

With analogue control a section switch would be needed to isolate the Class 73 in the loop, but with digital both the 33 and 73 can be controlled independently allowing more realistic train movements.



Track PLANNING

Whatever grand plan you may have for your model railway, it is likely there will be elements of compromise along the way as you hone the design.

MARK CHIVERS offers a few track planning tips to get you started along with examples for 'OO' gauge.

HAVING IDENTIFIED the space available for a layout, whilst it might seem like a good idea to assemble a selection of track parts and simply hope for the best, developing a track plan really is the best way forward. Give thought to the ideal size of your baseboard and the scale you wish to model. In the following examples, we have elected for 'OO' gauge.

Firstly, map out your intended plan - a simple pencil drawing should suffice, acting as an indicator of the track layout and any features you may wish to include. Consider whether it is to be a continuous loop or end-to-end scheme and if it is to be of freelance design or something based on a prototype location. You might wish to mix and match, with the option to run trains around the loops while shuttling others back and forth on

an end-to-end branch line or perhaps shunting to and from a yard or carriage sidings. If you are basing your layout on a prototypical location, get a feel for the area in question by tracking down relevant books and photographs to ascertain placement of structures in relation to the full-size track layout.

Freelance design

You may decide to keep the layout's origins fluid, and in this case it will naturally evolve as you develop the plan, but you will still need to consider the main ingredients. These may include a station, goods yard, locomotive depot, junction, elevated section, branch line, tunnel, sidings, bridges, viaducts, a river, townscape and more. However, it will soon become apparent that unless you have unlimited space, some elements of selective compression may be necessary such

as reducing platform length or the number of sidings that will fit. Signal placement may also need to be closer together, while curves may inevitably end up much sharper than the real thing. Pointwork will almost certainly need reviewing too. Also, don't be tempted to fill all the baseboards with track - allow room for a few buildings, structures and scenery such as greenery and trees as well.

Be realistic in your aspirations and consider train lengths. When planning platform run-round loops, headshunts and stabling sidings, allow enough space for the longest locomotive in your fleet. In similar vein, multiply the length of your longest carriages accordingly to accommodate the required length in platforms. Given that a 'OO' gauge BR Mk 1 carriage measures approximately 280mm, a platform length of around 1,400mm (4ft 6in) should be considered to hold a four-



coach train plus locomotive. Also, consider any overhang and clearance issues that may occur on run-round loops and curves.

For multi-level layouts, ensure you allow as much of a run as possible for a gentle gradient. Realistically, a 1-in-30 gradient (a rise of 1mm over a 30mm run) is probably the steepest gradient you would wish to consider, with anything gentler being more acceptable to prevent traction issues. To help, there are off-the-shelf products available such as Woodland Scenics' Sub Terrain incline risers which come in a selection of grades and Hornby's inclined piers pack (R658) which includes seven graduated piers for use over a defined length. Again, the distance required needs to be planned into your diagram.

Track choices

Next, decide on which track type to use – sectional or flexible. Code 100 sectional track is supplied with most 'OO' gauge train sets with options available from Bachmann, Hornby and Peco. It is designed to follow specific geometry to make planning simpler, with curved track pieces available in first, second, third and fourth radius options.

As the radius increases, so does the space required to form a 180-degree curve, with first radius generally requiring a 742mm (2ft 4in) space, a second radius curve 876mm (2ft 9in), third radius 1,010mm (3ft 3in) and fourth radius 1,144mm (3ft 7.5in), which gives a rough indicator as to how much baseboard space to allow. Each radius can be spaced equally (67mm over centre lines) to form neat multiple curves without clearance issues, while track pieces are available in a range of sizes and arcs to suit individual needs. It

is also worth bearing in mind that unless you are only running short wheelbase locomotives, most manufacturers recommend use of second radius curves and above, while the selection of turnouts available is limited.

Peco also offers an alternative track system with its Streamline range which incorporates 914mm (1yd) lengths of flexible track, together with a broader selection of turnouts in both code 100 and code 75 rails. This flexible track can be formed to produce bespoke flowing curves without reliance on specific geometry, as well as straight and gently curving orientations. Pointwork includes small, medium, large and curved variants, catch points, three-way points, double-slip crossings, Y points and more. The added benefit to the flexible track range is that it can be gently bent to shape, cut to length and is more cost-effective. Finescale 'OO' options, including a choice of earlier style bullhead rail and more modern flat bottom type, are also available from C&L, DCC Concepts, Peco, SMP and more.

Planning applications

Having taken these factors into consideration, as the plan develops you will find that a detailed and accurate representation will reap benefits. Over and above the simple pencil drawing on graph paper, there are numerous options that can be utilised to help the process. Computer based track planning software is available to download including options from AnyRail, Hornby Trackmaster, SCARM, XTrackCAD and WinRail, each of which offer libraries of track parts to gradually build up your plan. Some offer a free trial version with limited functionality, which can be upgraded to a full-functioning version

on payment of a fee. Having trialled the SCARM software whilst compiling *Hornby's Magazine's* track plan articles it has shown its value. It enables you to select and drop track pieces into position, including flexible track, as well as move and rotate the schemes and features an extensive library of selectable track components and accessories across multiple scales and manufacturers. You can also view the finished design in 3D form too.

Traditional methods are also available including Peco's free-to-download scale-size turnout templates which can be placed directly on the baseboard so you can draw the design directly onto it.

An additional tip when plotting your plan is to include scale representations of the baseboard sections too as these will help with turnout placement. If the layout is likely to be semi-portable, try to keep points away from joints between baseboards and any strengthening battens below, as these may cause issues if you wish to place point motors beneath the surface. ■

USEFUL LINKS

Manufacturer	Website
Anyrail	www.anyrail.com
Bachmann	www.bachmann.co.uk
C&L Finescale	www.finescale.org.uk
DCC Concepts	www.dccconcepts.com
Hornby	www.hornby.com
Peco	www.peco-uk.com
SCARM	www.scarm.info
Scale Model Products	www.marcway.net
WinRail	www.winrail.com
XTrackCAD	www.xtrkcad.org

Model railway design is about much more than just filling a baseboard with track. For the best in realism the railway needs to become part of a scene as here at Shortley Bridge station where allotments border the goods yard and station where a Class 17 Bo-Bo diesel is waiting to enter the yard to collect wagons.



PLAN A

IF SPACE IS LIMITED, a small baseboard may be the answer. Plan A measures just 4ft x 18in and aims to represent a small country halt with adjacent goods yard and locomotive shed. Whilst small, it packs a lot into the available space with single face station platform, small headshunt, run-round loop, locomotive shed, goods platform and goods shed. Ideal as a

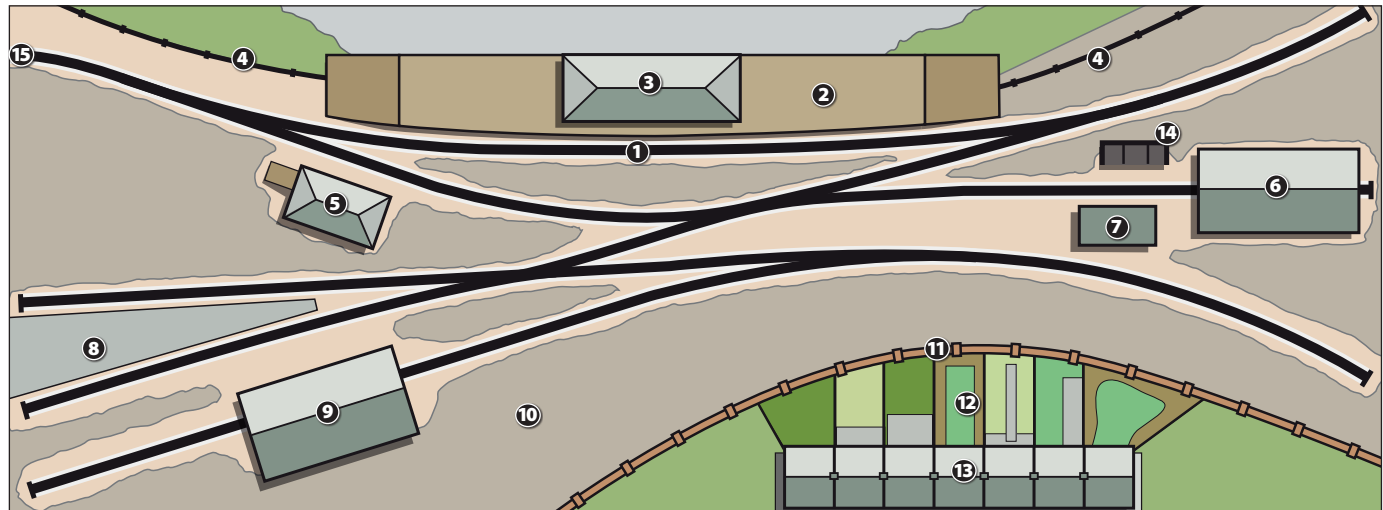
shunting puzzle layout, it comprises two space-saving Peco double-slip crossings (Cat No. SL-E190), two medium left-hand (SL-E196) and two medium right-hand points (SL-E195), together with five lengths of flexible track (SL-100F). Access to and from the layout is via off-scene cassette storage to the top left of the scheme, with provision for a two-carriage passenger train at the station platform, while the run-round loop could also be used for shunting goods trains too. Whilst the train locomotive heads to the shed, the resident shunting locomotive can distribute the wagons accordingly and reform the train for its return journey, making for some interesting

WHAT WE USED			
Product	Manufacturer	Cat No.	Quantity
Flexible track, yard length	Peco	SL-100F	5
Double slip crossing	Peco	SL-E190	2
Medium radius right-hand point	Peco	SL-E195	1
Medium radius left-hand point	Peco	SL-E196	2

KEY	
1 Station halt	9 Goods shed
2 Platform	10 Goods yard
3 Station halt shelter	11 Wall
4 Fence	12 Gardens
5 Signalbox	13 Terrace houses
6 Locomotive shed	14 Coaling stage
7 Water tower	15 To/from cassette yard
8 Goods platform	

operating sequences, despite its diminutive size.

● For more compact layout plans see HM117, March 2017.



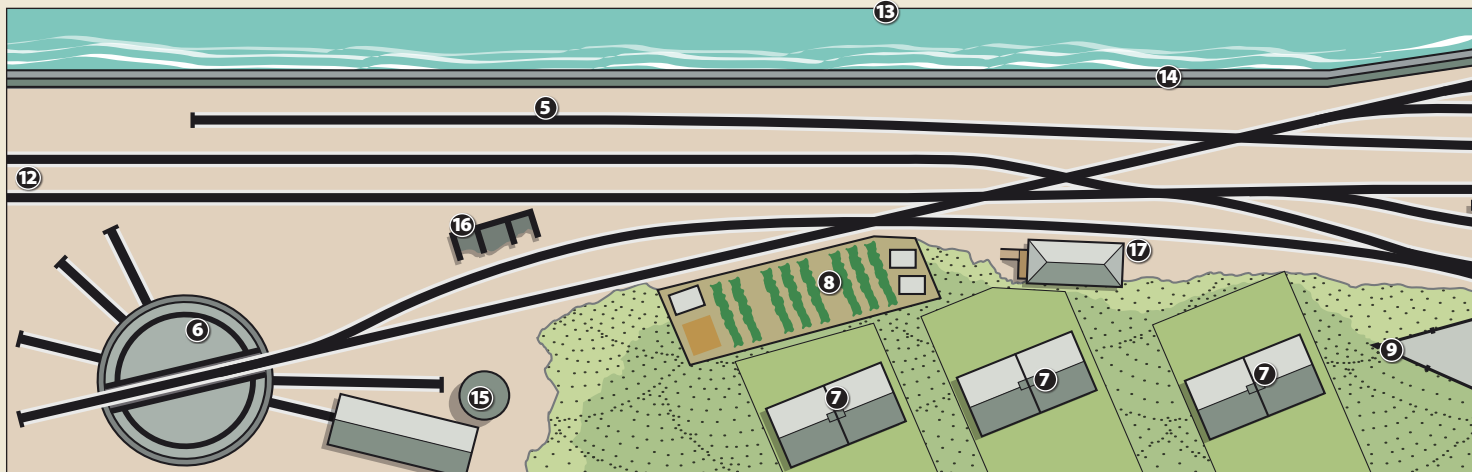
PLAN B

ANOTHER end-to-end design sees Plan B represent a coastal passenger terminus, in this case at a West Country location,

where it is assumed summer holiday traffic makes extensive use of the double-faced station platform and accompanying carriage sidings. As there are no run-round facilities as such, locomotive hauled services would require shunt-releasing – this means that a station pilot would couple onto the rear of an arriving train to take the carriages away. The train engine can then reverse along the platform to head to the depot. This manoeuvre will take the carriages through the complicated

double-slip crossing at the centre of the scheme and then see them propelled into one of the carriage sidings. Meanwhile the locomotive could head to the small locomotive servicing facility for turning, as well as replenishing with water and coal ready for its next working. A goods yard is included too, with direct access to/from the locomotive shed to reduce conflicting movements with passenger arrivals and departures. At 14ft x 3ft, the scenic area

for this layout utilises Peco code 100 Settrack and Streamline track components and would suit a large shed or garage, as the hidden storage yards would require additional space to hold suitably lengthy passenger and goods trains while ‘off-scene’. The storage yard design could involve a return loop if you have space, a series of dead end sidings, a traverser or cassettes. ● For more coastal layout plans see HM110, August 2016.





THIS SCHEME is altogether different in that it portrays a diesel-era locomotive depot with an operating turntable dominating the scene (HM101). Ideal for displaying your locomotive fleet at its best, there are nine stabling roads, plus offshoots to other areas of the

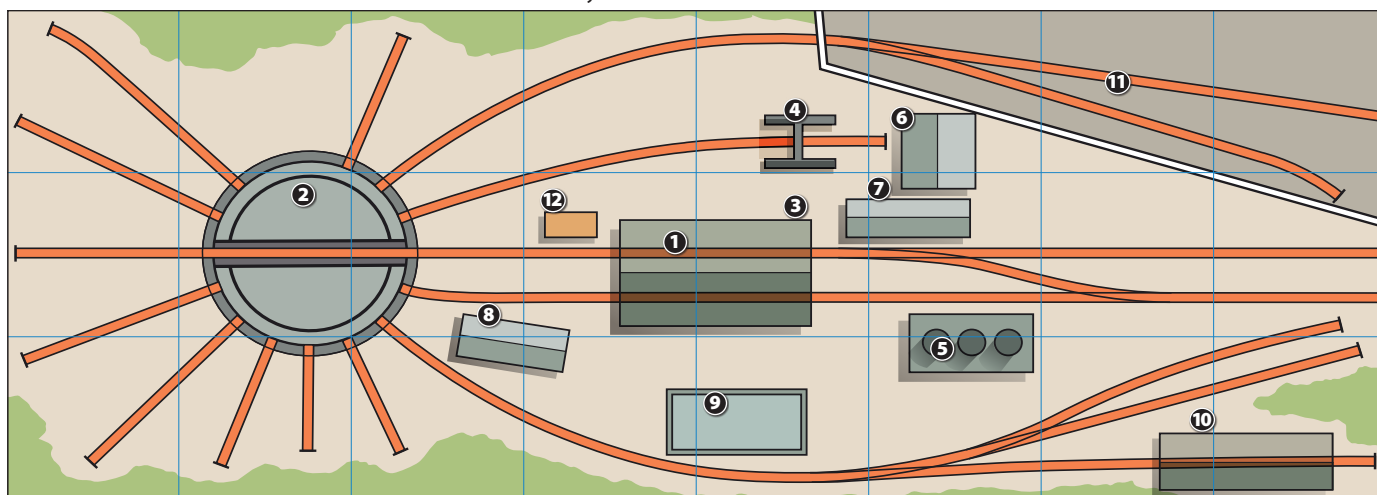
WHAT WE USED			
Product	Manufacturer	Cat No.	Quantity
Turntable kit	Peco	LK-55	1
Flexible track, yard length	Peco	SL-100F	14
Medium radius right-hand point	Peco	SL-E195	3
Medium radius left-hand point	Peco	SL-E196	2

depot including the maintenance shed, inspection shed and further stabling sidings. Access to the turntable is through the two-road servicing/fuelling shed, with the entrance/exit to the layout at the right-hand side. Again, this would require a separate off-scene storage yard or cassette storage system. Two hidden sidings are also provided at the top of the scheme, which could also be used to change motive power and feed them in and out of the layout.

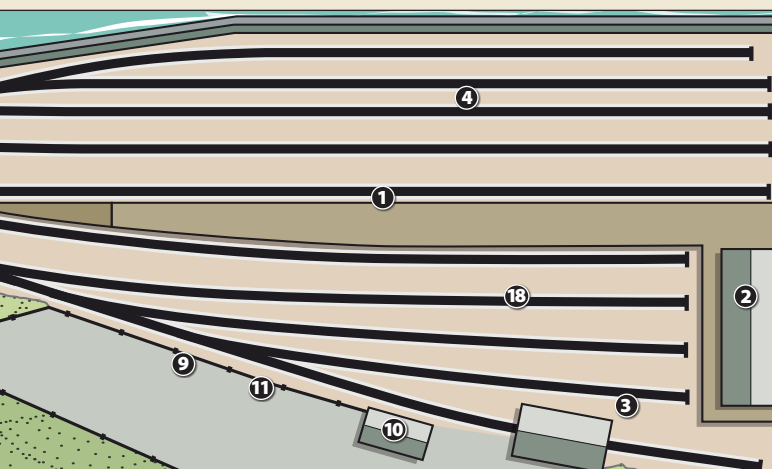
At 8ft x 3ft, this plan utilises three Peco code 75 medium right-hand (SL-E195) and two medium left-hand turnouts (SL-E196), together with 14 lengths of flexible track (SL-100F). Extra detailing can be added with hoist gantries, office buildings, fuel storage tanks and more to create some exciting scenarios as locomotives progress through the depot, ready to be stabled. Whilst primarily intended as a diesel era layout, it could also easily be backdated for steam operation too.

KEY	
1	Servicing shed
2	Turntable
3	Maintenance shed/offices
4	Hoist gantry
5	Fuel tanks
6	Stores
7	Crew room
8	Shunters mess
9	Secure compound for flammable liquids
10	Inspection shed
11	Hidden sidings
12	Grounded van body (sand store)

• For more depot layout plans see HM101, November 2015 and HM125, November 2017.



KEY	
1 Platform	10 Goods office
2 Station building	11 Goods yard area
3 Goods shed	12 To/from storage yard
4 Carriage sidings	13 Sea
5 Carriage siding headshunt	14 Sea wall
6 Turntable	15 Engine shed/water tower
7 Houses/gardens	16 Coaling stage
8 Allotments	17 Signalbox
9 Fence	18 Sidings



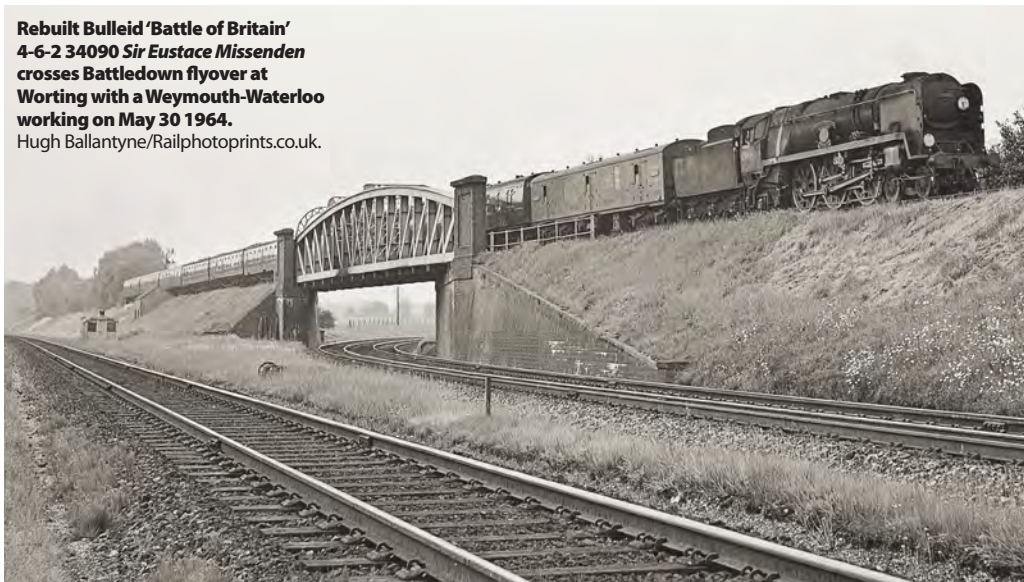
The Great Western Main Line's sea wall through Dawlish and on to Teignmouth is probably the best known of all Britain's coastal railway lines. On August 6 1976 1068 *Western Reliance* approaches Teignmouth with a Down West of England express. Graham Smith/Railphotoprints.co.uk.

WHAT WE USED			
Product	Manufacturer	Cat No.	Quantity
Turntable kit	Peco	LK-55	1
Flexible track, yard length	Peco	SL-100	24
Double-slip crossing	Peco	SL-90	5
Medium radius right hand point	Peco	SL-95	3
Medium radius left hand point	Peco	SL-96	3
Double straight	Peco	ST-201	3
Short straight	Peco	ST-202	1
Long straight	Peco	ST-204	1
Medium crossing	Peco	ST-250	1

PLAN D

PLAN D IS DIFFERENT in that not only is it a continuous loop plan, it also doesn't feature a station. The track plan measures 16ft x 12ft and includes two multi-level junctions – one at the top and the other at the bottom of the scheme. Each junction features a representation of the prototype, although clearly a full-scale replica would be impossible to reproduce in the space available. A novel twist with this design is that the lower level lines that pass beneath the junction at the top of the plan become the elevated lines at the other junction, and vice versa. As a result, consideration is required to the rise and fall of the lines to allow sufficient clearance beneath each of the flyovers – especially amongst the four lines to the far right of the plan. Allowance for a 7ft run between junctions

Rebuilt Bulleid 'Battle of Britain' 4-6-2 34090 Sir Eustace Missenden crosses Battledown flyover at Worting with a Weymouth-Waterloo working on May 30 1964. Hugh Ballantyne/Railphotoprints.co.uk.



is required, possibly more for gradual gradients. In addition to the main circuits, storage lines are also included within the centre of the scheme, with enough stabling for multiple train formations, accessible from the inner circuit. One road could be kept clear to enable trains to divert off the main lines and so lengthen the journey time.

Ideal for a garage, shed or loft conversion, if you just want to run trains, this layout could

prove ideal, with ample space to loop trains off the main line and create exciting scenarios. With a longer room the layout could

be extended for more realistic gradients.
● For more junction layout plans see HM123, September 2017.

WHAT WE USED

Product	Manufacturer	Cat No.	Quantity
Flexible track, yard length	Peco	SL-100F	85
Curved double radius right point	Peco	SL-E186	4
Curved double radius left point	Peco	SL-E187	5
Large radius left point	Peco	SL-E189	1
Medium radius right point	Peco	SL-E195	5
Medium radius left point	Peco	SL-E196	4
Large radius 'Y' point	Peco	SL-E198	3

PLAN E

OUR FINAL PLAN represents a traditional continuous loop track diagram with a large station and a distinctive junction at one end of the station offering an eye-catching spectacle. Provision is also included for a link to further 'off-scene' storage or additional loops – perhaps even another end-to-end station plan – for added potential in the future if you have the space. With three main platform faces, plus a bay platform, there is plenty of scope for passenger operations while parcels and branch line trains could also be operated. In the lower section of the scheme, five storage roads with two extra kick-back sidings are provided, although more could be added if space allows.

At 12ft x 8ft, this plan would



The trackwork at Barnstaple Junction's station approaches offer superb modelling potential, as shown in Plan C. Bulleid 'Battle of Britain' 34061 73 Squadron eases through the junction with the 3pm from Ilfracombe on May 19 1959. Ken Cook/Rail Archive Stephenson.

suit a large spare room, garage, loft conversion or shed. Station platforms, as drawn, could accommodate three or four carriage trains and may be extended if you have room, particularly if located in a loft space.

25 turnouts are required, with two different sized crossovers to achieve the distinctive angles, including three short crossings (SL-E193), one long crossing (SL-E194), one double-slip crossing (SL-E190), 11 curved double radius points (SL-E186/E187) and four large radius turnouts (SL-E188/E189). The remainder is made up of medium radius turnouts (SL-E195/E196) in the station area, plus a single small

radius Y point to get the angle just right for the short crossings at the top of the plan.

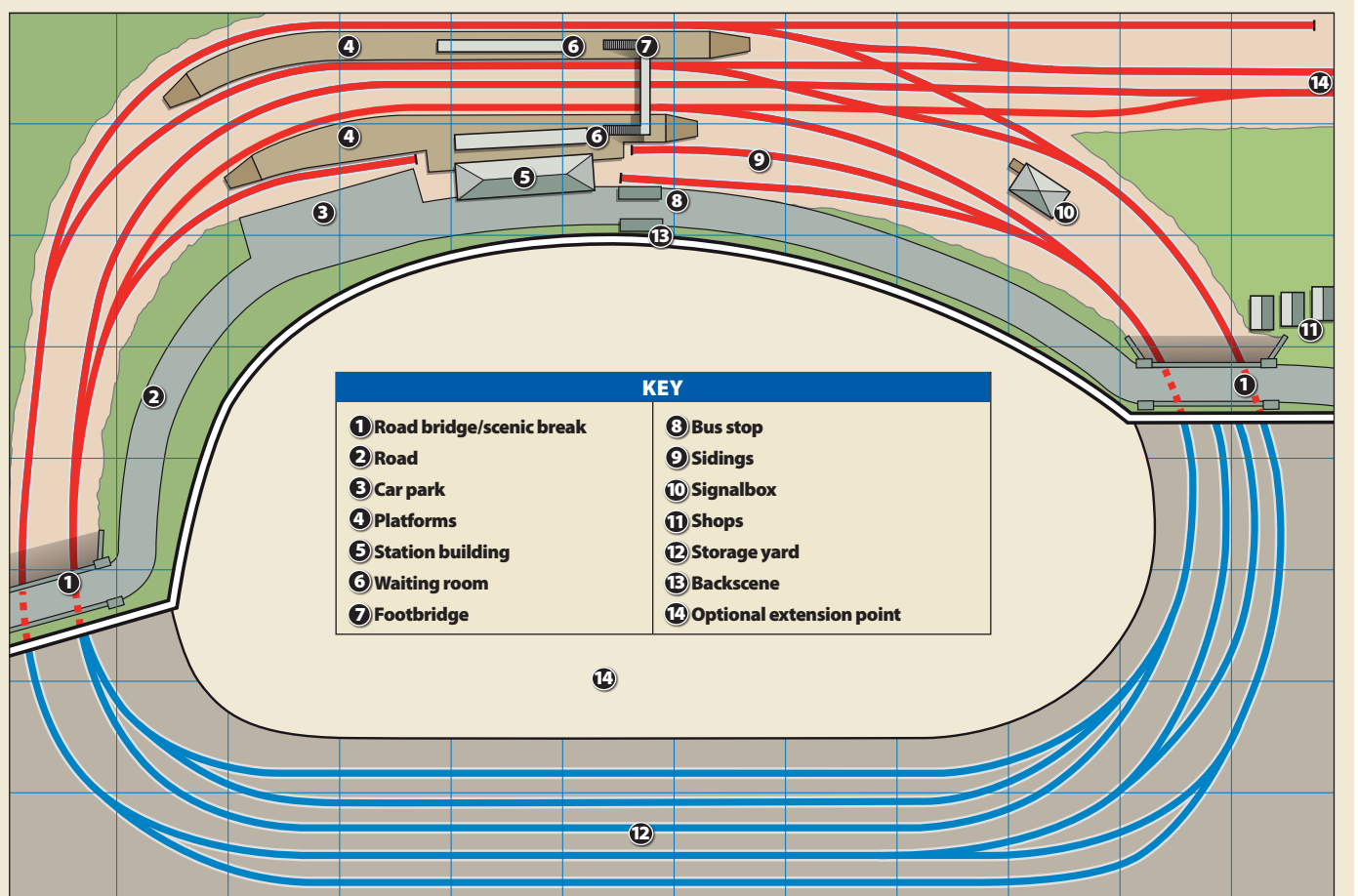
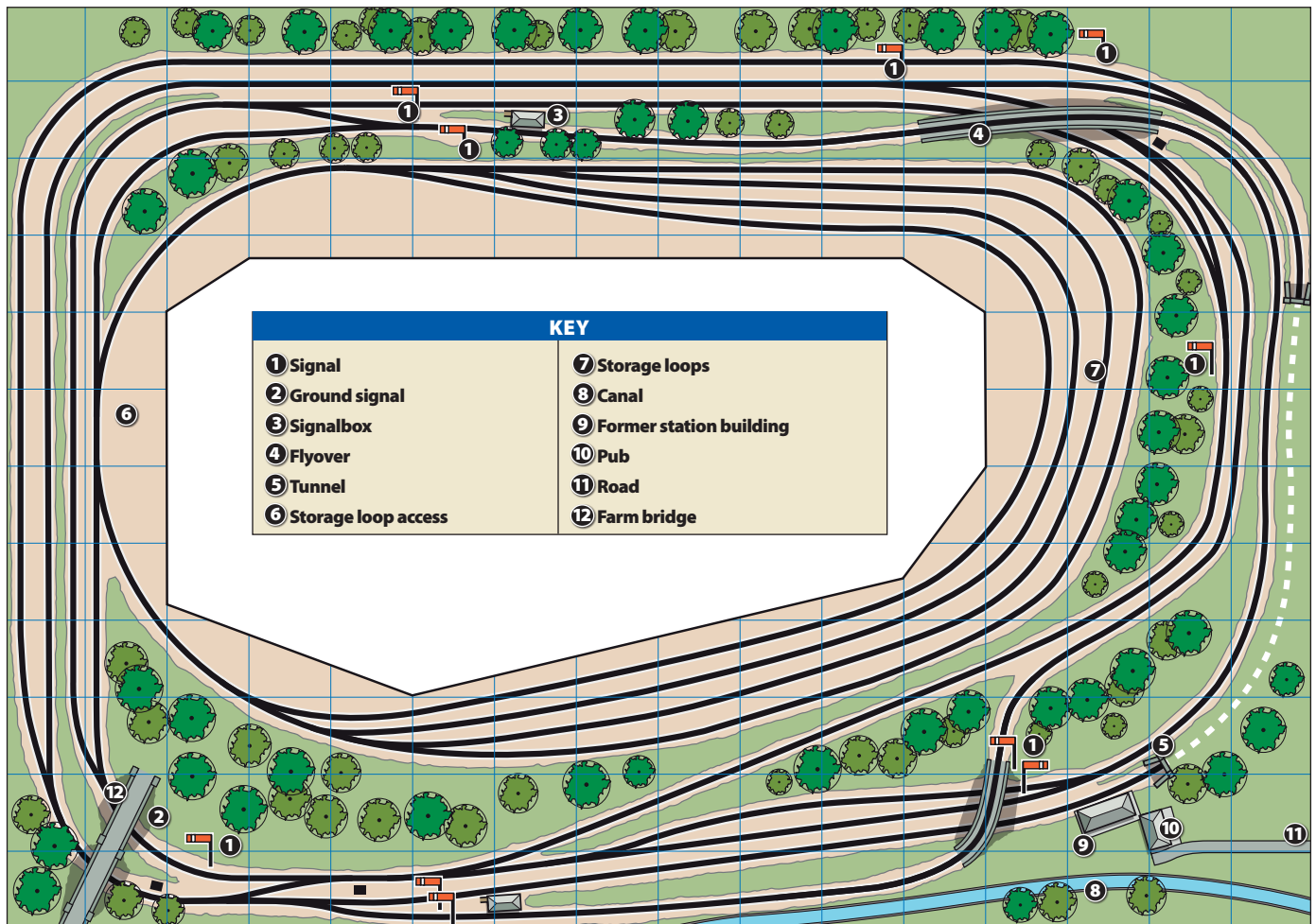
With long-distance and branch line passenger trains, pick-up

goods and milk traffic potential, it offers plenty of operational scope.

● For more secondary station layout plans see HM103, January 2016.

WHAT WE USED

Product	Manufacturer	Cat No.	Quantity
Flexible track, yard length	Peco	SL-100F	40
Curved double radius right-hand point	Peco	SL-E186	5
Curved double radius left-hand point	Peco	SL-E187	6
Large radius right-hand point	Peco	SL-E188	3
Large radius left-hand point	Peco	SL-E189	1
Short crossing	Peco	SL-E193	3
Long crossing	Peco	SL-E194	1
Double-slip crossing	Peco	SL-E190	1
Medium radius right-hand point	Peco	SL-E195	2
Medium radius left-hand point	Peco	SL-E196	1
Small radius Y point	Peco	SL-E197	1



Minimum space MAIN LINE

Are you short on space but still have a burning desire for main line trains? **MIKE WILD** offers one solution in the form of Barrenthorpe – an 'N' gauge four track main line and shed scene in just over 8ft x 3ft.

The ash and coal towers frame a Stanier 'Jubilee' 4-6-0 and Fowler 'Jinty' 0-6-0T. Both are Bachmann Scenecraft models with light weathering added.



FINDING THE SPACE for the railway you really want isn't always quite as easy as we'd hope. Main line scenes are seen as the most appealing where long express trains can flash past goods trains which seem to go on forever. But how can you accommodate all that if all you have is an 8ft x 4ft baseboard space?

The answer is 'N' gauge. Running on 9mm gauge track and now supported by extensive ranges from Dapol and Graham Farish as well as a number of smaller suppliers and kit manufacturers, 'N' gauge is a viable alternative to 'OO' gauge - and particularly where space is at a premium. The quality of the models, both in performance and appearance, is on a level with larger 'OO' gauge products while the variety and variations available continue to expand.

Moreover, 'N' gauge is catching up with technology too with locomotives now being equipped with Digital Command Control (DCC) decoder sockets as standard, mostly 6-pin with

the more comprehensive and space saving Next18 socket being introduced too. There are now locomotives with factory fitted sound and, in the latest generation, often factory fitted speakers as well as decoder sockets. It is all making 'N' gauge a much closer relation to the more popular 'OO' gauge, reducing the difference to size alone.

Here at *Hornby Magazine* we have built several 'N' gauge layouts over the magazine's lifetime, but one which has stood out is Barrenthorpe. It started out as an 8ft x 2ft double track main line with a six-track storage yard at the rear and a depot scene as the centrepiece of the scenic area. While that sounds good in principle, and it was capable of hosting realistic train lengths, it lacked greatly in the operating department. Main line trains simply circulated and due to the nature of the track plan there wasn't even a crossover.

Fast forward three years from its original construction and, having been used as a test track first and foremost, it was brought back into the *Hornby Magazine* workshop for a dramatic makeover. The aim was to turn what was a bland

and uninspiring layout to operate into a busy main line scene with plenty of route choices and gradients. The latter feature was intended for testing purposes as much as it was to enable even more railway to be packed into the footprint.

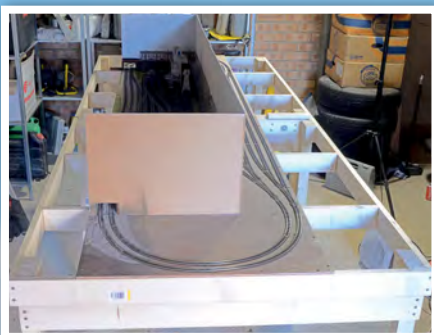
The frames were extended by 6in at the front and 10in at the rear taking the full width of the layout to 3ft 4in. The length didn't change much, but we were able to add on an additional 3in at one end taking it to 8ft 3in while still allowing it to fit in its original location in the office. This set the wheels in motion for the build which would push the boundaries of what was possible in 8ft 3in x 3ft 4in.

Rebuilding

The initial phase of modifications concentrated on changes to the framing and baseboard surfaces. Following extension of the frames and fitting of new cross-members at the outer ends, fresh 9mm plywood was used to create the baseboard tops. This included a consistent gradient across the rear 10in along the full

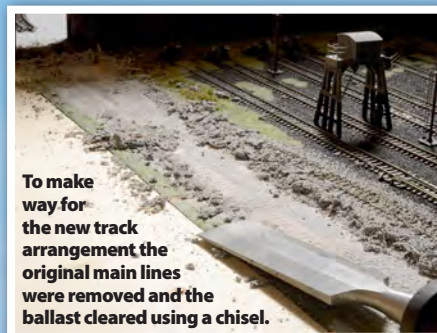
A Stanier rebuilt 'Royal Scot' 4-6-0 thunders along the main line through Barrenthorpe passing a pair of English Electric Type 1s on a coal train crawling into the loop and a Pressed Steel single car DMU held at the signal on the left. The coaling tower from the locomotive shed dominates the skyline.





THE DETAILS	
Name:	Barrenthorpe
Scale:	'N' gauge
Size:	8ft 3in x 3ft 4in
Track:	Peco code 55 and code 80
Control:	Analogue and digital
Period:	London Midland Region, 1960s

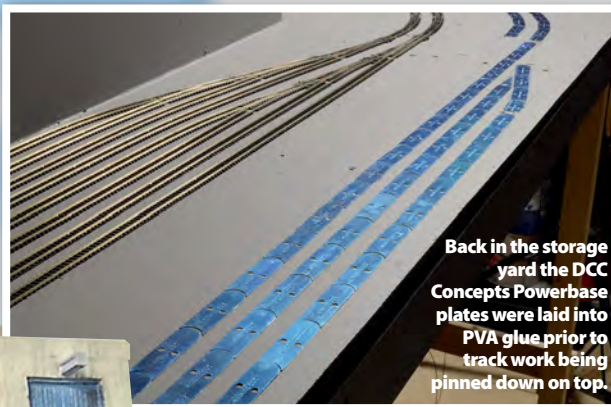
Left: Stage one – Barrenthorpe's baseboards were modified by extending them 6in at the front and 10in at the rear. The original 4ft x 2ft baseboard tops and backscenes were kept as before.



To make way for the new track arrangement the original main lines were removed and the ballast cleared using a chisel.



New 9mm plywood was cut to size to create the gradient at the rear and also extend the width of the lower level storage yard. Here the new panels are laid loose to check their fit.



Back in the storage yard the DCC Concepts Powerbase plates were laid into PVA glue prior to track work being pinned down on top.

8ft length of the layout while at the front the gradient was shorter and steeper being confined to one of the original pair of 4ft long boards. This created the first two challenges for model locomotives on this layout – a 1-in-68 and a 1-in-30 gradient.

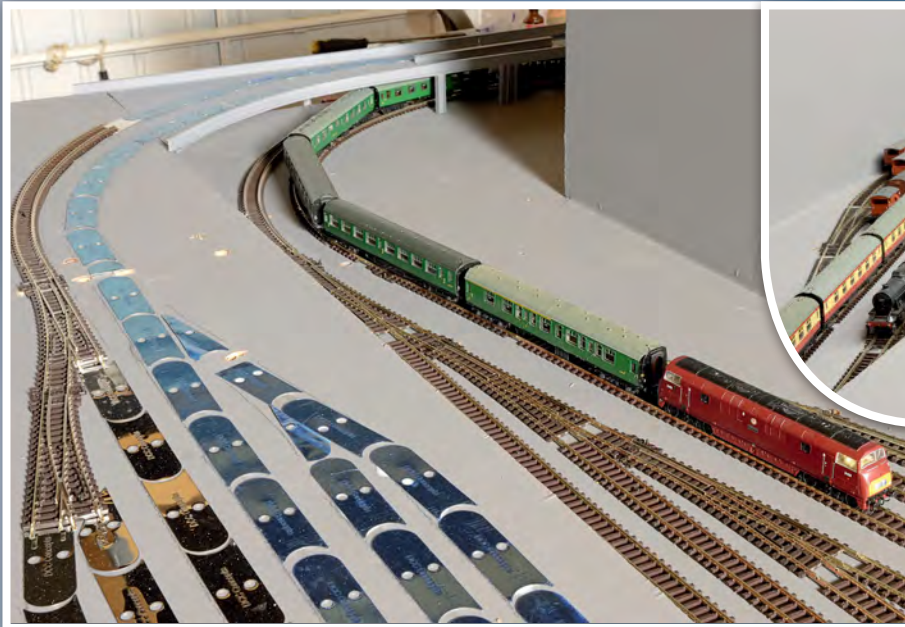
The original main line was lifted entirely and the scenic breaks at each end were stripped out to allow the new four track main line to enter at one end and split into two twin track routes at the other. Ballast was scraped away with a chisel, being careful not to damage the baseboard surface or the depot scene alongside, and all the new timber at the rear for the storage was painted in grey to give a clean surface on which to lay the new storage yards – one on the level, one on the 1-in-68.

As ever we had new products to test during the building of Barrenthorpe and one of those was DCC Concepts' Powerbase. This is designed to increase traction for locomotives on gradients and consists of

stainless steel plates to be fitted below the track and high-powered magnets which are fitted to the underside of locomotives. In combination these two components make a tremendous difference to the ability of models tackling gradients and in most cases they at least gave a 50% performance boost while for others it doubles their capacity on the gradients.

The stainless steel Powerbase plates were laid underneath the track for all the uphill sections including on the approach and until the point where the last wagons of the longest freights would be going downhill or on the level again. PVA glue secured the plates in place and we have been wholly impressed





Above: The new storage yards offer a tremendous amount of space for trains. Up to 20 are stocked for an operating session covering goods, parcels, local and express passenger.

Left: The storage yard takes shape with the addition of an inverted bridge over the lower main lines. This reduced the height required to clear the lower level.

by the difference it makes for 'N' gauge steam locomotives. Powerbase is also available for 'OO' gauge and offers similar, if not greater, performance advantages.

The vast majority of the track on Barrenthorpe is from Peco's code 55 range, although we have used code 80 set track curves at each end to ensure consistent corner profiles and performance on this layout. Flexible track was used for all other areas of the layout while the centre of the scenic area track plan is now a pair of double junctions which allow trains to change routes via large radius points and diamond crossings – the third challenge for new products on test. We were also able to include goods loops

on both the inner and outer circuits adding further to the operational potential of the layout.

Exhibition deadline

Rigorous testing of the track layout followed and soon we were ready to install point motors for full control of the layout from a new DCC Concepts Mimic Panel. This was custom built to control all 45 of the points which now make up the layout, all of which are powered by DCC Concepts Cobalt point motors. In addition the panel operates the colour light signals on the outer goods loop while all of the remaining signals use the same accessory address as their corresponding point so that they change at the same time.

While Digital Command Control (DCC) has been employed from the start for this layout, it has also retained the ability to test models under analogue control. The power feeds for the outer and inner circuits can be disconnected and replaced by analogue controllers, the only restriction being that analogue trains can't use the crossovers to change routes as these are powered by Tam Valley Hex Frog Juicers which automatically change the polarity of the diamond crossings on digital to keep trains moving seamlessly.

Up until this point Barrenthorpe had always been an office-based layout, but in 2016 we made the decision to take it out on show to the Great Electric Train Show in the October of that year. At





On the scenic section Berko colour light signals were installed at the junctions prior to scenic development.



Wiring of the new Cobalt IP digital point motors was carried out swiftly. A handful of analogue Cobalt motors were also used requiring DCC Concepts Cobalt accessory decoder boards to operate them.

the time modification of the scenery following the baseboard and track remodelling hadn't been started, but in our usual fashion, sleeves were rolled up and the layout was transformed in the weeks leading up to the show.

First up was ballasting of the new main lines. To start the track was sprayed with Humbrol No. 29 brown, taking care to ensure the point blades were masked first. This was followed with Woodland Scenics fine blended grey ballast glued down with Deluxe Materials Ballast Magic – a powder adhesive which is mixed into the ballast dry and then activated by spraying with a water mister.

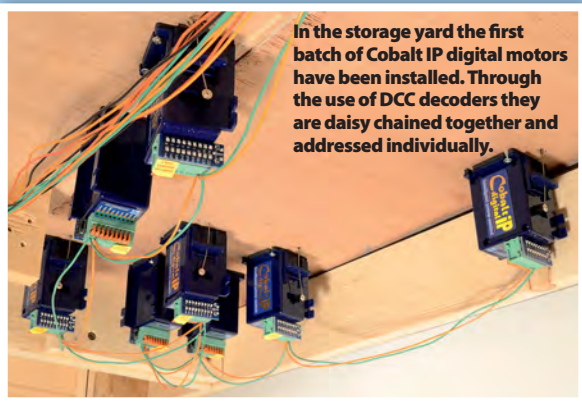
We also elected to replace the entire length

BARRENTHORPE PRODUCT LIST

PRODUCT	MANUFACTURER	CAT NO.
Code 55 large radius right point	Peco	SL-E388F
Code 55 large radius left point	Peco	SL-E389F
Code 55 medium radius right point	Peco	SL-E391F
Code 55 medium radius left point	Peco	SL-E392F
Code 55 large diamond crossing	Peco	SL-E394F
Code 55/code 80 rail joiners	Peco	SL-310
Code 55 flexible track	Peco	SL-300F
Turntable	Peco	NB-55
Rail built bufferstops	Peco	SL-340
Yard lamp	Eckon	ELN2
Fine cinders ballast	Woodland Scenics	B1376
Fine blended grey ballast	Woodland Scenics	B1393
Blended green fine turf	Woodland Scenics	T1349
Burnt grass coarse turf	Woodland Scenics	T1362
Static grass fibres	Green Scene	Various
Twin aspect single head colour light signal, offset	Berko	BN0R
Twin aspect twin head colour light signal	Berko	BN04T
Low relief corner pub	Scenecraft	42-206
Low relief corner shop	Scenecraft	42-203
Low relief terrace house	Scenecraft	42-202
Coaling tower	Scenecraft	42-070
Ash tower	Scenecraft	42-086
Depot crane	Scenecraft	42-072
Locomotive depot	Scenecraft	42-050
Signalbox	Scenecraft	42-187
Lamp huts	Scenecraft	42-114
Water tower	Scenecraft	42-097
Factory building	Kestrel Designs	KD1001
Plasticard, white, 1.5mm thick	Evergreen	9060
Tiled plasticard	Evergreen	4501
Red brick self adhesive sheets	Redutex	148LV112
Street lamps	Knightwing	KWA4
Dustbins	Knightwing	KWA12
Bus shelters	Knightwing	HWA40
Power base 'N' gauge starter pack	DCC Concepts	DCX-PBKitN
Cobalt IP digital point motor	DCC Concepts	DCP-CB1DiP
Hex Frog Juicer	Tam Valley	HFJ003U
Twin aspect signal decoder	Train-Tech	SC1



'WD' 2-8-0 90565 works hard through the junction at the head of a long rake of 16ton mineral wagons. The signals use the same accessory address as the point underneath the 2-8-0 and change at the same time as the point.



In the storage yard the first batch of Cobalt IP digital motors have been installed. Through the use of DCC decoders they are daisy chained together and addressed individually.



Right: More destruction was required around the scenic breaks before work could begin to make it all scenic again. Here the original backscene support has been chopped out to allow two of the depot lines to be extended through the backscene.

of the retaining wall around the depot scene by using 1.5mm plasticard sheet cut to size and overlaid with Redutex self-adhesive and pre-coloured moulded brick sheets. This gave a superb new finish to the layout and allowed a consistent finish to all the brickwork around the railway. A little toning down is still needed. Also new was the addition of a factory building at the junction end of the layout to act as a scenic break at the end of the shed. A Kestrel Designs plastic kit was used as the basis for this which was modified to suit the location by leaving out the rear wall

and finishing it with Lifecolor worn brick colours. The final component of the project was development of the scenery in front of the main line and around the gradient from the junction. Here Green Scene static grasses and fine turfs were used to create the appearance of a grassed area with some sections suggesting an overgrown former siding being taken over by nature.

Operation

What was a quite uninteresting layout to operate now has great potential. There are 14

tracks in the storage yard at the rear – six on the gradient and eight on the lower level – and in combination they can host up to 20 trains by doubling up in some roads. Sequences of events mean that trains from the lower yard can be exchanged for those on the gradient using the signals at the junction as a stop point. Freights can extend to 25 wagons while the longest passenger trains are eight vehicles long to allow them to fit into roads on both the upper and lower yards.

Traction is drawn from the Dapol and

Overlooking the busy main line scene, a Stanier 'Duchess' 4-6-2 races through on an express as a '9F' 2-10-0 enters the goods loop with Presflo cement wagons. Behind are the coal and stabling roads at Barrenthorpe shed.





The roadway was extended using matching 3mm thick Medium Density Fibreboard. Placing road vehicles helps to gauge the width of the road.

Graham Farish ranges with a strong London Midland Region theme. This includes 'Jinty' 0-6-0Ts, '4F' 0-6-0s, '8F' 2-8-0s, '9F' 2-10-0s plus '5MT', 'Jubilee', 'Black Five' and 'Royal Scot' 4-6-0s. 'Duchess', 'A1', 'A2' and 'A4' class 'Pacifics' appear together with other interlopers from the Eastern Region such as 'B1' 4-6-0s, 'J39' 0-6-0s and others. Diesels represented consist of classes 08, 20, 24, 25, 27, 31, 37, 40, 46 and 47 plus a collection of Class 108 Diesel Multiple Units in two and three-car formations.

The stock roster is constantly being updated

with new arrivals while more of the stock is being sent through the weathering process to make each train more realistic in its appearance. A handful of locomotives have been equipped with digital sound while all those operating on the layout are at least fitted with either a Bachmann or Gaugemaster 6-pin decoder.

The future

Following Barrenthorpe's appearance at the 2016 Great Electric Train Show it has been

back at *Hornby Magazine's* HQ carrying out its daily duties hosting new models for testing. These can be anything from a new wagon to the very latest modern image locomotive or multiple unit including the recent Class 68 from Dapol and Class 390 Pendolino by Revolution Trains.

One day it will more than likely head out on show for *Hornby Magazine* again, but until then keep an eye on the magazine website for new videos of the latest models in action on this intensive main line scene. ■

USEFUL LINKS

DCC Concepts	www.dccconcepts.com
Eckon/Kestrel/Berko/Knightwing	www.gaugemaster.com
Green Scene	www.green-scenes.co.uk
Peco	www.peco-uk.com
Redutex (UK)	www.dccsupplies.com
Scenecraft/Woodland Scenics	www.bachmann.co.uk
Tam Valley	www.digitrains.co.uk
Train-Tech	www.train-tech.com



Underneath the final scenic covering is a web of masking tape overlaid with newspaper coated in PVA glue. This combination of materials creates a surprisingly rigid landscape on which to add ground cover.



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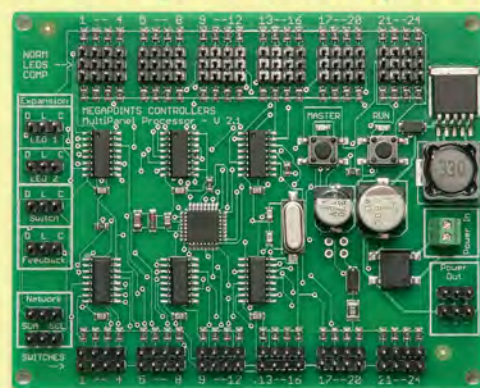
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Track laying

A fundamental component of a model railway is track. **NIGEL BURKIN** presents his guide to successful tracklaying for newcomers to railway modelling.

MOST NEWCOMERS to our hobby quickly become acquainted with set track systems, especially if a trainset has been purchased as a first step. Trainsets include a basic oval of track and perhaps a siding or two. They can be expanded with track packs and additional pieces to increase the system within a neatly defined geometry.

Set track is ideally designed for setting out temporary layouts on a tabletop or the floor for a rainy Sunday afternoon of operations and then put away in its boxes once the session is over. Set track layouts can be made permanent too when laid out on a baseboard and the track may be coloured and ballasted for a more realistic appearance.

Many experienced modellers are familiar with track sections such as Hornby R600 and R601; the geometry of the set track curves and how

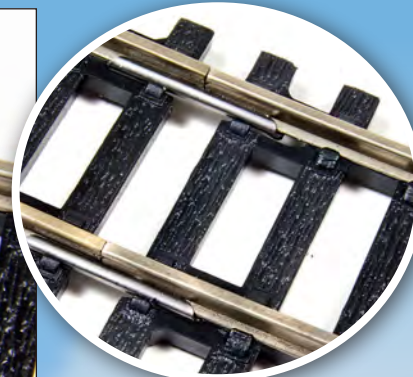
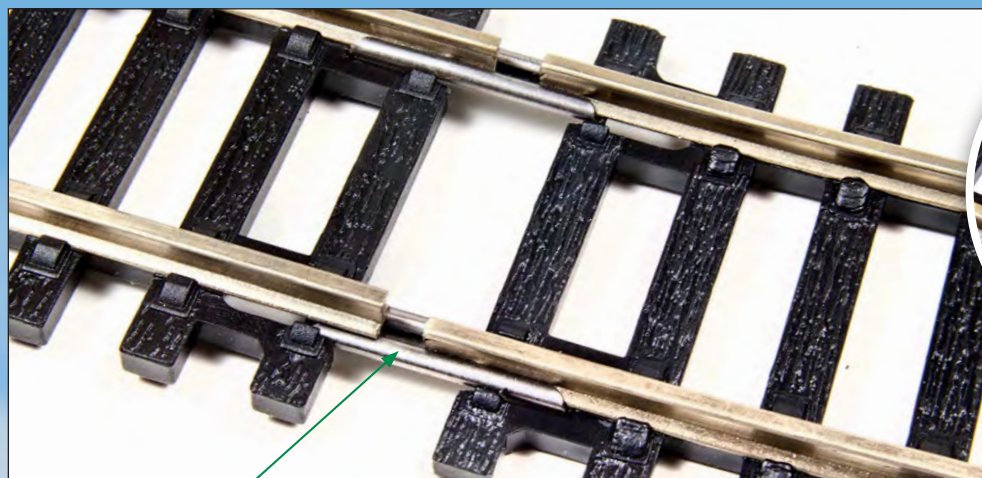


it all fits together with adequate clearances on curves. Set track is a neat and convenient way to build up a layout without having to think about clearances and cutting flexible track, and many experienced modellers probably cut their modelling teeth on the Hornby set track system.

Common track systems used in British outline modelling include the set track packs

offered by Bachmann and Hornby. In fact, most track manufacturers offer some sort of predetermined geometric track system. From Peco to Atlas, the more advanced flexible track systems are supplemented with set track pieces. Furthermore, there are track systems with moulded ballast bases which are perfect for building up temporary layouts including the 'N' and 'OO' gauge Unitrack system by Kato.





When assembling set track, be sure to check all rail joiners to see that they are correctly aligned and there are no kinks in the track.

Above: Misaligned rail joiners are guaranteed to derail some if not all of the trains run on a set track layout.

Left: Tools for tracklaying including pin vice, track templates, modelling knife and a means of cutting flexible track to length, including cutting discs and the popular Xuron track cutters.

THE STAGES OF TRACKLAYING

- Complete the baseboard tops
- Mark in the proposed track formation using photocopies of the turnouts as templates and lengths of plain track to set out the formations
- Fit the track underlay – it may be composed of cork, foam or a moulded material
- Work out the position of under track devices, if any, and prepare the trackbed to accept them
- Lay the track using gauges and clearance tools
- Wire up the track for power – fit operating devices such as point motors and test everything extensively
- Paint the track, rails and surrounding area of baseboard
- Ballasting, rail cleaning and weathering

Flexibility

Flexible track systems are a step up from set track and offer the modeller more freedom to create bespoke track formations. Manufacturers usually offer matching turnouts made with greater diverging angles to go with flexible track products. Smoother flowing track and junctions together with increased realism

is possible, at the cost of losing the temporary nature of the layout.

Flexible track allows the modeller to shape curves into the track to create a wide range of layout designs, limited by the minimum radius curves that the rolling stock can reliably negotiate. Whilst flexible track may be stiff enough to hold any shape introduced to it, »

Well laid track is essential to the successful operation of a model railway. At Grosvenor Square, Hornby Magazine's Western Region terminus, a Collett 'Castle' 4-6-0 departs with an express through the complex junction formation, all of which is laid with Peco code 75 track.





Set track is easy for newcomers to use and with the right care and attention it can look very good in appearance. A small test section was built for this article using some Hornby set track pieces.

Permanently laying track on a baseboard is preferable to creating temporary layouts on carpet or wooden floors where dirt, fluff and hairs can be a problem. To improve performance, consider using dense foam or cork track underlay.

flexible track cannot really be used to make temporary tabletop layouts.

With flexible track comes more serious layout building with track firmly fixed in place, either using glue or track pins and with the potential for considerably more scenic treatment. Popular systems include Peco Streamline for 'OO' and 'N' gauge which is compatible with all British ready-to-run rolling stock. Peco

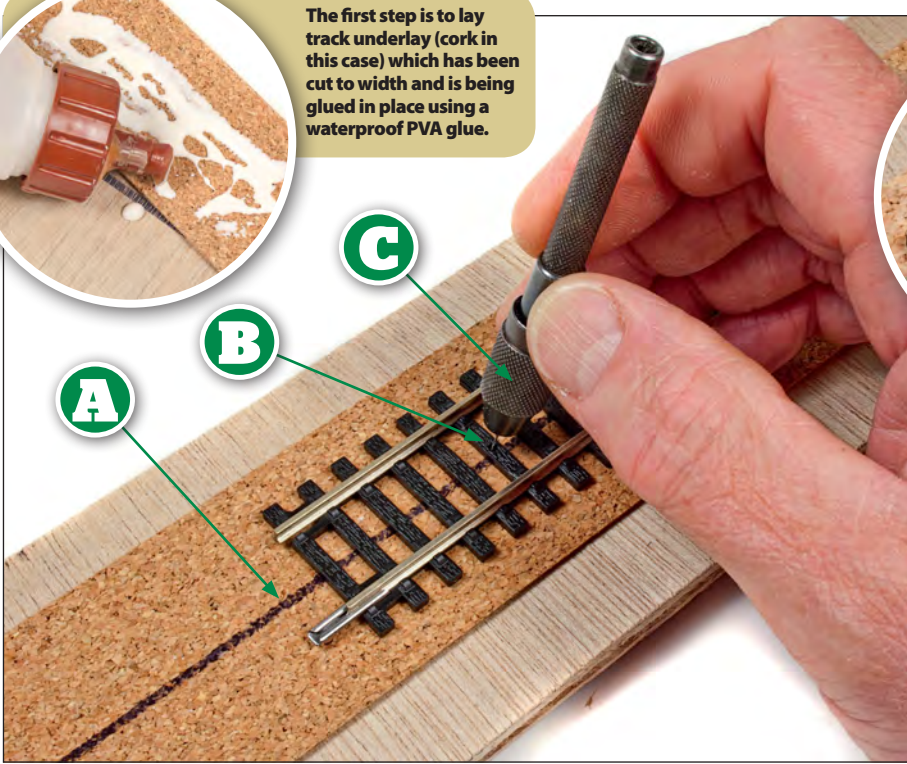
has recently introduced bullhead rail flexible track and points which have scale sleeper spacings too. Other flexible track systems include Tillig which is gaining in popularity in the UK. Flexible track is offered by companies regarded as 'finescale' including C&L Finescale and Marcway for use with turnout kits and individual track components.

There is nothing to prevent you from mixing and matching track systems to suit your layout plans, so long as they have the same rail profile or adapter sections are used. The most common rail profile is Code 100, used in all British set track systems, while finescale rail profiles such as >>

Model railway track comes in many forms, from set track pieces and extension packs to flexible track systems and components for kit and hand-built track. No matter which type you prefer to use, the basic principles of tracklaying remain the same.



The first step is to lay track underlay (cork in this case) which has been cut to width and is being glued in place using a waterproof PVA glue.



Inspect the rail joiners for misalignment and run a finger over them to find any rough spots that could prevent trains from running smoothly over the layout.

Left: A pin vice and twist drill are used to drill through the sleepers and part way into the baseboard top, to a depth of approximately 2/3 of the length of the track pins. Track pins may be pushed into the holes without bending them or distorting the track. Note the centreline for track alignment (A); pin hole moulded in the Hornby set track (B) and pin vice used to drill into the baseboard top (C) to ease the use of track pins.

10 top tips

FOR LAYING TRACK



During tracklaying and also when planning the layout, test clearances with the longest vehicles to be operated on the layout to determine your minimum clearance measurement. The sharper the curves, particularly when using set track, the greater the chance of stock touching when passing on double track sections.



A gentle rub with fine grade wet and dry paper soon removes any rough edges or burrs.

1 Before diving straight in, plan your track carefully, ensuring you have the right materials and look at ways in which the track for large layouts can be laid in phases to spread the cost and make the task of wiring and testing easier to do. To work out if your trackplan will fit your space, take turnouts to a copy shop and photocopy them. Check levels carefully and take note of any possible inclines – are they likely to be too steep for your trains?

2 Track on the full size railway is laid on specially prepared ground which has been levelled and graded for the smoothest transition into curves and gradients and covered by a layer of ballast. Ballast holds the track in place and provides the all-important drainage to keep the water flowing away from the line. To make your track look more realistic, do not lay it flat on the baseboard top - use either cork or dense underlay foam to raise it above the baseboard level.

3 Track pins are a favourite way of securing track to the layout and are easily removed when adjustments to the track are required, at least until it is ballasted. When using set track, use the holes provided for track pins. Flexible track systems rarely have pinholes, leaving it to you to drill your own using a pin vice. Use a drill slightly thicker than your pins, drill clean through the sleepers and into the baseboard top to about 2/3 of the length of the pins. Apply pins using pliers or a light hammer.

4 Should you find the sight of track pins unsightly, consider removing them after ballasting the track. Dilute PVA or cements formulated for scenery work are strong enough to hold track in place, making the track pins, at least the majority of them, unnecessary. There are alternative techniques for securing track including white glue and double sided foam tape.

5 There are numerous techniques for cutting track into desired lengths. The Xuron track cutter has become a popular tool for quick trimming of rails to speed up tracklaying. Rails can be cut using a cutting disc fitted to a minidrill. It is a less precise cutting method because the disc can slip on the rail.

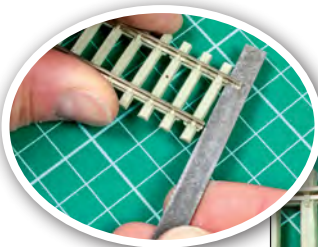
6 When cutting flexible track to length, save any surplus sleepers that may become detached. They are used to fill in gaps between track sections where they are joined with rail joiners. To accommodate rail joiners, the web under the rails together with the rail clips at the end of the track length must be trimmed.

7 Consideration has to be given to the location of uncoupling devices, particularly those fitted under the track. When the track formation has been decided upon the position of any under track device should be determined and a hole of the appropriate size cut in both track bed and baseboard top before track is laid.

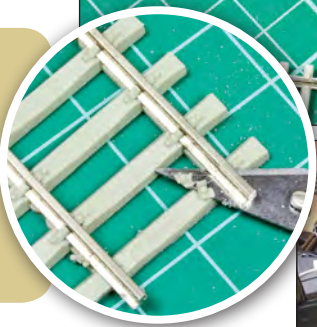
8 Remember that your stock has a say in your plans too - the sharper the curves you plan to use, the greater the overhang with bogie stock. Some stock may not be able to negotiate sharp curves and it is worth doing some tests to see if your planned minimum radius curve is acceptable to the locomotives and stock you wish to run.

9 Allow for heat expansion and contraction when laying track. Rails on a model railway expand in much the same manner as those of the full size railway. Avoid laying track in particularly cold or hot conditions so expansion gaps are not exaggerated when temperatures drop or become closed too soon after temperatures rise.

10 Tracklaying is only a part of the story. Once track is in place, it has to be equipped with turnout motors and wired up (assuming you want to use point motors, of course). Do not start any scenic work or ballasting until it has been wired up and extensively tested with all of your stock. Look for faults such as misaligned rail joiners you have missed.



A quick rub with a file along the end and underside of the cut rails makes it easier to slide rail joiners into place.



The first moulded rail clip or two must be removed from the end of flexible track lengths to allow the rail joiners to be used. The ends of the rails must be clean and smooth too.



Flexible track allows smooth flowing curves of any radius to be laid. Here the extension to *Hornby Magazine's Twelve Trees Junction* is shown in the early stages of track laying with the new curves taking the line back to the storage yard. All of this is laid with Peco code 75 flexible track.

Code 75 are available only as flexible track and larger radii points. Given the use of Code 100 profile track, set track can be used with flexible track to make a formation fit a given space. Set track may be used for convenience in off-scene parts of a layout such as an off-scene storage yard whilst flexible track systems will enhance the appearance of scenic areas.

The right tools

Using the correct tools for track laying will make the task easier, quicker and will produce a better result. Whilst there is no need to buy specialist tools, there are certain ones which will be needed no matter which type of system you use. When laying set track on a baseboard, you will need a small hammer to apply track pins, a pin vice for holding twist drills and a pair of fine nose pliers for handling rail joiners.

When using flexible track, the aforementioned small hammer, pin vice, drills and pliers are all necessary. You will also need some way of cutting flexible track to length to fit track formations. Some modellers like to use a cutting disc and minidrill (use eye protection). Others like to use specialised shears such as Xuron track cutters. Files are needed to clean away any burrs from the cut end of the rail whichever method you use.

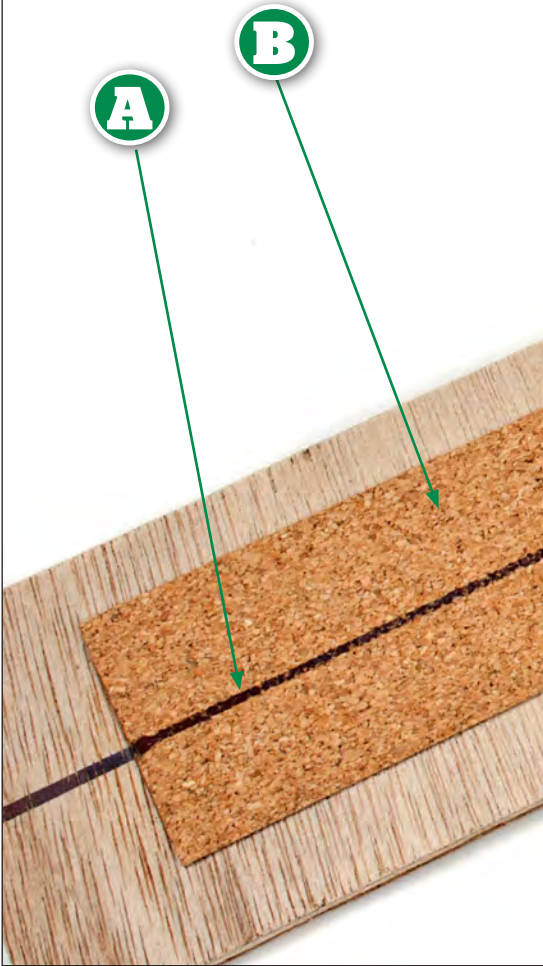
Consumable materials include track pins, adhesives, rail joiners, track underlay and some

shims of 10 thou styrene for levelling. Gauges such as Tracksetta are very helpful for achieving straight track lengths or curves of a given radius using flexible track. Finally, give thought to the type of point or turnout motor you plan to use and buy in enough to complete each phase of tracklaying. Preparation of the trackbed to accommodate point motors may need to be completed before track and points are fixed to the layout – see pages 70-73. The same applies to many proprietary under-the-track uncoupling magnets and, in both cases, read the instructions to see what is required before

Flexible track is linked with plastic webs between the sleepers. They make the assembly of track sections easier during manufacturing. However, some flexible track is stiff. When laying curved sections consider cutting into the web between the sleepers to free it up should it be required.

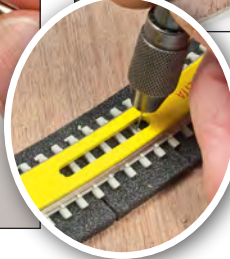


Right: Cork and foam underlay can be laid to curves too. This picture shows how to slice part way through the width of underlay foam so it may be laid to a tight curve. The cuts are made on the outside edge of the curve.

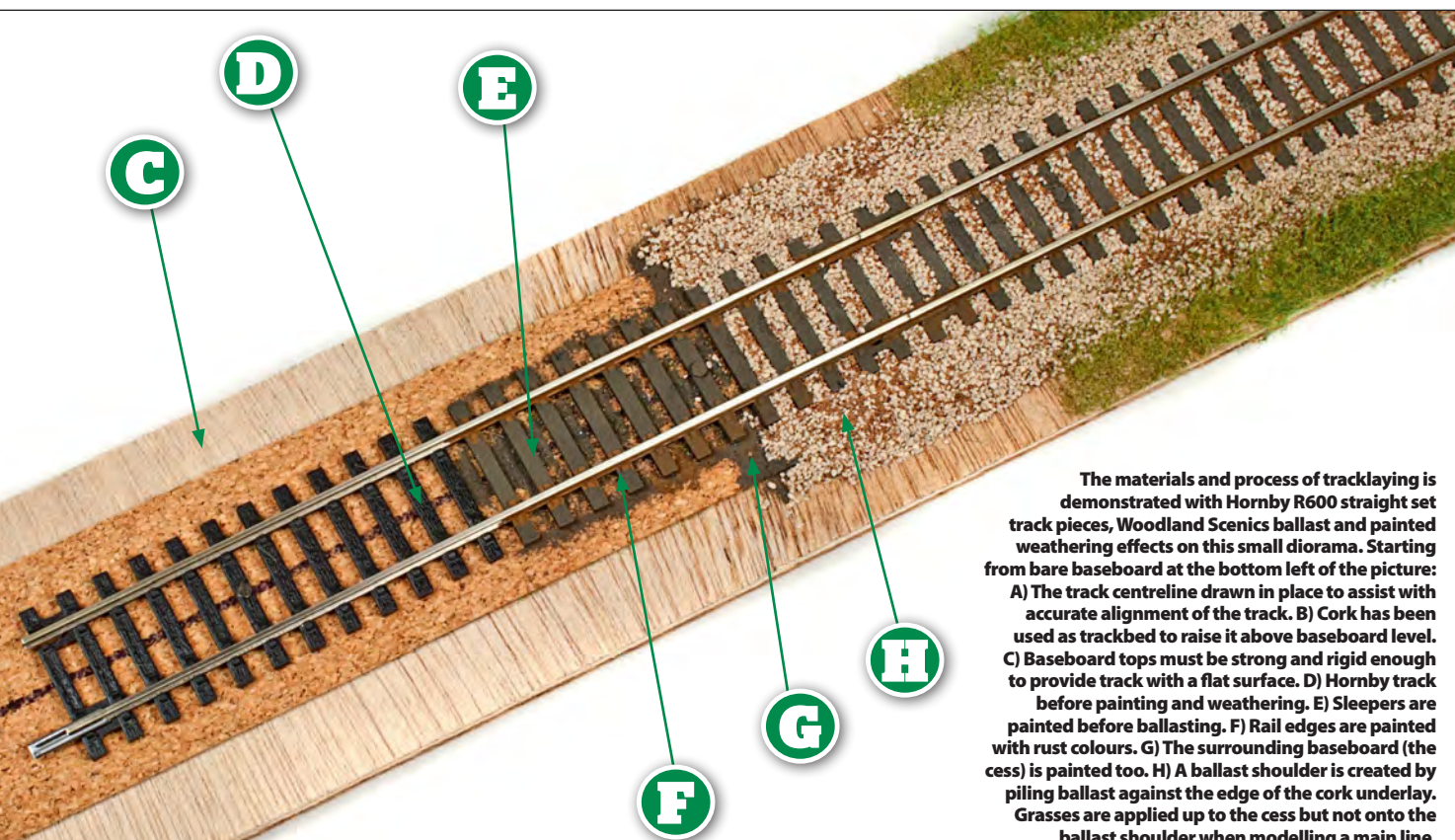


placing track underlay and the track itself. Give some thought as to how track on the full size railway appears and how you can make your layout track look as good in model form, even when you plan to use set track pieces. Colour has an important part to play together with choosing the right ballast, both in size and colour. Spend some time studying photographs of track and make notes on colour, texture, the type of track and how it becomes weathered through long term use and exposure to the elements. Then the fun of making scenery can commence! ■

When glued in place, the gaps in the foam resulting from the cuts are not too wide and the track will be fully supported. Ballasting will hide any evidence of your underlay tricks!

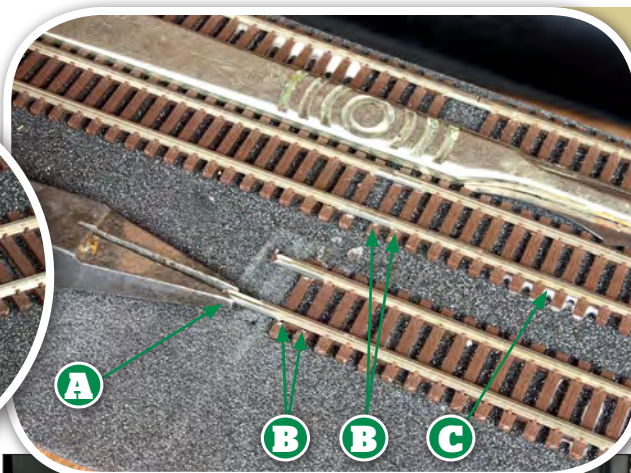
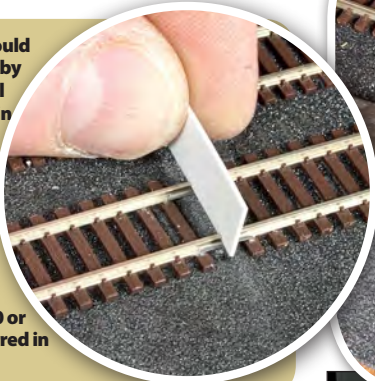


Left: Tracksetta is an extremely useful range of gauging tools designed for use with flexible track in 'OO' and 'N' gauges. An 'N' gauge Tracksetta of 15in radius is shown. It has slots along its length to enable track pins to be used.



The materials and process of tracklaying is demonstrated with Hornby R600 straight set track pieces, Woodland Scenics ballast and painted weathering effects on this small diorama. Starting from bare baseboard at the bottom left of the picture: A) The track centreline drawn in place to assist with accurate alignment of the track. B) Cork has been used as trackbed to raise it above baseboard level. C) Baseboard tops must be strong and rigid enough to provide track with a flat surface. D) Hornby track before painting and weathering. E) Sleepers are painted before ballasting. F) Rail edges are painted with rust colours. G) The surrounding baseboard (the cess) is painted too. H) A ballast shoulder is created by piling ballast against the edge of the cork underlay. Grasses are applied up to the cess but not onto the ballast shoulder when modelling a main line.

Expansion should be catered for by leaving a small gap at each join in the track. A piece of 20 thou styrene is ideal as a gauge for making expansion gaps in 'N' gauge, with 30 or 40 thou preferred in 'OO' gauge.



Another view of tracklaying underway, this time with Atlas code 55 track. Fine nose pliers are useful for sliding rail joiners in place (A) and rail clips have been pared away from two sleepers (B) to allow rail joiners to be used without forcing them onto the rail ends. This track has been glued into place carefully to avoid too much glue from squeezing up between the sleepers (C) and making a mess.



Track types can be mixed on one layout. This junction formation uses a mix of kit-built turnouts and flexible track made by C&L Finescale, track components by Peco and handbuilt track using copper-clad sleeper strip. All the rail profiles are the same, even if the sleeper type is different.

USEFUL WEBSITES

Hornby	www.hornby.com
Bachmann	www.bachmann.co.uk
Peco	www.peco-uk.com
Tillig	www.tillig.com



With practice the basics of track laying can be used to create a track layout as complex as your imagination and space allows and with flowing curves too. This is one end of the new arrangement for Topley Dale's scenic section taking shape - see pages 104-111 for more on Topley Dale.

Point motors

Motorising points makes a model railway more realistic and easier to operate. **MIKE WILD** explains how solenoid point motors are installed and how to connect them for analogue and digital control.

MOTORISED POINTS are a great feature to add to a model railway and with the right tools, equipment and knowledge they can be simple and quick to install. In this guide we explain how to install Peco solenoid point motors – a readily available product which can be bought for a few pounds.

The majority of this guide is relevant to Gaugemaster and Hatton's solenoid motors too, all of which work on the same principles – the main differences being in how the motors mount to a layout.

Deciding on how you will operate point motors is just as important as their installation. The primary choices are analogue and digital and we have explained the basics of both in the step by step guide. Making bigger layouts with more points is simply a case of repeating the steps over and over to reach the end result – and thinking through your wiring plan.

There are alternatives on both fronts. For analogue you have the choice of stud and probe,

toggle and push button switches (all will require a 16v AC power supply and a Capacitor Discharge Unit (CDU) for reliable operation) while digital layout builders have a wide range of choice when it comes to accessory decoders.

We've used many brands on *Hornby Magazine's* layouts over the years, but by the far the strongest and most dependable for solenoid point motors are DCC Concepts' ADS series which are available in two and eight output formats. For this guide we have used Train Tech's quadport accessory decoders – another well regarded choice in the *Hornby Magazine* office.

Also worthy of mention are stall motors such as DCC Concepts' Cobalt and the Tortoise motor. Both of these are regularly referred to as slow action motors and, rather than having solenoids

which 'fire' the point blades, they have geared motors which move the point blades across in a realistic manner. They are more expensive, but are much more feature-rich with the Cobalt including built in frog switching, feedback and control options for digital and analogue.

One final product range to mention is DCC Concepts' Alpha Panel system. This impressive set of plug and play electronics allows a professional standard control panel to be developed at home using a selection of illuminated panel mounted switches and circuit boards which can be connected to any digital control system for point operation. We used this product range to build a control panel for our 'N' gauge layout Barrenthorpe – see pages 54-59 – with great results. ■

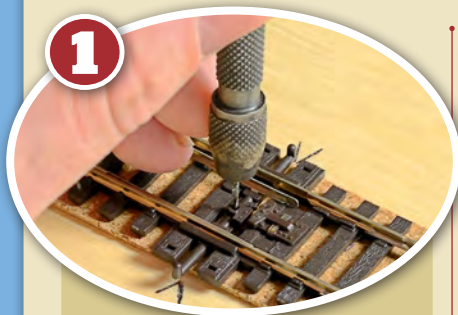
WHAT WE USED		
PRODUCT	MANUFACTURER	CAT NO.
Extended pin point motor	www.peco-uk.com	PL10E
Point motor mounting base	www.peco-uk.com	PL9
7 x 0.2mm multi-core equipment wire	www.rapidonline.com	GW010435
Quad-port accessory decoder	www.train-tech.com	PC2



STEP BY STEP INSTALLING SOLENOID POINT MOTORS

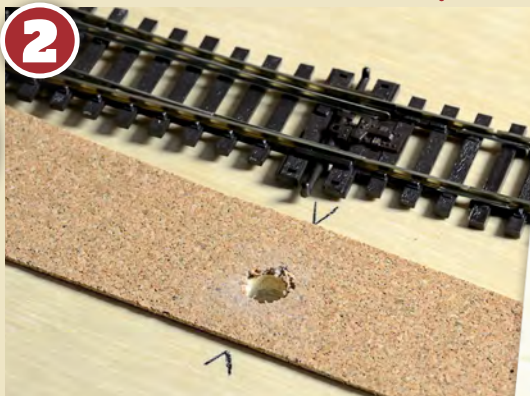
Beginner **SKILL LEVEL** Intermediate Advanced

1



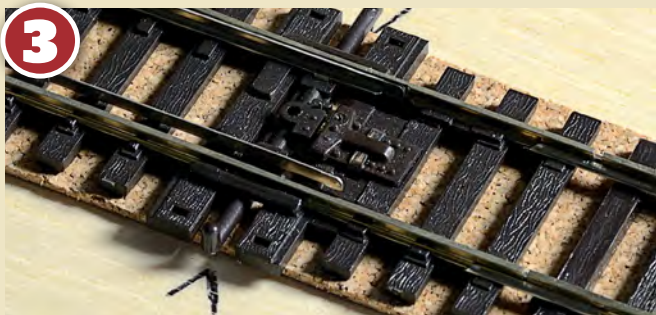
Point motor installation begins by preparing the baseboard to accommodate the actuating rod which will move the point blades from side to side. The first three steps relate to any type of below-baseboard installation. First, mark the maximum throw position of the blades using the central holes in a '00' gauge point. We do this with a 1mm drill bit in a pin vice.

2



Make pen marks at the outer ends of the tie bar to assist in locating the 1mm holes. An 8mm diameter hole can then be drilled through the baseboard to accommodate the throw of the point motor actuating rod.

3



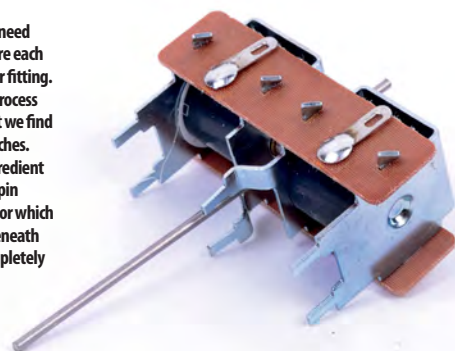
Return the point to its original position taking care to ensure that the previously drilled hole is visible through the centre hole in the tie bar at both end of its movement.

4

Now we need to prepare each motor for fitting.

This is a repeated process for each motor that we find easiest to do in batches.

This is the base ingredient – a Peco extended pin solenoid point motor which can be mounted beneath the baseboard completely out of sight.



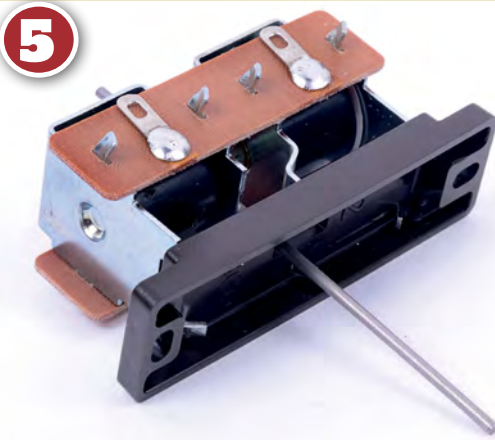
TOOLS

- » Craft knife
- » Soldering iron
- » Wire strippers
- » Side cutters
- » Flatblade screwdriver
- » Crosshead screwdriver
- » Pin vice and 1mm drill
- » Pin hammer
- » Electric drill
- » 8mm drill bit

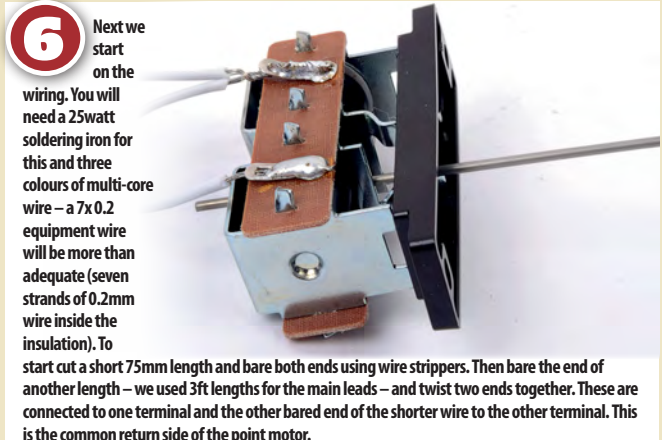


Changing points with point motors makes for much more realistic operation and has equal benefits for home and portable layouts. At St Stephens Road a 'Warship' hydraulic stands in the platform road to wait for a Collett '2251' 0-6-0 to clear the single line.

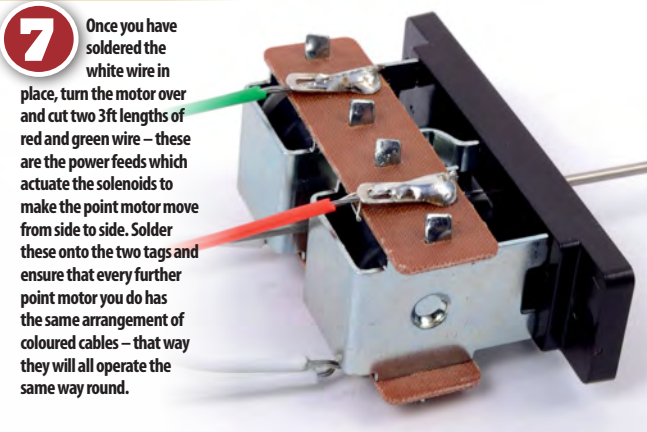
STEP BY STEP INSTALLING SOLENOID POINT MOTORS



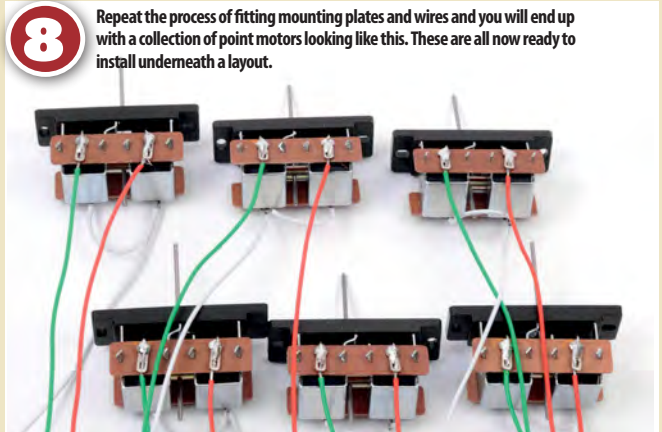
To prepare the motor for installation, we fitted a PL9 mounting plate to the motor. This simply slides over the tags on the top of the motor frame and the tags are then folded over to secure the two components together. Use a small flatblade screwdriver to bend the tags.



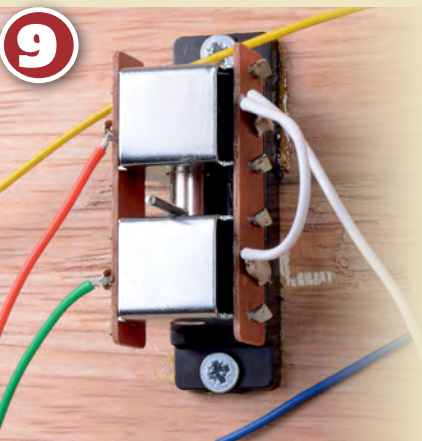
Next we start on the wiring. You will need a 25watt soldering iron for this and three colours of multi-core wire – a 7x0.2 equipment wire will be more than adequate (seven strands of 0.2mm wire inside the insulation). To start cut a short 75mm length and bare both ends using wire strippers. Then bare the end of another length – we used 3ft lengths for the main leads – and twist two ends together. These are connected to one terminal and the other bared end of the shorter wire to the other terminal. This is the common return side of the point motor.



Once you have soldered the white wire in place, turn the motor over and cut two 3ft lengths of red and green wire – these are the power feeds which actuate the solenoids to make the point motor move from side to side. Solder these onto the two tags and ensure that every further point motor you do has the same arrangement of coloured cables – that way they will all operate the same way round.



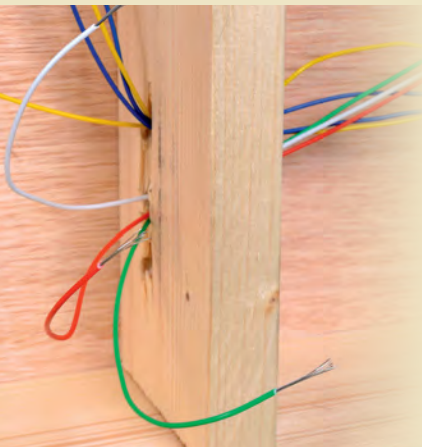
Repeat the process of fitting mounting plates and wires and you will end up with a collection of point motors looking like this. These are all now ready to install underneath a layout.



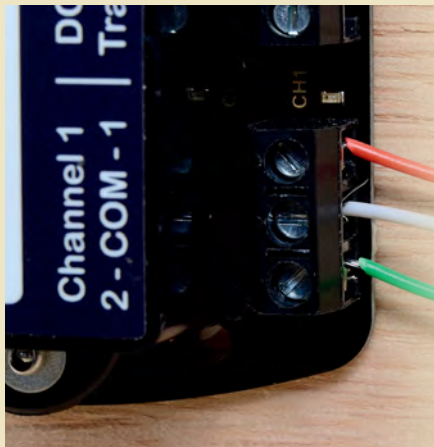
Using the pre-drilled 8mm holes in the baseboard, motors can be fitted in place underneath the point they operate. For convenience, all were fitted in the same orientation – green and red wires to the left, white to the right. When installing these motors they need to be adjusted carefully for perfect operation – the motor should move freely underneath and the point blades should also move freely when it is correctly fitted. No. 4 1/2in screws were used to secure the baseplates to the baseboard, which also allow for a little adjustment if necessary.



When it comes to powering point motors there are two choices: digital or analogue. First we will show how to power them with digital control using a Train Tech PC2 quad-port accessory decoder. This process is the same for all types of point motor accessory decoder. These are simple to install and operate and full instructions are supplied with them. First fix the decoder block to the baseboard using No. 4 1/2in screws.



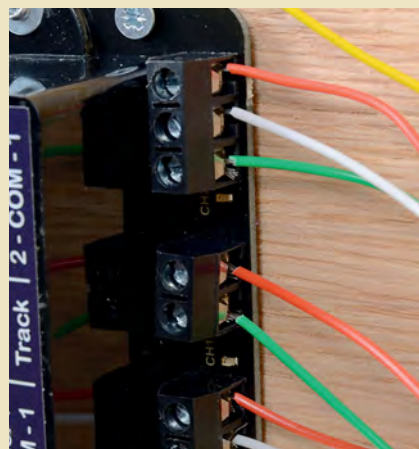
Cut the wires of the first point motor to length allowing at least 2in of flexibility. Bare the ends with wire strippers then twist the multi-core strands together and fold them in half – this gives a strong connection for the terminals on the accessory decoder.



Insert the wires into the terminals. The white from our point motor is the common return so this always goes into the centre terminal of each output on the Train Tech decoder. We then fitted green to terminal 2 and red to terminal 1 as standard throughout this layout project.



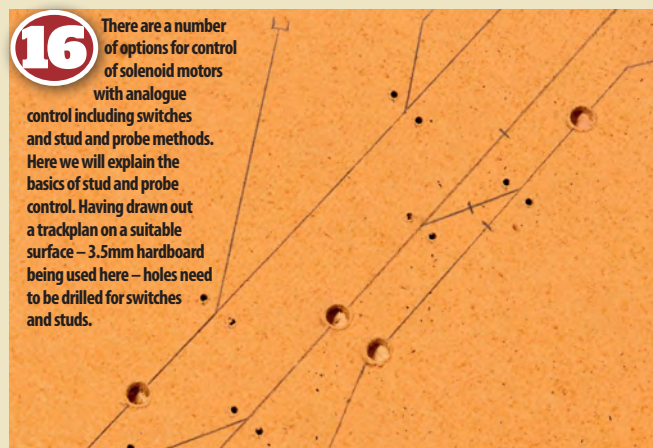
13 Repeat the process for all other point motors to connect them to the accessory decoder – each decoder can support four points. As there are six points on the layout we used two PC2 decoders and wired them logically so that the station run-round loop is operated by accessory outputs 1-4 and the goods yard by 5-6.



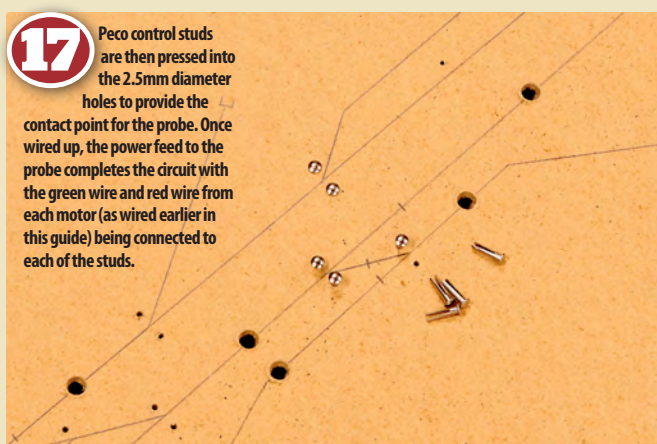
14 As a final step, the accessory decoder now needs connecting to the DCC power supply. We link the central pair of red and green wires directly back to the controller connection point on this layout for simplicity. For bigger layouts it may be necessary to provide a separate power feed through a booster to operate the point motors as solenoids have a high current draw. The accessory decoder can then be addressed as detailed in the Train Tech instruction sheet using their one-touch learning button.



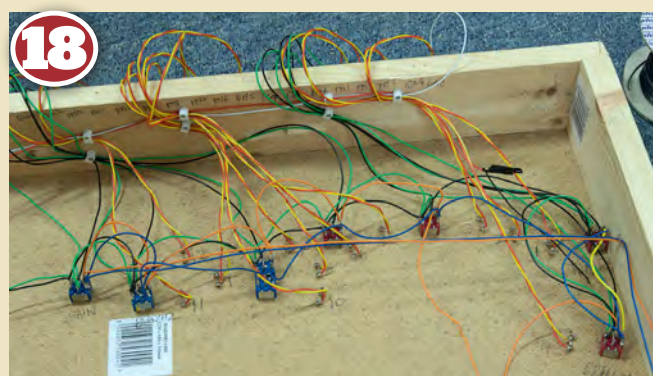
15 Having tested all the motors operate correctly under power, the final step is to remove the excess pin from the point motor protruding above the baseboard. Use either a pair of sharp side cutters or carefully cut the excess off with a cutting disc in a minidrill. Be aware though that the heat generated by this method can melt plastic, so cut partway through each one, allowing them to cool before continuing.



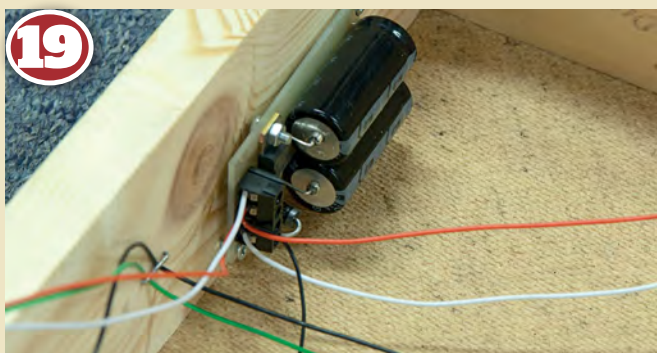
16 There are a number of options for control of solenoid motors with analogue control including switches and stud and probe methods. Here we will explain the basics of stud and probe control. Having drawn out a trackplan on a suitable surface – 3.5mm hardboard being used here – holes need to be drilled for switches and studs.



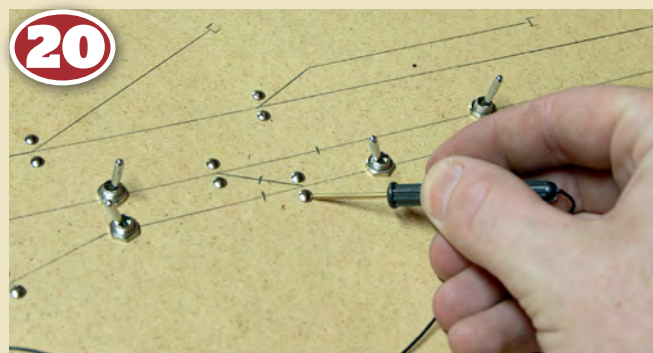
17 Peco control studs are then pressed into the 2.5mm diameter holes to provide the contact point for the probe. Once wired up, the power feed to the probe completes the circuit with the green wire and red wire from each motor (as wired earlier in this guide) being connected to each of the studs.



18 Looking underneath the panel, built for another layout, the red and yellow wires here are the control wires for the point motors which would join to the red and green wires on the motors shown earlier in this sequence.



19 The final component is a Capacitor Discharge Unit (CDU). This is essential for reliable operation of solenoid motors as it stores a charge of power which gives a positive throw to the point. The red and white wires going to the right go back to the 16v AC power supply while the red and white wires going to the left go to the probe (red) and common return (white) connection on the point motors.



20 A stud and probe control panel can be built to suit any layout of any shape or size. The probe completes the circuit and when it contacts the studs sends power to one side of the solenoid motor or the other to operate the coils, throwing the point blades for the route required.

Ballasting

The railway uses ballast to hold the track in place and provide drainage, but in model form it is a cosmetic feature which can make or break a layout. **MARK CHIVERS** explains the principles and shows how you can achieve brilliant ballast in miniature.

BALLAST is an essential component of any railway large or small - and replicating it in model form is a straightforward task with the right materials, glues

and a handy dose of patience.

The first thing to understand is how ballast is used on the real railway. It is there to hold the track in place and provide drainage, but different areas of the railway call for a variety of ballast styles. Main lines require a shoulder used to support

the edges of the track while in a station environment that feature won't be so pronounced. In depots and yards it will be virtually non-existent while in a locomotive depot ballast will be a rare commodity. Instead (for steam era depots at least) you will find ash and cinders

crushed between the sleepers holding the track in place.

Another consideration for accurate ballast is the location and its age. For example, ballast in the Scottish Highlands has a pink hue while most other areas have varying grades of grey depending on age.

A Hughes-Fowler 'Crab' 2-6-0 leads a mixed goods through the bridge onto the newly ballasted section of main line. Weathering is at an early stage here with the first applications of Geoscenics Track Grime and Black done. More will be added later once these first layers have fully dried.



Materials weather with time with the centre of the running lines gaining the most staining, while at stations, and anywhere where locomotives stand, black staining will appear too.

Having observed the real railway for inspiration, we can start developing our model ballast. This feature really can make or break a layout's scenery – and when done right it complements the rolling stock which runs on the track beautifully.

There are several options. Foam covered with ballast is available for set track pieces and there are also ballast mats which can be laid underneath the track. None of these compare to the potential of loose ballasting a model railway by hand. It's a time-honoured process

WHAT WE USED		
PRODUCT	MANUFACTURER	CAT NO.
Blended grey medium grade ballast	Woodland Scenics	B1393
Blended grey fine grade ballast	Woodland Scenics	B1394
Ballast Bond	Deluxe Materials	AD75
Roket fine tips (six pack)	Deluxe Materials	AC20
Track Grime paint	Geoscenics	TG50
Black Concentrate paint	Geoscenics	BC50

which most exhibition layouts and thousands of home layouts use. The most important ingredient in getting it right is time and patience. Ballasting is not a job to be rushed.

Loose ballast is available from many manufacturers including Woodland Scenics, DCC Concepts, Gaugemaster, Peco, Natural Scenics, Javis, Hornby, Green Scene and more. Top of the charts in the *Hornby Magazine* office are Woodland Scenics and DCC

Concepts products. For this guide we will be using Woodland Scenics blended grey ballast in fine and medium grades to match the previous ballasting on earlier parts of this scenic layout.

What you will need to hand are a plastic tub, two grades of ballast, a paint brush and adhesive. For this guide we are using Deluxe Materials Ballast Bond, but a 50:50 mixture of PVA wood glue with water and a drop of detergent applied with

TOOLS

- » Plastic tub
- » $\frac{1}{2}$ in or 1in paintbrush
- » Patience!

a syringe will reap the same result should you choose to. This was our first time using Deluxe Materials' Ballast Bond and we were wholly impressed at its ability to flow into the ballast without the need for pre-wetting with a water mister.

The step by step guide explains the process from start to finish. ■



STEP BY STEP BALLASTING A MODEL RAILWAY



The first steps are in preparing this main line scene for ballast. We've recently laid the track over a 1/16in cork sheet, but it now needs trimming back around the running lines to create the ballast shoulder we want.



Using a craft knife with a fresh blade, cut through the cork along the edge of each side of the track.



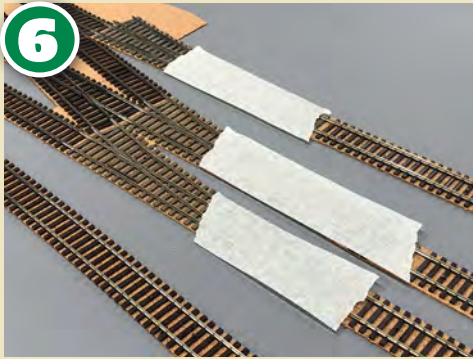
Now simply pick up one end of the cut strip and pull. This will remove the central strip of cork sheet allowing the track to stand proud of the baseboard surface.



Continuing the same process, the cork around all four of our main line tracks has now been trimmed back. The final step is to clear away the tools and any debris from track laying.



Basic weathering of the track comes next. In this case we needed to cover previously completed ballast and buildings using a combination of masking tape and scrap A4 sheets of paper. Take your time and ensure that anything you don't want painted is covered.



The points on this section of the layout had previously been weathered on another baseboard before being reclaimed for this one. Always cover the point blades for weathering of the track: normally strips of 10mm wide Tamiya masking tape over the blades will do the job. Here we have used strips of 30mm masking tape to cover the pre-weathered points.



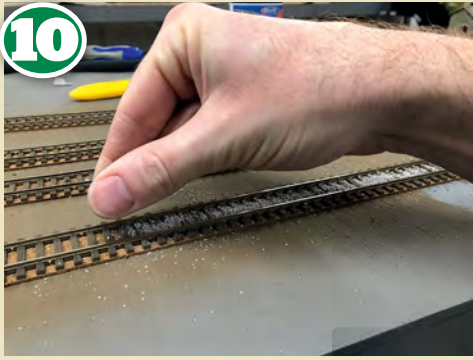
Our first layer of track weathering is a simple spray over with Humbrol No. 29 from a spray can – hence the masking. It's a quick and effective means of colouring the rail sides and sleepers at the start of the ballasting process.



Having left the paint to dry for a couple of hours (being acrylic it goes off within 30 minutes) the rail heads need to be cleaned. It is best to do this now rather than wait until after ballasting. A couple of cleans might be necessary to get rid of all traces of paint.



Using a combination of Woodland Scenics fine and medium grade blended grey ballast, the two grades are mixed together in a plastic tub before application. We vary the levels of each mix to avoid the ballast looking too regimented.



Using fingers, we pinch ballast from the tub and drop it in place along the centre of the running line first, aiming between the sleepers. It takes time, but it is well worth investing it here to get the best looking track.



11



Having completed the centres work down the edges of the sleepers aiming for the ballast to form a neat shoulder spreading around 10-12mm away from the ends of the sleepers.

12



Next, the loose ballast needs to be tamped into place using a 1/2in or 1in paintbrush. This is a critical stage in ballasting – get this right and everything else will fall into place. Work along the centre of the track first, brushing loose grains of ballast off the sleepers, then work along the sleeper ends.

13



With the ballast tamped into place the, it should look neat and tidy with a shoulder either side of the running lines. We've added a light covering between the running lines too and it is now ready to be glued in place.

14



In most of *Hornby Magazine's* layouts we have used PVA wood glue diluted with water to a 50:50 ratio and a drop of detergent to fix loose ballast in place, but this time we are using Deluxe Materials' Ballast Bond. This is a ready mixed adhesive formulated to work by capillary action and not to disturb loose ballast on application of the glue.

15



Place a Rocket Fine Tip on top of the bottle (one is supplied with each bottle of Ballast Bond), allow the glue to flow into the fine tip and begin application down the centre of the track. As with the PVA it will spread via capillary action. Wetting the ballast with water isn't essential, but we found a spray with a water mister did help it flow more easily.

16



With the glue applied, the ballast won't look at its best - but be patient and allow the glue to cure thoroughly before moving onto the next stage.

17



Left overnight, the glue is now set and the ballast is ready for weathering. We are going to apply basic colours at this stage, but more can be added in the future. The starting points are Geoscenics Track Grime followed by Geoscenics Black Concentrate – both let down with water to a 50:50 ratio.

18

The most effective way to apply the Geoscenics colours is with an airbrush, but it can be done by hand by letting the colours down further with 75% water and 25% colour. Here we are using an Iwata dual action airbrush to apply Track Grime.



19

The final application of Black Concentrate is made down the centre of the track helping to blend it into the original ballasting from the scenic section of this layout. This can be built up in layers until the desired level of weathering is reached, several thin coats being much more effective than one heavy attack of paint. The track now needs cleaning again once the paint has dried, then normal service can resume.



Building PLATFORMS

There are myriad of methods and materials which can be used to make model platforms. **MIKE WILD** explains how with a combination of timber, plastic, card, resin and ballast, realistic platforms can be built while also offering alternatives.

Four separate platforms make up the seven faces of Grosvenor Square. The surface is Slater's embossed plasticard with mounting card, MDF and Redutex brick textures making up the underlying parts.

- TOOLS & glues**
- » Handsaw
 - » Tape measure
 - » Steel ruler
 - » Pencil
 - » Craft knife
 - » Scissors
 - » Contact adhesive
 - » PVA wood glue



EVERY TIME WE CATCH A TRAIN we stand on the platforms, but how often have we actually taken note of how they are built? When it came to building Grosvenor Square – a seven platform terminus station, we had to develop a simple, cost effective and timely method of building platforms and, as the signature feature, they had to look right too.

There a lot of choices when it comes to model platforms. Kits, ready-made and scratchbuilding are the main options, but within that there are choices of material including timber, plastic and card. Kits can be useful but time consuming while ready made structures are quick to install but limited in their flexibility.

For this layout the only real option was a multi-media scratchbuilding project, but using methods which should make it relatively quick to erect the seven platform faces. The basis is 12mm Medium Density Fibreboard (MDF) which is cheap to buy and easy to cut. It also gives good clean edges which is very useful for adding facing to the platform edges. However,

WHAT WE USED		
PRODUCT	SOURCE	CAT NO.
12mm Medium Density Fibre board	DIY store	-
1/16in cork sheet	Gaugemaster	-
2.0mm thick mounting card	Hobby store	-
Embossed plasticard paving	Slaters	0414
Flexible embossed pre-coloured brick sheets	Redutex	076LD112
Medium Sea Grey acrylic	Tamiya	XF-83
Rain marks wash acrylic	Lifecolor	LPW11
Matt varnish	Humbrol	49
Fine blended grey ballast	Woodland Scenics	B1393
Medium blended grey ballast	Woodland Scenics	B1394

there isn't a depth of MDF available which gives the perfect height for platforms, so we have raised the total depth to 16mm with two layers of 1/16in cork.

Edging is cut from sheets of Redutex brick sheeting – a wonderful material range which consists of ready coloured self-adhesive flexible resin sheets which can be cut to shape and applied in minutes. These have been a tremendous help in getting the base structure completed in a timely fashion.

Topping the base is 2mm thick mounting

card covered with Slater's embossed plasticard. This has been cut into strips for the edges and panels for the centres before being treated to a triple coating of paints consisting of Tamiya Medium Sea Grey, Lifecolor Rainmarks wash and Humbrol acrylic matt varnish.

The completed platforms are all capable of hosting a six coach train – two will hold six plus a parcels van – and are now ready for the finishing touches of detailing and weathering. The step by step guide explains how we built the platforms from the ground up. ■



STEP BY STEP BUILDING PLATFORMS FOR GROSVENOR SQUARE



The basis of the platforms is 12mm MDF, but unfortunately it isn't quite the right height and 16mm MDF isn't available from stores. However, it cuts easily and is relatively cheap too. We used two 4ft x 2ft sheets to build these platforms.



All of the straight sections of platform and the area underneath the station building were cut to size first and laid out on the layout. Any adjustments were then made prior to the final sections for the ends and ramps being cut to length.

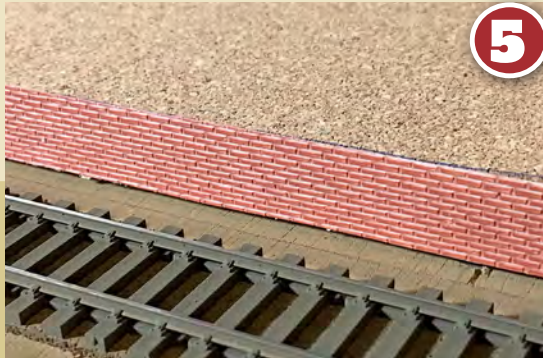


To begin raising the height of the platform base, 1/16in cork sheet was laid underneath – this was a simple, quick and effective means of achieving small height increases.



With a brick face positioned against the now 14mm deep platform base, trains were positioned in the platforms to gauge their height. Diagnosis: they were still too low.

Another layer of cork was layered on top of the MDF base next to add a further 2mm to the overall height of the platform bases which for us turned out to be just about perfect.



Redutex brick sheets, a self-adhesive moulded and pre-coloured resin material, were cut into 15mm deep strips to make the platform edging – a process which took a little over an hour to edge the entire platform area.



Next the surfaces were cut from 2mm thick mounting card taking care to ensure adequate clearance for rolling stock moving in and out of the station.



The overhang of the platform tops will give a realistic appearance to the finished station. Here we see it all coming together under the station canopy.



To create the platform edging, Slater's embossed stone plasticard was cut into strips so that the stones could be laid along the edge of each platform. Contact adhesive secures these in place.



The main platform surface is formed from strips of the same stone plasticard positioned at 90 degrees to the edging to distinguish different patterns. Each panel was cut to size with a craft knife and steel ruler.

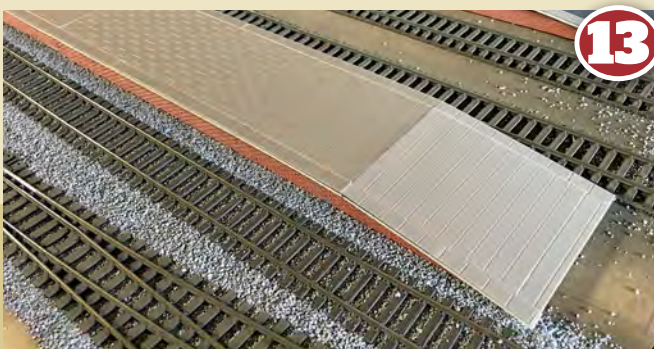


Contact adhesive was used throughout this part of the build to fix the plastic sheet to the cardboard tops.



To allow the card to bend neatly at the ends of the platforms a triangular notch was scribed in the rear 80mm from the end.

This was then overlaid with embossed plasticard in the same way with the plastic being scribed to follow the bend for the ramp too.



Suitably painted in stone grey colours and with use of Lifecolor washes the platforms are starting to look the part. A Class 22 ticks over next to the parcels office.



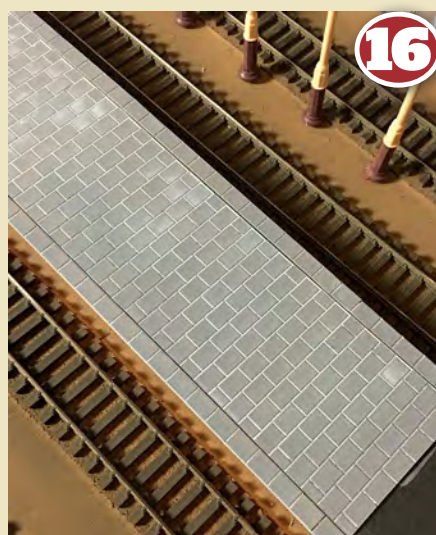
14

After several hours of cutting and shaping plasticard, the platform surfaces were complete. To create a neat edge with the station building the plasticard sheets go underneath the rear of the building so no joins are apparent.

Colouring starts with a thinned coat of Tamiya Medium Sea Grey acrylic (XF-83) applied by brush. It was thinned with acrylic thinners to make application quicker and easier.

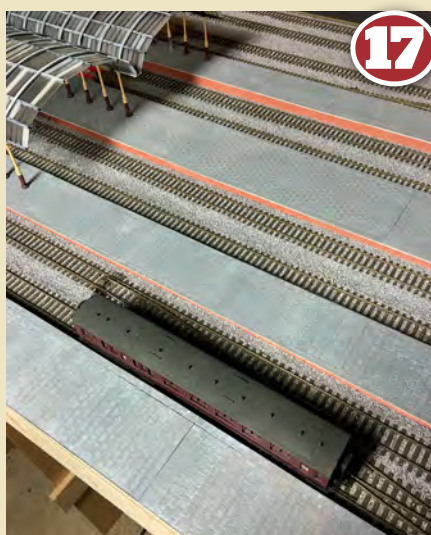


15



16

Next Lifecolour Rainmarks wash (LPW11) was brushed over the platforms and left to dry before being reworked where necessary with the remover liquid from the Rain and Dust Liquid Pigments set.



17

To soften the appearance of the colours, a final application of Humbrol Matt Varnish (49) was sprayed over the platforms readying them for final weathering and detailing.



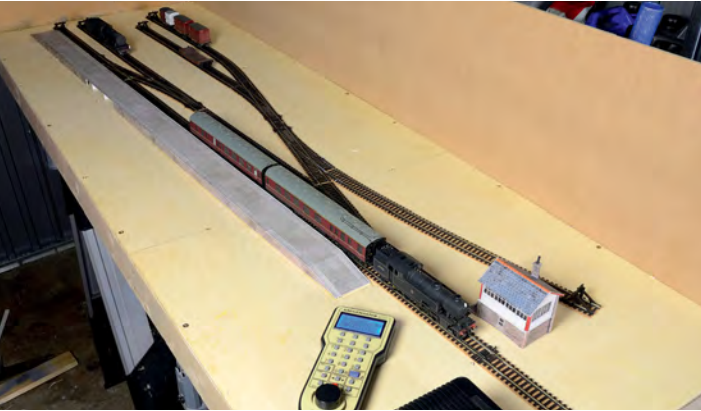
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Finally the platforms were glued down to the bases using contact adhesive and the final section of the rear platform was filled with Woodland Scenics blended grey ballast secured in place with PVA glue to give this area a different look.

THE ALTERNATIVES...

BUILDING PLATFORMS WITH CARD

A number of card kits exist for platforms including those produced by Metcalfe and Superquick. This kit is a Scalescenes download which was built for this simple terminus station layout. It consists of 2mm thick artists mounting board overlaid with textures cut from home printed A4 sheets. The finished model has stone facing and, while it takes some time to assemble, it goes together well and can be built to any size by printing multiple kits. Visit www.scalescenes.com to see the full range of platform kits and more. Brick finishes are available as well as stone.



Above: The completed Scalescenes kit for a stone platform in 'OO'.



Above: The Scalescenes kit can be printed at home and overlaid on card.

PLATFORMS ON A CURVE

Curved platforms are amongst the hardest to build in model form. Clearances have to be checked and double checked and then there is the difficulty of choosing the right material. For *Hornby Magazine's* office test track Topley Dale we used 12mm MDF and 3mm hardboard to make the two curved platforms for the station.



The 12mm MDF base was cut to size using a paper template as a guide followed by the final surface from hardboard. To complete the modelling Wills stone sheets were cut into strips to make the edging while Woodland Scenics fine ballast makes the finishing touch for the surface. This was recoloured with Tamiya grey applied via an airbrush. Detailing followed by Ratio fencing, Skaledale benches, DCC Concepts lights and a set of Skaledale station buildings.

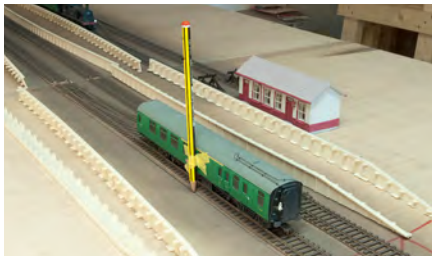


Trial positioning the station buildings gives a guide to where the platforms will go on Topley Dale.

PECO CONCRETE PLATFORMS

The concrete platform edging sections by Peco are ideal for Southern Region and modern layouts. For straight platforms they are simple to use, as illustrated here in the early phases of construction for Twelve Trees Junction. The sections clip together and can be glued with plastic cement such as Deluxe Materials Plastic Magic. End ramps are available too. To create the platform surface we reinforced the edging with plastic strips cut as braces before adding sheet plasticard for the tops. This was then skimmed with household filler to give the platforms a natural finish which sat level with the Peco edging. Alternatively thicker plasticard, 2mm thick instead of the 1mm thick used here, can be used for the surface to avoid the need for filler.

Visit www.peco-uk.com to see the full range of platform edging.



Above: A pencil taped to the side of a carriage marks the position of the platform edge.



Above: Deluxe Materials' Plastic Magic glues the plasticard stretchers to the edging.



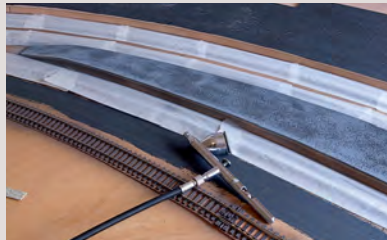
Above: Marking the position of the platform edge.
Below: PVA glue can be used to join parts together.



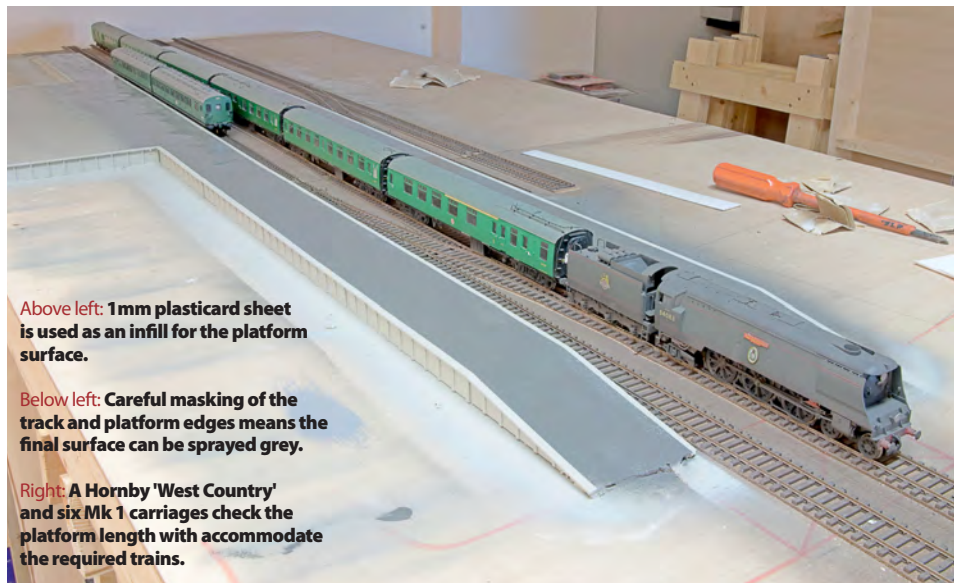
Above: Paper textures are overlaid on thick card to build the Scalescenes platform.



Above: Paper templates allow bases to be cut from 12mm MDF. **Below:** Wills stone plastic sheet was cut into strips for the platform faces while an airbrush was used to colour the final surface.



The MDF platform bases were cut to shape with a jigsaw using the paper templates as a guide. An important step is to check that trains will pass through without issue.



Above left: 1mm plasticard sheet is used as an infill for the platform surface.

Below left: Careful masking of the track and platform edges means the final surface can be sprayed grey.

Right: A Hornby 'West Country' and six Mk 1 carriages check the platform length with accommodate the required trains.

Working semaphores

Installing working semaphore signals has never been simpler thanks to the ready-made motor driven models available from Dapol. **MIKE WILD** explains how to connect the 'OO' gauge versions for both analogue and digital users.



SIGNALS are an essential part of the real railway – without them disaster would unfold very quickly. In the world of model railways we often pay little attention to this essential equipment partly because of the perceived complexity of installing working semaphore signals.

Dapol's introduction of ready-made working semaphores has been very well received and we have used these products on a number of *Hornby Magazine's* exhibition layouts, perhaps most notably on Grosvenor Square where seven GWR lower quadrant signals control departures from this seven-platform terminus station.

These signals have been developed with ease of installation in mind and they succeed in this wholly. They do, however, require care during

their installation, particularly when being wired into an analogue layout as a regulated stable voltage is necessary to avoid damaging the delicate electronics inside the bases. For digital installations, life is made simpler by the fact that a specialist accessory decoder by Train-Tech does the job for you. It should also be noted that standard accessory decoders cannot be used to operate Dapol's signals.

For this installation we have shown how a 12v regulated supply can be set up and how

to install and connect the signals to a switch to operate the arms. It is all straightforward and will take around 45 minutes per signal depending upon how long the wires need to be and whether they cross baseboard joints. The more joints you have to cross, the longer it will take to install the necessary wiring.

The end result is working signals which add detail, life and realism to a model railway. Now you really can drive your trains to the signals, just like the real thing. ■

WHAT WE USED

PRODUCT	SUPPLIER	CAT NO.
LMS motorised stop (home) signal	www.dapol.co.uk	4L-002-001
LE DC 12v/2A power supply adaptor	www.amazon.co.uk	LE DC 12V
DROK DC-DC 12v voltage regulator	www.amazon.co.uk	LM2596
Dapol semaphore accessory decoder (DCC only)	www.train-tech.com	SC3

A BR '3MT' 2-6-2T enters the passing loop at Ashland with a set of Maunsell carriages and passes the newly installed Dapol signal. A second signal has been installed at the end of the loop behind the camera which controls departures in the opposite direction.



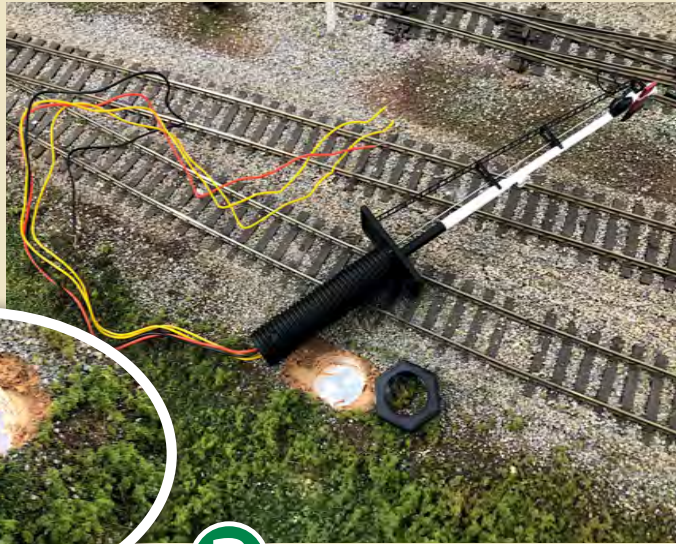
STEP BY STEP INSTALLING DAPOL SEMAPHORE SIGNALS IN 'OO'



Dapol produces a range of single arm signals for GWR, SR and LMS style stop and dinstants. This is a LMS/BR stop signal which we will be installing at the end of a loop. Full instructions are supplied with each model.



Physical installation couldn't be simpler. A 14mm diameter hole is required through the baseboard to accommodate the mount. If you have already ballasted your track, a small amount of stone removal may be necessary to create a level mounting surface.



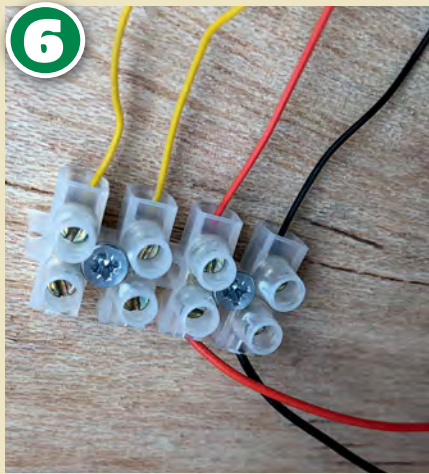
Release the wires from their packing band and unwind the securing nut to prepare the signal for installation.



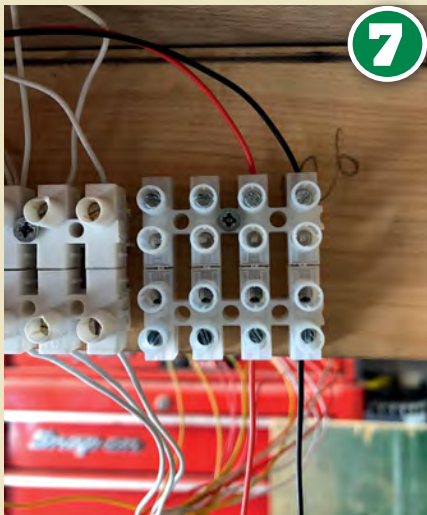
The wires can then be threaded through the baseboard followed by the mounting base on the signal. Once in position it will sit flush and level with the baseboard surface.



Undemeath the board, wind the securing nut back onto the threaded base to secure the signal in place. Don't over-tighten the nut as it can put strain on the mechanism – finger-tight is perfectly acceptable.



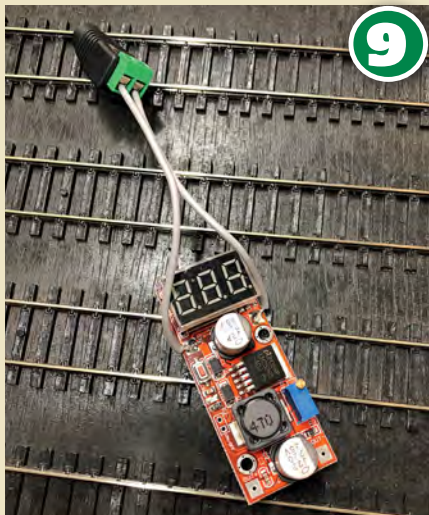
Next we need to prepare the connections back to the control panel for this analogue operated signal. Using a terminal block, the red, black and two yellow wires were joined on one side. The black and red were extended first back to the power source as detailed in the instruction sheet.



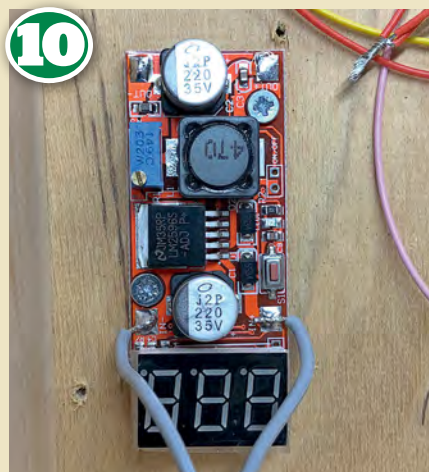
As this signal is being installed on a portable layout, the red and black cables were taken back to a plug-in terminal block which will provide a detachable power connection from the control panel. The spare terminals to the left of the red wire will be used to extend the yellow wires later.



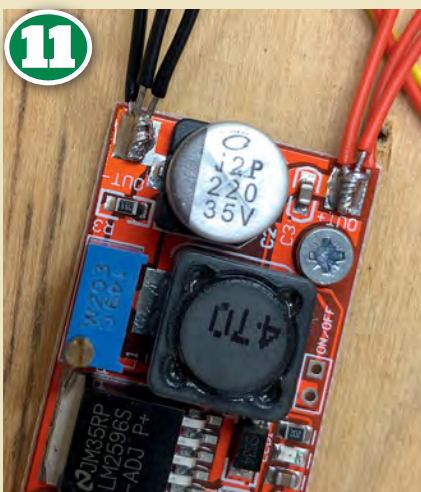
Dapol's signals require a regulated voltage to ensure their safe operation, but fortunately 12v power supplies and variable regulator circuits are cheap to buy – this pair cost just £18 from Amazon.



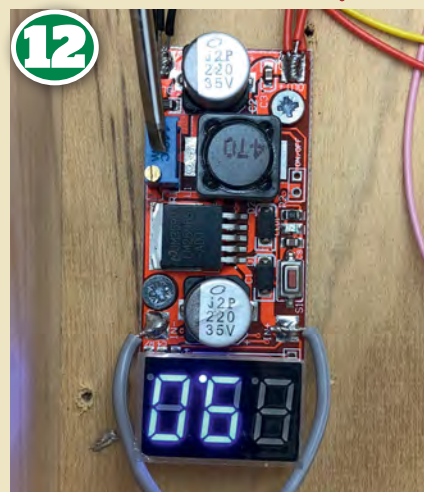
The regulator we had selected required the power connections to be soldered to the board, but others have screw terminals. A connector supplied with the 12v power adapter was added to the other end of the input wires to make connection of the adapter simple.



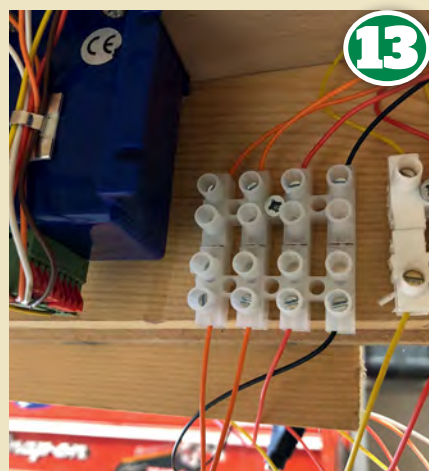
The regulator circuit board was fixed in position underneath the control panel. Three circuits are being run from this regulator – one for point motors and two separate circuits for the two signals on the layout. The contact points for the output have been pre-tinned ready for connection of the red and black wires from the signal.



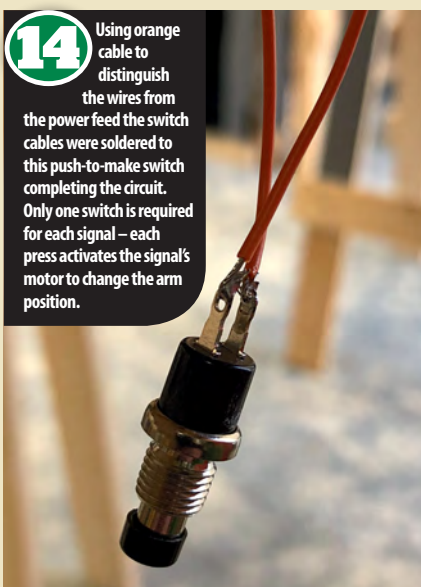
To complete the circuit the red and black wires were soldered to the output terminals on the voltage regulator taking care to ensure that the polarity was correct as per Dapol's instruction sheet. Red is positive and black is negative.



The power adapter was then connected so that we could set the output voltage. As this regulator is being used to power both Dapol signals and DCC Concepts Cobalt point motors we set the output voltage to 9v – a safe level for both devices.



Having established the power source, we can now extend the yellow wires from the signal back to a push-to-make switch on the control panel. The first step is to extend the wires using the spare connections on the same terminal blocks as we used for the red and black wires.



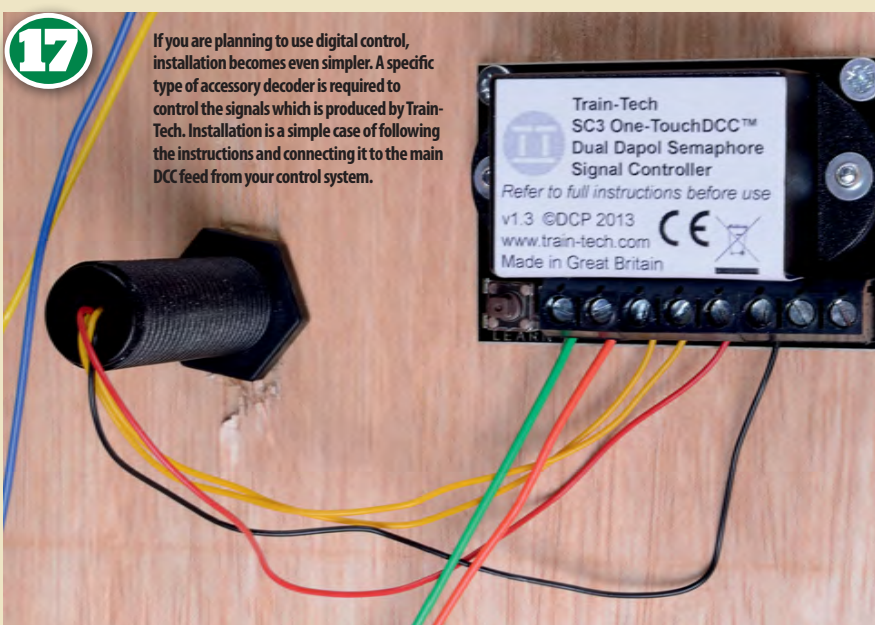
Using orange cable to distinguish the wires from the power feed the switch cables were soldered to this push-to-make switch completing the circuit. Only one switch is required for each signal – each press activates the signal's motor to change the arm position.



A 7mm diameter hole in the control panel allows the switch to be allocated a position mirroring its location on the layout.



That completes installation of the analogue signal. If you wish, the base can be painted or ballasted in to blend it into the scenery of the layout. If you choose to ballast it into place, ensure you don't get glue on the operating wire.

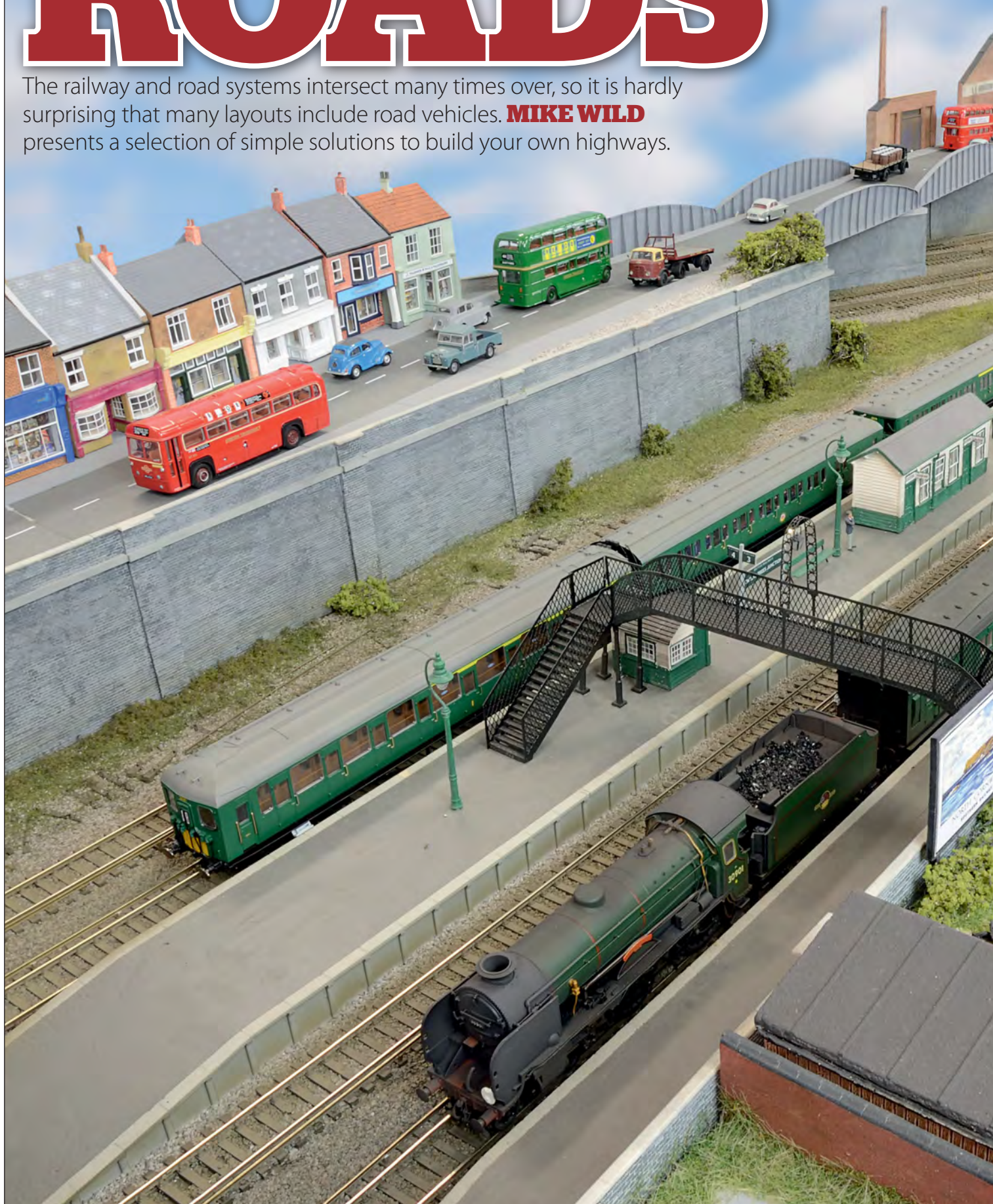


If you are planning to use digital control, installation becomes even simpler. A specific type of accessory decoder is required to control the signals which is produced by Train-Tech. Installation is a simple case of following the instructions and connecting it to the main DCC feed from your control system.



Building ROADS

The railway and road systems intersect many times over, so it is hardly surprising that many layouts include road vehicles. **MIKE WILD** presents a selection of simple solutions to build your own highways.



Below: Roadways surround our railways providing transport links from the station forecourt and goods yard into the town and surroundings. In this view of Twelve Trees Junction, there are three types of model road construction. The main road at the back is artists' card from Hobbycraft with Busch rub-on road markings, at the front right chinchilla dust is used as the ground covering around the garage and builder's yard, while the station forecourt is a skim of household filler painted grey.



Above: German scenic manufacturers Busch and Noch produce a range of self-adhesive products to create street scenes ranging from smooth tarmac to traditional cobbles as well as sheets of parking spaces and more. This is Busch's self-adhesive country road which is simple to lay and has a degree of flexibility to allow it to follow gentle curves.

ROADS come in all shapes and sizes from minor lanes to multi-lane motorways - and the chances are that you will want to add at least one form of road or another to your model railway. Just like the railway, roads need planning to make sure they will fit in with the railway scene: after all, the two transport mediums work hand in hand (so goes the theory of integrated transport).

There are many ways to produce model roads and a vast number of products on the market. Here we are providing an overview of the choices available to you, but if you want to go further there is also the possibility of introducing moving road vehicles with Faller's car system designed for 'HO' scale European outline railways.

We will concentrate on static roads here explaining the methods used across *Hornby Magazine's* exhibition layouts. These range from artists' mounting card chosen in a suitable charcoal grey base colour at the simplest end of the scale through to bespoke potholed road kits, fine ballasts and even specially designed self-adhesive products from Europe.

Whichever road you go down, always ensure you have enough space for the number of lanes you want to include and don't be tempted to overpopulate them once complete. This is particularly important on a 1960s period layout when private car ownership was just taking off.

When it comes to vehicles, the world is your oyster. With the likes of Oxford Diecast, EFE, Corgi and BT Models all producing 1:76 scale vehicles for 'OO' gauge layouts, modellers in that scale are now truly spoilt. These ranges include buses, lorries, vans, cars, tractors, diggers and more - and covering a variety of periods in motoring. An increasing range of products is becoming available for 'N' gauge too through Oxford Diecast, BT Models and Bachmann's Graham Farish brand while 'O' gauge can look to the Oxford catalogue as a starting point for 1:43 scale cars and light commercials.

Check out the useful links panel for more suggestions to find that perfect road surface or vehicle for your layout. ■



Above: Recreating the subtle effect of tarmac is a challenge in miniature, but one of the options available is Redutex textured self-adhesive sheets. These are very simple to use and realistic in their finish. Supplied in 12in x 8in sheets, they can be cut to size to suit any location. This is the station forecourt on Grosvenor Square which uses Redutex sheets for the road and paths.

Below: An ideal way of providing roads in a goods yard are stone setts such as those produced by Wills. Offered in 6in x 4in plastic sheets, they can be cut to size with a craft knife while the edging stones can be removed from the main sheet and arranged along the side of the main roadway. Set into place with ballast and static grass they make a great finishing touch to a goods yard.

USEFUL LINKS	
Geoscenics	www.geoscenics.co.uk
Redutex	www.dccsupplies.com
Hobbycraft	www.hobbycraft.com
Train-Tech	www.train-tech.com
Wills	www.peco-uk.com
Noch	www.gaugemaster.com
Busch	www.goldenvalleyhobbies.com
Woodland Scenics	www.bachmann.co.uk
Oxford Diecast	www.oxford-diecast.co.uk
EFE	www.bachmann.co.uk
Corgi	www.corgi.com
BT Models	www.ayrey.co.uk

Above: Goods yards often had gravel yards and a simple way of replicating this is with chinchilla dust. Its fine texture and buff appearance make it a perfect medium for modelling gravel yards. Alternatives include fine grade ballasts from the likes of Woodland Scenics.



Level crossings make an attractive feature on a model railway. This model uses Train-Tech's new illuminated and sound equipped crossing lights together with artists' mounting card for the approach road and Wills planked sheets for the infill across the railway. Complete kits are available for level crossings containing barriers and track section for set track railways from Peco and Hornby too.



Above: Another alternative for a goods yard is to use air drying clay. This can be spread out over a layer of PVA glue and pressed in between the sleepers and their ends to suggest a railway bedded into the ground, as here on St Stephens Road. Air dry clay is available from Geoscenics.

Not all roads are made to a high standard with many early and minor roads having a rough finish. This can be replicated with Geoscenics' potholed road kit which contains all the ground cover materials required to recreate a realistic finish.



Landscaping

NIGEL BURKIN shows how to create a model landscape with one of the cheapest and easiest methods of all.

ONE OF THE LAYOUT building tasks I particularly enjoy is creating the basic landscape. This is the process of filling in the gaps between man-made features such as the railway, roads and structures with a land surface. No matter if the landscape is to be spectacularly mountainous, rocky, rolling or relatively flat, it can be achieved using some fairly simple and inexpensive techniques.

Here I will describe one of the cheapest and most effective ways of making landscape hard shell. A lattice of cardboard is glued together and covered in plaster cloth (also known as ModRoc). It is a technique I regularly use to make a lightweight landscape to which scenery is applied. It can be used to span large areas between baseboard frames and the baseboard top. It's perfect for those areas where there is nothing to support foam blocks or balled-up newspaper too.

Tools of the trade

The principal tool is a hot glue gun together with standard glue sticks. Hot glue enables the assembly of a section of lattice in no time at all because of the speed at which the glue cools and hardens. The glue won't be affected by water either which is important for the covering of plaster cloth.

It is easy to burn your fingers by getting glue on them and it is difficult to remove, so wear protective gloves when using it. They will not protect you from the heat but are quick to remove so the glue does not continue to burn. In use, hot glue can string a little, so protect sensitive areas of the layout from the web of fine glue strings that can occur.

It takes a little dedication to create lattice hard landscaping, especially for a large layout. To begin, you must collect together as many cardboard boxes as you think you are going to need, preferably corrugated cardboard, which is stronger than single layer card. It takes a little time

to tear the cardboard boxes into strips which are woven together to make the lattice structure. The width of the strips can be varied depending on the area being covered. Typically, I cut my strips between 10mm and 15mm in width and when I need strength, I cut each one along the line of the corrugations, not across them. Should you need strips that are more flexible, cut across the corrugations.

When you have a goodly bundle of strips long enough to span the widest part of the gap you need to cover with landscape, plug in the hot glue gun and make a start on gluing the vertical strips in place, secured at the top and bottom of the slope. Space them about 15mm to 25mm apart, give or take a millimetre or two. It's not an exact science and each strip is adjusted and trimmed to length to adjust the angle of slope and the depth of it.

When the vertical strips are secured in place, the horizontal ones are woven through them to create a structure strong enough to support wet

Once hardened and dry, the plaster bandage can be stained or painted. Woodland Scenics Earth Undercoat (C1229) is used on my layout, although any diluted water based brown paint would do the job. The land behind the blue Class 09 is now ready for greenery to be added.



STEP BY STEP MAKING HARD SHELL LANDSCAPES

Beginner Intermediate Advanced
SKILL LEVEL



Hard shell landscaping can be achieved in a variety of ways. Materials suitable for supporting a layer of plaster cloth include packing foam, balled-up newspaper and of course, cardboard. A hot glue gun is an essential piece of kit for this technique and plaster cloth forms the hard surface to support the scenery.



2 Start work by collecting as much corrugated cardboard as you need and cutting it into strips which can be woven together. The width is a personal choice, but they should be long enough to span the widest point.



STEP BY STEP MAKING HARD SHELL LANDSCAPES



Hot glue is used to secure the card strips to the baseboard frame, backdrop board and track bed. It speeds the job up dramatically and is resistant to moisture from wet plaster doth.



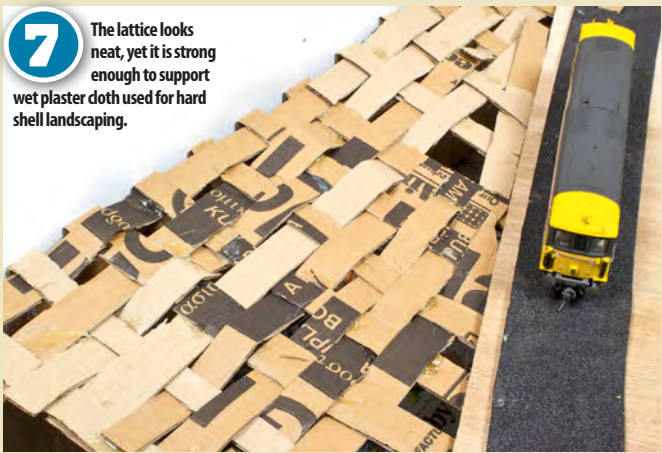
Start by applying the cross strips first (or vertical ones on a slope), secured at the ends with hot glue. Note how I have tucked the ends under the plywood forming the trackbed.



Thread in the long or horizontal strips of card through the vertical ones, ensuring that each strip threads above and below the vertical ones in an alternate pattern for strength.



Hot glue is used to secure the long card pieces to every third (or so) short or vertical strip.



The lattice looks neat, yet it is strong enough to support wet plaster doth used for hard shell landscaping.



To prevent water from plaster cloth from soaking and weakening the card strips, masking tape is applied to the lattice in long strips until it is covered with at least two layers.



Managing the mess of using plaster doth is a matter of preparing the materials and working area first. Protect adjacent track and other features with masking tape and old newspaper.

10



Beginner **SKILL LEVEL** Intermediate Advanced

Dip the plaster cloth quickly in water, but do not soak it! Allow excess water to drain from it before placing on the masking tape.

TIP

Using plaster cloth can be a messy process. Make sure you cover your working area with newspaper and also mask areas of previously completed scenery and track to stop any unwanted plaster marks.

11



I find it easier to use plaster cloth in small strips which ensures that none of it hardens before it can be used. Nonetheless, careful but speedy application is a must, especially if your plaster cloth has a short setting time.

12



Smooth the plaster cloth with fingers to hide all those tiny holes and to create a smooth surface. At least three layers are needed for a fixed layout and more for a portable one where durability is important.

13



The stages of hard shell landscaping are demonstrated in this picture. Masking tape covers the card lattice protecting it from the plaster cloth application until it completely dries. A coat of brown or earth-coloured paint is applied to the dry hard shell to prepare it for scenery application which can include static grass, turf, shrubs and bushes. Surrounding features are protected with masking tape when plaster cloth is applied.

plaster cloth. Use hot glue to secure each weave of the lattice to one another. The lattice will not be strong enough at this stage to support scenery structures or your weight, so avoid leaning on it!

One of the biggest causes of failure of this technique is soggy cardboard when it falls in taking the plaster cloth with it creating a horrible mess. The secret to protecting the lattice from damp is to cover it with at least two layers of masking tape, including the extreme edges. Be sure it is pressed firmly in place before proceeding to hard shell application.

Applying the hard shell

The potential for making a complete mess should not be underestimated! Plaster cloth application is messy at the best of times. By carefully preparing your work area, most of this can be avoided. Lay out your tools and protective coverings neatly. Cut the plaster cloth into the required pieces ready for use and have some cloths to hand to wipe up any accidental spillage.

ModRoc and other brands of plaster cloth harden in a matter of a few minutes, especially when the environment is warm. Be prepared to work quickly once the plaster cloth is wet - hence the importance of logically setting out your work area. Soak only as much as you need at a time and transfer it to the working area after the excess moisture has been removed by squeezing against the water dish. Pop it into place and smooth down with your fingers to remove the tiny holes as far as possible. Do not overwork it once it begins to set.

As the layers are built up, the plaster cloth will harden and you will get a feel for how much is needed for your application. I usually apply two to three layers for a small span and up to five for a wide span of landscaping. Avoid the temptation to poke or prod it once the job is done. When finished, walk away, clean up tools and the working area and leave the hard shell for several days to harden and cure.

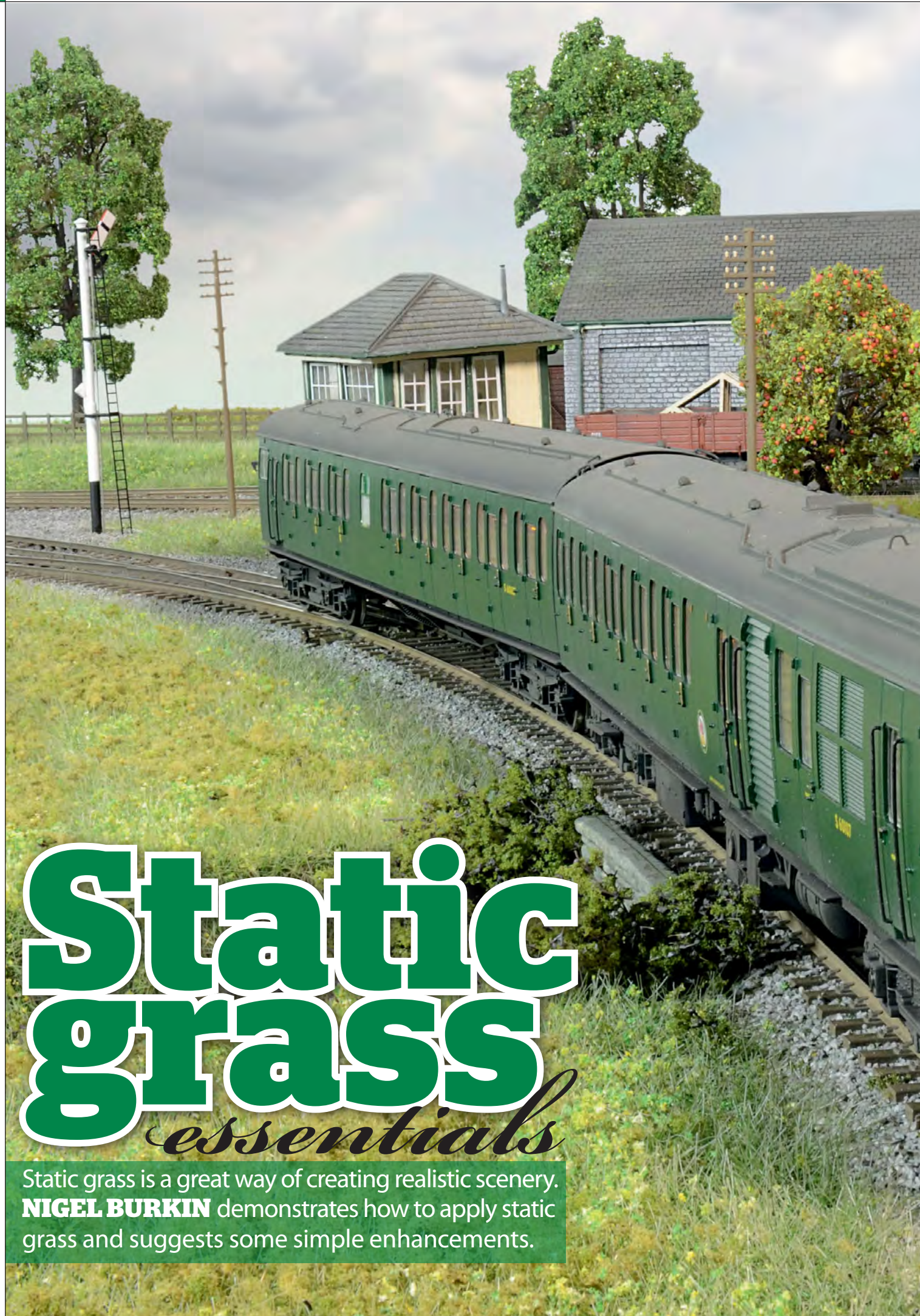
Setting the scene

It is tempting to think that hard shell is ready to paint after it has first hardened. Ideally, the it should be left to dry out for several days depending on the conditions. There is a simple test to see if your hard shell is ready for paint: touch it with the palm of your hand and if it feels 'cold' to the touch, it is still holding moisture. When that cold feeling has gone, it is ready for paint.

Painting seals the hard shell ready for addition of scenic materials and will prevent white from showing through. Some modellers use household paints diluted a little so it soaks into the hard shell. Woodland Scenics brown coloured C1229 Earth Undercoat pigment can be applied undiluted to the hard shell where it will soak into the plaster.

Plaster cloth and lattice hard shell is surprisingly strong and can be used to span quite large areas without support. However, it does have its limitations and it may be necessary to add some support to the underside of the lattice if it appears to want to sag under its own weight. With the hard shell completed, it can be treated with rock moulds, skimmed with casting plaster to add to the relief or textured with turf, static grass, bushes, shrubs and more.

The real benefit of the technique is its relative cheapness and today when modelling budgets are under particular stress, low cost methods for layout building and scenery are worth considering and will allow more money to be spent on quality scenery materials for a great looking layout. ■



Static grass *essentials*

Static grass is a great way of creating realistic scenery. **NIGEL BURKIN** demonstrates how to apply static grass and suggests some simple enhancements.

SCENERY MODELLING has long moved away from coloured sawdust to represent grass and weeds. Even dyed ground foam scatter has taken a back seat to the growing popularity of static grass which is available from a number of manufacturers and in a variety of natural colours ranging from the bright to the subtle.

Static grasses are simple to use. They are scattered onto the landscape surface after coating with either scenery adhesive or diluted PVA glue. A special electric applicator is used to charge the grasses with static electricity, enabling the grasses to stand upright in the adhesive in a natural looking way. Static grass applicators can be expensive to buy depending on the model, but the results speak for themselves and the devices are similarly priced to a new locomotive. The upside is that they produce grass which matches the detailing of the locomotives which we can now buy ready-to-run. *Hornby Magazine* has been using static grass on its exhibition and demonstration layouts for almost 10 years.

Static grass is produced in a variety of lengths from 1mm to 6mm depending on the manufacturer. MiniNatur offers an 'Early Fall' and 'Late Fall' colour in various lengths which works well for dry summer grasses in the context of British landscape modelling. Static grass is also produced by Green Scene, Noch, Woodland Scenics and War World Scenics.

Applying static grass

Firstly, protect the track, ballast and any lineside features from spray adhesive and grass fibres with masking tape and newspaper. Damp paper towels will protect buildings and structures from stray fibres which can be the very devil to remove – glue or no glue! Backdrop boards are covered in newspaper for the same reason.

The Noch applicator I use is supplied with a variety of screens and a narrow funnel. Before selecting a screen, the applicator is filled to about one third with static grass material teased out so it is loose. I usually use a fine mesh screen fitted to the end of the applicator, as demonstrated in the photographs, when working on larger areas. For smaller or more confined areas, the mesh screen can be replaced with the funnel which directs the static grass to where it is needed. Typically, working on a 2ft square area of landscape at a time, unless treating awkward spots, is a good policy.

An essential first step is a scattering of green or blended green 'Fine Turf' by Woodland Scenics as an undercoat onto the hard shell to disguise the painted hard shell before the first layer of grass is applied when lush growth is needed. Grasses can be applied directly to the hard shell, especially if thin grass over soil or compacted ground is the desired effect. Be sure to achieve the right ground colour and texture first.

To prepare for the static grass fibres thinned PVA glue or Scenic Cement is spread/sprayed on to the painted hard shell before charging up the applicator. The Noch applicator relies on a grounding pin which is inserted into the wet area before the grass is sprinkled from the applicator onto the landscape. Hold the applicator an inch or two from the surface and listen for the ticking noise of the fibres leaving the applicator and hitting the landscape surface.

Remove protective materials before the glue hardens completely. Once the glue has dried, the grass fibres should be standing upright. When longer grasses are needed, apply more protection to layout features if necessary and scatter a second layer of grass. Firm hold hairspray or acrylic matt varnish can be used to hold any second application. This can be done in patches or evenly across the treated area for variety.

When you have developed your technique, remember to take a record of the exact process, including products and colours so you can repeat the process in the future. ■

ADDING TEXTURE

Some of the most effective scenery has been created using a mixture of materials and techniques which adds texture and prevents unnatural-looking uniformity. Here's a summary of possibilities:

- Add a second hit of static grass to create texture and depth
- Mix fibres of different sizes in the applicator
- Mix different colours and makes of static grass for variety
- A second application of short fibres could be of yellow or 'dry' grasses representing the longer grasses with seed heads which dry out in summer and autumn whilst the lower part of the grasses remains green
- Brush your fingers gently through some areas of grass to make them look flattened after heavy rain or strong wind. Grasses which all stand uniformly upright do not look convincing
- Sprinkle a pinch of fine turf material onto the grass in a random manner to represent weeds growing through the grass
- Summer flowers can be represented by using Woodland Scenics T48 'Flowers' scatter which includes red, white and yellow suitable for many British wild flowers

Static grass makes a huge difference to the appearance of a scenic model railway. A Class 205 DEMU departs Axe Regis – the grass alongside is static grass detailed with fine and coarse turfs as well as multiple layers of static fibres.



STEP BY STEP STATIC GRASS TECHNIQUES



1 Static grasses usually end up where you do not want them! Protect track, ballast and scenic details with masking tape and newspaper. Cover trees and structures with damp paper towels.



2 One option is to apply an underlying layer of fine ground foam scatter before scattering static fibres. Note how the backdrop boards have been covered in newspaper to protect them from scenery glue.



3 Dilute PVA wood glue is brushed onto the landscape surface for the first layer of scenery materials. Static grass could be directly applied to this if desired, but the base colour of the landscape will show through.



4 I prefer to apply a layer of fine turf by Woodland Scenics first. It is left to dry before spraying on a coat of scenery cement or matte medium for the static grass.

Static grasses are ideal for bedding buildings and structures into the ground such as in this shed scene at Axe Regis. Note the additional textures of fine turfs which have been added to the basic grass after application.





5 Load up the applicator with static grass material, mixing colours and length for variety. If the material is balled, as seen in this picture, take a few minutes to tease it out.



6 The applicator is turned on and the fibres discharged from a height of an inch or two. Note the grounding lead to the left.



7 Spray on more scenic cement or dilute matte medium to further secure the grasses if necessary. A second application of grass could be made at this stage before the glue sets.



8 Texture can be added before the glue completely dries by sprinkling some fine scatter onto the surface of the grasses to represent weeds. Coloured scatter, when applied very sparingly, gives the impression of wild flowers such as poppies.



9 Carefully remove the protective masking tape before the scenery glue completely dries out and make any minor repairs to the edge of the grassy area.



10 Static grass has grown in popularity in recent years, despite the relatively high price of electric applicators. The uniformity of static grass can be broken up using pinches of fine ground foam scatter to add the impression of weeds and flowers.

Simple TREES

Making your own trees is a cost effective and therapeutic means of adding foliage to your layout. **NIGEL BURKIN** explains two methods for the DIY tree maker.

TREES CAN BE RATHER LARGE. Even the weed trees that grow on railway embankments and abandoned railway land can reach considerable height and width when left to grow

unchecked. In the past, when steam power dominated the railways, trees were carefully cut back from embankments and cuttings to reduce the risk of fires and to keep railway property tidy before they became too large.

Layout builders should see trees differently. They make great scenic features, visually powerful backdrops, may be used as scenic breaks and even be used as a sort of visual sleight of hand to hide the join between structures, backscene boards and landscaping, making the layout appear finished. Taking the time to make your own trees is rewarding and enjoyable, so it is worth factoring them into your design from the very start.

Trees can be modelled in a number of ways and they are relatively easy to do for any scale. They can be used to populate embankments and cuttings and by varying their height they can add a great deal of depth to even the shallowest of layouts.

Sea foam trees

The first technique we will show here is the use of sea foam which produces ideal nondescript background trees. Sea foam is a natural plant material and the part used in tree-making and scenery is the flower. It has to be dried before use and the flower heads are delicate and easily broken which should be a consideration when using it on a portable layout. However, the natural shape and relative low cost per finished tree are factors in its favour. Considerable areas of layout can be covered with one box of sea foam and a modest outlay in scenery glue, foliage material and paint.

Sort through the box of sea foam armatures to

find those most suited to tree making. Choose them according to size, shape and avoid those with excessive curl. Set up a hanging line from which the armatures can be suspended using clamps and set out a working area on a table top with suitable protective covers.

After trimming away any leaves from the armature and shaping it by cutting off unwanted branches, dip each one into a jug of dilute matte medium for a few minutes at a time. Shake off excess matte medium and attach them to the line by the stem so they are suspended upside down. Attach a clamp or clothes pegs to the bottom end to apply weight which will straighten them as the matte medium dries.

The armatures are left for at least 12 hours in good conditions to thoroughly dry before being painted the desired trunk and branch colour. I chose a dark brown acrylic paint sprayed on to save time.

Again, leave the armatures sufficient time to dry after painting before applying foliage material. Whilst I use ground foam from Woodland Scenics for foliage there are numerous ways of decorating sea foam trees. Noch offers a leaf product that can be applied to prepared tree armatures and this is available in several colours including summer greens – perfect for sea foam trees.

To avoid damaging the delicate armatures, I used firm hold hairspray as an adhesive. Woodland Scenics Scenic Cement could be applied too using a spray bottle instead if you prefer. To make sure the foliage material sticks well, do not be too sparing with the adhesive you choose to use – spray on a good coating.

Woodland Scenics armatures

Woodland Scenics offers a variety of tree kits, ranging from the Learning Kit (Cat No. LK953) which contains foliage, adhesive, a mix of deciduous and evergreen tree armatures and full instructions to 'Realistic Tree Kits' which contain »

TOOLS

SEA FOAM TREES

- » Plastic jug or water bottle
- » Plastic trays
- » Bulldog clips
- » Clothes pegs
- » Scissors
- » Tweezers
- » Cocktail sticks

WOODLAND SCENICS TREES

- » Brown, bauxite and grey acrylic paints for painting tree armatures
- » Woodland Scenics Hob-e-Tac adhesive
- » Plastic trays to hold and catch scenery material during foliage application
- » Old newspapers to protect working areas

WHAT WE USED – SEA FOAM TREES

PRODUCT	PURPOSE
Woodland Scenics S191 Scenic Cement	To soak trees
Woodland Scenics S192 Scenic Sprayer	Applying scenic cements
Brown and grey acrylic paints	Painting tree trunks
Woodland Scenics T64 medium green turf	Summer foliage
Woodland Scenics T63 light green turf	Accent colour
Extra firm hold hairspray	Scenic adhesive
Sea foam tree armatures	Tree materials

Sea foam trees dominate the background of this overhauled section of scenery. The new trees have been produced using the methods described in the step by step guide for sea foam.

STEP BY STEP MAKING TREES FROM SEA FOAM

Beginner Intermediate Advanced
SKILL LEVEL

1



Sea foam trees are widely available from a number of sources including Noch and Woodland Scenics. A box contains enough to cover a considerable area of landscape and the smaller pieces can be used to make shrubs and bushes.

2



Basic modelling materials are all that are required. One of my favourite adhesives for applying foliage to trees and bushes is firm-hold hairspray.

3



The part of the sea foam plant used for scenery making is the flower head, suitably dried.

4



Some leaves are cut from the sea foam armature with scissors. Trim unwanted branches and cut larger pieces to the desired height.

5

Toughen the armatures by dipping them in dilute matte medium or neat Scenic Cement, long enough for it to soak in.



USEFUL LINKS

Green Scene (sea foam, forest in a box)	www.green-scenes.co.uk
Woodland Scenics	www.bachmann.co.uk
Gaugemaster (Noch products)	www.gaugemaster.com



armatures and suitable foliage materials and lead-free cast metal tree kits including forest kits. Together with the wide range of foliage materials available from Woodland Scenics and other suppliers, you can have hours of fun making up trees for your layout quickly and economically.

The basis of the Woodland Scenics tree kits and armature packs is to twist flat mouldings into the desired three-dimensional shape, with branches arranged to suit. The learning kits and 'Realistic Tree Kits' contain foliage and plastic armatures, complete with a moulded base, the use of which is optional. The armature is gripped in the hands and twisted around to distribute the branches evenly around the trunk. Some branches can be removed to create different looking trees.

Woodland Scenics plastic armatures are pre-coloured and can be used without having to paint them to save time. However, painting the trees before adding foliage adds individual character and removes the plastic shine. Particular tree trunk

colours can be introduced such as the reddish brown of evergreen trees, the silvery grey of trees representing beeches and the off-white trunks of birches, the ever present tree of old railway land.

Ready to plant

Having assembled a batch of trees we can now move on to plant them on a model railway. Use the best specimens at the front and take the more

nondescript designs to the back of a scene. There they will add depth to the foliage and create a perception of the trees going into the distance. It takes practice and adjustment to get them into the right place, but it is highly rewarding to reach the final stages.

The step by step guides explain the processes involved in making sea foam and Woodland Scenics trees. ■

WHAT WE USED – WOODLAND SCENICS TREES

PRODUCT	MANUFACTURER	CAT NO.
Hob-e-Tac adhesive	Woodland Scenics	S195
Flowers	Woodland Scenics	T48
Dark green foliage	Woodland Scenics	F53
Light green turf	Woodland Scenics	T63
Medium green turf	Woodland Scenics	T64
Poly fibre	Woodland Scenics	FP178
Light green leaves	Noch	GM156
Medium green leaves	Noch	GM157

Commercial tree products come in all shapes and sizes.

Woodland Scenics offers a comprehensive range of armature packs, kits and learning packs. Ready-made trees can also be improved and customised using the products and techniques described here.



STEP BY STEP MAKING TREES FROM SEA FOAM

Beginner **SKILL LEVEL** Intermediate Advanced



6 Armatures are suspended from a line whilst drying. A weight is applied to them to help straighten them whilst the matte medium dries.



7 After painting, the armatures are either dipped in matte medium, scenic cement or sprayed with hairspray before being rolled in foliage material.



8 Woodland Scenics coarse turf makes good foliage material for '00' gauge. Leaves are available from Noch to create the same effect.



9 Using sea foam a large batch of trees can be produced quickly to develop the scenery of a layout. Build up a stock pile and then use them across your layout to their best effect, moving them around before gluing them in place.



10 With the new sea foam trees planted, the join between the landscape and the vertical backscene board is disguised to good effect.

STEP BY STEP HOW TO MAKE PLASTIC DECIDUOUS TREES

Beginner **SKILL LEVEL** Intermediate Advanced



The LK953 tree learning kit supplies the foliage and plastic armatures for creating simple but effective trees suitable for '00' gauge layouts. The kit also includes evergreen and deciduous tree armatures and Hob-e-Tac adhesive too.



Woodland Scenics offers packs of deciduous tree armatures of varying heights to suit various scales which are also supplied in the learning kit.



Each armature is cleaned of moulding flash and twisted into shape using your fingers.



Fine nose pliers help with adjusting individual branches. The twisting process should only take about five minutes per tree.



After a coat of paint, the branches are coated in a tacky scenery adhesive. Deluxe Materials Scatter Grip adhesive is a good alternative to Hob-e-Tac.



Rather than add individual pads of foliage, I used Poly Fibre to create complete tree canopies. It is teased out to make a fine covering.



The Poly Fibre is sprayed with firm hold hairspray (or other spray adhesive designed for scenery work) taking care not to soak the tree stem or branches. It helps to hold the tree upside down over newspaper when applying spray glues.



Foliage scatter is gently sprinkled onto the canopy with a tray underneath to catch the excess. A couple of layers separated with applications of spray adhesive may be required to complete this process making the tree ready to plant on your layout.

Topley Dale

Once restricted in size by its location, the *Hornby Magazine* office test track is being revitalised, extended and remodelled for a new future as the centre of our model testing operations. **MIKE WILD** reveals all.



NOT THAT LONG AGO IT seemed that Topley Dale, our office test track since 2012, was coming to the end of its life. It had no room for expansion and was becoming overused for video work as well as needing a significant amount of scenery refreshing to bring it back up to standard. All that changed at the beginning of 2018 with a new location for the *Hornby Magazine* test tracks which has opened up the potential to redevelop the layout and keep it in front line service.

First though, a little history. Topley Dale was originally conceived for *Hornby Magazine* Yearbook No. 5 in 2012. It was built to fit into a dining room where it had to fit in with daily home life including sharing its location with a fridge freezer. A removable board was essential for access and with the total space available covering 11ft x 10ft there were compromises to be made to allow a working double track main line scene to be built in a relatively compact area – Plan 2.

Chief among its limits was the lack of on-track storage. The limits of the room, and

THE DETAILS	
Name:	Topley Dale
Gauge:	'OO', 16.5mm
Scale:	4mm; 1ft
Track:	Peco code 75
Control:	Digital and analogue
Period:	BR 1955-1965 London Midland Region

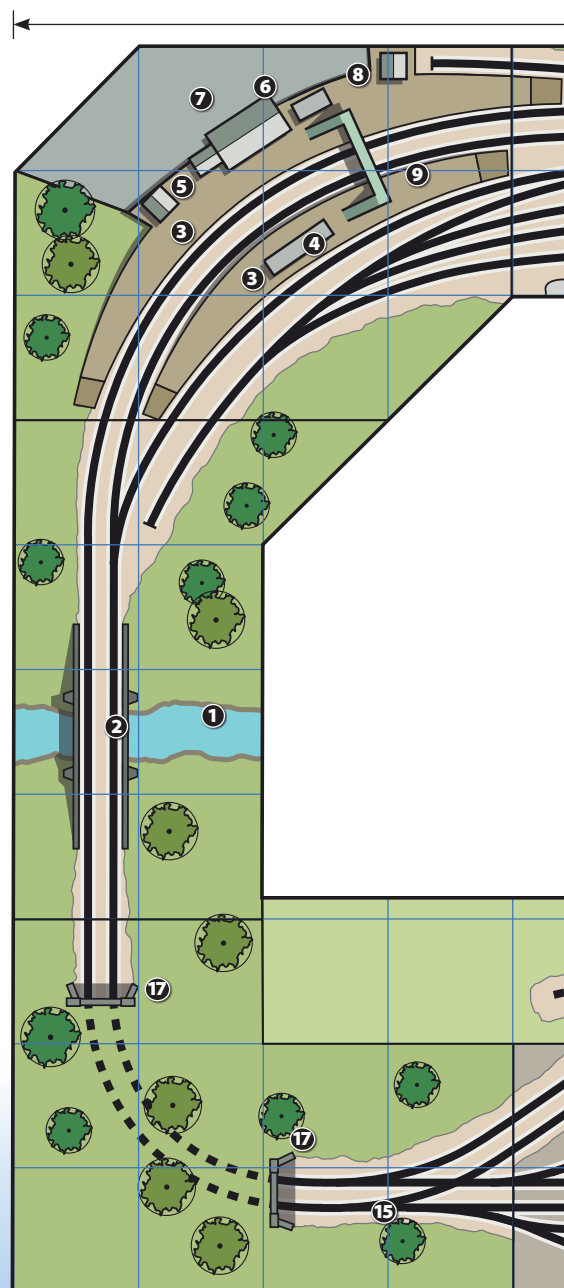
fridge, meant that the curves at one end were necessarily tight while the lift-out board had to be light enough for regular handling as well as robust enough to withstand repeated movement. In all it could only accommodate four trains, two in each direction. >>

BR '9F' 2-10-0 92077 crosses from the original layout into the new section with a rake of Hatton's ICI 45ton bogie limestone hoppers while in the distance a Hughes-Fowler 'Crab' 2-6-0 crosses the viaduct. The bridge has been reclaimed from the original curved section.

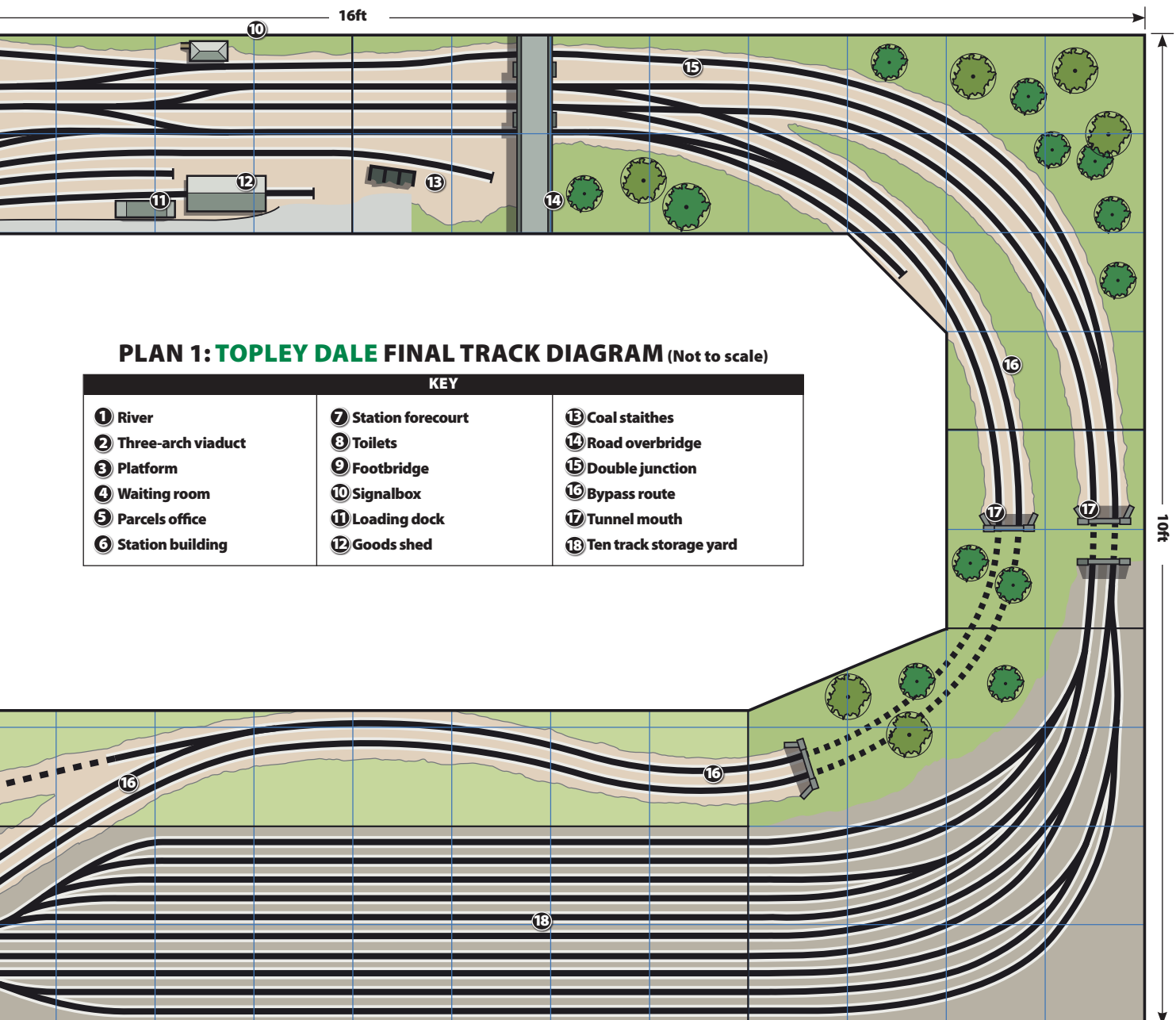


TOPLEY DALE PRODUCT LIST

PRODUCT	MANUFACTURER	CAT NO.
Code 75 large radius right point	Peco	SL-E188
Code 75 large radius left point	Peco	SL-E189
Code 75 large radius curved right point	Peco	SL-E186
Code 75 large radius curved left point	Peco	SL-E187
Code 75 medium radius right point	Peco	SL-E195
Code 75 medium radius left point	Peco	SL-E196
Code 75 large diamond crossing	Peco	SL-E194
Code 75 rail joiners, metal	Peco	SL-110F
Code 75 insulated rail joiners	Peco	SL-111F
Code 75 flexible track	Peco	SL-100F
Rail built buffer stops	Peco	SL-40
Tunnel mouth	Model Scene	5046
LMS stop signal	Dapol	4L-00X-00X
Midland signalbox	Dapol	C006
Footbridge	Dapol	C004
Prodigy Advance Digital Controller	Gaugemaster	DCC02
Fine blended grey ballast	Woodland Scenics	B1393
Medium blended grey ballast	Woodland Scenics	B1394
Blended green fine turf	Woodland Scenics	T1349
Burnt grass coarse turf	Woodland Scenics	T1362
Fine leaf foliage, light green	Woodland Scenics	F1132
Fine leaf foliage, olive green	Woodland Scenics	F1133
Rock moulds	Woodland Scenics	C1230/C1247/C1248
Rock making hydrocal	Woodland Scenics	C1201
Dent station buildings collection	Hornby Skaledale	Various
Platform benches	Hornby Skaledale	R8674
Granite stone walling	Hornby Skaledale	R8526
Three arch stone viaduct	Wills	SS80
Stone sheets (platform edging)	Wills	SSMP200
Stone setts	Wills	SSMP204
Victorian gents toilet	Wills	SS10
Corrugated metal lineside hut	Wills	SS22
Coal staithes	Wills	SS17
Wooden lineside fencing	Ratio	425
LMS station fencing	Ratio	426
Loading gauge	Ratio	471
Telegraph poles	Ratio	452
Ground signals	Ratio	465
Station posters	Sankey Scenics	Various
Dummy manual point levers	Dart Castings	L31
Static grass fibres	Green Scene	Various
Static grass fibres	MiniNatur	Various
Platform swan neck lamps	Gaugemaster	GM868
Cobalt IP digital point motor	DCC Concepts	DCP-CB1DiP
Dual Frog Juicer	Tam Valley	HFJ003U



A Bachmann Fowler parallel boiler 'Patriot' 4-6-0 rumbles through Topley Dale on the original alignment with a milk train. Ultimately the plan is to have fully working signalling throughout the layout.



However, negatives aside, as a layout it worked well and packed a lot into its small (for a main line) space. The double track main line circuit was complemented by a pair of goods loops, a goods yard and headshunt, a two-platform station on a curve, a three arch viaduct and deep scenery to suggest its position in the Peak District on the former Midland Main Line to Manchester from Derby.

Construction was carried out promptly during the summer of 2012 bringing the viaduct, station and goods yard sections to completion. The remaining return curves were developed in November 2013 in time for the first of two public appearances at the Warley National Model Railway exhibition for Topley Dale – the second taking place in 2015.

The layout wasn't designed with exhibitions in mind as the room layout meant an odd combination of baseboard sizes and shapes were required to bring the circuit together so it has spent most of its time in the *Hornby Magazine* offices where it has served its purpose as our 'OO' test track day in day out.

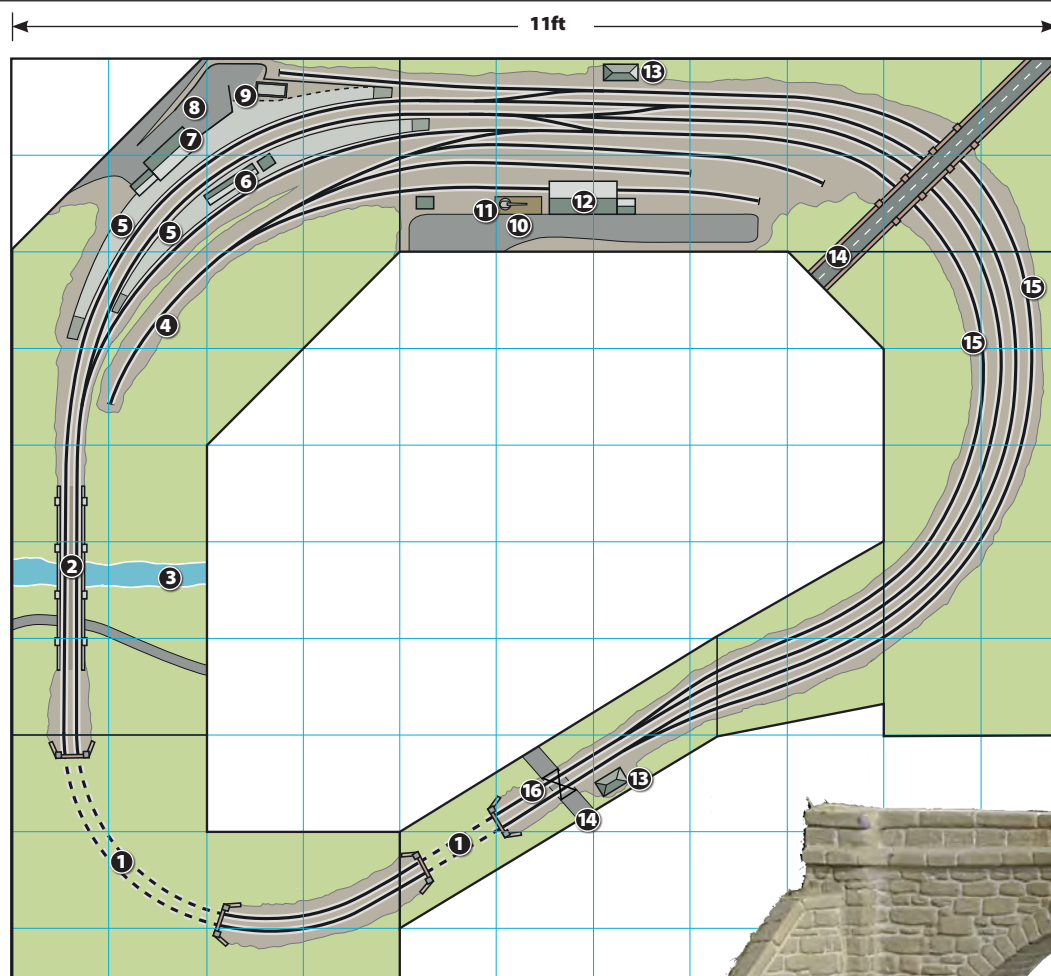
Double deck

In 2016 we began construction of an 'O' gauge test track underneath Topley Dale which extended beyond the 'OO' gauge layout's original footprint to 16ft x 10ft. At the same time a depot scene joined the layout which was later followed by a branch line terminus station. The original layout still stood fast, but still lacked in its abilities to host trains, which limited its operational value. Fast forward to early 2018 and the *Hornby Magazine* test tracks were moved to a new building which provided a much larger space to accommodate the 'OO', 'O' and 'N' layouts in one space and the instant potential to expand the 'OO' gauge layout was seized.

A two-part plan was devised. First both the 'O' and 'OO' levels would be raised to make access easier. In the end the 'O' gauge went up to 1m off the ground with the 'OO' raised from its original 1m height to 1.4m. Next on the cards was extension of the layout to take it from its original 11ft x 10ft (and unusual shape) to a 16ft x 10ft layout which would match the outline of the 'O' gauge layout below.

The design for the extended layout was initially based on a plan that we proposed in HM104 - Plan 3. This would have seen the main line extended but with the same basic track layout to fill the full 16ft length while a large storage yard was to be added at the rear. In front of this would be a quarry scene, replicating another element of the Peak District which is famous for its limestone quarries. After some deliberation a new plan was devised to further expand the layout's operational flexibility and also partly because we felt that the quarry scene would be wasted on the test track and be largely unused.

The final design - Plan 1 - extends the main line in almost the same way with a storage yard at the rear, but this time it will incorporate a pair of double junctions to allow a bypass route to be introduced in front of the storage yard where once we had proposed a quarry. This is to feature gradients as well as open frame scenery while there is still potential to create a small quarry scene between the end of the bypass route and the original viaduct baseboard at some stage in the future. >>



PLAN 2: TOPLEY DALE AS BUILT TRACK DIAGRAM

(Not to scale)

KEY

- ① Tunnel
- ② Viaduct
- ③ River
- ④ Headshunt
- ⑤ Platform
- ⑥ Waiting room
- ⑦ Station building
- ⑧ Station forecourt
- ⑨ Office
- ⑩ Loading dock
- ⑪ Crane
- ⑫ Goods shed
- ⑬ Signalbox
- ⑭ Road
- ⑮ Goods loop
- ⑯ Level crossing

USEFUL LINKS

DCC Concepts	www.dccconcepts.com
Dart Castings	www.dartcastings.co.uk
Gaugemaster	www.gaugemaster.com
Green Scene	www.green-scenes.co.uk
Peco/Ratio/Wills/Model Scene	www.peco-uk.com
Sankey Scenics	www.sankeyscenics.co.uk
Scenecraft/Woodland Scenics	www.bachmann.co.uk
Tam Valley	www.digitrains.co.uk
Train-Tech	www.train-tech.com



Reconstruction

As with any project, the rebuilding of Topley Dale started with new baseboards. Six new boards were built for the first phase to provide the new storage yard, ends and straight board to extend the scenic section. These consist of three 4ft x 2ft boards, two 4ft x 4ft boards with angled corners and a 2ft x 2ft board to join the two end boards together. The boards for the bypass route will be built at a later date.

The style of construction matches the other boards on the layout by using 9mm plywood for the surface and 69mm x 18mm planed softwood for the frames. These were glued and screwed together as outlined on pages 20-23 using No More Nails glue and 4.0 x 30mm twin thread wood screws.

Next the original end and level crossing boards from Topley Dale were removed to make way for the new boards to be assembled. The front and end boards are supported on 44mm x 44mm timbers either as single posts or paired legs, while the rear storage yard boards are supported on heavy duty 350mm x 350mm wall mounted brackets to reduce their impact on the

'O' gauge layout below. Once all the new boards had been assembled all of the surfaces were painted with grey emulsion paint to seal the wood while also giving a clean environment on which to begin the process of track laying.

All of the track is drawn from the Peco code 75 range to match the original formation of the remaining boards of the original layout. Work started on two fronts: at the entrance to the storage yard after the tunnel and at the opposite end of the original scenic boards where sections of track and ballast had to be removed to allow the new alignment to be introduced. The code 75 track has been laid on Gaugemaster 1/16in cork sheet which is cut away after track laying to create a ballast shoulder, as shown on pages 74-77 in the ballasting guide.

While the storage yard at the rear is a complete departure from the original layout – ultimately it will feature 10 tracks, five for each direction – we wanted the scenic areas to continue to be recognisable from the original layout. To do this we reclaimed the three-arch bridge from the redundant board to introduce

an original feature while the track plan includes a goods loop on the outer main line too. The same tunnel mouth styles are also being used, these having been reclaimed from the level crossing board, but there are deviations. The addition of a double junction will make the layout look significantly different after the bridge and the look will be changed further when the junction route includes a gradient. The aim here is to show two railway routes on different alignments and, if all goes to plan, there will be a siding on the level while the junction route climbs away. These elements are the next on the project list for Topley Dale and progress will be updated in Staff Projects in *Hornby Magazine*.

Digital and analogue

By the end of March 2018 we had reached the stage of having both main lines through the storage yard laid together with all the points and crossings for both junctions. Three separate power bus feeds had been installed – one for the inner circuit, one for the point motors and accessories and one for the outer main line. Why? >>

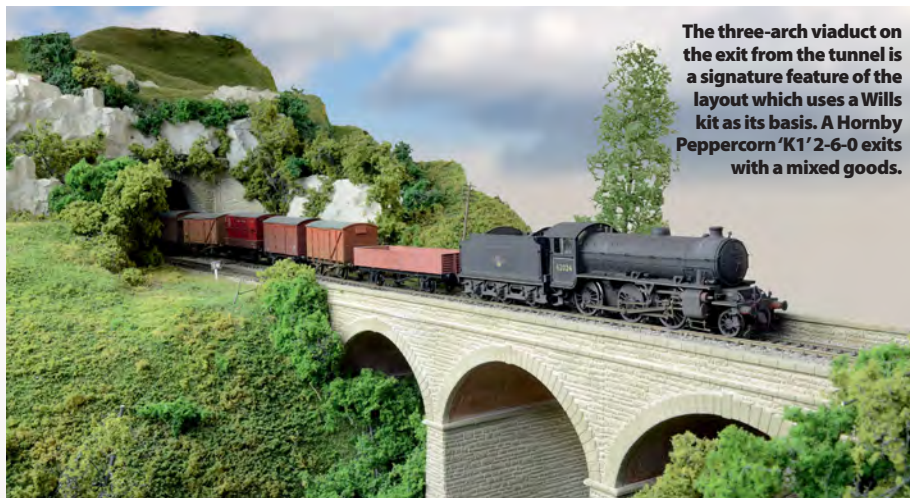


Because we need the ability to connect analogue and digital controllers to the outer main line which means providing separate power supplies for each circuit.

The wiring has been installed using 28 strand multi-core wire for the power bus and seven strand equipment wire for the track feeds, as outlined on pages 38-43. However, the wiring process is far from complete. Part of the project includes rewiring the original baseboards to bring them up to the same standard as the new boards.

Underneath the layout DCC Concepts' ADS series decoders power the solenoid point motors on the original boards while Cobalt IP digital motors operate the points on the new sections. The same motors will be used throughout the storage yard at the rear as well. Signals will be Dapol semaphores powered by Train-Tech SC3 accessory decoders which have been specifically designed to operate these motor driven working signals.

Even though the redevelopment of Topley Dale is far from complete it is already proving to be much more enjoyable to operate and has provided an opportunity to bring out locomotives and rolling stock which haven't seen the light of day for some time. This is all part of layout construction – testing the track and electrics and discovering any potential problems before we progress onto scenic aspects which lock the track in place. Long freights, fast passenger trains and a variety of steam and diesel locomotives have been running on the layout to check that everything works as intended and we will continue the same process



The three-arch viaduct on the exit from the tunnel is a signature feature of the layout which uses a Wills kit as its basis. A Hornby Peppercorn 'K1' 2-6-0 exits with a mixed goods.

with all the new additions to the track plan as it develops. Perfect running is the only option.

Future development

While progress is currently focused on the inner circuit storage yard, as soon as that has been completed attention will turn to building the boards and laying the track for the bypass route including its gradients. Then it will be scenic development alongside rewiring the original boards.

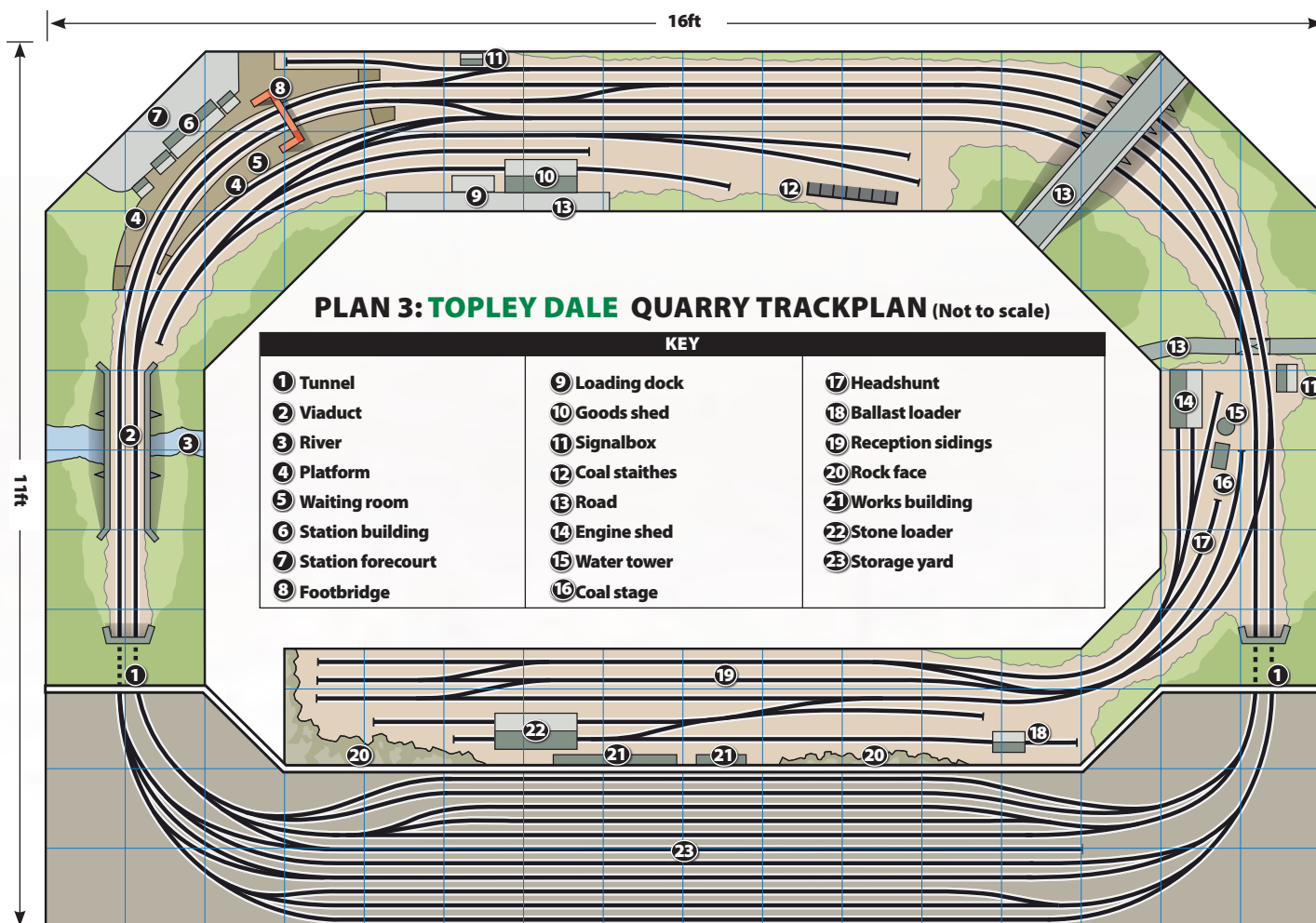
The scenery will follow a similar style to that of the original layout to keep the Peak District theme. Rocks will be cast from Woodland Scenics Hydrocal using the same manufacturer's rock moulds while we plan to use Woodland Scenics

pigments for realistic colouring of the rocks. Grasses will be drawn from the Green Scene static fibre range over the land forms which will undulate above and below the level of the railway.

Redeveloping Topley Dale is an exciting project for the *Hornby Magazine* team – just as enticing as a fresh layout build – and we are looking forward to bringing the scene together over the coming months as the backdrop to photographs and videos for the magazine and its online content.

Keep watching at www.hornbymagazine.com for the latest updates as well as in the Staff Projects section and other areas of the magazine as we showcase all the techniques which are being used to develop the layout for its new lease of life as our main testing facility. ■





Stanier rebuilt 'Royal Scot' 4-6-0 46109 *Royal Engineer*, a renumbered and renamed Hornby model, thunders through Topley Dale with an express and passes a Cravens DMU which is about to cross over from the loop into the station. Only the lack of grass textures on the bottom of the image gives away the in progress transition between the original and new sections of the layout.



Woodland Scenics JUST-PLUG SYSTEM

Lighting buildings used to be a challenge involving a range of skills, but Woodland Scenics has changed all that with its Just-Plug lighting system. **MIKE WILD** shows how to use it and adds extras to bring Twelve Trees Junction to life after dark.



Overlooking the station a 'Warship' has just arrived with an Exeter-Waterloo working while a 2-EPB pauses in the platform behind. The buildings have been lit with Woodland Scenics' Just-Plug range of lighting accessories.

ADDING LIGHTING to buildings used to be a difficult project, but that is no longer the case with the introduction of Woodland Scenics' new range of Just-Plug lighting products. As the name suggests the Just-Plug system is a plug-in lighting system covering all the main elements needed to install interior lighting in buildings and more.

Traditionally lighting of buildings required LEDs, an understanding of basic electric practice and skills in soldering. It could be time consuming and doubtless put modellers off from including this atmospheric addition to their layouts. The Just-Plug system is a plug-and-play design and takes all the complication out of lighting circuits.

To illustrate how to use this product range we went to town on the station and high street buildings on *Hornby Magazine's* Twelve Trees Junction layout. The complete installation

features 26 lights from the Just-Plug series. These are linked to the specially designed Light Hubs – each of which can power four LEDs and feature dimmer switches for each output – which in turn are connected to Expansion Hubs which connect the mains power supply to further Expansion Hubs and four Light Hubs from each Expansion Hub. It may sound complicated but it really is a very simple system – see Diagram 1.

Moreover, it doesn't stop at just the lighting circuits themselves. It covers specific kits for blacking out the interior of buildings, window films to improve the performance of interior lights – and to tint the windows too – a very handy Tidy Wire Kit which does exactly what it says. Plus, while we have used the warm white LEDs for our project, there are a number of other lighting colours available in the range.

To complete our scene we added station lamps and street lamps using the DCC Concepts swan neck lamp range which is now available through Gaugemaster. Using the

value packs – each of which contains six full height lamps, two wall mounted lamps, a pack of LEDs and miniature circuit boards to connect the lamps to a 9-12v power supply – we were able to quickly and neatly add these quality lamps where needed. Installation of these does require basic soldering skills, but an installation diagram is provided with each pack to assist all modellers in equipping their layout.

The introduction of lighting to Twelve Trees Junction's town scene and station has changed the look of the layout, instantly adding more character and detail. The atmosphere it creates is excellent and the speed with which the Just-Plug lighting system can be connected up is impressive.

The step by step guide with this feature explains how we went about the installation. ■

USEFUL LINKS

Woodland Scenics	www.bachmann.co.uk
DCC Concepts Lamps	www.gaugemaster.com



STEP BY STEP USING WOODLAND SCENICS' JUST-PLUG LIGHTING SYSTEM

1 The Just-Plug lighting system from Woodland Scenics encompasses all the parts you could need to install building lights – and it all just plugs together too: no soldering is required. The range includes lighting hubs, expansion hubs, stick on LED and nano LED lights in a variety of light colours, a light block kit, window film, a tidy wire kit, connecting cables and a power supply.



2 The standard lighting hub has a single input for power and four outputs to connect Just-Plug system lights to. Four dimmer controls are provided allowing each output to be adjusted to suit particular applications.



3 Most layout lighting situations will need more than four outputs and the Expansion Hub is the answer to that. It has been designed with 'in' and 'out' power connections allowing multiple Expansion Hubs to be connected together. Four hubs can then be connected from the right-hand four outputs. The maximum number of lights which can be run from a single power supply is 50.



4 A standard connection has been designed for all Just-Plug components. All you have to do is join the cables in the right order by pushing the plugs into the correct sockets – it is that simple.



5 Illustrating a basic setup, from the left we have the mains power supply (which includes a built-in transformer), an Expansion Hub, a Light Hub and a single LED. This basic setup can be expanded to suit by connecting additional Expansion Hubs, Light Hubs and, finally, LEDs.



6 A lot of the work in this project is in preparing the buildings for interior lighting. By their very nature resin buildings leak light but Woodland Scenics has developed products to stop this problem. The Light Block kit contains a black rubber based paint and two rolls of black sealant. Painting the inside of the building with the black paint is the first step – the black sealant will be used later.



7 Having blacked out the building interior, and allowed the paint to dry fully, the next step is to add an LED. With just this single Stick On LED the lighting wasn't particularly effective, but Woodland Scenics has developed a Light Diffusing Kit which changes the appearance of the lighting altogether.



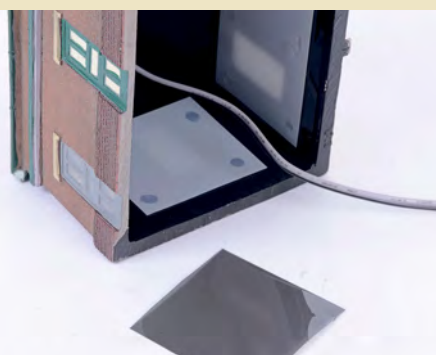
8 The Diffusing film from the Light Diffusing Kit (fixed in place with the contact adhesive) alters the performance of the light and means that a single Stick On LED can be used to illuminate the whole of this building.



9 To improve things further the Diffusing Kit also includes a Window Tint which has no effect on the quality of light from inside but stops light entering the building.



10 The Window Tint film needs to be immediately behind the window with the Diffusing Film behind that. Contact adhesive, carefully applied to avoid it appearing in the windows, was used to fix this layer in place.

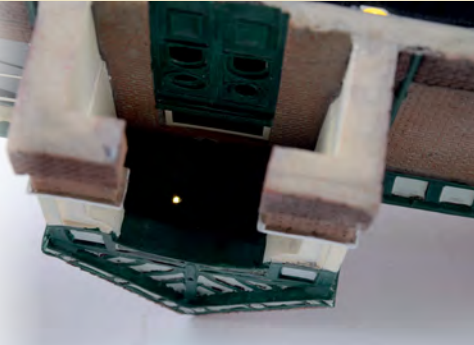




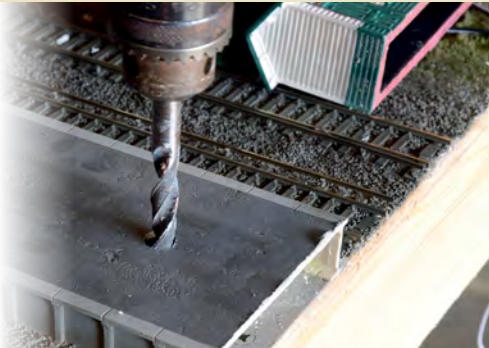
11 As well as the large Stick On LEDs, Woodland Scenics also produces packs of Nano LEDs – and these have huge potential. They are just 2mm in diameter and can be fitted into small spaces. To add extra lighting to this building we drilled a 2mm hole above the doors in the porch and then passed a Nano LED through from the inside.



12 Inside the blacked out roof it is difficult to see the Nano LED – the small spot of light is the giveaway. Once the room lights are turned down this addition makes a huge difference and is a perfect tool for lighting doorways. It could be used in many other locations too.



13 To fit lights into the rest of the buildings for this project it is a simple case of repeating the steps above. Once you are ready to reposition the buildings an 8mm hole through the baseboard surface will accept the plug from each lamp.



The station garage is open late catching up on a busy day's work.

WHAT WE USED

PRODUCT	CAT NO.
Woodland Scenics Just-Plug equipment	
Light Hub and lights	WJP5700
Expansion Hub	WJP5702
Light diffusing window film	WJP5715
Light Block Kit	WJP5716
Tidy Wire Kit	WJP5717
Stick on LEDs, warm white	WJP5740
Nano LEDs, warm white	WJP5743
Connecting cables	WJP5760
UK power supply	WJP5772
DCC Concepts swan neck lamps	
Swan neck lamp value pack, Southern Region green	GM867
Swan neck lamp value pack, soft black	GM866



Having drilled the hole and fed the wire through this building is ready to reposition on the platform. Initially we temporarily positioned all the buildings to check for light leaks.

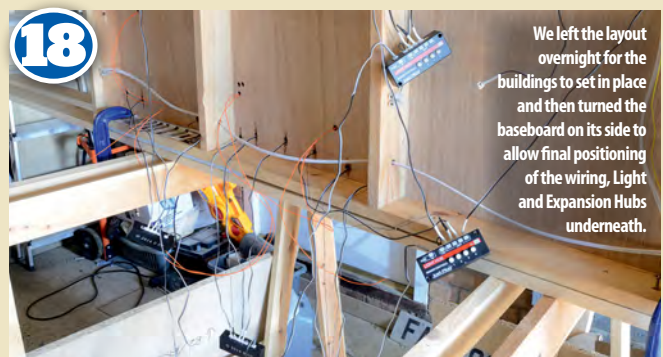
15 With all the buildings positioned loose in their locations and temporarily connected to the Light and Expansion Hubs and the lights turned on we were able to see how things were looking. It highlighted a couple of buildings where the Window Tint and Diffusing Film needed adjusting or redoing and also where light leaks were occurring from underneath buildings.



16 The station buildings were particularly prone to light leaks at their base. To prevent this we used the sealant – supplied in a rolled strip – from the Light Block Kit and pressed a length around the base of each building which was affected by light leaks.



To fix the building in position we could have used just the sealant, but because this layout has to travel we opted to double up for safety and add contact adhesive around the building footings. It was then positioned on the layout and left to set – repeating the process for all other buildings.



We left the layout overnight for the buildings to set in place and then turned the baseboard on its side to allow final positioning of the wiring, Light and Expansion Hubs underneath.

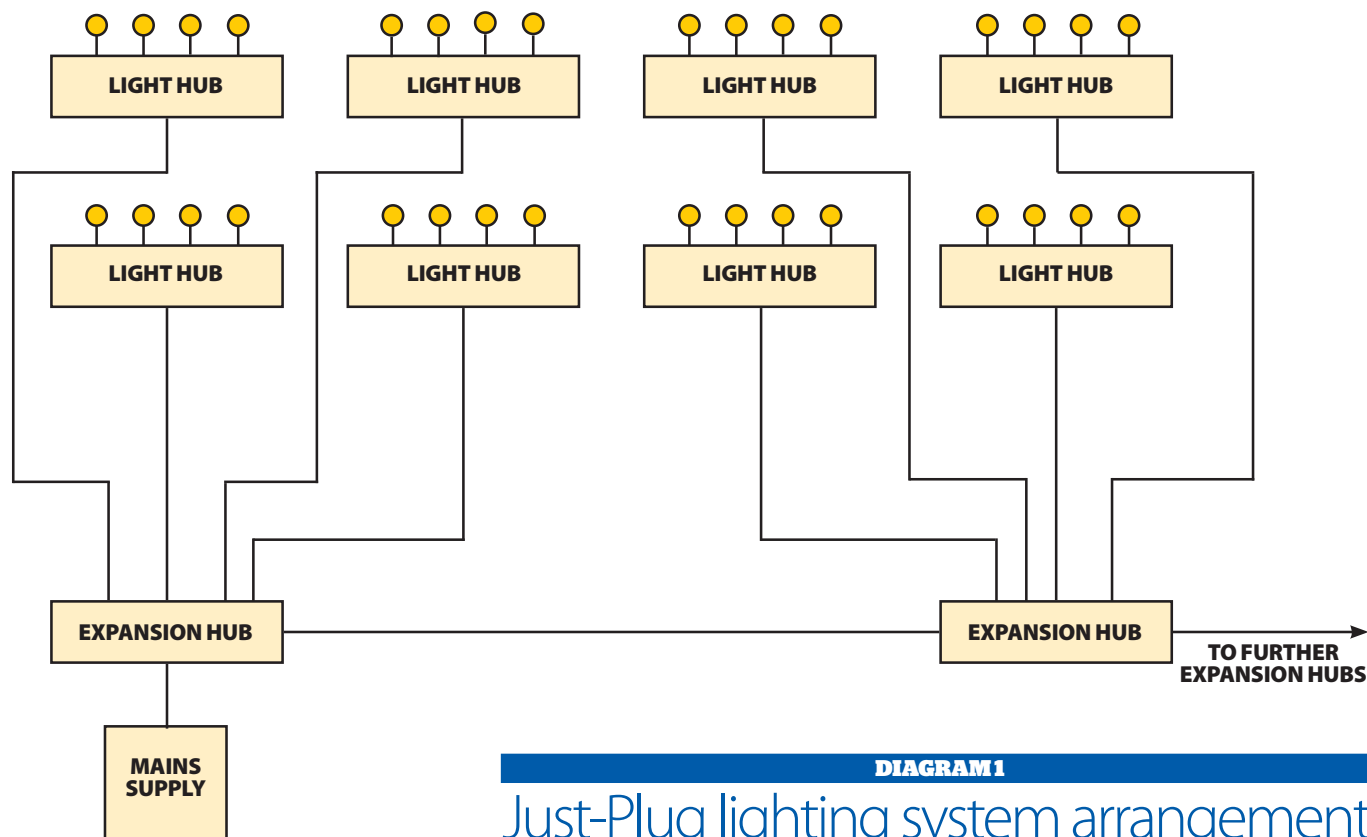
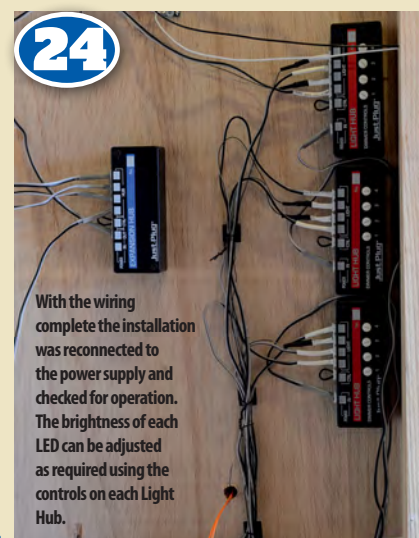
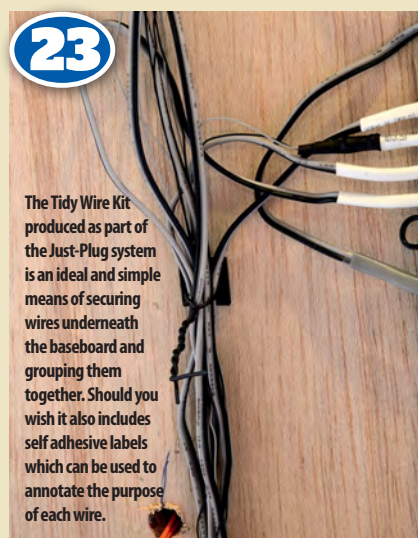
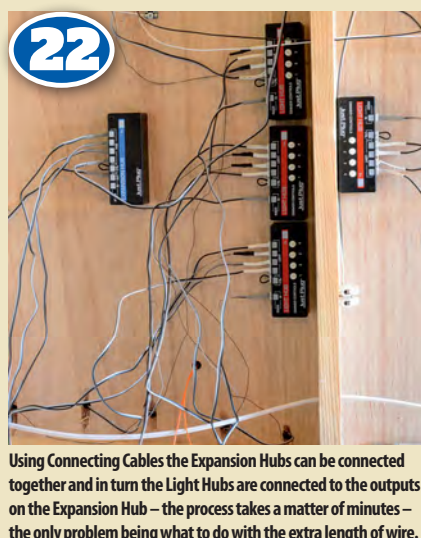
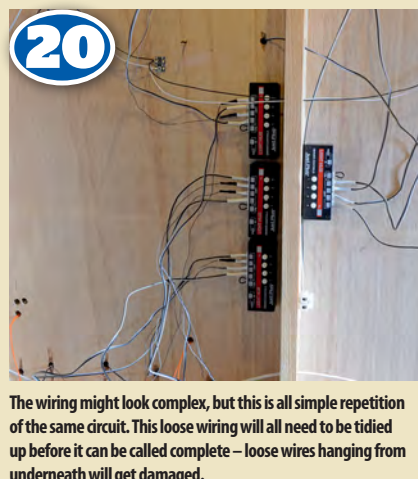
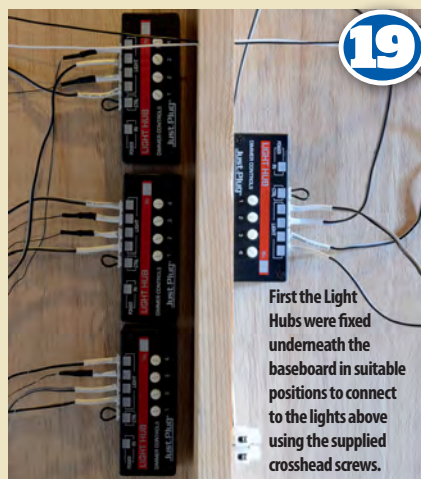


DIAGRAM 1

Just-Plug lighting system arrangement

STEP BY STEP USING WOODLAND SCENICS' JUST-PLUG LIGHTING SYSTEM CONT...

Beginner **Intermediate** SKILL LEVEL Advanced

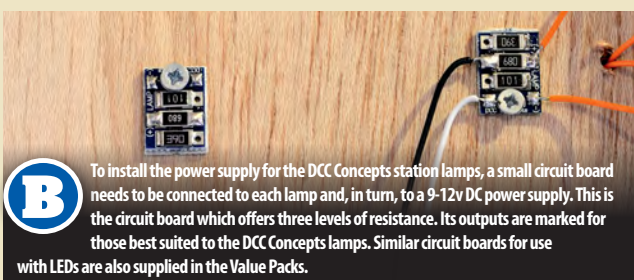


STEP BY STEP WIRING DCC CONCEPTS STATION LAMPS

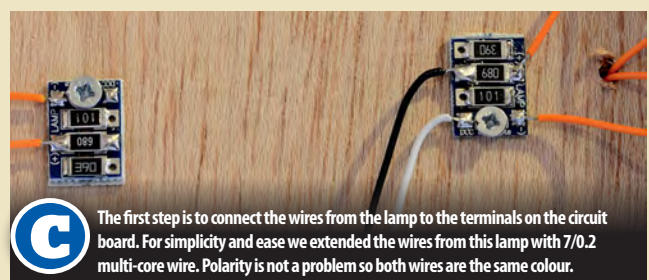
Beginner  Intermediate
 SKILL LEVEL
 Advanced

A

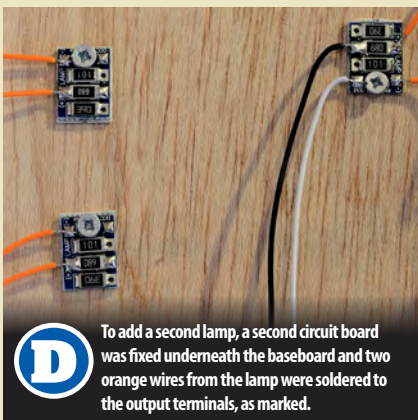
To provide station and street lighting this layout is equipped with DCC Concepts Swan neck lamps. These are supplied in packs of three or six. Here we are using the Value Packs which contain six full height lamps with extensions, two wall mounted lamps and a pack of additional LEDs and circuit boards to operate both types of bulb.

**B**

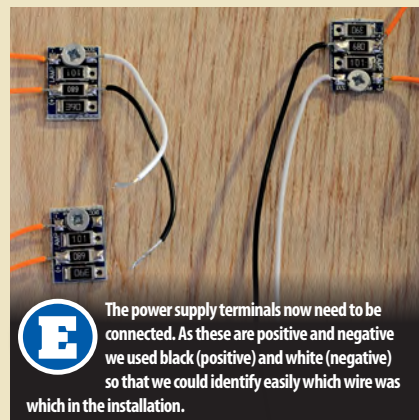
To install the power supply for the DCC Concepts station lamps, a small circuit board needs to be connected to each lamp and, in turn, to a 9-12v DC power supply. This is the circuit board which offers three levels of resistance. Its outputs are marked for those best suited to the DCC Concepts lamps. Similar circuit boards for use with LEDs are also supplied in the Value Packs.

**C**

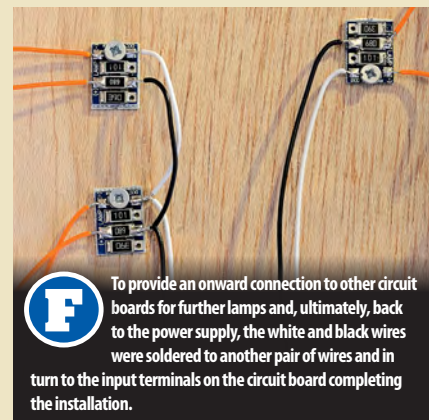
The first step is to connect the wires from the lamp to the terminals on the circuit board. For simplicity and ease we extended the wires from this lamp with 7/0.2 multi-core wire. Polarity is not a problem so both wires are the same colour.

**D**

To add a second lamp, a second circuit board was fixed underneath the baseboard and two orange wires from the lamp were soldered to the output terminals, as marked.

**E**

The power supply terminals now need to be connected. As these are positive and negative we used black (positive) and white (negative) so that we could identify easily which wire was which in the installation.

**F**

To provide an onward connection to other circuit boards for further lamps and, ultimately, back to the power supply, the white and black wires were soldered to another pair of wires and in turn to the input terminals on the circuit board completing the installation.



A Just-Plug nano light lights the porch at Twelve Trees station.

DETAILING

a railway

Bringing a model railway to life means getting up close and personal with the world around the trains. **MARK CHIVERS** reveals *Hornby Magazine's* top tips to bring colour and life to any layout.

COUNTRY STATION

Detail is everywhere and replicating it in model form is highly rewarding. It takes a keen eye to get the features right as there is so much to see and include. At Shortley Bridge, a Thompson 'L1' 2-6-4T has just arrived with a rake of Gresley suburban carriages framed by a Hornby Skaledale footbridge.

Bringing life to the station is a guard from Dart Castings, Gaugemaster gas lamps in

maroon, benches from the Hornby Skaledale range and Ratio spear fencing along the platform edges. Between the tracks, a section of rail, suitably rusted, has been left following track maintenance together with a trio of sleepers.

In front of the island platform, Woodland Scenics' fine leaf foliage blends the Scalescenes platform into its surroundings while on the

left is an allotment produced with a range of Noch scenic accessories from its laser cut series as well as potted plants, tools and more. The fencing around the allotments is Ratio lineside fencing while the goods shed behind is a repainted Bachmann Scenecraft item which models the building at Shillingstone on the Somerset & Dorset Railway.



The goods shed at Shortley Bridge is served by a BT Models Karrier Bantam articulated lorry in BR carmine and cream colours. Its load is a Harburn Hamlet stone cast product while the wooden panels and strips are by Model Railway Scenery. The cable drum is from Bachmann Scenecraft.



Period adverts always add colour and detail to a station scene including these by Sankey Scenics. Cut them out from the paper sheets and fix them to fencing or walls to suit your needs.



Gradient posts are a neat way of introducing a spot of detail to the lineside. Sankey Scenics produces packs of printed gradient signs which include suitable square section plastic strip to mount them on.



DEPOT SCENES

Locomotive depots are both the simplest to get the appearance right on and the most complex to bring life to in miniature at the same time. Typically, a depot is well kept with little left lying around to allow workers safe passage around the site, but it is always tempting on a model railway to add clutter here there and everywhere.

However, at larger depots there is plenty of potential as shown here at the roundhouse scene built by *Hornby Magazine* in 2015. The main buildings are Scenecraft models sold exclusively by Kernow Model Rail Centre while the turntable is a Peco product delivered by ADM Turntables with an indexing drive system underneath for accurate alignment on every turn.

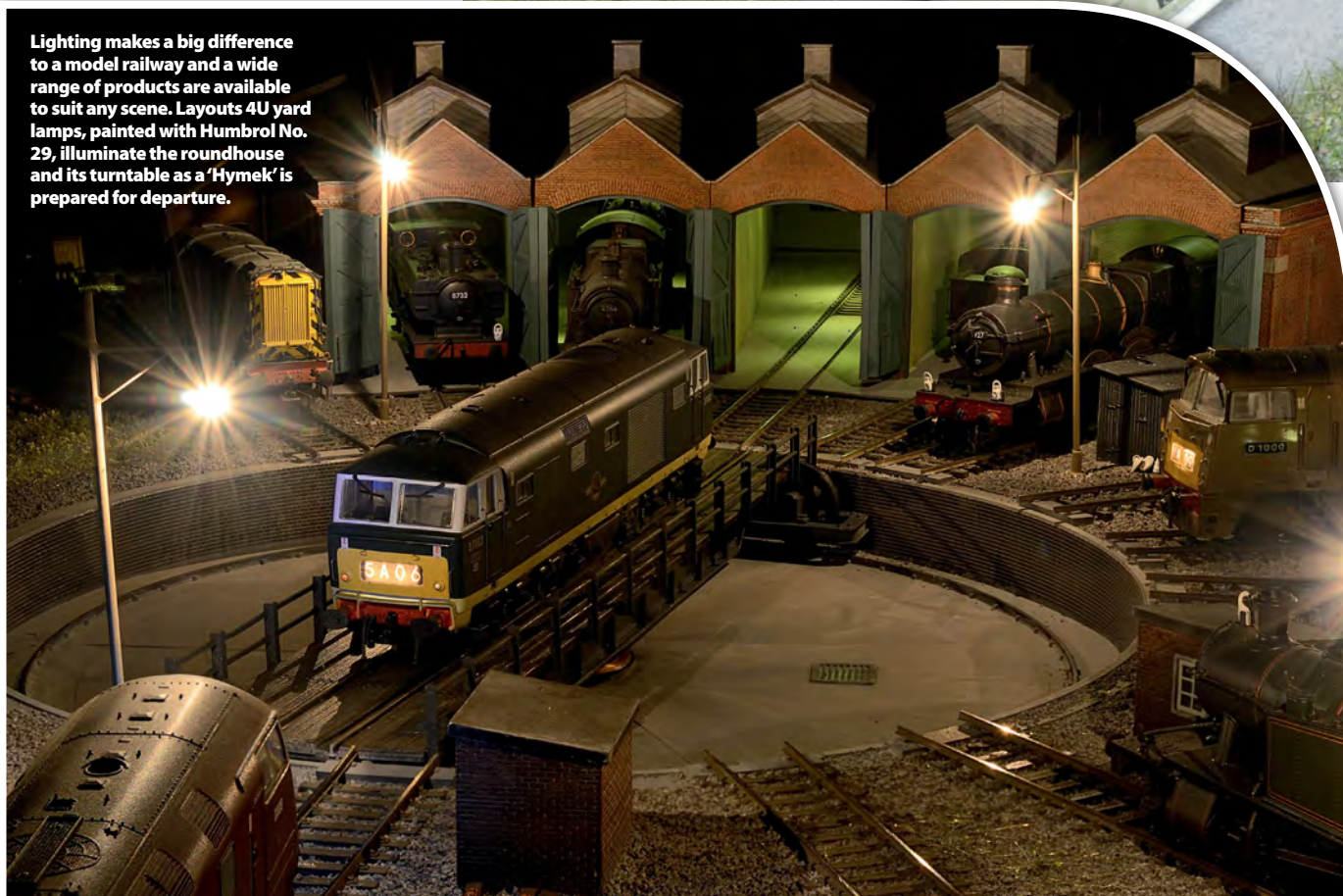
The back of the depot buildings are kept clear as a passage for light commercial vehicles to reach the office. The Volkswagen pick-up is from Oxford Diecast while its plywood panel load is by Model Railway Scenery and is part of a builder's yard set. Meanwhile, the sidings have a temporary buffer stop in the form of a sleeper wrapped in chain. Coal sacks, Ratio plastic mouldings, have just been delivered and a member of staff is moving them to a safe location. In the siding where the Class 08 stands, spare wheelsets have been gathered from redundant carriages and painted in suitable rust colours to suggest that they have been standing outside for some time.

In the distance a couple of redundant pallets litter the ground together with a trio of sleepers stored from repairs to the siding previously. In the background you can see yard lights from Layouts 4U while the figures visible are both from the Dart Castings range.

A couple of hours spent painting details with a suitable array of muted browns and greys can add realistic detailing to a shed scene like this, without introduces any overstated pieces.



Lighting makes a big difference to a model railway and a wide range of products are available to suit any scene. Layouts 4U yard lamps, painted with Humbrol No. 29, illuminate the roundhouse and its turntable as a 'Hymek' is prepared for departure.





Buffer stops are integral to the end of every siding – and there is plenty of choice. Above left are the humble Peco rail built buffer stops (SL-40) which take seconds to assemble. Their appearance can be improved greatly with painting and weathering to take away the original plastic finish. Alternatively, for the best of the best, DCC Concepts produces superbly detailed scale bufferstops which are pre-fitted with a red lamp (above right).

LIFE IN THE CITY

It's early in the morning at Grosvenor Square station and the staff are preparing for another busy day of arrivals and departures at this large Western Region terminus in the Midlands. Across the platform ends, hydraulic buffers by Peco are positioned to protect passengers should a train overrun while Ratio spear fencing makes sure that the passengers keep well away from the 'stops' as they walk onto the platforms.

Parcels and packages lay by the end of Platform 1 ready for loading into the next departing stopping train while on Platform 2 one of the porters has left a trolley of bagged mail. In front of the main station building the newspaper kiosk is ready for trade while, under the canopy, signage by Trackside Signs and period poster boards mean everyone knows where to go when they arrive to work in the city centre.

GWR benches, white metal kits by Dart Castings, line each platform illuminated under the Peco canopy by Gaugemaster Western Region coloured gas lamps. All it really needs now is a miniature population to go with the size of this seven-platform terminus.



Above: Trackside Signs produces a large collection of self-adhesive station signage and railway headed poster boards. These two are from a Western Region set to decorate the end of Grosvenor Square's station building.





Above: Sometimes it isn't just about the products you choose but how you use them. Here Ratio's spear fencing gates pack has been used at the entrance to the platform with the gate left part open. Add to this newspapers by the kiosk by Dart Castings, a British Railways van and a pair of bicycles leaning against the fence and it all starts to suggest real life.



Platform numbers by Trackside Signs adorn the lamp while wicker baskets and milk churns by Hornby Skaledale join Model Scene luggage, suitably painted in brown.

USEFUL LINKS

ADM Turntables	www.admturtables.com
Bachmann/Woodland Scenics	www.bachmann.co.uk
BT Models	www.ayrey.co.uk
Dart Castings	www.dartcastings.co.uk
DCC Concepts	www.dccconcepts.com
Gaugemaster/Noch	www.gaugemaster.com
Harburn Hobbies	www.harburnhobbies.co.uk
Hornby	www.hornby.com
Kernow Model Rail Centre	www.kernowmodelrailcentre.com
Layouts 4U	www.layouts4u.net
Model Railway Scenery	www.modelrailwayscenery.com
Oxford Diecast	www.oxforddiecast.co.uk
Peco/Model Scene/Ratio	www.peco-uk.com
Sankey Scenics	www.sankeyscenics.co.uk
Trackside Signs	www.tracksideesigns.co.uk

Keeping the trains moving

You've built your layout and it's now ready to enjoy. **MIKE WILD** explains how to get the best from it with simple maintenance techniques and products which really make a difference.

Tip You can't beat a basic track rubber for keeping on top of track cleaning. Here we are using a well used Hornby R8087 rubber which has proved to be one of the best of its breed in our experience.





Keeping a railway in the best condition starts with track cleaning – without this trains will stall on dirt accumulating on the railheads. Be prepared to vacuum your layout occasionally too to keep dust and fluff away from the trains. Here we are using a Woodland Scenics Railtracker to clean the track through the station on Topley Dale.

Deluxe Materials Track Magic should be in every model railway toolbox. It cleans track, cleans point blades and cleans locomotive pick ups – in fact, it can clean any metal surface for consistent power collection. We wouldn't be without it!



EVERY RAILWAY NEEDS maintenance to keep it in perfect running order all the way down from the full-size railway to the smallest models. Keeping on top of track cleaning and locomotive upkeep will result in a layout which is always a pleasure to operate. Leaving it to an annual clean would result in quite the opposite.

At the heart of consistent operation is electrical continuity. This comes in the form of clean railheads, point blades and wheels on the locomotives, consistent contact between the pick-ups on locomotives and neatly installed wiring and smoothly laid track.

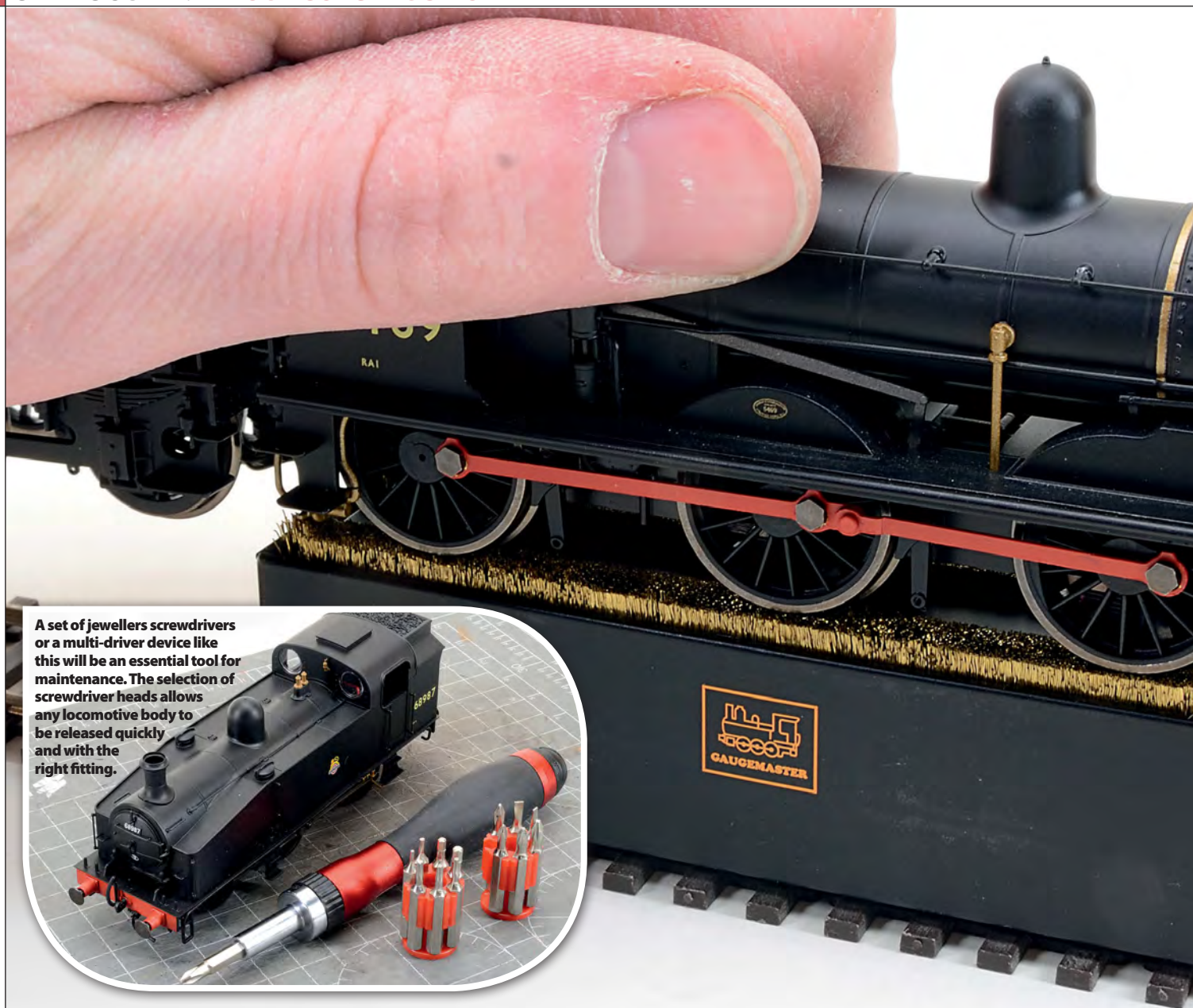
There are many gadgets on the market to assist in model railway cleaning – some work just as described, but others are less effective than they might at first seem. For *Hornby Magazine's* layouts there is a simple cleaning tool kit: a Hornby track rubber, a Gaugemaster wheel cleaning brush and a bottle of Deluxe Materials Track Magic. It might not sound like much, but it really does the job.

Railhead treatments

So how do we use these products? The Hornby track rubber is used for general railhead cleaning. Other rubbers which we have used have tended to disintegrate during cleaning, which makes more of a mess than before cleaning in the first place. The Hornby track rubbers are stable and don't fall apart and make light work of cleaning everything from paint to general electrical dirt. We have two of these – one for heavy cleaning following painting and ballasting and one for the 'cleaner' job of general railhead cleaning.

Regular cleaning with a track rubber means we only need to carry out a light pass around the layout before a running session for our permanent office test track while the exhibition layouts will require a more thorough clean with a track rubber at the start of each event making sure that we don't miss any important areas. This is due to the periods in storage. Following this initial clean at a show, a quick whip round on the Saturday and Sunday morning sets the wheels in motion for an enjoyable operating session throughout the day.

An alternative which we have found both effective and useful is the Woodland Scenics Rail Tracker cleaning set. This consists of a plastic handle and a head which can host a variety of different cleaning pads. These work just as well as a handheld rubber but have the advantage »



A set of jewellers screwdrivers or a multi-driver device like this will be an essential tool for maintenance. The selection of screwdriver heads allows any locomotive body to be released quickly and with the right fitting.

of a handle making it easier to manage the pads where access is more difficult due to baseboard width or the position of structures.

A third popular source of rail cleaning is a track cleaning wagon. A wide range of designs are available from Dapol's Track Cleaning wagon which can scrub, vacuum and polish rails. Other designs have cleaning cloths and fluids which sit around brass rollers to keep the railheads in the best possible condition for the next passing train. The advantage of these is that they need to be hauled around the layout so, with a little thought about routeing, they will never miss a spot. The downside is that they are a considerable outlay compared to a track rubber.

Deluxe Materials Track Magic is a toolbox essential for the *Hornby Magazine* team. It is a catch-all electrical cleaner (which we have even used to restore operation of a poor

CLEANING PRODUCT CHOICES		
PRODUCT	CAT NO.	PRICE
Gaugemaster wheel cleaning brush	GM60 ('OO'), GM59 ('N')	£19.95 (£15.95 – 'N')
Woodland Scenics Rail Tracker	TT4550 ('OO' and 'N')	£30.25
Deluxe Materials Track Magic	AC13	£9.50
Hornby track rubber	R8087	£3.00
Peco track rubber	PL-41	£3.50
Gaugemaster track rubber	GM27	£5.95
Dapol Track Cleaning wagon	B800	£77.59
Ten Commandments Track Cleaning Wagon	TCWOO	£40.00
CMX Clean Machine	'HO'/'OO'	£150.00
Sharge UK Track Cleaning wagon	'OO'	£93.00

contact in a car taillight). It can be used to clean railheads using specially designed pads, but we keep it on hand for two purposes – cleaning between point blades and cleaning the back of locomotive wheels to maintain current collection through wiper pick-ups. It's an

invaluable product which we highly recommend – just be aware that it will remove paint too, so use it carefully.

Locomotive maintenance

Maintenance extends beyond the track as locomotives need to be kept in premium condition to ensure they are always capable of running to the highest standards. As we have mentioned, Track Magic is a useful tool in cleaning pick-ups, but it can also be used for stubborn dirt on the wheels of locomotives in combination with a wheel cleaning brush.

For general cleaning of locomotive wheels, we use Gaugemaster's wheel cleaning brush. This is a plastic cased pair of brass brushes which stands on top of the running rails to collect power which

USEFUL LINKS

Gaugemaster/Deluxe Materials	www.gaugemaster.com
Woodland Scenics	www.bachmann.co.uk
Hornby	www.hornby.com
Dapol	www.dapol.co.uk
Ten Commandments	www.tencommandmentsmodels.co.uk
CMX Clean Machine	www.dccconcepts.com
Sharge UK	www.model-train-track-cleaner.co.uk
Peco	www.peco-uk.com

Just as important as maintaining the track is keeping locomotive wheels clean and fresh for consistent electrical connection with the track. We use a Gaugemaster GM60 rail mounted wheel cleaning brush to keep our locomotive wheels clean both at home and at exhibitions.



is then transferred through the brushes to a locomotive which is held on top. Light pressure ensures the brushes clean dirt from the wheels as they rotate, and this always restores service for a locomotive suffering from dirt. It's a simple process which takes no more than a minute or two to complete – and it is very worthwhile.

Beyond this, locomotives require occasional light oiling with a suitable model lubricant – don't be tempted to grab the nearest bottle of Castrol GTX – but always follow the instructions for oiling and be conservative in the quantity applied. Applying too much model oil is just as bad as having none.

Regular running

Keeping up with the basics of model railway maintenance will result in a great experience and a reliable layout which works time after time. It might seem at odds, but a regularly used layout will always fare better than one which is only switched on occasionally as the passing of trains assists in keeping the railway in the best order, especially if you follow a regular basic maintenance procedure.

Happy modelling! ■



Beyond the basics of track rubbers there are a number of readily available track cleaning wagons. Dapol's track cleaning wagon can scrub, vacuum and polish the rails and includes its own motor to operate the vacuum. It still requires motive power to move it around a layout, as illustrated here by a pair of Class 20s.



Some of the track cleaning wagons on the market rely on fluid based cleaning, such as the Sharge UK Track Cleaning Unit. We tested this in 2017 and found it highly effective, once adjusted to suit our track layout, at removing dirt from rails.

Like the Dapol cleaner it can be coupled to a locomotive for operation.



Proser produces a range of useful cradles to support locomotives during maintenance. This is one of its stands which is designed to support a model at an angle during repairs or maintenance.



Locomotives will require periodical lubrication to keep them in full working order. Always apply specially designed hobby lubricants carefully – too much is as bad as none at all.



While not strictly maintenance, rerailing locomotives and rolling stock can be made easier with a railer. This is a powered device by Proser which allows locomotives to be driven straight onto the track.

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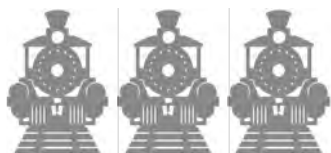
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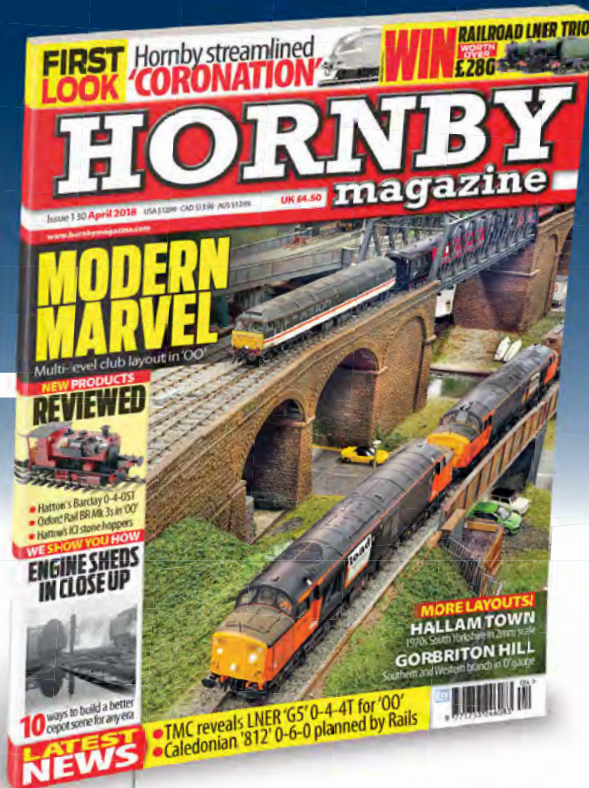
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