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BRM

JULY 2017

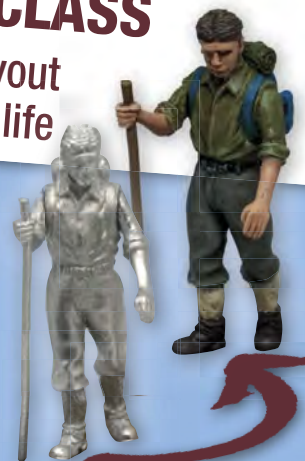
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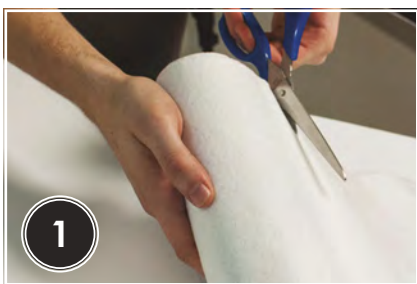
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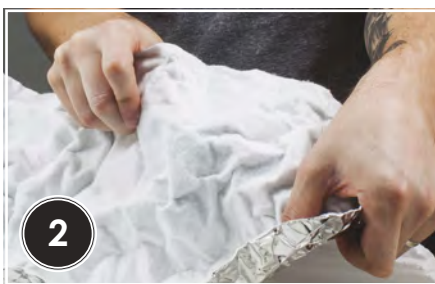
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Your letters and layouts, this month with an dark diorama featuring Jack the Ripper, Sweeney Todd, the Elephant Man and more. We kid you not.

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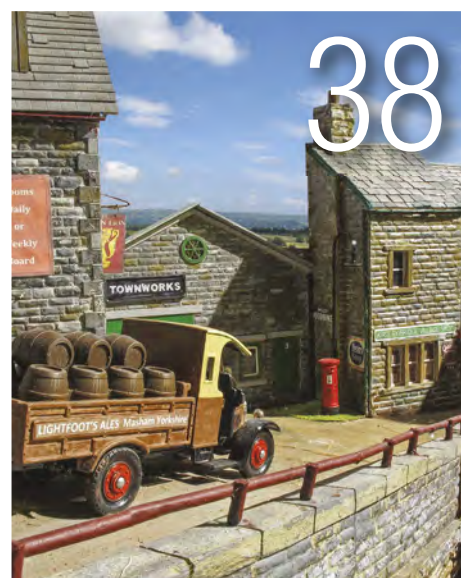
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On this month's BRM TV DVD: See Kirtley Bridge in action, build a canal boat, hop aboard the Ecclesbourne Valley Railway and more...



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BRM TV

BRITISH RAILWAY MODELLING

IN THIS EPISODE...

Explore our layout of the month, 'Kirtley Bridge' with an in-depth tour of its station, mill and quarry. In the studio, Phil Parker hones his carpentry skills with a wooden narrow boat kit that's quick to build and Howard Smith explore's Norwich's premier model shop - Great Eastern Models on its scenic special open day.



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This month I stood in front of a 1955 prototype Deltic, in what I can only be described as open-mouthed awe – I mean, just look at the thing! That was just the first of many impressive locomotives on display at 'Locomotion' in Shildon, however. This NRM offshoot certainly deserves more prominence than it apparently achieves. As it is, it rather falls within the shadow of its York-based sibling. That's understandable, I suppose, but it's a shame it isn't better known. Perhaps some of the special events being planned will help to boost its reputation beyond the local area. Likewise the exclusive models in the offering. But more about those in due course.

Cloer to home, I had a very enjoyable day at the recent Derby Model Railway exhibition. Mickleover MRG's annual expo is appropriately located in a re-fitted roundhouse. It was well attended and well-stocked too, with a great selection of layouts on show and traders doing brisk business. Call me a renegade, if you will, but I particularly liked the N gauge layouts and a continental diorama that, if I'm honest, amounted to little more than a big turntable with an engine shed – great examples of both, obviously, and I'm well aware that I'm straying into dangerous territory even mentioning the existence of continental modelling! It was a pleasure too to chat with Paul Rolley, of 'Vopak Terminal' fame, who was keen to tell about his next project and give me a tantalising preview of his new work in progress. There will be more about Paul and his new layout in a forthcoming issue.

Speaking of whom, Paul told me a story about one of his earlier layouts, where he was criticised for building some scaffolding out of uncooked spaghetti strands – apparently they had been deemed to be 'out of scale', although Paul was merely exercising a bit of creative license. A similar conversation was had with Doug Kightley, the builder of the T-gauge 'Forth Bridge' layout. Nobody could fairly criticise him

on the basis of scale. Not only is Forth Bridge massive – even in T gauge – but Doug used original technical drawings and even counted the pixels on his printed reproductions to ensure absolute accuracy when it came to 3D printing the individual bridge parts. This laudable attention to detail aside, it seems that a lot of the subsequent chatter online was more concerned with the scale speed of the little train crossing at regular intervals. Given the undeniable impact that Forth Bridge makes wherever it's exhibited, such comments are a little mean-spirited in my opinion. Horses for courses, and all that, but isn't any railway modelling of any kind good for the hobby in general?

Moving on, we have another packed issue for you. We kick off with the substantial 'Duffield'. At 36 feet long and a third as wide, it's small wonder that Mickleover's 60s-set behemoth rarely makes it out of the clubroom. It was almost too big for a trackplan too, until Andy York suggested using an actual map. 'Kirtley Bridge' is no tiddler either, but we think you'll enjoy its stone buildings and 30s Yorkshire Dales scenery. We have three other great layouts besides, including the moody cityscape 'Up the Junction', which looks a treat after dark.

This month's practicals will show you how to improve a card kit shop, how to maintain your railway modelling motivation and how to give your wagons a thorough weathering. And then we throw in a bit of a curve-ball, when a professional from the world of fantasy war-gaming gives you a figure-painting masterclass. The results may well transform your layout.

On that note, let's get to it... ■



Andy
MANAGING EDITOR | Andy McVittie

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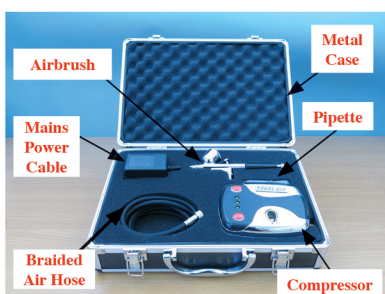
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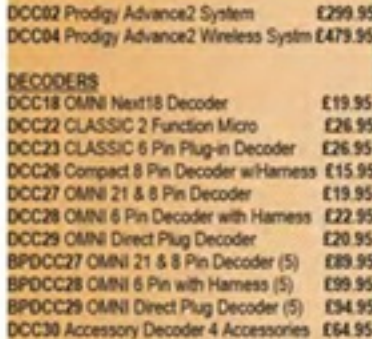
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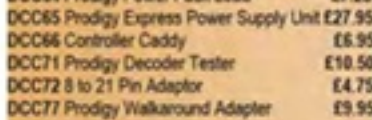
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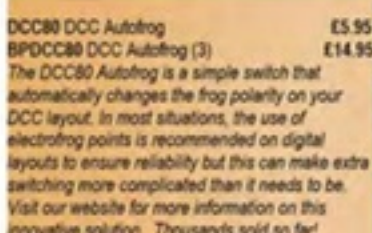
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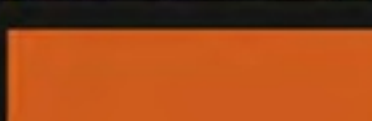
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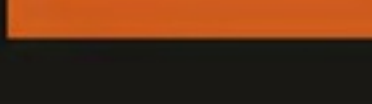
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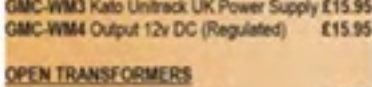
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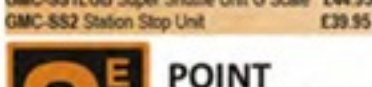
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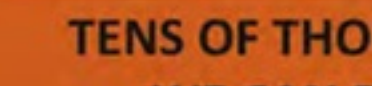


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GMC-PM1 SEEP Motor with Built-in Switch £5.75

GMC-PM2 SEEP Motor No Switch £5.25

GMC-PM4 SEEP Motor Latching Mechanism £6.50



GMC-PM10 Solenoid Point Motor £6.95

GMC-BPPM10 Solenoid Point Motor (5) £29.95

Designed with easy installation in mind, this motor features a built-in reversible mounting plate (with adjustment slots and holes), robust, plated metalwork and fibreglass PCBs for longer life. The magnetic coils are high efficiency for reliable operation. Also has easy to use "solder-free" screw terminals. Includes mounting screws and a three-bar extension.



GMC-PM100 Digital Solenoid Point Motor £18.95

All the features of the PM10 but with an inbuilt DCC decoder to make wiring even easier.



GMC-PM20 Surface Mount Point Motor £9.95

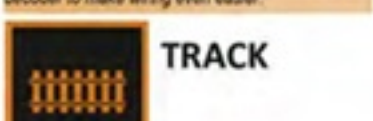
GMC-BPPM20 Surface Mnt Point Motor(5) £44.95

Designed with easy installation in mind, PM20 is placed parallel to your point-work and operates equally well orientated either way. PM20 works well with all popular modelling scales, and with the leading brands of track in the UK. The magnetic coils are high-efficiency for reliable operation. PM20 also has a plug-in harness that is very easy to use. Mounting screws are included.



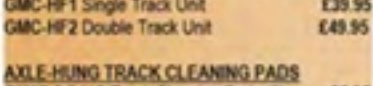
PM200 Digital Surface Mount Point Motor £22.95

All the features of the PM20 but with an inbuilt DCC decoder to make wiring even easier.



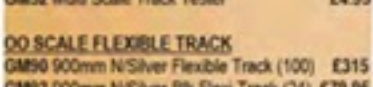
GMC-HF1 Single Track Unit £39.95

GMC-HF2 Double Track Unit £49.95

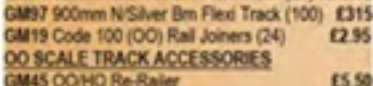


GM37 OO/HO Track Cleaning Pads (3) £5.95

GM39 N Track Cleaning Pads (3) £5.95



GM52 Multi Scale Track Tester £4.95



GM90 900mm N/Silver Bk Flexi Track (100) £315

GM93 900mm N/Silver Bk Flexi Track (24) £79.95

GM94 900mm N/Silver Bk Flexi Track (24) £79.95

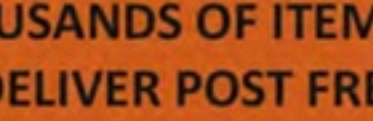
GM97 900mm N/Silver Bk Flexi Track (100) £315

GM19 Code 100 (OO) Rail Joiners (24) £2.95

GM45 OO/HO Re-Railer £5.50

GM54 OO Buffer Stop £1.95

BPGM54 OO Buffer Stop (5 Pack) £8.75



GM55 OO LIT Buffer Stop £7.25

GM56 OO Buffer Stop Lights (Pack of 2) £9.95

N SCALE FLEXIBLE TRACK

GM96 900mm N/Silver Bk Flexi Track (24) £64.95

GM18 Code 80 (N) Rail Joiners (24) £2.95

GM46 N Re-Railer £2.95

GM53 N Scale Buffer Stop £4.95

BPGM53 N Scale Buffer Stop (Pack of 5) £22.50

GM57 N LIT Buffer Stop on Track £9.25

GM58 N Buffer Stop Lights (Pack of 2) £9.95

GM17 Pair of Leads (N Joiner/Bare Wire) £4.95

GM114 OO/HO Granite Ballast (500g) £3.75

GM117 OO/HO Granite Ballast (200g) £2.65

GM200 Flexible Ballasted Underlay (5m) £23.95

GM204 Point & Crossing Ballasting Kit £8.25

GM111 OO/HO Brown Ballast (500g) £3.75

GM102 Mid Green Scatter (50g) £1.95

GM103 Dark Green Scatter (50g) £1.95

GM105 Spring Green Scatter (50g) £1.95

GM108 Earth Brown Scatter (50g) £1.95

GM109 Black Scatter (50g) £1.95

GM110 Red Brown Scatter (50g) £1.95

GM112 Imitation Coal (50g) £2.45

GM116 Grey Tarmac Scatter (50g) £1.95

GM113 N Brown Ballast (500g) £3.75

GM211 N Flexible Ballasted Underlay (5m) £23.95

GM215 Point & Crossing Ballasting Kit £8.25

GM251 3mm Cork Trackbed 4.5 x 50cm (8) £9.25

GM252 3mm Cork Plates 15 x 50cm (2) £4.75

GM240 For RH Sectional Points (2) £4.50

GM241 For LH Sectional Points (2) £4.50

GM244 For RH Sectional Curved Points (2) £4.50

GM245 For LH Sectional Curved Points (2) £4.50

GM247 For Y Sectional Points (2) £4.50

GM231 2mm Cork Trackbed 2.8 x 50cm (8) £9.25

GM232 2mm Cork Plates 15 x 50cm (2) £4.75

GM225 For RH Sectional Points (2) £4.25

GM226 For LH Sectional Points (2) £4.25



GM100 Mod Roc (2.75m) £4.75

GM119 Fine Plaster of Paris (1kg) £3.95

GM130 1/16 Cork Sheet 3' x 2' (60 x 90cm) £7.75

GM131 1/8 Cork Sheet 3' x 2' (60 x 90cm) £11.75

GM167 Balsa Bundle 50 x 76 x 229mm £2.95

GM168 Balsa Bundle 75 x 150 x 450mm £11.95

GM20 Spring Grass Mat 100cm x 75cm £7.95

GM21 Summer Grass Mat 100cm x 75cm £7.95

STATIC GRASS SYSTEM



GM196 Static Grass Starter Set £9.95

GM193 Puffer Bottle £4.95

GM169 Static Grass Glue (250ml) £6.95

GM170 Spring Grass Flock (30g) £3.45

GM171 Summer Grass Flock (30g) £3.45

GM172 Moorland Grass Flock (30g) £3.45

GM173 Meadow Grass Flock (30g) £3.45

GM174 Woodland Floor Grass Flock (30g) £3.45



GM101 Meadow Scatter (50g) £1.95

GM102 Mid Green Scatter (50g) £1.95

GM103 Dark Green Scatter (50g) £1.95

GM105 Spring Green Scatter (50g) £1.95

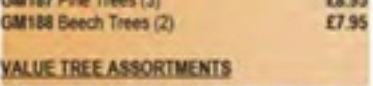
GM108 Earth Brown Scatter (50g) £1.95

GM109 Black Scatter (50g) £1.95

GM110 Red Brown Scatter (50g) £1.95

GM112 Imitation Coal (50g) £2.45

GM116 Grey Tarmac Scatter (50g) £1.95



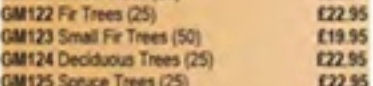
GM160 Light Green Hedgerow (1m) £7.50

GM161 Dark Green Hedgerow (1m) £7.50

GM164 Light Green Lichen (80g) £4.95

GM165 Dark Green Lichen (80g) £4.95

GM166 Assorted Lichen (80g) £4.95



GM150 Fine Light Green Foliage (30g) £3.55

GM151 Fine Dark Green Foliage (30g) £3.55

GM152 Fine Mid Green Foliage (30g) £3.55

GM153 Fine Light Brown Foliage (30g) £3.55

GM154 Fine Brown Foliage (30g) £3.55



GM180 Plum Trees (3) £7.95

GM181 Plum Trees in Blossom (3) £7.95

GM182 Fruit Trees (3) £7.95

GM183 Apple Trees (3) £7.95

GM184 Birch Trees (3) £7.95

GM185 Weeping Willow Trees (3) £7.95

GM186 Poplar Trees (3) £7.95

GM187 Pine Trees (3) £8.95

GM188 Beech Trees (2) £7.95

GRASS STRIPS/TUFTS

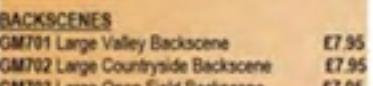
GM136 Spring Grass Strips (36) £11.95

GM137 Summer Grass Tufts (104) £11.95

GM138 Flowering Grass Tufts (108) £11.95

GM162 Green 6mm Mini Tufts (42) £4.95

GM163 Green 12mm Mini Tufts (42) £4.95



GM30 Plain Stone Wall Grey £9.75

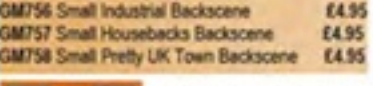
GM31 Grey Stone Wall & Buffresses £9.75

GM32 Grey Stone Wall & Arches £9.75

GM197 Stone Tunnel Wall £8.75

GM198 Single Tunnel Mouth & Walls £15.75

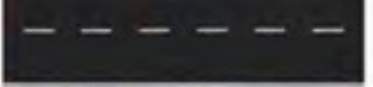
GM199 Double Tunnel Mouth & Walls £20.75



GM701 Large Valley Backscene £7.95

GM702 Large Countryside Backscene £7.95

GM703 Large Open Field Backscene £7.95



GM704 Large Village Backscene £7.95

GM705 Large Cloudy Sky Backscene £7.95

GM706 Large Industrial Backscene £7.95

GM707 Large Housebacks Backscene £7.95

GM708 Large Pretty UK Town Backscene £7.95

GM751 Small Valley Backscene £4.95

GM752 Small Countryside Backscene £4.95

GM753 Small Open Field Backscene £4.95

GM754 Small Village Backscene £4.95

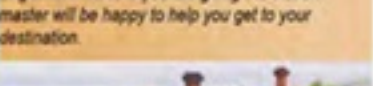


GM755 Small Cloudy Sky Backscene £4.95

GM756 Small Industrial Backscene £4.95

GM757 Small Housebacks Backscene £4.95

GM758 Small Pretty UK Town Backscene £4.95



GM370 80mm Wide Tarmac Road (1m) £7.25

Gaugemaster Controls Ltd, Gaugemaster House, Ford Road
Arundel, West Sussex, BN18 0BN, United Kingdom

Tel - 01903 884488

Fax - 01903 884377 E Mail - enginehed@gaugemaster.co.uk



GAUGEMASTER



STRUCTURES

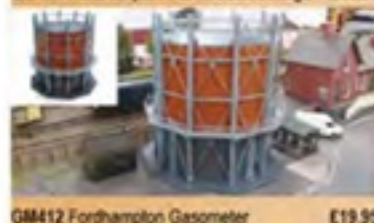
GM407 Fordhampton Carriage Platforms £9.95
GM408 Fordhampton Village Store or Pub £17.95
GM409 Fordhampton Pub/Bistro £19.95



GM410 Fordhampton Doctors Surgery £15.95



GM411 Fordhampton Farmhouse/Cottage £15.95



GM412 Fordhampton Gasometer £19.95



GM413 Fordhampton Nurseries £19.95
GM414 Fordhampton Bridge £12.95



KESTREL DESIGNS

N GAUGE PLASTIC KITS

GMKD01 House £4.75
GMKD02 Shop £4.75
GMKD03 Bungalow £4.00
GMKD04 Church with Porch £6.50
GMKD05 House/Shop Unit with Glazing £7.25
GMKD06 Two Shop Unit with Glazing £7.25
GMKD07 Four House Unit £7.25
GMKD08 Country Station £9.50
GMKD09 Station Buildings £5.75
GMKD10 Island Platform with Flat Canopy £9.00
GMKD11 Flat Canopy £6.50
GMKD12 Small Signal Box £7.00
GMKD13B Farm Rail Fencing Brown £3.50
GMKD13W Farm Rail Fencing White £3.50
GMKD14 Telegraph Poles £3.50
GMKD15 Windows Doors & Guttering £4.75
GMKD16 Platforms (2) £3.25
GMKD17 Platform Ramps (2) £2.75
GMKD18 Station Yard Huts £3.75
GMKD19 Weighbridge & Office £4.75
GMKD20 Coal Office £3.75
GMKD21 Level Crossing/Keepers Cottage £6.50
GMKD22 Four Greenhouses £3.50
GMKD23 Two Domestic Garages £3.50
GMKD24 Water Tower £4.25
GMKD25 Corner Shop £5.00
GMKD26 Corner Shop £5.00
GMKD27 Three Storey Townhouse £6.50
GMKD28 Three Storey Town Shop £6.50
GMKD29 Modern Station £8.75
GMKD30 Modern Station Waiting Room £6.25
GMKD31 Station Masters House £7.00
GMKD32 Pair Pre War Semi Det. Houses £8.00
GMKD33 Boilerhouse & Chimney £7.00
GMKD34 Stable Block £4.25
GMKD35 Cow Shed £4.00
GMKD36 Barn £6.50
GMKD37 Farm House £8.25
GMKD38 Steel Footbridge £8.25
GMKD39 Modern Industrial Unit £6.50
GMKD40 Modern Fire Station £8.00
GMKD41 Platforms Wide (2) £3.75
GMKD42 Platform Ramps Wide (2) £3.25
GMKD43 Goods Shed £8.50
GMKD1000 Town Station £17.95
GMKD1001 Old Factory with Chimney £20.95

N GAUGE LASER CUT KITS

The same as the ultra detailed OO equivalents (GM451/GM452/GM453) - pack sizes vary from the 4mm versions though
GMKD51 Wooden Fencing £5.75
GMKD52 Lattice Fencing £5.75
GMKD53 Garden Sheds (2) £6.00

N GAUGE VALUE KIT SETS

GMKD2000 Station Set £15.95
GMKD2001 Town Set £13.95
GMKD2002 Suburban Set £15.95
GMKD2003 Farm Set £17.95



LIGHTING

OO SCALE LAMPS & LIGHTING

Fine 4mm scale lamps with prototypical post extensions and light control PCBs

GM801 Barley Twist Gas Lamp Soft Black (3) £13.95
GM802 B/Twist Gas Lamp BR/SR Green (3) £13.95
GM803 B/Twist Gas Lamp LMS Maroon (3) £13.95
GM804 B/Twist Gas Lamp GWR Stone (3) £13.95
GM805 B/Twist Gas Lamp Grey Undercoat (3) £13.95
GM806 Taper Post Gas Lamp Soft Black (3) £13.95
GM807 Taper Post Gas Lamp BR/SR Green (3) £13.95
GM808 Taper Post Gas Lamp LMS Maroon (3) £13.95
GM809 Taper Post Gas Lamp GWR Stone (3) £13.95
GM810 Taper Post Gas Lamp Grey Undercoat (3) £13.95
GM811 Taper Post Oil Lamp Soft Black (3) £13.95
GM812 Taper Post Oil Lamp BR/SR Green (3) £13.95
GM813 Taper Post Oil Lamp LMS Maroon (3) £13.95
GM814 Taper Post Oil Lamp GWR Stone (3) £13.95
GM815 Taper Post Oil Lamp Grey Undercoat (3) £13.95
GM816 Swan Neck Lamp Soft Black (3) £13.95
GM817 Swan Neck Lamp BR/SR Green (3) £13.95
GM818 Swan Neck Lamp LMS Maroon (3) £13.95
GM819 Swan Neck Lamp GWR Stone (3) £13.95
GM820 W/Mounted Swan Neck Black (2) £13.95
GM821 W/Mounted Swan Neck SR/BR Green (2) £13.95
GM822 W/Mounted Swan Neck LMS Maroon (2) £13.95
GM823 W/Mounted Swan Neck GWR Stone (2) £13.95
GM824 W/Mounted Gas Lamp Soft Black (2) £13.95
GM825 W/Mounted Gas Lamp BR/SR Green (2) £13.95
GM826 W/Mounted Gas Lamp LMS Maroon (2) £13.95
GM827 W/Mounted Gas Lamp Undercoat (2) £13.95
GM828 W/Mounted Gas Lamp GWR Stone (2) £13.95
GM829 Modern Sgl Head Adjustable Lamp (4) £15.95
GM830 Modern DBL Head Adjustable Lamp (3) £13.95

OO SCALE VALUE PACKS LAMPS & LIGHTING

Typically 6 x lamps, plus two matching wall lamps with prototypical post extensions as well as 6 prototype white LEDs for building interiors and all required light control PCBs.

GM851 Barley Twist Gas Lamp Soft Black £32.95
GM852 B/Twist Gas Lamp BR/SR Green £32.95
GM853 B/Twist Gas Lamp LMS Maroon £32.95
GM854 B/Twist Gas Lamp GWR Stone £32.95
GM855 B/Twist Gas Lamp Grey Undercoat £32.95
GM856 Taper Post Gas Lamp Soft Black £32.95
GM857 Taper Post Gas Lamp BR/SR Green £32.95
GM858 Taper Post Gas Lamp LMS Maroon £32.95
GM859 Taper Post Gas Lamp GWR Stone £32.95
GM860 Taper Post Gas Lamp Undercoat £32.95
GM861 Taper Post Oil Lamp Soft Black £32.95
GM862 Taper Post Oil Lamp BR/SR Green £32.95
GM863 Taper Post Oil Lamp LMS Maroon £32.95
GM864 Taper Post Oil Lamp GWR Stone £32.95
GM865 Taper Post Oil Lamp Grey Undercoat £32.95
GM866 Swan Neck Lamp Soft Black £32.95
GM867 Swan Neck Lamp BR/SR Green £32.95
GM868 Swan Neck Lamp LMS Maroon £32.95
GM869 Swan Neck Lamp GWR Stone £32.95
GM870 Modern Sgl Head Adjustable Height £32.95
GM880 Modern DBL Head Adjustable Height £19.95

LIGHTING ACCESSORIES

GM895 Light Control PCB - LED/Lamp (2) £6.95
GM896 Light Control PCB - LED/Lamp (5) £12.95
GM897 Mini Light Control PCB - LED (10) £4.95
GM898 Mini Light Control PCB - Lamp (10) £4.95
GM899 Spare Bulbs for Lamps (5) £4.95



TOOLS

MODEL RAILWAY MAINTENANCE

GM50 OO/HO Locomotive Wheel Cleaner £39.95
GM47 N Gauge Wheel Cleaner £34.95
GM51 Spare Pads for GM50 £17.95
GM49 Spare Pads for GM47 £17.95
GM59 N Scale Wheel Cleaner £15.95



RAZOR SAWS

GM671 4 in 1 Saw Set £19.95
GM672 Razor Saw Superfine £11.95
GM673 Razor Saw Fine £11.95
GM674 Razor Saw Medium £11.95
GM675 Aluminium Mire Box £16.95
GM677 Fine Woodcraft Saw £11.95
GM678 Flush Cutting Saw £15.95
GM679 Universal Razor Saw £12.95

SOLDERING STATION

GM661 Complete Soldering Station £29.95
GM662 Spare Tip £2.95

TRACK RUBBERS

GM26 Track Rubber £3.25
GM27 Jumbo Track Rubber £5.95

CUTTING MATS

GM599 A6 Size £2.95
GM600 A2 Size £15.95
GM601 A3 Size £10.95
GM602 A4 Size £5.95
GM603 A5 Size £3.95

GENERAL MODELLING TOOLS

GM604 Round Nose Pliers £6.95
GM605 Flat Nose Pliers £6.95
GM606 Side Cutters £6.95
GM607 Half Round Pliers £6.95
GM608 Bent Nose Pliers £6.95
GM609 S/Steel Tweezers (4) £7.95
GM610 Double Ended Pin Vice £5.95
GM611 Sawset 1 w/ Scalpel Handle £10.95
GM613 Trim-away Knife £3.95
GM614 Stainless Steel Scalpel & Blades £5.50
GM615 Plastic Scalpel & Blades £5.95
GM616 Disposable Knife Set (3) £1.95
GM617 Pick-Up Tool £6.95
GM618 Magnifier Tweezers £4.25



GM620 Flexible Model Sanders (3) £2.95
GM621 Locking forceps Curved £7.50
GM622 Hot Wire Cutter for Scenic Modelling £19.95
GM623 Wires for Hot Wire Cutter (5) £4.95
GM624 Swivel Top Pin Vice £6.95
GM625 Curved Tweezer Reverse Action £4.95
GM626 Straight Tweezer Reverse Action £4.95
GM627 Blunt End Tweezer Reverse Action £4.95
GM628 Mini Hobby Hammer £3.95
GM629 Cutting Discs (10) £4.95
GM630 Screw Top Mandrels (3) £4.75
GM631 Slitting Discs (10) & Mandrel £5.50
GM632 Budget Needle File Set £6.25

GM633 Glass Fibre Pencil 4mm

GM634 4mm G/Fibre Refills (10) £4.75
GM635 2mm Glass Fibre Pencil £7.50
GM636 2mm G/Fibre Refills (5) £9.95
GM637 Modelling Scissors £6.95
GM638 Cutting Brooches 0.6-2.0 £16.50
GM639 150mm (6") Steel Rule £3.50
GM640 Archimedian Drill Stock £6.95
GM641 HSS Jobbers Drills 0.5 (5) £3.95
GM642 HSS Jobbers Drills 0.8 (5) £3.95
GM643 HSS Jobbers Drills 1.0 (5) £3.95
GM644 HSS Jobbers Drills 1.2 (5) £3.95
GM645 HSS Jobbers Drills 1.5 (5) £3.95
GM646 HSS Jobbers Drills 1.8 (5) £3.95
GM647 HSS Jobbers Drills 2.0 (5) £3.95
GM648 Microbox Drills 0.3-1.6 £10.95
GM649 Microbox HSS Twist Drill Bits 61-80 £10.95
GM650 HSS Jobbers Drills 0.3 (5) £3.95
GM651 HSS Jobbers Drills 0.4 (5) £3.95
GM652 HSS Jobbers Drills 0.6 (5) £3.95
GM653 HSS Jobbers Drills 0.7 (5) £3.95
GM654 HSS Jobbers Drills 0.9 (5) £3.95



GM657 Five in One Angle Gauge & Tool

GM660 Pick n Place Twin Pack £9.95
GM664 Economy Sprue/Plastic Cutter £4.95
GM666 Clip on Magnifying Eye Glass £6.95
GM669 Pin Pusher with Depth Stop £10.95
GM670 Deluxe Paintbrush Set £12.95
GM683 Soft Grip Knife Set with Blades £6.95
GM684 Spare Blades for GM683 £1.50
GM693 Value Model Railway Drill £9.95
GM694 Mains Powered Value Drill £16.95
GM695 Model Railway Screwdriver Set £4.95
GM696 Masking Tape 6mm x 18m (2) £2.95
GM697 Masking Tape 10mm x 18m (2) £2.95
GM698 Masking Tape 16mm x 18m (1) £2.95

GM671 4 in 1 Saw Set

GM672 Razor Saw Superfine £11.95
GM673 Razor Saw Fine £11.95
GM674 Razor Saw Medium £11.95
GM675 Aluminium Mire Box £16.95
GM677 Fine Woodcraft Saw £11.95
GM678 Flush Cutting Saw £15.95
GM679 Universal Razor Saw £12.95

SOLDERING STATION

GM661 Complete Soldering Station £29.95
GM662 Spare Tip £2.95

SOLDERING IRONS & BITS

GM680 15W 230V Soldering Iron £16.95
GM681 25W 230V Soldering Iron £17.95
GM682 40W 230V Soldering Iron £19.95
GM685 15W No.6 Tip £3.95
GM686 15W No.8 Tip £3.95
GM687 25W No.6 Tip £3.95
GM688 25W No.7 Tip £3.95
GM689 25W No.8 Tip £3.95
GM690 40W No.6 Tip £3.95
GM691 40W No.7 Tip £3.95
GM692 40W No.8 Tip £3.95

SOLDERING ACCESSORIES

GM01 Low Melt Solder 70 degrees (20g) £4.45
GM02 Solder 180 degrees (20g) £4.15
GM03 White Metal Flux £6.25
GM04 Brass Flux £6.25
GM05 Non Acid Safety Flux £6.50
GM06 Solder Wire 145 Degrees £4.95
GM09 Desoldering Pump £3.95

SWITCHES

GM501 Slide Switch DPDT £1.70
GM502 Slide Switch DPDT (Cioff) £1.70
GM503 Toggle Switch SPST £2.35
GM504 Toggle Switch DPDT £2.65
GM505 Mini-Toggle DPDT (Cioff) £3.15
GM506 Mini-Toggle DPDT £2.75
GM507 Mini-Toggle SPST £2.45
GM508 Mini-Toggle SPDT £2.45
GM509 Mini-Toggle SPDT (Cioff) £2.45
GM510 Mini-Toggle for Point Motors £2.70
GM511 Mini-Toggle for G Point Motors £3.65
GM512 Push to Break Black (5) £5.95
GM513 Push to Make Black (5) £2.85
GM514 Push to Make Blue (5) £2.85
GM515 Push to Make Green (5) £2.85
GM516 Push to Make Red (5) £2.85
GM517 Push to Make White (5) £2.85
GM518 Push to Make Yellow (5) £2.85
GM519 Rotary Switch 1 Pole 12 Way £3.75
GM520 Rotary Switch 2 Pole 6 Way £3.75
GM521 Rotary Switch 3 Pole 4 Way £3.75
GM522 Rotary Switch 4 Pole 3 Way £12.95
BPGM501 Slide Switch DPDT (25) £12.95
BPGM502 Slide Switch DPDT (Cioff) (25) £12.95
BPGM503 Toggle Switch SPST (25) £34.95
BPGM504 Toggle Switch DPDT (25) £42.95
BPGM505 Mini-Toggle DPDT (Cioff) (25) £44.95
BPGM506 Mini-Toggle DPDT (25) £42.95
BPGM507 Mini-Toggle SPST (25) £34.95
BPGM508 Mini-Toggle SPDT (25) £34.95
BPGM509 Mini-Toggle SPDT (Cioff) (25) £38.95
BPGM510 Mini-Toggle for Point Motors (25) £44.95
BPGM511 Push to Make Black (25) £9.95
BPGM512 Push to Make Blue (25) £9.95
BPGM513 Push to Make Green (25) £9.95
BPGM514 Push to Make Red (25) £9.95
BPGM515 Push to Make White (25) £9.95
BPGM516 Push to Make Yellow (25) £9.95
BPGM517 Push to Make White (25) £9.95
BPGM518 Push to Make Yellow (25) £9.95

WIRE

GM09RB Twinned Wire Red/Black (10m) £5.95
GM10 Wire Red/Black/Green (10m of each) £5.95
GM11BK Wire Black 7 x 0.2mm (10m) £2.15
GM11BL Wire Blue 7 x 0.2mm (10m) £2.15
GM11BN Wire Brown 7 x 0.2mm (10m) £2.15
GM11GN Wire Green 7 x 0.2mm (10m) £2.15
GM11GR Wire Grey 7 x 0.2mm (10m) £2.15
GM11W Wire White 7 x 0.2mm (10m) £2.15
GM11Y Wire Yellow 7 x 0.2mm (10m) £2.15
BPGM11BK Black Wire 7 x 0.2mm (100m) £7.95
BPGM11BL Blue Wire 7 x 0.2mm (100m) £7.95
BPGM11BN Brown Wire 7 x 0.2mm (100m) £7.95
BPGM11GN Green Wire 7 x 0.2mm (100m) £7.95
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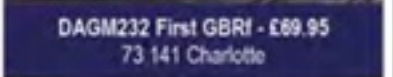
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- H7-A4-007 60012 "Commonwealth of Australia" in BR green with early crest
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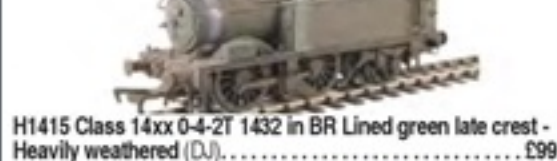
1322 Class 1366 0-6-OST 1370 in GWR green (Hel) £124



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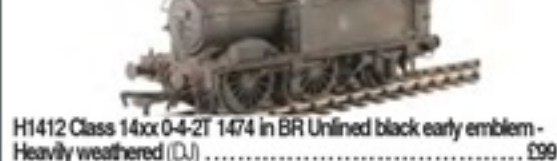
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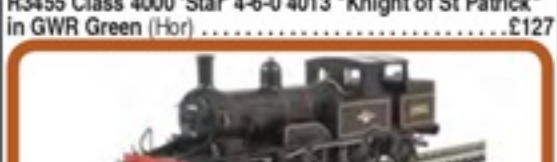
R3277 Class 38xx 4-4-0 "County Of Devon" in Great Western Railway green - Railroad range (Hor) (RRP £89.99) BARGAIN £60



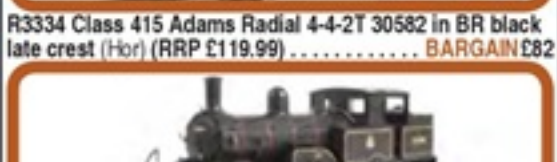
R3498 Class 3F Jinty 0-6-OST 19 in S&DJR Blue - Railroad Range (Hor) (RRP £44.99) BARGAIN £25



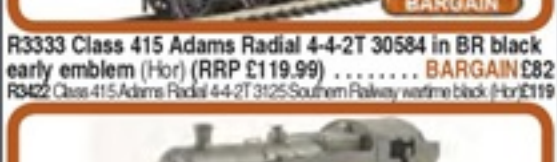
R3455 Class 4000 'Star' 4-6-0 4013 'Knight of St Patrick' in GWR Green (Hor) £127



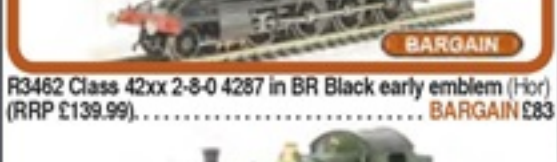
R3334 Class 415 Adams Radial 4-4-2T 30582 in BR black late crest (Hor) (RRP £119.99) BARGAIN £82



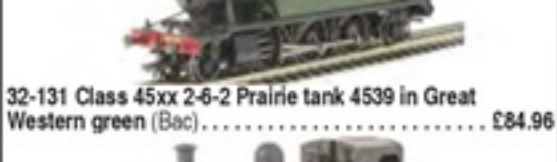
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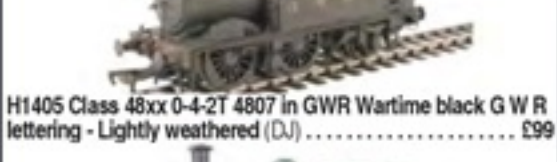
R3333 Class 415 Adams Radial 4-4-2T 30584 in BR black early emblem (Hor) (RRP £119.99) BARGAIN £82



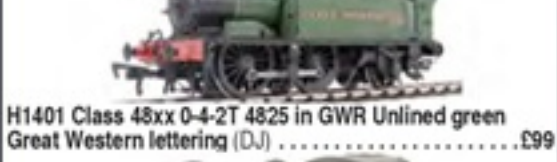
R3462 Class 42xx 2-8-0 4287 in BR Black early emblem (Hor) (RRP £139.99) BARGAIN £83



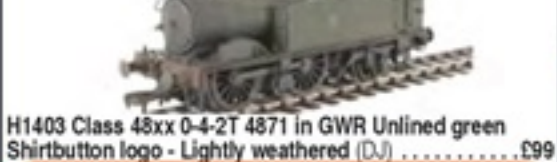
32-131 Class 45xx 2-6-2 Prairie tank 4539 in Great Western green (Bac) £84.96



H1405 Class 48xx 0-4-2T 4807 in GWR Wartime black GWR lettering - Lightly weathered (DJ) £99



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R3499 Class 49xx 4-6-0 6947 'Helmingsham Hall' in BR Green late crest - Railroad Range (Hor) (RRP £94.99) BARGAIN £57



R3313 Class 4F 0-6-0 4323 in LMS Black (Hor) (RRP £99.99) BARGAIN £58



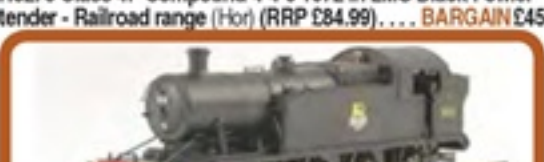
R3460TTS Class 4F 0-6-0 44198 in BR Black late crest - TTS sound fitted (Hor) (RRP £139.99) BARGAIN £100



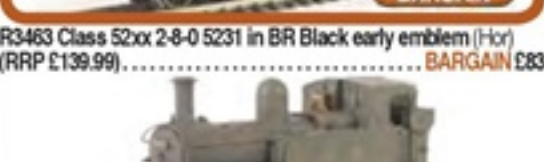
R3314 Class 4F 0-6-0 44341 in BR Black early crest (Hor) (RRP £99.99) BARGAIN £58



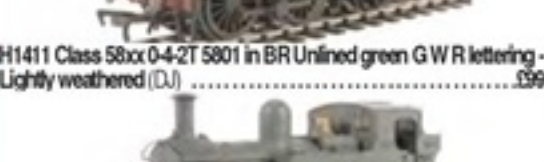
R3276 Class 4P Compound 4-4-0 1072 in LMS Black Fowler tender - Railroad range (Hor) (RRP £84.99) BARGAIN £45



R3463 Class 52xx 2-8-0 5231 in BR Black early emblem (Hor) (RRP £139.99) BARGAIN £83



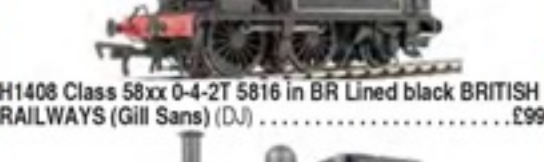
H1411 Class 58xx 0-4-2T 5801 in BR Unlined green GWR lettering - Lightly weathered (DJ) £99



H1402 Class 58xx 0-4-2T 5814 in GWR Unlined green Great Western lettering - Lightly weathered (DJ) £99



H1408 Class 58xx 0-4-2T 5816 in BR Lined black BRITISH RAILWAYS (Gill Sans) (DJ) £99



H1410 Class 58xx 0-4-2T 5819 in BR Unlined black early emblem (DJ) £99



32-176 Class SMT Crab 2-6-0 42705 BR lined black early emblem (Bac) £123.21



31-690 Class 5P4F Stanier Mogul 2-6-0 2965 in LMS lined black (Bac) £135.96



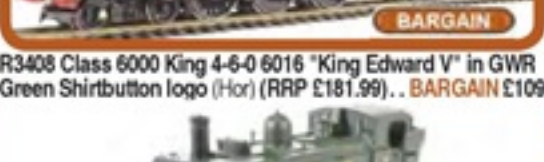
31-692 Class 5P4F Stanier Mogul 2-6-0 42968 in BR lined black late crest (Bac) £135.96



31-691 Class 5P4F Stanier Mogul 2-6-0 42969 in BR lined black early emblem (Bac) £135.96



R3409 Class 6000 King 4-6-0 6002 'King William IV' in BR Green late crest (Hor) (RRP £181.99) BARGAIN £109



R3408 Class 6000 King 4-6-0 6016 'King Edward V' in GWR Green Shirtbutton logo (Hor) (RRP £181.99) BARGAIN £109

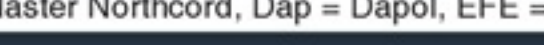


31-635A Class 64xx 0-6-OST pannier tank 6424 in GWR green (Bac) £81.55



R3278 Class 6P Patriot 4-6-0 45518 'Bradshaw' in BR Green early crest - Railroad range (Hor) £64.80

31-204 Class 6P Patriot 4-6-0 5530 'Sir Frank Peel' LMS crimson (Bac) £140.21



R3420 Class 700 'Black Motor' 0-6-0 30346 in BR Black late crest (Hor) (RRP £124.99) BARGAIN £69



R3421 Class 700 'Black Motor' 0-6-0 30698 in BR Black early emblem (Hor) (RRP £124.99) BARGAIN £69



R3419 Class 700 'Black Motor' 0-6-0 693 in Southern Railway black (Hor) (RRP £124.99) BARGAIN £69



31-015 Class 7F 2-8-0 13810 in LMS black (Bac) £125.76



31-014 Class 7F 2-8-0 89 in Somerset & Dorset Railway black (Bac) £125.76



R3520 Class 7MT 4-6-2 Britannia 70007 'Coeur-de-Lion' in BR green late crest (Hor) £153



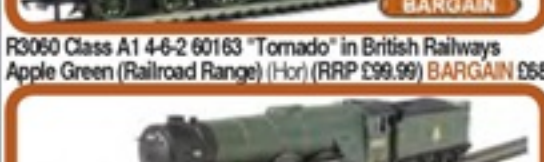
R3288 Class 9F 2-10-0 92220 'Evening Star' in BR Green late crest (Hor) £89



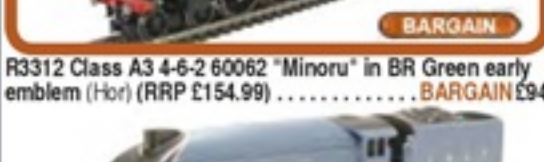
R3066 Class A1 4-6-2 4472 'Flying Scotsman' in LNER apple green - Railroad Range (Hor) (RRP £94.99) BARGAIN £55



R3284TTS Class A1 4-6-2 4472 'Flying Scotsman' in LNER Green - TTS Sound - Railroad range (Hor) (RRP £119.99) BARGAIN £85



R3060 Class A1 4-6-2 60163 'Tornado' in British Railways Apple Green (Railroad Range) (Hor) (RRP £99.99) BARGAIN £68



R3312 Class A3 4-6-2 60062 'Minoru' in BR Green early emblem (Hor) (RRP £154.99) BARGAIN £94



R3371 Class A4 4-6-2 4468 'Mallard' in LNER garter blue - Railroad range (Hor) £74.06



R3395TTS Class A4 4-6-2 4468 'Mallard' in LNER Garter Blue - TTS sound fitted - Railroad Range (Hor) (RRP £132.99) BARGAIN £85



R3285TTS Class A4 4-6-2 4469 'Gadwall' in LNER Garter Blue - TTS Sound - Railroad range (Hor) (RRP £99.99) BARGAIN £70



R3441 Class A4 4-6-2 4499 'Sir Murrough Wilson' in LNER wartime black (Hor) (RRP £164.99) BARGAIN £109



R3522 Class A4 4-6-2 60026 'Miles Beevor' in BR green early emblem (Hor) NEW £144

R3338 Class B1 4-6-0 61310 BR Apple Green (Hor) (RRP £155.99) BARGAIN £87

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BARGAIN

R3311 Class V Schools 4-4-0 30908 "Westminster" in BR Green early crest (Hor) (RRP £134.99) ... **BARGAIN** £74

NEW

R3402 Queen of Scots Train Pack Class A4 4-6-2 in LNER garter blue and three Pullman coaches - Ltd Ed of 1000 (Hor) **NEW** ... £280

R3431 Class B12/3 4-6-0 61533 in BR black early emblem (Hor) £136



R3430 Class B12/3 4-6-0 8573 in LNER apple green (Hor) £136

R3447 Class B17 4-6-0 2842 "Kilverstone Hall" in LNER Lined Apple Green (Hor) (RRP £159.99) ... **BARGAIN** £99R3004 Class B17 4-6-0 61631 "Serlby Hall" in BR Green early emblem - weathered (Hor) (RRP £131.99) **BARGAIN** £79R3318 Class B17/6 4-6-0 61646 "Gilwell Park" in BR Green early emblem (Hor) (RRP £131.99) ... **BARGAIN** £74R3433 Class D16/3 4-4-0 "Claud Hamilton" 8900 in LNER Lined Apple Green (Hor) (RRP £139.99) ... **BARGAIN** £99

NEW

R3521 Class D16/3 4-4-0 8802 in LNER black (Hor) **NEW** £119R3495 Class D49/1 4-4-0 62760 "The Cotswold" in BR early crest - Railroad Range (Hor) (RRP £84.99) ... **BARGAIN** £5935-075 Class E4 Brighton tank 0-6-2 579 in LB & SCR umber (Bac) (RRP £109.95) ... **BARGAIN** £80R3416 Class J15 0-6-0 65464 BR Black late crest (Hor) (RRP £126.49) **BARGAIN** £99R3415 Class J15 0-6-0 65477 in BR Black early emblem (Hor) (RRP £126.49) ... **BARGAIN** £75R3406 Class J50 0-6-0T 585 in LNER Black (Hor) (RRP £93.49) **BARGAIN** £69

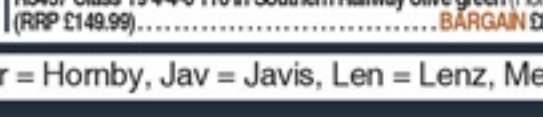
J9403 Class J94 0-6-0T 68012 in BR black late crest - lightly weathered - Ltd Ed of 250 (DJ) ... £99



BARGAIN

R3242A Class K1 2-6-0 62032 in BR Black early emblem (Hor) (RRP £129.99) ... **BARGAIN** £82R3243B Class K1 2-6-0 62064 in BR Black late crest (Hor) (RRP £129.99) ... **BARGAIN** £82R3461 Class L1 Thompson 2-6-4T 67702 in LNER apple green BR number (Hor) (RRP £154.99) ... **BARGAIN** £89R3456 Class N15 King Arthur 4-6-0 30792 "Sir Hervis de Revel" in BR Lined Green early emblem (Hor) (RRP £159.99) ... **BARGAIN** £108

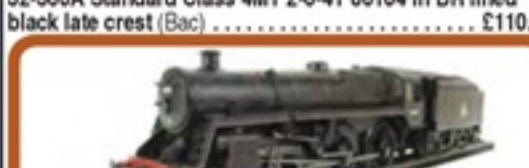
R3440 Class P2 2-8-2 2001 'Cock O' The North' in LNER apple green - gloss finish (Hor) ... £122.50

R3171 Class P2 2-8-2 2001 'Cock O' The North' in LNER Green (Railroad range) (Hor) (RRP £94.99) ... **BARGAIN** £68R3424 Class O6 Raven 0-8-0 3418 in LNER Black Gill Sans lettering (Hor) (RRP £154.99) ... **BARGAIN** £105R3426 Class O6 Raven 0-8-0 63429 in BR Black late crest (Hor) (RRP £154.99) ... **BARGAIN** £105R3413 Class S15 4-6-0 30831 in BR Black late crest (Hor) (RRP £154.99) ... **BARGAIN** £88R3412 Class S15 4-6-0 30842 in BR Black early emblem (Hor) (RRP £154.99) ... **BARGAIN** £88R3411 Class S15 4-6-0 827 in Southern Railway wartime black (Hor) (RRP £154.99) ... **BARGAIN** £88R3457 Class T9 4-4-0 116 in Southern Railway olive green (Hor) (RRP £149.99) ... **BARGAIN** £89R3457 Class T9 4-4-0 116 in Southern Railway olive green (Hor) (RRP £149.99) ... **BARGAIN** £89

35-050 LNWR 0-6-2T Webb Coal tank 1054 in LNWR plain black (Bac) ... £101.96

35-052 LNWR 0-6-2T Webb Coal tank 58900 in BR black early emblem (Bac) **NEW** ... £101.9635-051 LNWR 0-6-2T Webb Coal tank 7841 in LMS black (Bac) **NEW** ... £101.96

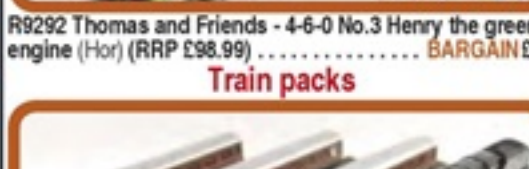
31-080 Standard Class 3MT tank 82020 BR green late crest - weathered (Bac) £118.96



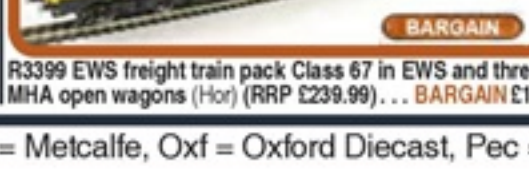
32-360A Standard Class 4MT 2-6-4T 80104 in BR lined black late crest (Bac) ... £110.46

32-509 Standard class 5MT 73109 in BR lined black early emblem and BR1B tender (Bac) (RRP £129.95) **BARGAIN** £89

32-858 Standard Class 9F 2-10-0 92189 in BR black late crest & BR1F tender - weathered (Bac) ... £140.21

R9287 Thomas and Friends - 0-6-0T No.1 Thomas the Tank Engine (Hor) (RRP £43.99) ... **BARGAIN** £31R9290 Thomas and Friends - 2-6-0 No.5 James the red engine (Hor) (RRP £82.49) ... **BARGAIN** £55R9292 Thomas and Friends - 4-6-0 No.3 Henry the green engine (Hor) (RRP £98.99) ... **BARGAIN** £65R3299 'Going Home' train pack - 70th Anniversary of the end of WWII Black 5 4-6-0 5156 in LMS Black and 3 x LMS Period 3 Coaches - Ltd Ed (Hor) (RRP £289.99) ... **BARGAIN** £150

30-430 Capital Commuter train pack Class 416 in Network SouthEast and low relief station building (Bac) ... £178.45



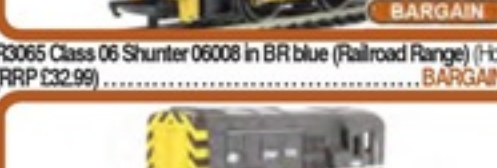
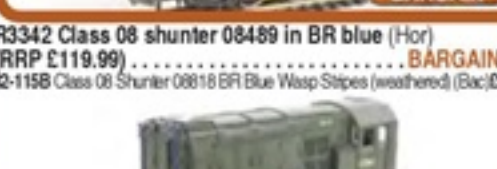
30-425 Class 251 Midland Pullman train pack in Pullman nanking blue - Collectors Edition (Bac) ... £490

R3399 EWS freight train pack Class 67 in EWS and three MHA open wagons (Hor) (RRP £239.99) ... **BARGAIN** £139R3401 The Bristolian Train Pack - Ltd Ed (Hor) (RRP £304.99) ... **BARGAIN** £195

30-575 The Railway Children Train Pack GWR 57xx Panier in GWSR, 2 x GWSR Coaches & Scenecraft Oakworth Station Building (Bac) £114.71

R3501 Virgin Trains East Coast train pack Class 91 91124 & Mk4 DVT 82219 in VTEC - Ltd Ed of 1000 (Hor) (RRP £229.99) ... **BARGAIN** £145

R3300 Winston Churchill's Funeral Train Pack Battle of Britain class 4-6-2 34051 "Winston Churchill" in BR green late crest, 2 Pullman coaches & SR Baggage car - Ltd Ed (Hor) ... £222.21

10001HAP 10001 BR Brunswick green orange, black & orange lining Aug 1956 - Oct 1957, (Dap) (RRP £105) ... **BARGAIN** £94R3065 Class 06 Shunter 06008 in BR blue (Railroad Range) (Hor) (RRP £32.99) ... **BARGAIN** £19R3490 Class 08 08673 in InterCity - Railroad range (Hor) (RRP £44.99) ... **BARGAIN** £28R3342 Class 08 shunter 08489 in BR blue (Hor) (RRP £119.99) ... **BARGAIN** £85

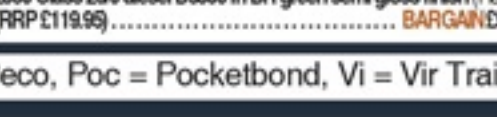
32-115B Class 08 Shunter 08818 BR Blue Wasp Stripes (weathered) (Bac) £93.46



R3484 Class 08 shunter 13363 in BR green red con rods (Hor) £118

1603 Class 16 North British Type 1 D8407 in BR green with full yellow ends - Ltd Ed of 750 (Hel) (RRP £134.95) ... **BARGAIN** £721604 Class 16 North British Type 1 D8409 in BR green grey roof - Gloss finish - Ltd Ed of 750 (Hel) (RRP £134.95) ... **BARGAIN** £72

1718 Class 17 D8523 in blue full yellow ends (Hel) ... £94

30-049 Loco Class 20 20088 in BR railfreight triple grey - DCC Sound Fitted - Split from 30-049 set (Bac) ... **BARGAIN** £154

32-038DS Class 20 20124 in BR Blue with Indicator Discs (Weathered & DCC Sound Fitted) (Bac) ... £195.46

32-044 Class 20 D8028 BR Green Indicator Discs & Tablet Catcher (Bac) ... £93.46

32-408 Class 25/3 25286 in BR Blue Domino Headcode (Bac) ... £93.46

2560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £592560 Class 250 diesel D5300 in BR green semi gloss finish (Hel) (RRP £119.95) ... **BARGAIN** £59

Prices valid until 19/07/17

All prices correct
when going to press.
Errors excepted.



2661 Class 26/0 diesel D5301 in BR green (Hel) (RRP £119.95) **BARGAIN** £61



2664 Class 26/0 diesel D5302 in BR green small yellow panels (Hel) (RRP £119.95) **BARGAIN** £61
2662 Class 26/0 diesel D5309 in BR green (Hel) (RRP £119.95) **BARGAIN** £61



2665 Class 26/0 diesel D5312 in BR green - weathered (Hel) (RRP £129.95) **BARGAIN** £65
3416 Class 33/0 D6551 in BR green small yellow panels (Hel) £94



32-781B Class 37/0 37041 in BR blue - split headcode (Bac) £117.26



32-787 Class 37/0 D6714 in BR green no yellow ends (Bac) £117.26



32-377A Class 37/4 37401 'Mary Queen Of Scots' in BR large logo blue (Bac) £117.26



32-389 Class 37/4 37421 in Colas Rail (Bac) £117.26



32-376A Class 37/4 37422 'Robert F. Fairlie' in Regional Railways (Bac) £123.21



32-484 Class 40 40159 in BR Blue (Bac) £118.96



R3392TTS Class 40 40164 in BR blue - TTS sound fitted - Railroad Range (Hor) (RRP £99.99) **BARGAIN** £74



32-483 Class 40 D338 in BR Green small yellow panel (Bac) £118.96



R3491 Class 42 Warship D805 'Benbow' in BR green - Railroad Range (Hor) (RRP £64.99) **BARGAIN** £39
32-067A Class 43 Warship D836 'Powerful' in BR blue (Bac) £127.46



32-069 Class 43 Warship D841 'Roebuck' in BR green (Bac) £127.46
31-661DS Class 47/3 47346 BR Civil Engineers 'Dutch' - DCC sound fitted (Bac) £203.95
31-662 Class 47/3 47359 BR Railfreight Metals sector triple grey (Bac) £114.71
31-654 Class 47/4 47576 'Kings Lynn' original Network SouthEast (Bac) £114.71



R3482 Class 4DH Sentinel DH16 in MSC (Manchester Ship Canal) (Hor) (RRP £65.99) **BARGAIN** £40



R3483 Class 4DH Sentinel in Crossley and Evans (Hor) (RRP £65.99) **BARGAIN** £40



4D-003-012 Class 52 diesel loco D1026 'Western Centurion' in BR blue full yellow ends - weathered (Dap) £113
5310 Class 53 D0280 'Falcon' original lime green and brown - Ltd Ed (Hel) £125



5312 Class 53 D1200 'Falcon' in BR blue - Ltd Ed (Hel) £125
32-534DS Class 55 Deltic 55004 'Queen's Own Highlander' in BR blue - DCC sound fitted (Bac) £212.46
32-753DS Class 57/0 57007 'Freightliner Bond' in Freightliner green - DCC sound fitted (Bac) £203.96



32-764 Class 57/3 57305 'Northern Princess' in DRS Northern Belle (Bac) £131.71



32-763 Class 57/3 57309 'Pride of Crewe' in DRS Compass blue (Bac) £125
32-756 Class 57/6 57603 'Tintagel Castle' in GWR (2015) green (Bac) £131.71



R3479 Class 60 60066 in DB Schenker/Drax Powering Tomorrow silver (Hor) £149.50



32-725U Class 66 66111 in EWS Livery Highland Rail Stag - Ltd Ed (Bac) £132



R3486 Class 66 66185 'DP World London Gateway' in DB Schenker (Hor) (RRP £98.99) **BARGAIN** £59
32-982 Class 66 66434 in DRS blue Compass Logos (Bac) £127.46



R3268 Class 67 67003 in Arriva Trains Wales (Hor) (RRP £139.99) **BARGAIN** £99



R3388TTS Class 67 67004 'Caim Gorm' in Caledonian Sleeper - TTS sound fitted (Hor) (RRP £184.99) **BARGAIN** £104



R3481 Class 67 67025 'Western Star' in EWS (Hor) (RRP £159.99) **BARGAIN** £99



4D-022-003 Class 68 68010 in Chiltern Railways (Dap) £123.72



4D-022-004 Class 68 68014 in Chiltern Railways (Dap) £123.72



4000 Hawker Siddeley Brush HS4000 'Kestrel' prototype diesel electric loco (Hel) £150



32-991 Type 27 Wickham Trolley and trailer B30W in BR Maroon (Bac) £67.96

Electric locos



R3376 Class 71 E5022 in BR Green no yellow ends (Hor) £127.50



7602 Class 76 EM1 Woodhead electric E26049 in BR blue - Ltd Ed for Olivias Trains (Hel) £160



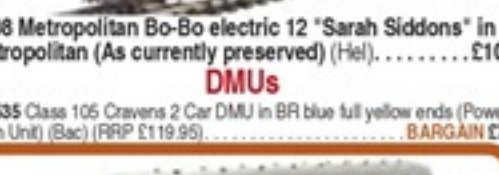
7704 Class 77 EM2 Woodhead electric 27001 'Ariadne' in BR green - Ltd Ed for Olivias Trains (Hel) £165



7702 Class 77 EM2 Woodhead electric 27004 'Juno' in BR electric blue - Ltd Ed for Olivias Trains (Hel) £165



7705 Class 77 EM2 Woodhead electric E27003 'Diana' in BR green half yellow panels - Ltd Ed for Olivias Trains (Hel) £165
R3585 Class 90 90135 in InterCity Mainline - Railroad Range (Hor) NEW £76

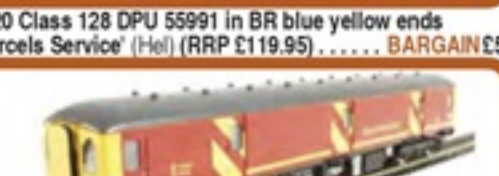


9008 Metropolitan Bo-Bo electric 12 'Sarah Siddons' in Metropolitan (As currently preserved) (Hel) £108

DMUs



31-535 Class 105 Cravens 2 Car DMU in BR blue full yellow ends (Power Twin Unit) (Bac) (RRP £119.95) **BARGAIN** £78



8920 Class 128 DPU 55991 in BR blue yellow ends 'Parcels Service' (Hel) (RRP £119.95) **BARGAIN** £59



8923 Class 128 DPU 55991 in Royal Mail Letters red (Hel) (RRP £119.95) **BARGAIN** £59



8990 Class 128 DPU in BR green speed whiskers and Midland style fronts M55987 (Hel) (RRP £119.95) **BARGAIN** £69
8922 Class 128 DPU W55982 in BR blue yellow ends & no branding 'Scooby Doo' - weathered (Hel) (RRP £129.95) **BARGAIN** £59
32-515A Derby Lightweight 2 Car DMU BR green half yellow ends (Bac) £123.21



8801 Railcar W79976 in BR light green speed whiskers. Matt finish (Hel) £94

EMUs



R3341 Class 2-HAL 2 Car EMU 2677 in BR blue (Hor) (RRP £130.25) **BARGAIN** £62



R3341A Class 2-HAL 2623 2 car EMU in BR blue (Hor) (RRP £149.99) **BARGAIN** £62



R3215 Class 373 Eurostar 4 car EMU in new (post-2014) Eurostar (Hor) (RRP £169.99) **BARGAIN** £94



31-427B Class 411 4-CEP 7106 in BR Blue & Grey (Bac) £254.96

Track Maintenance vehicles



B800 Non-motorised OO Track Cleaner motorised cleaning heads & vacuum in blue (Dap) £56

Train sets - analogue



R1183 'Master of the Glens' Train Set Class P2 2-8-2 'Cock O' The North' in LNER green and three LNER teak coaches (Hor) (RRP £184.99) **BARGAIN** £110



R1151 Caledonian Belle trainset 0-4-0 steam loco in blue 4 wheel coach & open wagon (Hor) (RRP £49.99) **BARGAIN** £35
R9285 Thomas the Tank Engine - Passenger and Goods Train Set (Hor) (RRP £109.99) **BARGAIN** £80



R9283 Thomas the Tank Engine starter Train Set (Hor) (RRP £64.99) **BARGAIN** £45

Train sets - DCC

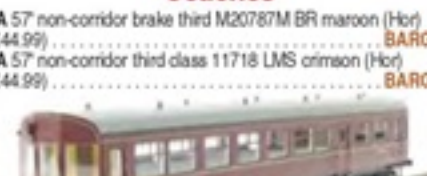


R1172 e-Link Majestic train set A1 Pacific Peppercorn Class in Experimental blue & BR Class 47 (Hor) (RRP £299.99) **BARGAIN** £230



R1126 Mixed Freight DCC digital train set Class 08 0-6-0 BR diesel electric loco, steam loco & 4 wagons (Hor) (RRP £249.99) **BARGAIN** £165
R1125 Somerset Belle train set Class 3F 0-6-0 S&DJR 0-6-0 steam loco & 3 wagons - DCC control (Hor) (RRP £199.99) **BARGAIN** £115
R1184 Western Express digital train set eLink TTS sound Hall steam loco (Hor) (RRP £329.99) **BARGAIN** £199

Coaches



R4691A 57' non-corridor brake third M20787M BR maroon (Hor) (RRP £44.99) **BARGAIN** £33
R4657A 57' non-corridor third class 11718 LMS crimson (Hor) (RRP £44.99) **BARGAIN** £33



39-576 BR Hawskworth Auto Trailer Maroon (Bac) £58.61

NEW



R4760 Collett corridor brake third (left hand) 5090 in GWR chocolate and cream (Hor) NEW £38

Opening Hours

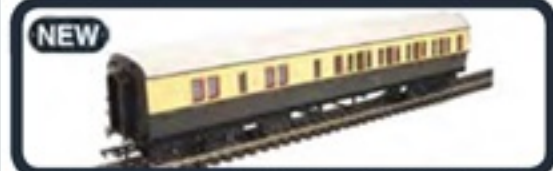
Store: 09:00 - 17:00 Mon - Sun

07:30 - 18:30 Mon - Sat
09:00 - 17:00 Sun

Hatton's
Est. 1946
MODEL RAILWAYS



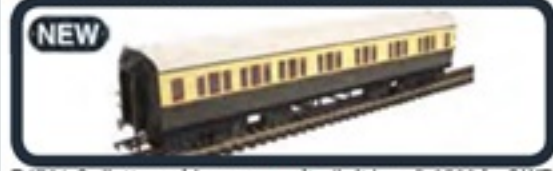
R4765 Collett corridor brake third (left hand) W4936W in BR maroon (Hor) £38



R4759 Collett corridor brake third (right hand) 5089 in GWR chocolate and cream (Hor) **NEW** £38



R4764 Collett corridor brake third (right hand) W4935W in BR maroon (Hor) £38



R4761 Collett corridor composite (left hand) 6530 in GWR chocolate and cream (Hor) **NEW** £38



R4766 Collett corridor composite (left hand) W6138W in BR maroon (Hor) £38



R4762 Collett corridor composite (right hand) 6531 in GWR chocolate and cream (Hor) **NEW** £38



R4767 Collett corridor composite (right hand) W6137W in BR maroon (Hor) £38



R4763 Collett corridor third class W5147W in BR maroon (Hor) £38



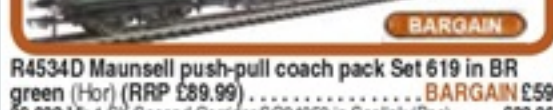
R4518B Gressley non-vestibled suburban brake third 3738 LNER teal (Hor) £40



39-580 Hawksworth Auto-trailer in W231W in BR chocolate & cream - as preserved (Bac) £59.46



39-578 Hawksworth Auto-trailer in W234W in BR crimson & cream (Bac) £59.46



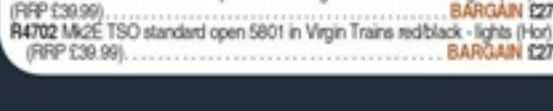
R4697 K-Type Pullman First Class Parlour Car 'Ursula' (Hor) (RRP £54.99) **BARGAIN** £39



R4695 K-Type Pullman Third Class Parlour Brake Car 'Car No. 80' (Hor) (RRP £54.99) **BARGAIN** £39



R4694 K-Type Pullman Third Class Parlour Car 'Car No. 83' (Hor) (RRP £54.99) **BARGAIN** £39



R4736 Maunsell brake third 3797 SR malachite green (Hor) (RRP £44.99) **BARGAIN** £31

R4734 Maunsell corridor first 7406 SR malachite green (Hor) (RRP £44.99) **BARGAIN** £31

R4737 Maunsell corridor six compartment brake third 3798 in SR malachite green (Hor) (RRP £44.99) **BARGAIN** £31

R4735 Maunsell corridor third 1216 SR malachite green (Hor) (RRP £44.99) **BARGAIN** £31

R4534D Maunsell push-pull coach pack Set 619 in BR green (Hor) (RRP £89.99) **BARGAIN** £59

39-032 Mk1 SK Second Corridor SC24859 in Sealink (Bac) £39.96



R4655 Mk3 DVT driving van trailer 82146 in DB Schenker silver (Hor) (RRP £42.99) **BARGAIN** £26



R4595 Mk3 TGS trailer guard second E44037 in BR blue & grey - lights (Hor) (RRP £35.49) **BARGAIN** £20



39-005 Pack of Mk2A TSO & Class 101 DTCL 'Highlander Pack' in Kyle Line green and cream passenger figures (Bac) £118.96



R4663 Pullman First Class Kitchen Car - K-Type Pullman Car (Hor) (RRP £49.99) **BARGAIN** £33



R4664 Pullman First Class Parlour Car - K-Type Pullman Car (Hor) (RRP £49.99) **BARGAIN** £33



R4660 Pullman Third Class Kitchen Car - K-Type Pullman Car (Hor) (RRP £49.99) **BARGAIN** £33



R4661 Pullman Third Class Parlour Car - K-Type Pullman Car (Hor) (RRP £49.99) **BARGAIN** £33



39-530 SR PMV parcels van S1151S in BR green black ends (Bac) £25.46



34-461 Thompson 3rd class brake corridor in BR crimson and cream (Bac) £46.71



34-386 Thompson 3rd Class corridor in BR crimson & cream (Bac) £46.71



34-411 Thompson composite corridor in BR crimson and cream (Bac) £46.71



34-486 Thompson first corridor in BR crimson and cream (Bac) £46.71



R4572A Thompson non-corridor composite 88426 in LNER teal (Hor) £38



38-190B 10 Ton BR Insulated Van Light Blue (Bac) **NEW** £13.56

38-032A 100 ton HHA hopper wagon in Freightliner Heavy Haul - weathered (Bac) £37.36

38-191C 10T insulated van in white - weathered (Bac) **NEW** £14.41

4F-016-019 12t banana van 'Fylles' B240755 in BR yellow (Dap) **NEW** £9.50

4F-016-020 12t banana van 'Fylles' B240755 BR yellow - weathered (Dap) **NEW** £10.50

37-378 16 ton pressed end door steel mineral wagon in BR grey (Bac) £11.01

37-253B 16 ton steel mineral wagon without top flap doors in BR grey - weathered (Bac) £12.71

R6788 20 Ton Tank Wagon, ICI - Three Wagon Pack (Hor) **NEW** £38

R6798 20-ton tank wagon - 'Hornby 2017' (Hor) £13

R6808 21 ton hopper wagon 'Coalite Fuel' (Hor) **NEW** £14

R6809 21 ton hopper wagon E304952 in BR grey (Hor) **NEW** £14

4F-013-037 4-wheel gunpowder van 'Blue Circle' (Dap) **NEW** £9.50

4F-013-038 4-wheel gunpowder van 'Blue Circle' - weathered (Dap) **NEW** £10.50

R6790 40 ton Seacow YGA bogie ballast wagon in EWS maroon (Hor) **NEW** £24

37-587 45 T TTA tank wagon in Aviation Fuel green - weathered (Bac) £21.21

NEW 4F-054-001 45' IDA 'super low' container twin wagon (SL 45) 39 70 490 1000 - 2 in DRS (Dap) **NEW** £37.36

4F-054-002 45' IDA 'super low' container twin wagon (SL 45) 39 70 490 1004 - 4 in DRS (Dap) **NEW** £37.36

4F-054-003 45' IDA 'super low' container twin wagon (SL 45) 39 70 490 1005 - 1 in DRS (Dap) **NEW** £37.36

4F-054-004 45' IDA 'super low' container twin wagon (SL 45) 39 70 490 1011 - 9 in DRS (Dap) **NEW** £37.36

4F-071-148 7-plank open wagon 'Buckley Junction' (Dap) **NEW** £9.50

4F-071-549 7-plank open wagon 'Buckley Junction' - weathered (Dap) **NEW** £10.50

4F-090-007 9-plank open wagon 'Loco Coal' in LNER grey (Dap) **NEW** £10

4F-090-008 9-plank open wagon 'Loco Coal' LNER grey - weathered (Dap) **NEW** £11

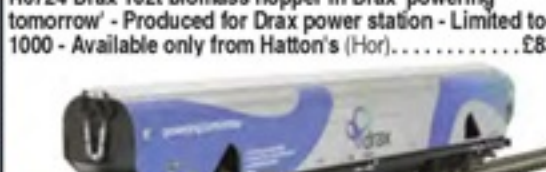
R6773 BR Ferry Van VIX 2380 251.5 in BR Railfreight (Hor) £19



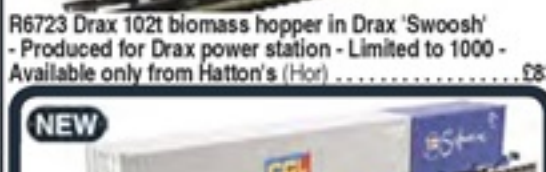
R6367 Coal train pack - pack of 3 open wagons in EWS - Railroad Range (Hor) (RRP £19.99) **BARGAIN** £14



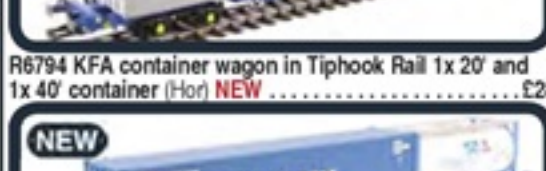
R6772 CTA 100 ton tank wagon 870010 in EWS maroon (Hor) £28



R6724 Drax 102t biomass hopper in Drax 'powering tomorrow' - Produced for Drax power station - Limited to 1000 - Available only from Hatton's (Hor) £83



R6723 Drax 102t biomass hopper in Drax 'Swoosh' - Produced for Drax power station - Limited to 1000 - Available only from Hatton's (Hor) £83



R6794 KFA container wagon in Tiphook Rail 1x 20' and 1x 40' container (Hor) **NEW** £28



R6793 KFA container wagon in Tiphook Rail 1x 20' and 1x 40' container (Hor) **NEW** £28



R6473 Pack of 3 16 ton mineral wagons in BR bauxite - Railroad Range (Hor) (RRP £19.99) **BARGAIN** £15



33-090 Pack of three 5-plank china clay wagons GWR grey flat canvas hoods (Bac) £31.41



R6831 RailRoad Triple Pack - Box Vans (Hor) £19



R6832 YGB Seacow bogie ballast hopper DB980100 in engineers Dutch (Hor) **NEW** £25.19



NEW DCC accessory decoders PC2 One Touch DCC Quad Point Controller x 4 (Tra) £32



NEW DCC controllers R8214 DCC Elite unit digital controller (Hor) £205



NEW Point motors R8243 Surface Mounted point motor (Hor) £8



NEW Lighting equipment CL2 Standard Coach Lighting Strips - Warm White (Tra) £17



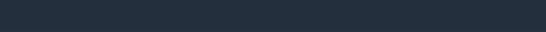
NEW Cables & Wires PL-80 Power feed joiners - Code 100/124 (x4 pairs) (Pec) £5.50



NEW Spares SL-110 Finescale rail joiners/fishplates (for code 70, 75 & 83) for OO & HO gauge - Pack of 24 (Pec) £2



NEW Buildings - railways CK16 'Craftsman' kit - brick built country station platform (Wli) **NEW** £27



NEW Buildings - railways CK19 'Craftsman' kit - brick goods shed (Wli) **NEW** £13.50

NEW Buildings - railways CK14 'Craftsman' kit - single road engine shed (Wli) **NEW** £13.50

NEW Buildings - railways CK15 'Craftsman' kit - stone goods shed crane (Wli) **NEW** £13.50

NEW Buildings - railways CK17 'Craftsman' kit - stone station building (Wli) **NEW** £28

NEW Buildings - railways CK12 'Craftsman' kit - Two road engine shed (Wli) **NEW** £13.50

NEW Buildings - railways PC213 2 Road Red Brick Engine Shed & Workshop Building (Card Kit) (Met) £12.50

NEW Buildings - railways SL-10 Metal rail joiners/fishplates (for code 100 rails inc Hornby, Peco & Peco Streamline) For OO, HO & O gauge - Pack of 24 (Pec) £2.20

NEW Buildings - railways 19KADEE NEM382 Kadee coupling - Long (10.78mm) - Pack of four (Kad) £5

NEW Buildings - railways 18KADEE NEM382 Kadee coupling - Medium (8.63mm) - Pack of four (Kad) £5

NEW Buildings - railways CK16 'Craftsman' kit - brick built country station platform (Wli) **NEW** £27

NEW Buildings - railways CK19 'Craftsman' kit - brick goods shed (Wli) **NEW** £13.50

NEW Buildings - railways CK14 'Craftsman' kit - single road

Visit

www.hattons.co.uk/new

for all new releases



Track underlay



GM200 5 metres of realistic grey ballasted OO gauge underlay (Gau) £19.50
SL-50 Roll of foam track underlay sleeper indentation. Suitable for Setrack and Streamline 5m long (16" 4") (Pec) £9.50

Railway publications

R8154 Hornby 2017 Catalogue - 63rd Edition (Hor) £7.50

Buses

76CA029 Bedford CA Minibus BEA (Oxf) NEW £5



76MW6002 Bristol MW6G Hants & Dorset (Oxf) £15.50
76MW6001 Bristol MW6G Royal Blue (Oxf) £16
18206 Daimler Fleetline "London Country Blue Arrow" (EFE) (RRP £27.50) BARGAIN £10
26407 Daimler Utility Bus Wills & Dorset New Year 2010 (EFE) NEW BARGAIN £12.50
27901 DMS type Daimler Fleetline open top deck bus "Big Bus Company" (EFE) (RRP £20.50) BARGAIN £9

NEW



76DR003 Duple Roadmaster Wye Valley Motors (Oxf) NEW £15.50
12122 Harrington Cavalier "Southdown" (EFE) £29.33
12309 Harrington Grenadier "Black & White" (EFE) (RRP £27.50) BARGAIN £10
17505 Leyland National II sidor "First Provincial" (EFE) (RRP £21.99) BARGAIN £9
17215 Leyland National Mk1 long sidor "Alder Valley" (EFE) (RRP £18.99) BARGAIN £9
24902 Plaxton Minibus (B) low roofbox "First Capital" (EFE) (RRP £18.99) BARGAIN £9
24323 Willowbrook BET 1950's s/deck bus "South Wales NBC" (EFE) (RRP £18.99) BARGAIN £9

Cars

76SET44 5 Piece Land Rover Set (Oxf) NEW £21
76AMZ001 Aston Martin DB4GT Zagato VEV (Oxf) NEW £25
76AMV002 Aston Martin Vanquish Coupe Selenia Bronze (Oxf) NEW £5
76RRE001 Range Rover Evoque Coupe (Facelift) Firenze Red (Oxf) NEW £5

Commercial vehicles

NEW



76DXF001 DAF XF Euro 6 CombiTrailer/Container Maritime Transport (Oxf) NEW £20
76FBB001 Fowler BB1 16hp Ploughing Engine No.15445 Rusty Dorset (Oxf) £14.50
DB13 Kamier Bantam articulated flatbed "British Railways" Type A container (Bas) NEW £12
DB11 Kamier Bantam dropside "Sand and Gravel Supply Co." sack load (Bas) NEW £11
DB12 Leyland FG van "Roadline" (Bas) NEW £8

NEW



76SST007 Scammell Showtrac & Dodgem Trailer Arnold Bros (Oxf) NEW £16
76SP113 Volvo FH Curtainside Lorry Brains (Oxf) NEW £14

Farming & Construction

76FDE011 Ford 400E Fordson Tractors (Oxf) NEW £5

Military ground vehicles

76DOR004 Dorchester ACV Max (Rommel) North Africa 1941 (Oxf) NEW £11

Tools



SL-43 Loco Lift and storage unit (Pec) £12
BS-FUX-07 Mobile Automatic ballast glue applicator wagon (Pro) NEW £38

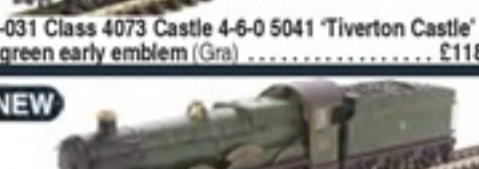
N Gauge

Steam locos

372-310 Class 21C1 Merchant Navy 4-6-2 35024 'East Asiatic Company' BR blue early emblem (Gra) £135.96



372-031 Class 4073 Castle 4-6-0 5041 'Tiverton Castle' in BR green early emblem (Gra) £118.96



372-030 Class 4073 Castle 4-6-0 5044 'Earl of Dunraven' in GWR lined green (Gra) NEW £118.96

NEW



NEW



372-032 Class 4073 Castle 4-6-0 5070 'Sir Daniel Gooch' in BR lined green late crest (Gra) NEW £118.96
372-061 Class 4F 0-6-0 3851 in LMS black Johnson tender (Gra) £93.46



372-752 Class 4MT Fairburn 2-6-4T 42073 in BR black late crest (Gra) £97.71



371-987 Class 64xx 0-6-0 Pannier Tank 6412 in BR Lined Green late crest (Gra) £80.71



372-800A Class A1 4-6-2 60163 "Tornado" BR lined Brunswick green (Gra) £133.75
2S-012-006 Class A1X Temer 0-6-0T 2644 Southern Railway green (Dep) £63
2S-008-008D Class A4 4-6-2 4488 "Mallard" in LNER garter blue valances - DCC Fitted (Dep) £150.57



2S-008-010D Class A4 4-6-2 4482 "Golden Eagle" in LNER apple green valances - DCC Fitted (Dep) £150.57



2S-008-002 Class A4 4-6-2 4498 "Sir Nigel Gresley" in LNER blue double chimney - as preserved (Dep) £118
2S-002-002D Class V Schools 4-4-0 30921 "Shrewsbury" in BR Black early emblem - DCC fitted (Dep) £142.50

Train packs



370-430 "Capital Connection" Network SouthEast train pack (Gra) £178.46



2S-011-001D Class A1 4-6-2 4472 "Flying Scotsman" in LNER apple green four Gresley teak coaches - DCC and light bars fitted (Dep) £220.64



2S-011-005 Class A3 4-6-2 4472 "Flying Scotsman" in LNER apple green (as preserved) four Gresley teak coaches in maroon - light bar fitted (Dep) £198.90



2S-011-004 Class A3 4-6-2 60103 "Flying Scotsman" in BR green early emblem four Gresley teak coaches in crimson & cream liver (Dep) £198.90

Diesel locos



371-166 Class 37/4 37406 'The Saltire Society' in Railfreight Distribution (Gra) £89.21

NEW



371-170 Class 37/4 37422 "Robert F. Fairlie" in Regional Railways (Gra) NEW £103.66



371-168 Class 37/5 37506 Railfreight Red Stripe Livery (Gra) £89.21

371-287 Class 55 Deltic 55005 'The Prince of Wales' Own Regiment of Yorkshire" in BR Blue (Gra) £93.46
2D-007-008 Class 66/0 66114 in DB Schenker red (Dep) NEW £89.90
2D-007-007 Class 66/4 66421 in DRS (Dep) NEW £89.90
2D-007-006 Class 66/7 66737 "Lesia" in GB Railfreight (Dep) NEW £89.90
2D-010-004 Class 67 67014 "Thomas Telford" Wrexham and Shropshire (Dep) £104.67

NEW



2D-010-006 Class 67 67015 in DB Schenker red (Dep) NEW £104.67
371-636 Class 70 Powerful 70003 Freightliner (Gra) (RRP £119.95) BARGAIN £82.50

DMUs

371-880 Class 108 2-car DMU in BR Green half yellow ends (Gra) £144.46



371-877A Class 108 2-car DMU in BR blue & grey (Gra) £144.46



371-330 Class 150/1 150128 in First Great Western (Gra) £131.71

EMUs

371-702 Class 350/1 Desiro 4 Car EMU 350 101 in London Midland (Gra) (RRP £169.95) BARGAIN £99

Coaches

374-044 BR Mark 1 BG in Royal Mail Letters (Gra) £25.46



374-710A BR Mk2A TSO Tourist Second Open in blue & grey (Gra) £25.46



374-017 Mk1 TSO second open in Regional Railways (Gra) £25.46

Wagons

2F-034-043 21-ton hopper "British Gas" 145 (Dep) NEW £9
2F-034-044 21-ton hopper "British Gas" 145 - weathered (Dep) NEW £10
2F-071-028 7-plank open wagon "Blue Circle Cement" (Dep) NEW £8
NR-P423 7-plank open wagon "Middleton Colliery, Leeds" (Pec) NEW £8

Lighting equipment

NC040b Light Bar coach lighting unit for older coaches (Yellow) (Dep) £8

Spares

2A-000-011 Magnetic couplings - short arm - 5 pairs (Dep) £18



SL-310 Rail Joiners/Fishplates for N & OO gauge (24 per pack) (Pec) £2

Buildings - general

PN190 Low relief timber-framed shop fronts - card kit (Met) NEW £8

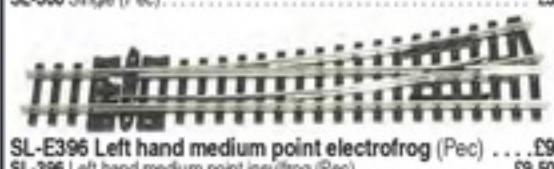
Track - Code 80 Setrack

ST-6 Setrack left hand point insulfrog (Pec) £8.50
ST-5 Setrack right hand point insulfrog (Pec) £8.50

Track - Code 80 Streamline



SL-300 Pack of 25 1 yard (91.5cm) length of Wooden-Sleeper Nickel Silver Flexible track (Pec) £64
SL-300 Single (Pec) £3



SL-E396 Left hand medium point electrofrog (Pec) £9
SL-396 Left hand medium point insulfrog (Pec) £9.50



SL-E395 Right hand medium point electrofrog (Pec) £9
SL-395 Right hand medium point insulfrog (Pec) £9.50

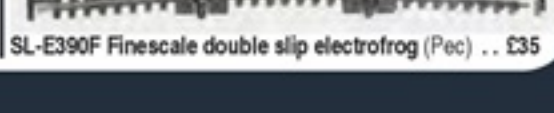
Track - Code 55 Finescale



SL-300F Pack of 30 1 yard (91.5cm) length of Finescale Nickel Silver flexible Wooden Sleeper track (Pec) £84
SL-300F Single (Pec) £3



SL-E399F 3-way finescale turnout (Pec) £28
SL-E388F Finescale curved double radius right hand point electrofrog (Pec) £11



SL-E390F Finescale double slip electrofrog (Pec) £35



SL-E99 3 way medium radius point electrofrog (Pec) £26
SL-99 3 way medium radius point insulfrog (Pec) £26
SL-90 Double slip insulfrog (Pec) £32
SL-87 Left hand curved point (Pec) £12.50



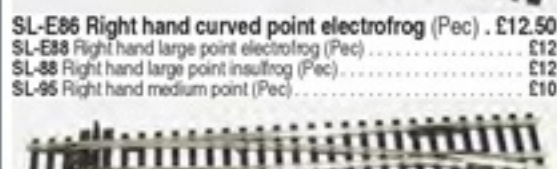
SL-E87 Left hand curved point electrofrog (Pec) £12.50
SL-E89 Left hand large point electrofrog (Pec) £12
SL-89 Left hand large point insulfrog (Pec) £12
SL-96 Left hand medium point (Pec) £10



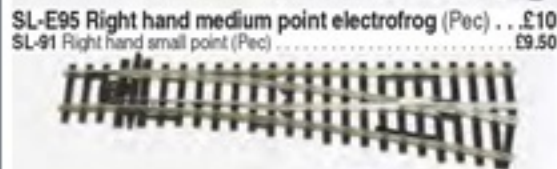
SL-E96 Left hand medium point electrofrog (Pec) £10
SL-92 Left hand small point (Pec) £9.50



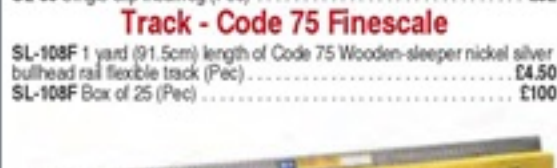
SL-E92 Left hand small point electrofrog (Pec) £9.50



SL-E86 Right hand curved point electrofrog (Pec) £12.50
SL-E88 Right hand large point electrofrog (Pec) £12
SL-88 Right hand large point insulfrog (Pec) £12
SL-95 Right hand medium point (Pec) £10



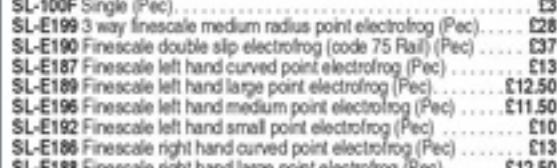
SL-E95 Right hand medium point electrofrog (Pec) £10
SL-91 Right hand small point (Pec) £9.50



SL-E91 Right hand small point electrofrog (Pec) £9.50
SL-80 Single slip insulfrog (Pec) £32

Track - Code 75 Finescale

SL-108F 1 yard (91.5cm) length of Code 75 Wooden-sleeper nickel silver bullhead rail flexible track (Pec) £4.50
SL-108F Box of 25 (Pec) £100



SL-100F Pack of 25 1 yard (91.5cm) length of Nickel Silver Finescale flexible track (Pec) £72

SL-100F Single (Pec) £3
SL-E199 3 way finescale medium radius point electrofrog (Pec) £26
SL-E190 Finescale double slip electrofrog (code 75 Rail) (Pec) £37
SL-E187 Finescale left hand curved point electrofrog (Pec) £13
SL-E189 Finescale left hand large point electrofrog (Pec) £12.50
SL-E196 Finescale left hand medium point electrofrog (Pec) £11.50
SL-E192 Finescale left hand small point electrofrog (Pec) £10
SL-E186 Finescale right hand curved point electrofrog (Pec) £13
SL-E188 Finescale right hand large point electrofrog (Pec) £12.50
SL-E195 Finescale right hand medium point electrofrog (Pec) £11.50
SL-E191 Finescale right hand small point electrofrog (Pec) £10

Track & Points

R607 2nd radius double curve track (8 make a circle) (Hor) £2.25
R607 Circle of 8 (Hor) £18
R609 3rd radius double curve track (8 make a circle) (Hor) £2.60
R609 Circle of 8 (Hor) £20
R6262 Double 4th radius curve (8 make a circle) (Hor) £3



R601 Box of 24 Double Straight (Hor) £47
R601 Single (Hor) £2.10
R6222 Extension Pack B. Contains 1 x R6073, 2 x R600, 4 x R607, 1 x R606, 1 x R603 (Hor) £24
HT8400 Hornby International Track Pack A (Hor) NEW £28
HT8401 Hornby International Track Pack B (Hor) NEW £22.50
HT8402 Hornby International Track Pack C (Hor) NEW £22



R6072 Left Hand Standard Point (Hor) £9
R603 Long Straight (Hor) £3
36-603 Long straight track nickel silver (same as R603) (Bac) £2.76
36-603 Box of 10 (Bac) (RRP £34) BARGAIN £24.80



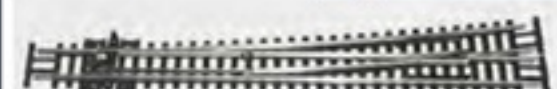
R6073 Right Hand Standard Point (Hor) £9
R621 Single 970mm length of flexible track (Hor) £3
R621 Pack of 24 (Hor) £66



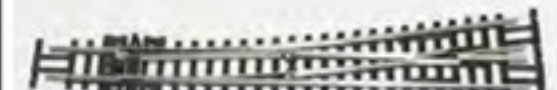
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SL-E392F Finescale left hand small point electrofrog (Pec) £9



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Commercial vehicles

NFT001 Ford Transit SWB Low Roof White (Oxf) NEW £4.50

O Gauge (1:43 Scale)

Steam locos

7S-010-010 Class A1X Terrier 0-6-0T W9 'Fishbourne' in Southern Railway green (Dap) £191.25



7S-010-011 Class A1X Terrier 0-6-0T 32636 in BR black late crest (Dap) £191.25



7S-010-009 Class A1X Terrier 0-6-0T 643 'Gipsyhill' in LB&SCR marsh umber brown (Dap) £191.25

Diesel locos

7D-008-001 Class 08 shunter 13282 in BR green early crest and no yellow warning panels (Dap) £199.95

2553 Class 25/1 in BR blue (unnumbered) (Hel) £470

2551 Class 25/1 BR green small yellow warning panels (unnumbered) (Hel) £470



4505 Class 45 'Peak' in BR early blue red bufferbeams - unnumbered (Hel) £550



4502 Class 45 'Peak' in BR green small yellow panels and green roof - unnumbered (Hel) £550



6000 Class 60 diesel in Railfreight triple grey (Supplied un-numbered separate waterslide numbers, sector emblems and, a selection of nameplates.) (Hel) £499

Wagons

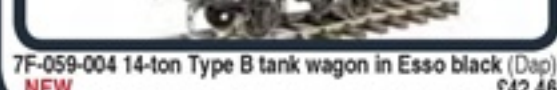
7F-058-001 14-ton Type A tank wagon in Esso silver (Dap) NEW £42.46

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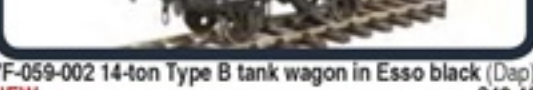
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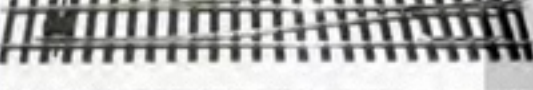
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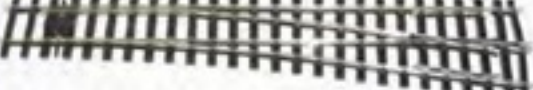
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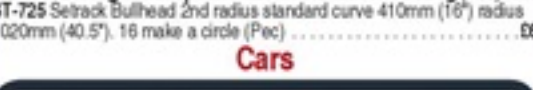
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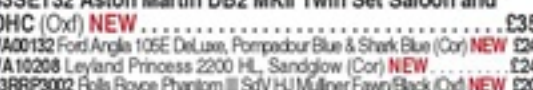
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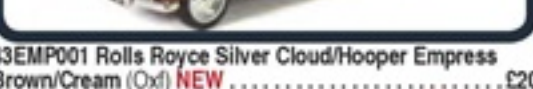
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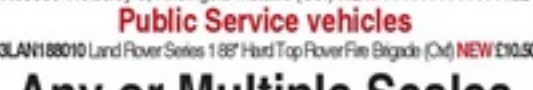
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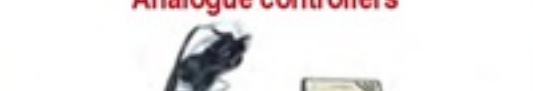
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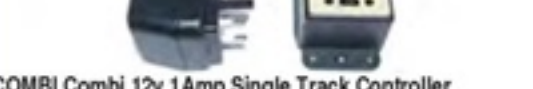
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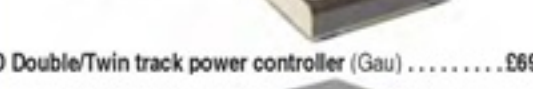
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DCC decoders



DCR-18Pin-Direct 18-pin 4-function 1.1Amp direct plug decoder back EMF (Hat) £13



DCR-21PIN-Direct Box of 10 21-pin 4-function 1.1Amp direct plug decoder back EMF (Hat) £110

DCR-21PIN-Direct Single (Hat) £12

DCR-21PIN-Direct Box of 5 (Hat) £57

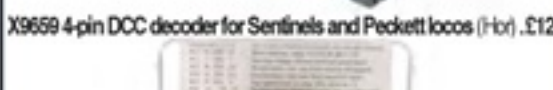


36-557 Pack of 5 21-pin E-Z Command 4-function 1A decoder back EMF (Bac) (RRP £92.50) BARGAIN £70

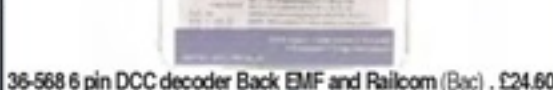
36-557 Single (Bac) £14.50



X9659 4-pin DCC decoder for Sentinels and Peckett locos (Hor) £12



36-568 6 pin DCC decoder Back EMF and Railcom (Bac) £24.60



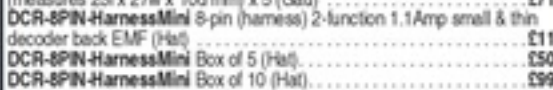
DCC23 6-pin 2-function 1A (2A peak) decoder (suitable for N gauge) (Gau) £24

BPDC27 6 & 21-pin 4-function 1A (1.6A peak) small OMNI decoder (measures 23x1 x 27x1 x 10d mm) x 5 (Gau) £71

DCR-8PIN-HarnessMini 8-pin (harness) 2-function 1.1Amp small & thin decoder back EMF (Hat) £11

DCR-8PIN-HarnessMini Box of 5 (Hat) £50

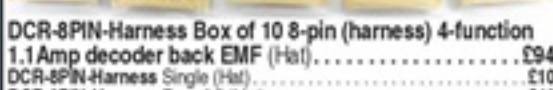
DCR-8PIN-HarnessMini Box of 10 (Hat) £99



DCR-8PIN-Harness Box of 10 8-pin (harness) 4-function 1.1Amp decoder back EMF (Hat) £94

DCR-8PIN-Harness Single (Hat) £10

DCR-8PIN-Harness Box of 5 (Hat) £48



36-553 8-pin 3-function 0.75A decoder back EMF (Bac) £15.50



R8249 Box of 6 8-pin 4-function 2-sided 0.5A (1A peak) decoder (Hor) £76

R8249 Single (Hor) £14



DCR-8PIN-Direct Box of 10 8-pin compact direct 4-function 1.1Amp decoder back EMF (Hat) £105

DCR-8PIN-Direct Single (Hat) £13

DCR-8PIN-Direct Box of 5 (Hat) £59

36-567 Next18-Pin DCC decoder (Bac) £18.65

DCC28 OMNI 6 Pin Decoder Harness (Gau) £17.50

DCC accessory decoders

DCD-ADS25X 2 output Accessory Decoder for all Solenoids and other point motors needing momentary power (DCC) NEW £24

DCC controllers



36-504RC Dynamis Ultima DCC System Trial copy RailController Software (Bac) £240



50200 ECoS Command Station DCC controller full colour LCD touch screen & dual controllers motorised dials & easy CV (ESU) £635



524-042 NCE Power Cab 2 Amp DCC controller (NCE) £140



DCC04 Prodigy 'Advance 2' Wireless starter DCC controller package (Gau) £369

DCC49 Prodigy 8 Amp booster unit (Gau) £150



DCC01 Prodigy Express Package. Can be extended the DCC13 Walkaround or DCC51 Wireless (Gau) £124



DCC51 Prodigy Wireless Conversion Set (Gau) £200



524-037 SB5 Smart Booster Entry level 5A DCC system for use Power Cab controller (NCE) £150

DCC accessories

BPDC80 Pack of three DCC autofrog polarity reversal switches - for electrofrog points (Gau) £14

Point motors

DCP-CB11IP Cobalt ip slow-action analogue point motor * 1 (DCC) £14

DCP-CB12DIP Cobalt ip slow-action digital point motor * 1 (DCC) £20



DCP-CB12DIP Cobalt ip slow-action digital point motor - pack of 12 (DCC) £177

DCP-CB6DIP Cobalt ip slow-action digital point motor - pack of 6 (DCC) £94

DCP-CB6OMG Cobalt slow-action analogue point motor * 6 (ex DCP-CB6) (DCC) £90

BPPM20 Pack of five Surface mounted seep point motors (Gau) £36



PL-10 Bag of 6 Point Motor (Switch Machine) (Pec) £34

PL-10 Single (Pec) £6

PL-10E Bag of 6 Point Motor Extended Pin (use PL-9) (Pec) £34

PL-10E Single (Pec) £6



PM-1 Seep point motor accessory switch (Gau) £4



PL-11 Side/surface mounted point motor (Pec) £7.50



HAT-PM-01 Pack of 6 Solenoid point motor including pin extension and 2-way arm for use points and signals. Exclusive to Hatton's (Hat) £35

HAT-PM-01 Single (Hat) £6.50

Switches & Levers

PL-13 Accessory Switch for fitting to turnout motor PL10 (Pec) £3



GM675 Zone Razor Saw (Medium - 32tpi) (Gau) £10

Railway publications

SYH27 Booklet - 'Shows You How' Series - Building Wills Craftmen kits (Pec) NEW £1

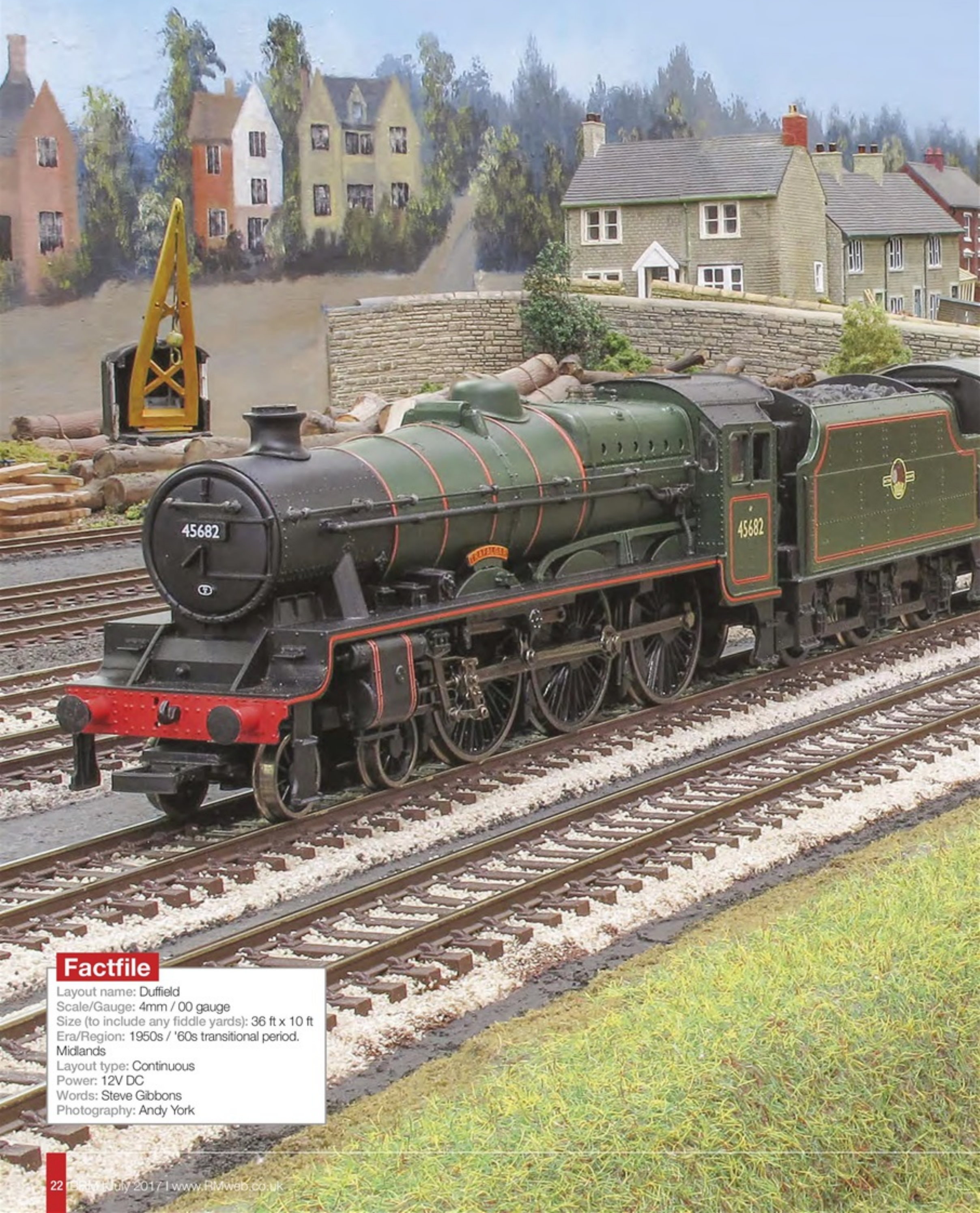
Tools

XU2175B Flexible track cutters (XURON) (Gau) £15

DCM-RR46 Rolling Road - Active (Powered) Set - 6 Way - For OO, N, HO, TT Gauge - See Description (ex DCP101) (DCC) £61

LAYOUT FOCUS

No. 45682 *Trafalgar*, a Bachmann Jubilee heads an inter-regional service towards Derby past the eastern edge of Duffield.



Factfile

Layout name: Duffield
Scale/Gauge: 4mm / 00 gauge
Size (to include any fiddle yards): 36 ft x 10 ft
Era/Region: 1950s / '60s transitional period.
Midlands
Layout type: Continuous
Power: 12V DC
Words: Steve Gibbons
Photography: Andy York

the original layout was set in the LMS period, and was constructed on 4' x 2' base boards that had to fit into trollies that could fit under the stage at the church hall



DUFFIELD

Steam eventually made way for diesel, but both run in together in Mickleover Model Railway Group's adaptable transition era scene.

Duffield station featured two lattice footbridges, which spanned all four lines to access land to the east of the station. Bachmann's Midland Pullman is absolutely at home on the evening Down service for a few miles, before bearing left at Ambergate on the Midland Railway's route to Manchester.



there is still more work to be done to get the remaining scenics completed and the rest of the signals wired and working. Is a layout ever finished?

Design

Duffield is 36' by 10' wide. It is a four track main line covering the track layout up to the 1960's. We have modelled from Makeney Road Bridge at the south of the A6 to Derby Road Bridge at the north end. The layout is not designed to be transported to exhibitions, but is built on baseboards that can be taken apart easily if required in the future. This may be necessary when we rebuild our clubrooms.

Rolling Stock

The layout includes a mixture of RTR and kit-built locomotives. On an exhibition weekend the only main criteria is that it must have ran through Duffield on a regular basis. On a club night it's 'anything goes'. Anything from an early Midland locomotive, right the way through to the latest class 70 Diesels. Any regions locomotives can also be seen running on a club night.

Buildings

Most buildings are scratch-built, with some dating back to the first incarnation of Duffield that the club built. These include the station buildings, built by Barry Carrington over the last 30 years. The signal box was constructed by David Wright. Resin buildings are now being used if they are suitable for the locations.



Watch more...

OO
GAUGE



Scenery

The backscene was painted by David Wright (see www.dovedalemodels.co.uk). This helps to give depth to the layout and blends in well with the scenery in front of it. Jim Heath has been constructing the line side fencing at the front from brass wire and rail. It is a very tedious job that requires using many small drillbits in the process, but it is well worth the effort for its scenic effect.

The main scenics are still to be completed



A venerable pair of Lima Class 27s head a van train on the Up fast. Detailed and weathered, they still serve as layout locomotives.

along the front. The row of cottages behind Duffield Station is still to be constructed, along with the adjacent station master's house. The stone wall alongside the A6 by the goods yard and timber merchants is still to be made and installed.

A lot of the scenic work has stalled of late due to the ongoing concerns over the rebuilding work required on the roof of the clubrooms, as we need to dismantle the layout in readiness for a period of storage whilst the work takes place.

About Mickelover MRG

Mickelover Model Railway Group began at a church hall in 1968. Originally called St. John's (Mickelover) Model Railway Group, the name change came when we moved into our own clubrooms in 1991. It is a diverse group of around 70 members. I have been a member of the group for nearly 35 years and have witnessed a number of changes in the hobby. I have learnt a lot from watching members in the past on the various layouts that have been constructed. In this hobby you never stop learning.

A lot of previous restrictions have disappeared since we had our own clubrooms. Since then club members have constructed 'Farkham', an award-winning layout that has been exhibited

all over Europe. Meanwhile, a club layout for running nights is suitable for multiple gauges – N, OO9, OO, 7mm Narrow gauge.

Why Duffield?

The idea for the layout came about in the late 1980s. The old club layout was due for replacement, so the members at the time set out a requirement list:

- 4 track mainline
- Plenty of stock movement and variety
- London Midland region
- A branch off the mainline.

Duffield fitted the criteria, being close by with a branch line going off to Wirksworth.

The original layout was set in the LMS period, and was constructed on 4' x 2' base boards that had to fit into trollies that could fit under the stage at the church hall. This restricted the depth of the scenery and also the height. Once we moved into our clubrooms in 1991 the layout went up permanently and became a running layout every club night.

By the early 2000s the layout was starting to show its age. The opportunity to rebuild it with wider base boards and no restrictions on height was taken. The decision was also made to extend it to its present length and width (36' x 10'). The time period was also moved on to the 1950s 60s era.



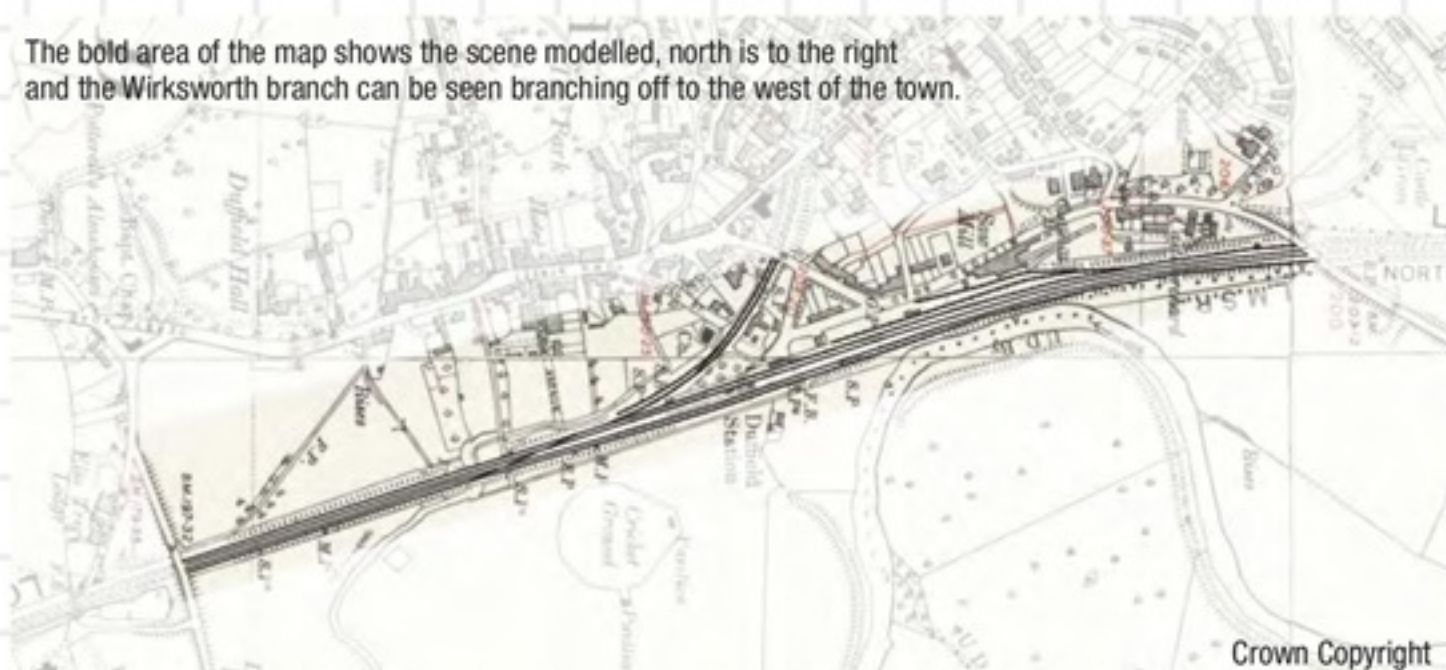


No. 70017 *Arrow*, a detailed and weathered Hornby Britannia, approaches Duffield from the north. David Wright's backscene shows the wooded surrounds of the Derwent Valley route.

Trackplan

DUFFIELD

The bold area of the map shows the scene modelled, north is to the right and the Wirksworth branch can be seen branching off to the west of the town.



Crown Copyright





A lot more research has gone into the construction of the layout, with the help of Howard Sprenger and his reprinted book about the Wirksworth branch. The one thing that is rewarding is that you can run "full" length trains around the layout. As you can see from the attached pictures 8 to 12 coaches and 40 plus wagon trains look correct. At an exhibition there can be up to 45 full length trains on the layout or in the fiddle yard. Now that's a lot of stock. A lot of this is renumbered and weathered accordingly for the periods depicted.

Otherwise, there is still more work to be done to get the remaining scenics completed and the rest of the signals wired and working. Is a layout ever finished?

Other inspirations

Over the years I have seen many excellent layouts that have inspired me. Dave and Shirley Rowe's dioramas set new standards in modelling back in the 80s. Also Manchester MRG's 'Chee Tor' – the scenery and railway in the landscape was awe inspiring. 'Bath Green Park' is another, but I find a lot of home-built layouts on RMWeb that are setting new standards. 'Manchester Central' and 'Kirkby Luneside' fall into that category.

Modelling Tips

If you are building a real location make sure you get the details right. There is always some smart so and so at an exhibition who is ready to tell you that you have got this or that wrong!

A Bachmann 3F waits at the branch platform for a clear path to cross the main lines and head south. The heavily loaded limestone train from the quarries at Wirksworth could well be heading to the Stewarts and Lloyds steelworks at Corby.





Controls and enjoyment

The layout is DC only at present. There has been talk of making it DCC. The signals on the up and down main are currently Heathcote Electronics IRDOT-operated. The goods/slow line signals are in place but require wiring. All points are electrically controlled. There is still work to be done, especially when you only have a few hours a week and a lot of that is spent running trains. The hobby is about enjoyment and pleasure, whether that is constructing a building, planting trees that you have just made or simply running that latest locomotive purchase. At the end of the day it's a hobby and not a chore.

Future plans

There are few thoughts for the future, but they are only thoughts at present. On a personal point, I have a new layout to construct for next year's Roundhouse event, so I'd best crack on with it!



'Jubilees' pass in a busy scene at Duffield with No. 45626 *Seychelles* on the Down fast - maybe the 3F, held on the branch with its limestone train, will now get a path onto the Up slow?



Pioneer diesel, No. 10001, not far from its birth-town of Derby, on the Down fast overtakes a loaded mineral train.



Bachmann 9F No. 92116, appropriately a Westhouses shed engine has been well weathered by club member Dave Roome.



What we think

Duffield has a long history as a club layout and still has many details to be completed over the coming years. Nonetheless, it stands up as an interesting and quite accurate model of a prototype location which can accommodate a great variety of express passenger services through to humble pick-up goods through the transition years.

Andy York
RMweb.co.uk editor

INBOX

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DISASTER STRIKES

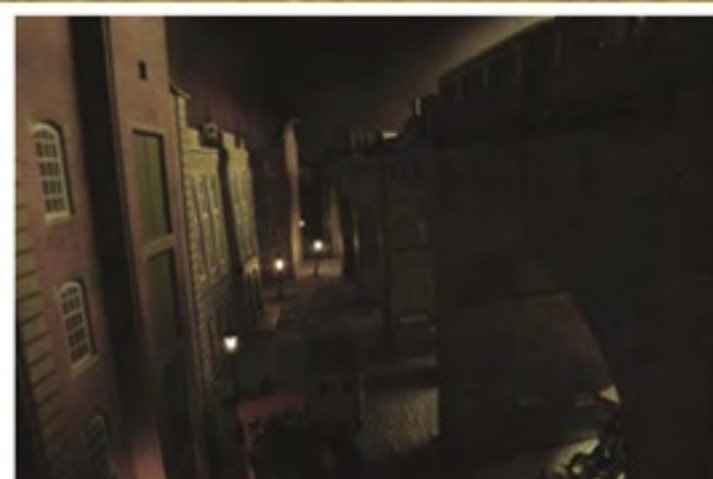
This is my layout 'Terror Street'. The trackplan was based on the **BRM** project layout 'Ruston Quays' – see September 2015 **BRM**. It has an inglenook-style frontage, with a raised upper track that shuttles. I've modelled Victorian London, so I could add a train derailment and 'scary' characters. The train has tumbled from a viaduct, crashing into a brewery - luckily, no beer was lost during the making of this layout.

It features 'Jack the Ripper', Sweeney Todd, Brunel (as a statue), Mr. Hyde, Sherlock Holmes, Dr. Watson, and Moriarty, Dracula, The Elephant Man, and a selection of steampunk people. I'm toying with the idea of perhaps adding a bit of Jules Verne or H.G. Wells, but so far have resisted that because I prefer it looking fairly 'normal'.

I wanted to use Metcalfe buildings because I've never made them before and wanted them to look less like cardboard, so they were weathered with an airbrush and cans. I've fitted lighting and every room has interior prints for the walls, floor and in some cases ceilings too. I have also added many figures inside.

I've made the cobbles using an imprinter block to speed up the process.

Laurie Calvert



GIANT LOFT LAYOUT

My layout 'Lakeside' is 40ft in length, 14ft wide one end and 10ft the other. It's a continuous loop with four main tracks with approximately 103ft around each track. The track is Peco Code 100 and the layout is DCC controlled using a wireless Prodigy Advance from Gaugemaster. The scene is fictitious so I don't stick to one region and I can run what I want. It's a layout for running full-length trains with either steam, diesel or electric. Stock comes from larger manufacturers such as Bachmann, Hornby, Heljan and Dapol. I have over 250 locomotives fitted with decoders. The steam locomotives have real coal and crews and diesel locomotives have drivers. Buildings are from Bachmann, Hornby, Townstreet, Walthers, Ratio and Peco. Older diesel locomotives from Hornby and Heljan have been fitted with wheels from Ultra Scale and many early diesel locomotives have had lights fitted using kits from Express Models.

Mick Smith

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FAIR CRITICISM

In the May issue of **BRM** Iain Farquharson asks, "do people watching model layouts notice the scenery or do they just watch the trains go by, then point out faults?" He thinks most just find errors, I disagree.

I'm a member of the Ebor Group of Railway Modellers based in York, and we have our annual club exhibition every February and take some club layouts to other shows. Our 'Rowntree Halt' was exhibited at the Derby Show in the MR roundhouse.

We received numerous favourable comments from the general public and from other club modellers. We got nice remarks on the road scenes, the authentic trees, the accuracy of the chocolate factory buildings and sidings and the unusual wagon loads. Being a model of a real location, there's always the extra risk of the purist or rivet counter finding fault - we've had none of that.

At this year's show we received complimentary comments about the space and uncluttered effect on our Southern Region layout, 'Westerham', how good the trees and buildings were on our 'Ripponden' layout, how good the atmosphere was on 'Rumbling Bridge' - see June 2017 **BRM**, how realistic the shepherd with his flock of sheep was on our layout 'Borrowdale' and how accurate the Co-operative grain milling mill was on our layout 'Wolfdale'. Of course some find fault, but most don't. I think 90% of our modelling time is great fun, and fair criticism I can live with.

David Quarrie



WHAT A SHED!

With reference to the Wickham Trolley shed mentioned in the Spring 2017 issue of **BRM**, one such shed exists at Didcot Railway Centre. It's situated about 20ft from the ticket office. Like the one in the article, it's made of sleepers - the giveaway is the gap under the front doors where rails used to be.



Arun Sharma



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Shopping list

- | Metcalfe Models PO263-4 OO/HO Corner Shop, M0054 – OO/HO Red Brick sheets
- | Craft knife
- | Steel rule
- | Scribing tool
- | Small screwdriver
- | Deluxe Materials Roket Card Glue
- | UHU
- | Wire
- | Tissue paper

OPEN ALL HOURS

Phil Parker channels his inner Arkwright with the build of a budget corner shop card kit from Metcalfe Models.

Subtle details make a difference on a model. The correct posters on a wall or cars in the street - even the clothes your figures wear define the era of your layout.

BRM Editor, Andy, presented me with a Metcalfe Models kit for a corner shop just as I finished reading the novel, 'The Trouble with Goats and Sheep' by Joanna Cannon. Set in the long, hot summer of 1976, the story included a detail that took me back to my childhood - orange shop windows.

In the days before air conditioning, many shops would stretch orange cellophane across the inside of windows to protect goods from the glare of the sun. As I

slurped my Walls Red Arrow lollipop (with free aeroplane!), I would have to strain my eyes to see what was inside. The decision was made - my miniature shop was to be set in 1976.

I'm a big fan of card kits. They're a cheap way to fill a baseboard with buildings for a start. Better still, if well designed, assembly is great fun. Although they aren't a five minute build, time spent is repaid with a lovely model.

My challenge is to modify the kit to look as good as possible with simple tweaks. By tackling those corners with readily available materials and working on the more obvious flat surfaces, I think the end result looks pretty respectable. ■

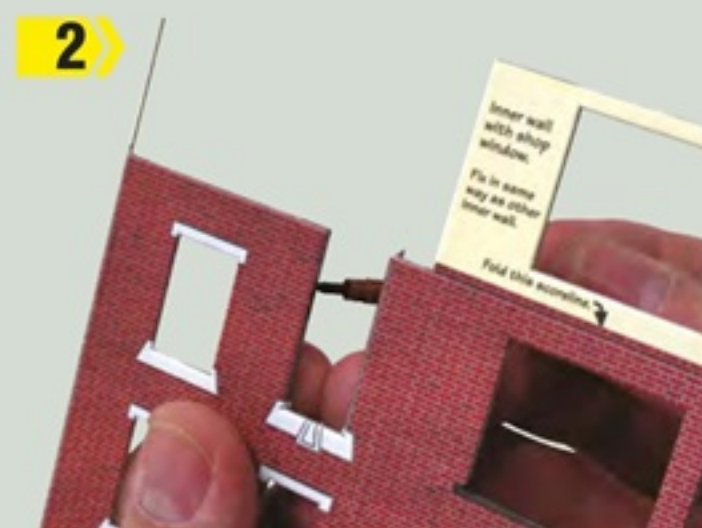
I'm a big fan of card kits. They're a cheap way to fill a baseboard with buildings



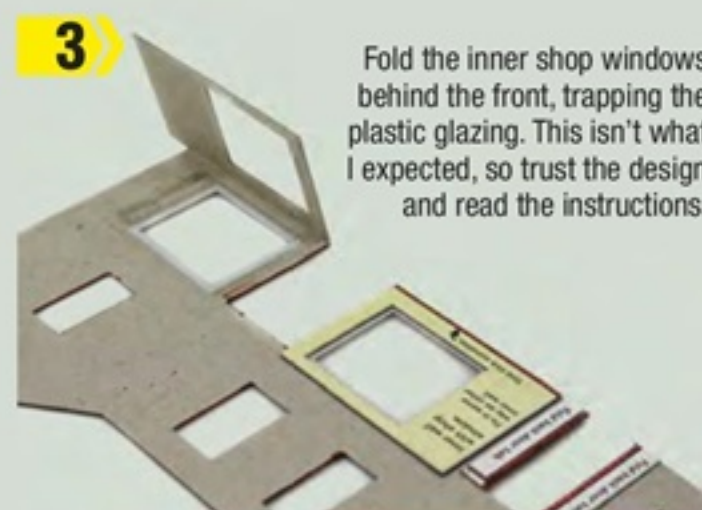
Young Phil Parker, circa 1976, orange shop windows not pictured.



Metcalfe Models' corner shop is supplied on thick, pre-printed cardboard sheets. All parts are die-cut, requiring a small nib to be cut through to release them from the sheet. Additionally, there are printed plastic windows and comprehensive instructions.



The classic upgrade for any card kit is to colour exposed edges using a felt-tipped pen. Colour from the back of the sheet to avoid getting ink on the printed front.



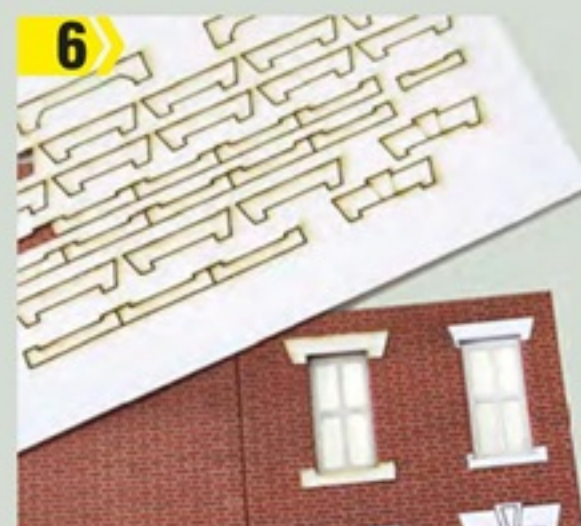
Fold the inner shop windows behind the front, trapping the plastic glazing. This isn't what I expected, so trust the design and read the instructions.



There are two window sizes, large and small, but the holes in the wall don't look very different. The printed side is matt and should face out. Clear all-purpose glue holds the plastic in place.



Printed curtains are provided and should be fitted with a scrap card spacer so they aren't on the back of the glass. The downstairs windows also need net curtains. A single ply of tissue paper works perfectly.



Laser-cut sills and lintels are found on a separate sheet. Fitting these provides depth to the detail, which makes them an essential addition no matter how good the printing.



I like to add interior walls so that you can't see through the building. Card offcuts from the kit or old packaging are perfect for this job. Test fit everything - a little trimming was required by some windows.



Despite being angled, the shop door fits perfectly between the two sides. Decorative mouldings surround the windows. I made a mistake by not colouring the visible brick edges - black paint sorts this.



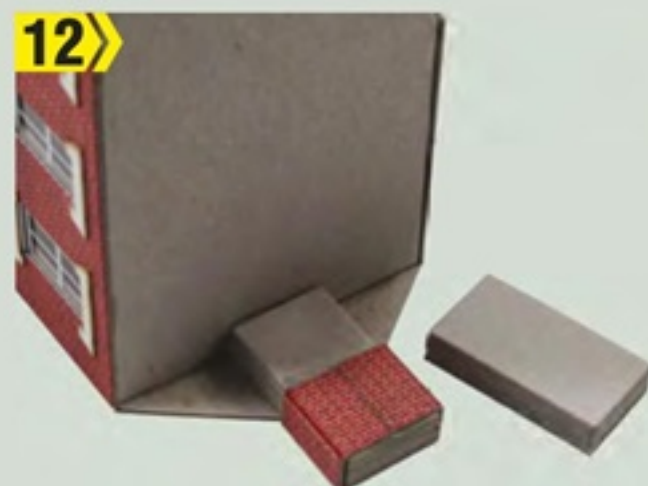
Assembling the shop sign looks complicated but once you fit the first spacers, it's easy. A small pink piece of card provides a guide to the correct distance for each above the window. It's not stuck but used as a jig.



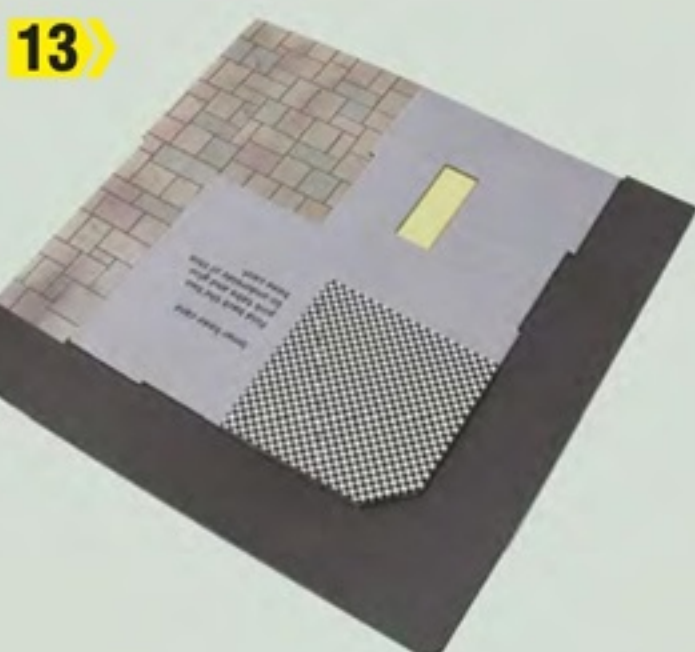
Several shop names are provided printed on thick card. More are on the thin card sheet to cut out and fix over the originals. Check the fit, I've coloured the ends and sides of the old name with black pen to hide gaps when the new name is added.



Orange cellophane used to be stuck to the back of shop windows to protect the goods from strong sunshine. Unable to find suitable sweet wrappers, I'm painting the inside with Humbrol clear paint.



Chimney stacks are built from plain card layers and wrapped with the thick card sides. A strong method of construction but one that relies on accurate alignment of the parts for a square result. A slow drying glue isn't a bad idea to allow for adjustment.



A couple of tabs in the main floor fold back to provide alignment guides when fitting it in the large sheet. Another layer is then added for the shop floor. You could print a different surface to add variety, although it's hardly obvious from outside the model.



Various shop interiors are provided although there are only two choices of back walls. A couple of small walls made from scrap card hide the gap behind the window displays when looking through the door.



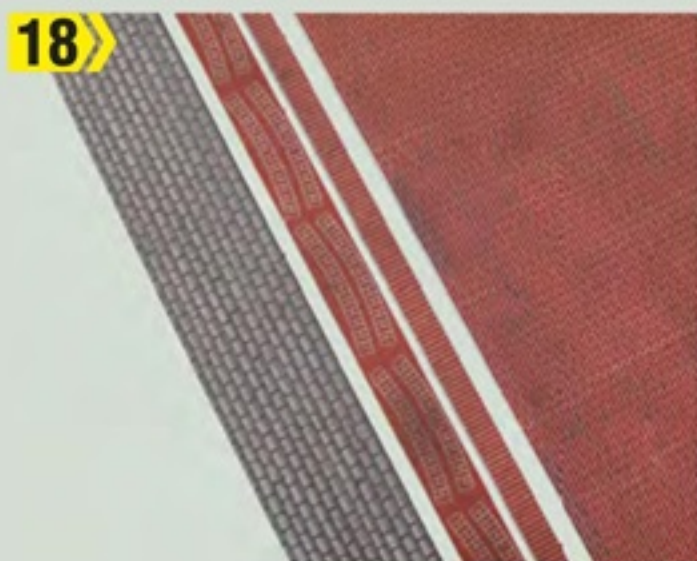
With the main part completed, a gable end is assembled in the same way. The inner walls for the passage aren't flush with the bottom of the wall but raised slightly to let the wall fit into a gap in the base.



Viewing a model from normal angles makes the roof more obvious than it is in real life. Printed sheets look too flat to be convincing, but scribing along the courses and between each slate improves things.



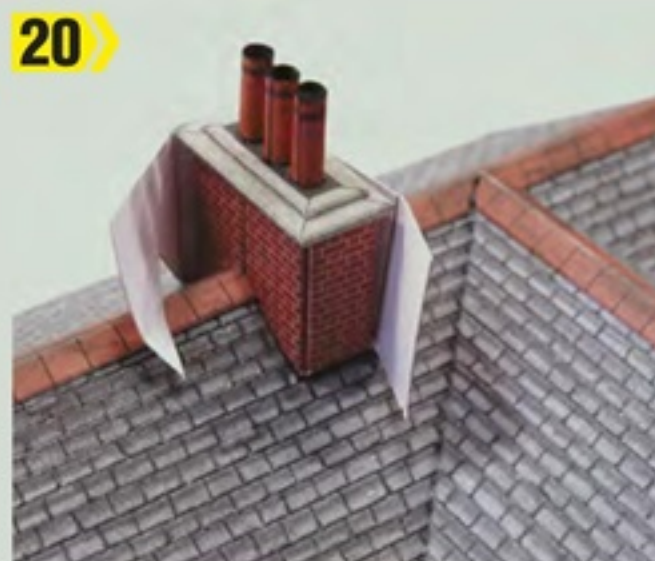
Both roof parts fit nicely, but I should've bevelled the inner edges of one of the gables with a fine sanding stick to have a less prominent join.



Bricks printed to match the Metcalfe range are available in Builder Sheet packs from the company. Each contains four thin and four thick brick card sheets which include useful curved lintels and roof tiles.



I've cut out the castellated design, ensuring that only whole brick faces appear. All the edges are coloured with felt pen and the part is test fitted. A tiny smear of glue holds it in place.



I feel that fancy corners would be excessive for the chimney stacks so these are wrapped in a single piece. While a join is still visible, it's not obvious and could be kept away from the viewing angle.



Chimneys get dirty, so a stiff brush and Humbrol Smoke weathering powder adds the all-important grime. As the card surface is very smooth, matt varnish, lightly sprayed and left to dry, helps adhesion.



Lead flashing stops rainwater seeping down between bricks and slates on real buildings. In model form, it's represented using 3mm wide strips of tissue paper and fixed with a tiny amount of PVA glue. A quick coat of paint finishes the job.



Printed pavement sheets and self-adhesive individual slabs are provided. The printed version matches the courtyard paving and the colours are superb, so I scribed the gaps between the slabs and used it.



No guttering is included, but it can be made from 4mm-wide strips from the edge of the thick card sheets. Colour with a black pen, then fix with the slightly curved edge from the die-cut sheet outwards.



Finally, the model is bedded into the ground with grass fibres blown into place from a bottle. Since this is a summer scene, I'm using mainly beige with only a hint of green.





Hear more...

there's a good range of models to choose from, but they all fit on a RTR chassis



THE WORLD'S SIMPLEST NARROW GAUGE ENGINE KIT?

Shopping list

Smallbrook Studio
7mm NG 'HERO' Small boiler side tank locomotive body kit
www.smallbrookstudio.co.uk
Eileen's Emporium
7mm scale Smokebox Dart
www.eileensemposium.com

Phil Parker shows that your first 7mm narrow gauge locomotive doesn't have to be expensive or complicated to build.

Fun little locos have been part of the Hornby range for as long as I can remember - thousands of them must have been produced. Early versions enjoy all the speed and control of a drag racing car, but many RMweb readers report that the modern chassis is surprisingly controllable.

What this means is we have a cheap and readily available line of locomotives. All we need to do is find something 'serious' to do with them.

You could add some details, a bit of weathering and the result is a passable

OO model. Some people have other ideas, though. The 7mm narrow gauge crowd care nothing for the prettily painted body, only for the mechanism inside.

7mm narrow gauge, or O16.5 as it's normally called, is possibly one of the most accessible scales for anyone wishing to get away from standard gauge modelling. You get to enjoy the easier-to-see parts of O gauge, but run on OO trackwork.

Building your first locomotive couldn't be simpler. Using a Smallbrook Studio kit, a respectable model can be assembled in

a couple of hours. There's a good range of models to choose from, but they all fit on a RTR chassis. That way you are guaranteed a working model at the end of the job.

Assembly requires few tools or materials - abrasives, superglue and a sharp knife will do. I eventually spent more time painting the model than I did building it.

In terms of rolling stock, many O16.5 modellers simply build replacement bodies on OO gauge wagons. And there's no shortage of those for sale cheaply on second hand stalls. ■



All parts are cast in resin and need very little cleaning up with fine emery paper. Do wear a mask to avoid breathing in the dust. Cleverly, the tanks incorporate lead shot to give the finished model plenty of weight. Wires embedded in the material strengthen the footplate.



A solid resin boiler seems like a lot of work to carve out to fit over the motor. It's far easier to find some plastic tube and cut it to length. A cutting tool designed for the plumbing industry makes producing accurate square ends a lot easier. Gradually tighten it on the tube while rotating the tool around. Eventually, a neat cut will be made.



All the remaining parts are attached with superglue. Keep looking along the model to make sure everything goes on square, as there are no location aids moulded into the components. Boiler bands are made from microstrip and the ring at the smokebox end from a length of solder. It's the right size and very easy to bend into position.



I can't claim to be very good at lining models with a bow pen, but once given a reasonably heavy weathering, my wobbly lines will hopefully look OK. The number is from an old waterslide set of LNER numerals and a set of etched nameplate finish the job.



A cheap Hornby 0-4-0, or chassis donor, as the narrow gauge world sees it. Produced in their thousands, you can pick them up second-hand everywhere. A screwdriver inserted between the gap above the cylinder and then twisted removes the body, which we don't need for this project.



Quite a bit of the tube has to be cut away for it to fit over the motor. Trial and error is the only way to do this. Don't worry about the gaps, these are hidden by the side tanks.



The finishing touch for the loco's 'face' is a brass smokebox dart. Supplied in three parts, the central spike fits into a hole drilled in the door. The arms are threaded over this, splayed at attractive angles and fixed with tiny dots of superglue.



The front of the cab looks a little plain so I've made up a whistle from plastic tube and wire. It's based on an old photo of the Ffestiniog Railway's 'Linda'. Adding this before fitting the dome would have made drilling through the cab front centrally a lot easier.



The chassis should clip straight into the resin footplate. If any material needs to be removed to make this happen, do it now. It's a lot easier than when the body is built. Pay special attention to the area where the front prongs clip on.



Another quick check – will the loco crew fit in the cab? It might seem silly, but I've been caught out several times with people who simply won't go in with all the cab fittings in place. The kit cab is pretty generous so there shouldn't be any problem.



Before the primer coat, resin models should be cleaned with washing-up liquid, rinsed well and left to dry overnight. Rattle-can car primer is perfect for this job and, once dry, will show up any areas that need a little filler or smoothing down.

Expert tip

When building kits, first find a box to put all the bits in to keep them together. That way you won't be searching for, say, a missing loco crew, and have to use a different figure from the ones you bought for the model.

KIRTLEY BRIDGE

Bob Hordern's West Yorkshire steam scenario relives the late 1930s in vivid detail, with both passenger and goods services in full working order.



Factfile

Layout name: Kirtley Bridge
Scale/Gauge: 7mm: 1ft / O gauge
Size including fiddle yards: 8.5m x 1m
Era/Region: Pre-war / LMS
Layout type: End to end
Words: Bob Hordern
Photography: Andy York



SEE IT IN ACTION
Watch Kirtley Bridge on your FREE DVD

0
GAUGE



“I've been replacing older wagons and constructing kits. Moving on from gluing Slaters wagons to soldering a Connoisseur etched brass horsebox has been quite a step for me

Johnson 1P 0-4-4T No. 1275, a Skipton engine, coasts into 'Kirtley Bridge's' sole platform with an evening service as the station staff look on.

LAYOUT OVERVIEW

Kirtley Bridge is my first venture into O gauge and, so far, has taken about five years to build. It's housed within an integral garage. It measures approximately 24ft and is made up of six boards, each with a 6mm plywood top set over a 9mm plywood frame. Trains run from a fiddle yard at one end, which is hidden from view by quarry workings.

The traverser and small manual turntable can handle up to five trains. In addition there is a cassette that can hold further stock when needed. At the Kirtley Bridge end of the layout there are goods facilities, sidings, two platforms and a passing loop.

Beyond the road bridge, 'Dalehead' is merely a set of sidings to receive and dispatch trains. This will enable a more interesting timetable at exhibitions. This option is only available at home, weather permitting, as it extends beyond the garage doors.

DESIGN AND STORAGE

Once the trackplan was settled upon much of the non-track area was cut away to reduce weight and allow scenic development. This was especially important where the river features were to be constructed. One board has two pairs of folding legs for stability whilst the others have one each. Cross-stays help keep it all secure. Some boards are stowed in pairs, allowing safer movement when the layout travels.

The track is C&L Finescale, built from lengths of rail, wooden sleepers and plastic chairs. My past experience of track-building has mostly been with copper-clad sleepers, so this has been a new departure.

ROLLING STOCK

Most items are secondhand and kit-built, plus two modified RTR items. Only one item is scratch-built. However, I've been steadily replacing older wagons and constructing kits. Moving on from gluing together Slaters wagons to soldering a Connoisseur etched brass horsebox has been quite a step for me. Here fellow modellers can offer good advice and help improve painting and weathering skills.

Passenger and goods vehicles total some 30 items. Most of the motive power is made up of ex-Midland Railway locomotives in pre-war LMS livery. These are steam dominated, but I own one early LMS diesel. Two classic tender locomotives – a 2P and a 4F – help a selection of tank engines run the scheduled services through Kirtley Bridge.



It's all about the Midland Railway in this picture; a Skipton-based 4F heads a short train of Midland vans with a Midland 20T Brake over the crossing passing the classic Midland signal box.



LAYOUT FOCUS



Half-relief buildings are used to good effect at the rear of the layout to save space, although from this angle, some can look out of place - the tree helps disguise the exposed edge.

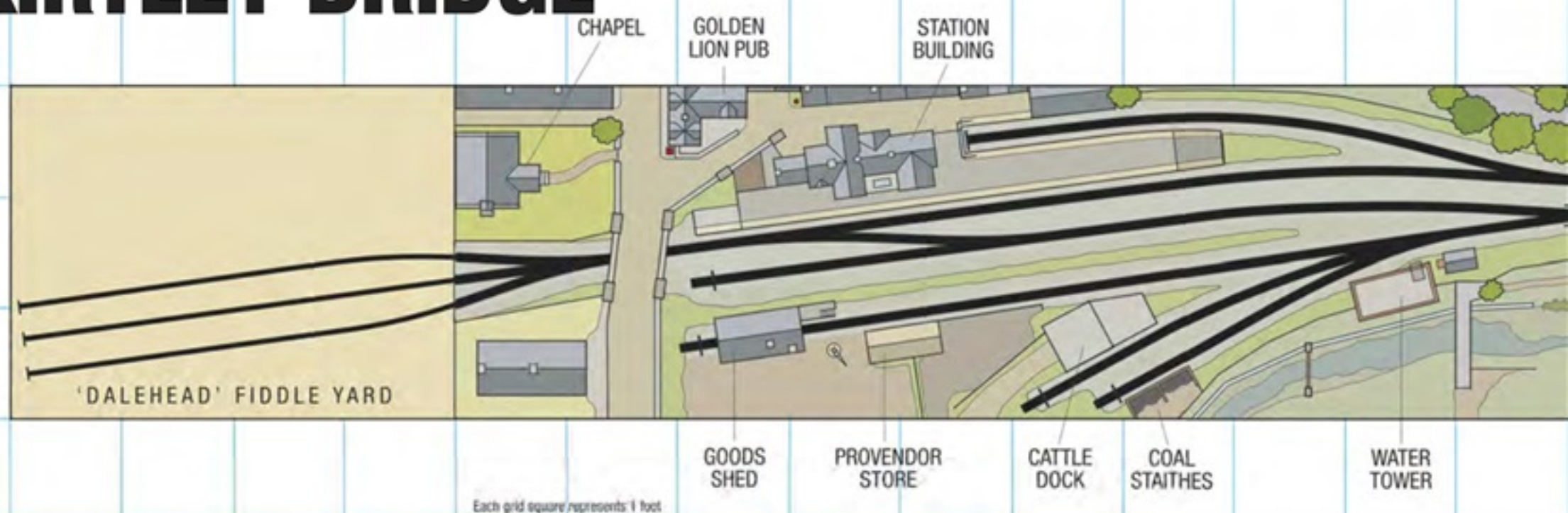


Against a limestone scenery backdrop, this watermill allows water to flow from the upper mill pond and through the mill to power the wheel.



Trackplan

KIRTLEY BRIDGE





BUILDINGS

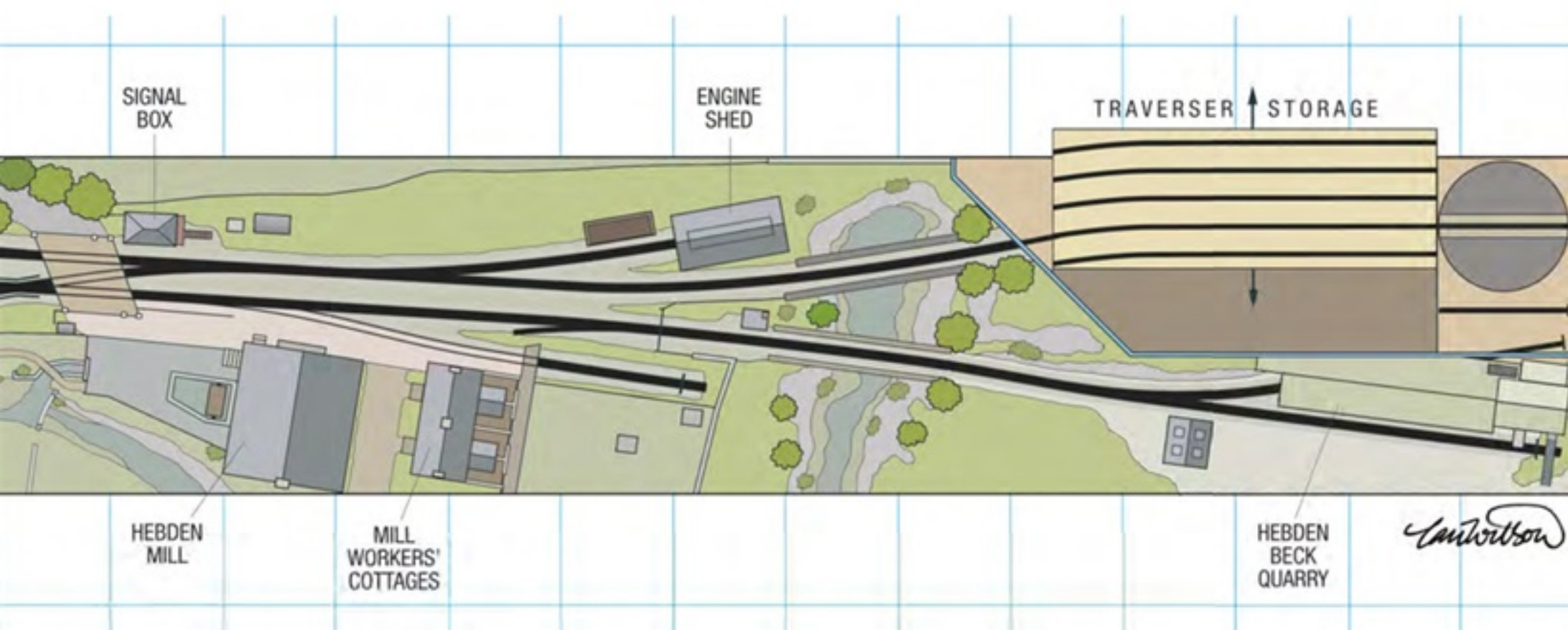
Constructions on the layout are mostly scratch-built. My method involves creating a framework built of thin plywood or strong card, and then this is clad in embossed Plastikard. All are based on real buildings, but often adapted to fit their eventual sites on the layout. Railway structures are mostly Midland Railway in style, as illustrated by the station building, whilst others are faithful to the locality modelled.

The Hebden Beck quarry building, for example, is a re-modelled version of a now gone prototype at Grassington (John Delaney and Co.) and the imposing Hebden Mill, with its workers' cottages, is a shortened version of Bridge End Mill at Settle. The model's back-shot wheel will eventually be motorised. I have tried to create a good mix of housing types, cottages and village amenities, with those at the rear of the layout being built in low-relief. Street and station lights are also provided by LEDs.

TRAINSPOTTING

The following locomotives run on Kirtley Bridge:

- 3F 0-6-0 No. 747
- 2P tender 4-4-0 No. 323
- 4F tender 0-6-0 No. 4197
- 1P 0-4-2 No. 1275 (auto-train)
- Hudswell Clarke 0-4-0 No. 6
- Fowler diesel 0-6-0 No. 2
- L&Y Pug 0-4-0 No. 11204
- Johnson 1F 0-6-0 No. 1820





LMS 0-4-4T No.1275 hauls a single brake-third coach on a local service. The backscene adds a nice touch in this view.

SETTING THE SCENE

The landscape is moulded using fly-screen mesh, which forms a base for plasterwork – this gives a light yet rigid framework. For rock outcrops in the quarry I've used bark, which was acquired when felling an overlarge poplar in the garden. The old quarry face shows this off well. The quarry bottoms are cat litter and fish tank gravel.

Modelling water was a big concern initially, but in the end I was able to master and utilise a variety of materials.

For the mill water I chose thin rippled perspex to allow the stream bed to show through, which looks effective. In the running water sections. After some experimentation, I settled on a top layer of Woodlands Scenics 'Realistic Water', which has created the shiny surface effect I wanted.

The smaller Hebden Beck curves across the layout and passes under two bridges. The branch line bridge from Wharfedale has lattice sides whilst the quarry traffic passes over a simple wooden trestle. Together they make an attractive scenic feature, especially as stone trains are often held on the bridge

by the signalman as they emerge from the quarry.

For trees I use wire armatures to which various types of foliage. The larger items are made of Sedum flower heads, which are carefully dried, fastened together and then covered in flock. I use the usual mix of proprietary scenic materials elsewhere, but I am much impressed with the finish provided by static grass application and continue to experiment with this medium.

Finally, I was very lucky to find a set of background sheets that really do match the area I have modelled.

FACT MEETS FICTION

In the closing years of the 19th century, a group of local businessmen in upper Wharfedale raised funds to build a light railway to serve their estates, farms, mills and quarries. Trains would run up the valley through the villages of Hebden and Kirtley Bridge, eventually reaching the small hamlet at Dalehead. Local people hoped to use the line to reach the towns of West Yorkshire.

As in many such enterprises, the optimism of the early owners didn't match the realities

of running a railway profitably, so it was with some relief locally that the Midland Railway Company took over the line even before it was completed. This was soon reflected in the trackwork, station buildings and railway practices that followed. The railway thrived and ran like this until the LMS took control in 1923.

This seems a convincing fiction and is not untypical of some railway operations in the Yorkshire Dales. My 0 gauge model version of this railway portrays the growing village of Kirtley Bridge served by its branchline. It is set in the late 1930s when passenger and goods services were both operating successfully.

Traffic on the line includes limestone from the quarry at Hebden Beck, where a transshipment shed transfers stone from narrow to standard gauge wagons. From here the quarry locomotive brings stone wagons across the Hebden Beck viaduct to the yard at Kirtley Bridge. Hebden Mill is built next to Hebden Water – a tributary of the larger river Wharfe. Owned by the same family for three generations, it uses water power and generates textile traffic on the branch.



Livestock movements are another feature, including cattle, lambs and milk. Passenger services use ex-Midland stock and in recent years Bradford Corporation has built a reservoir above Dalehead increasing freight to serve this facility too.

OPERATIONS

Controls is analogue and a mimic panel is operated from the rear of the layout, with two handheld controllers attached. The fiddleyard has its own small panel, which allows for two-person operation. Power comes from a box of three open transformers, giving six outputs to operate track and accessories. The baseboards are linked by a wiring loom and 'D' connectors. Tortoise motors operate the points and servos, the quarry gates and the signals. In addition to this there are two e-halogen lighting poles.

My immediate task is to add more signals to the layout and finish fitting the Dingham couplings and the uncoupling magnets.

For now I'm looking forward to running a proper timetable, and maybe getting some exhibition bookings. For the future

It's hot weather, and the locals are thirsty - luckily a delivery from Lightfoot's Ales will see to the current shortage behind the bar at the Golden Lion.



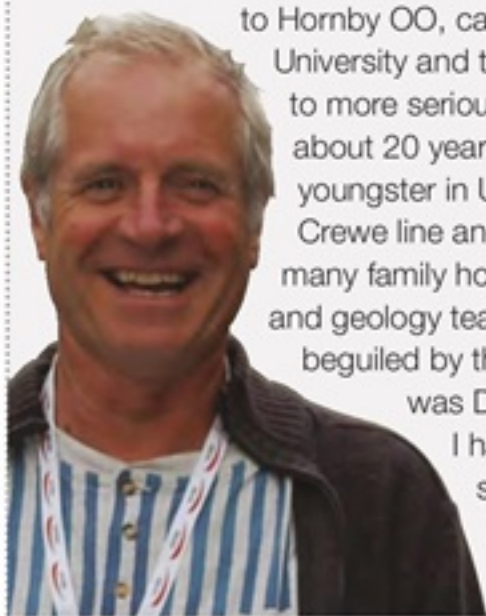
The quarry equipment is at rest and the foreman is getting anxious as he looks out of his office window. Someone is due an earful.

there is the possibility of adding two small extensions to the front of each end of the layout. An extra siding for the quarry would help too, as would longer sidings at Kirtley Bridge to accommodate more stock and prompt the building of a proper Midland goods shed.

Finally, apart from the expense of converting the locomotives, the layout's existing electrics would lend themselves relatively easily to DCC conversion.

We'll just have to see!

MEET THE MODELLER



I began my modelling with Triang TT in what was the box room. I then moved on to Hornby OO, captivated by the layouts of Peter Denny and P. D. Hancock.

University and then a growing family curtailed activities, but eventually I returned to more serious modelling, this time in EM gauge. I built various layouts over about 20 years before changing to 7mm scale about 5 years ago. As a youngster in Uttoxeter I would visit the local shed (5F), spot 'Jubilees' on the Crewe line and ride up to Alton on the Churnet Valley Line. Later on we spent many family holidays on the narrow gauge lines in Wales. As a geography and geology teacher I eventually moved to the Yorkshire Dales and was soon beguiled by the Midland Railway and the Settle and Carlisle line. This time it was David Jenkinson's 'Garsdale' that inspired my modelling.

I have always been happiest constructing buildings and creating scenery, though having now retired from education I have become interested in electronics such as CBUS and DCC. I'm a member of Skipton & District Railway Club and the O Gauge Guild.

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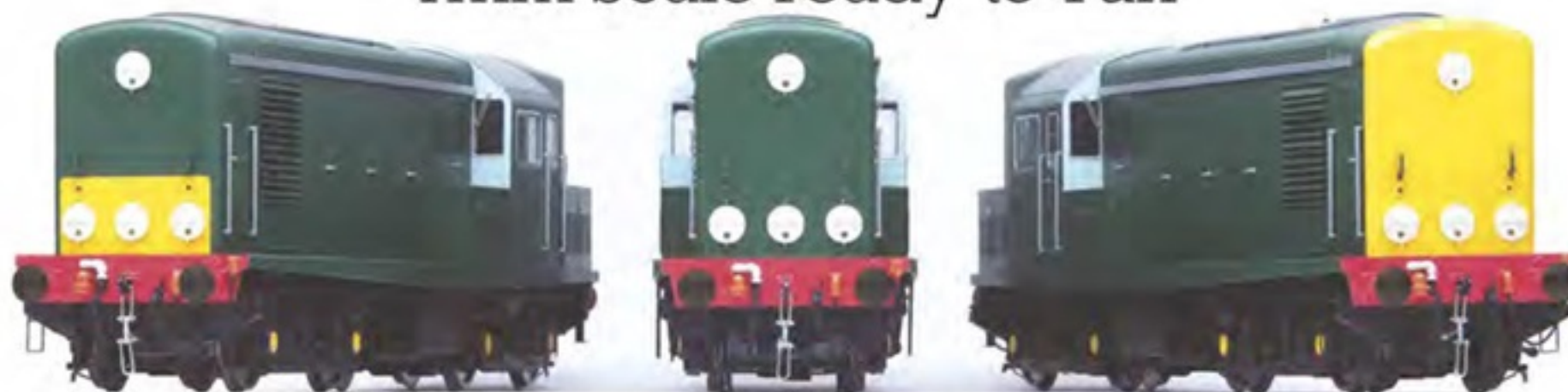
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ANY
GAUGE



MODELLING ECCLESBOURNE

This photograph is taken at track level, with the whole of the station building in view. The twin gabled design is identical to the station building at 'Hazelwood'. Besides the weathering to the stonework, note also the rain staining to the roofing slates.

Observation of the finer details is the key to modelling success. Accomplished artist David Wright finds there's much to study on the Ecclesbourne Valley Railway

Hazelwood station was much like other intermediate stations along the line. Another reason for choosing Hazelwood was to link it with the recently released limited edition private owner wagon from Bachmann. This 7 plank coal wagon belonged to H. Swift, the local coal merchant, and the wagon was lettered 'SWIFT HAZELWOOD'. The artwork was designed and supplied to Bachmann by me.

Hazelwood station is located in the lower wide expanse of the Ecclesbourne Valley, around two miles (3km) from the junction with the main line at Duffield. Before entering the station's single platform, the line



This is the view looking back towards the station, with the river bridge taking centre stage. The footpath crossing in the foreground is where the loop would have been. The footbridge is also clearly visible running parallel to the rail bridge.



The River Ecclesbourne as seen looking down from the railway.



I have included this image to show the main window detail, consisting of stone mullions. It also gives good colour reference to the weathering of the stonework.



These images show my construction methods for one of the over bridges on the line. Heavy duty cardboard is reinforced with a balsa wood inner frame, with thinner card inside the arches. Das modelling clay is used to skin the outside. When dry, the Das is scribed to represent the stonework. The results are both effective and rewarding.

“...the yard and goods facilities closed to traffic in 1964. The yard was then occupied by an indoor riding school for many years.”

was crossed by a three arched over bridge carrying Nether Lane. All the bridges along the line, including this one at Hazelwood, featured a central arch to accommodate two tracks. All the bridges of the lower section were constructed of brick, whereas those of the upper section were built from sandstone. The branch was originally to be laid with double track to reach Matlock and beyond, but the line terminated at Wirksworth.

The single platform had a loading dock at the Wirksworth end, with a loop running from a turnout beyond the end of the platform. Both the loading and the milk dock were accessed from a turnout off the station end of the loop. All the points were controlled from a ground frame. The station building featured two identical gables, joined together with a narrow booking hall. The centre section included a small canopy supported on a steel girder. The original building survives, although it has been



This photograph, taken at track level gives a good view of the station platform walling, edging stones and the diagonal Midland Railway design of fencing at the rear.



I have included the yard view of one of the gables to show the design of the barge boards. With the camera angle at a higher position, the barge boards could be used to scan for laser cutting ready to use on a model. The rain staining to the roofing slates is also clearly evident in this image.

altered to accommodate a local business. I have also included a photograph of the next station along the branch, 'Shottle'. The station building still retains most of its original features. It is exactly the same as the one at Hazelwood, providing all the reference required for the modeller.

The yard at Hazelwood could hold 38 standard-sized wagons. Herbert Swift became the local coal merchant and was based at the station, owning two 12 ton wagons.

At the Wirksworth end of the yard, both the loop and the main running line crossed the River Ecclesbourne on a two-arched bridge. A footpath crossed here which ran parallel with the railway on an extension to the river bridge. The loop connected back with the main running lines just beyond the bridge, with a head shunt provided.

Hazelwood station closed in January 1953 and the yard and goods facilities closed to traffic in 1964. The yard was then occupied by an indoor riding school for many years. Today the station site houses a timber yard and working sawmill.

The yard at Hazelwood could hold 38 standard-sized wagons. Herbert Swift became the local coal merchant and was based at the station, owning two 12 ton wagons.



This photograph shows the over bridge carrying the A517, Belper to Ashbourne trunk road. The over bridge at Hazlewood is almost identical to this one at Shottle, using blue and red brick for construction.



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BLUEBELL CUTTING

A childhood model railway leads to a lifetime passion in the hobby for Stephen Lowndes, culminating in this scenic N gauge layout with a little encouragement from his model railway club.

I was given a Hornby Dublo three-rail train set as a child; although hindsight suggests that I might not have been the sole beneficiary

ENTHUSIASTIC BEGINNINGS

I can't recall a time when I didn't have a model railway layout. I was given a Hornby Dublo three-rail train set as a child; although hindsight suggests that I might not have been the sole beneficiary in my father's mind when buying it. Nevertheless, my interest in the hobby has been unswerving ever since, and I still own the Dublo train set.

I am a stalwart of the Alsager Railway Association (ARA), which has club layouts ranging from Z to O gauge. In my loft I have an extensive fixed 00 gauge layout, but I also own an impressive collection of O gauge locomotives and rolling stock. Size constraints mean I don't have a layout at home. Fortunately, the ARA boasts what I believe is one of the country's best O gauge layouts - 'Hassel Harbour Bridge', and so running my fleet presents no problem. However, it's in N gauge that my passion for model railways has been given expression.

STRONG ENCOURAGEMENT

The ARA N gauge team has an extensive programme of exhibitions the length of the country. I soon became a regular operator, with either the club's 'Newcastle by the Water' layout (see BRM TV September 2016) or one of the members' layouts. It wasn't long before I succumbed to the peer-group pressure to build my own N gauge layout.

I wasn't a novice modeller and have been regarded as one of the club's 'go-to' guys; constantly in demand to solve a reluctant runner or an under-the-board electrical fault.

I was able to call on the carpentry skills of ARA Exhibition Manager, John Cox to build the base layout for Bluebell Cutting. This has all the hallmarks of John's skillful planning and design features, with foldaway legs for ease of transporting, and tongue and groove fitting between boards to ensure stability and smooth running across board joints.

MATERIALS AND PRODUCTS

Built using 3in x 1in plain square-edged frames and 6mm ply for the running surface, the layout measures 9ft long x 3ft deep, of which 2ft is the scenic section, plus a short 8ft bolt-on storage addition for clockwise-bound DMUs. The track is a basic double oval, with up and down lines each controlled by a Gaugemaster DC analogue controller. These are installed in a control box, which spans the ten fiddle-yard tracks at the back of the layout and has a hinged lid to access the tracks below. The control box also includes studs and probes for changing

Factfile

Layout Name: Bluebell Cutting
Scale/Gauge: 2mm:1ft scale, N Gauge
Size (including fiddle yards): 9ft x 3ft 8in
Era/Region: Present, non-specific region
Location: Fictitious rural
Layout Type: Continuous oval
Power/control: Gaugemaster 12V DC Analogue
Words: Richard Hart/Stephen Lowndes
Photography: Andy York

Seven rules for exhibitions:

- People pay to come through the door to see trains running.
- There should be train movement with a minimum of down time.
- Train movements should be in an interesting setting with things to view between trains.
- Layouts should be simple to run and operate so that problems can be traced and resolved quickly.
- Layouts should be low enough for people in wheelchairs to see.
- There should be a minimum of barriers between operators and public so dialogue can take place.
- The layout should be easily demountable and of appropriate size for transportation.

points on mimic trackplans for each track. I favour the use of Seep point motors and the track throughout is Peco Code 80. The switch points are mainly Peco Electrofrog medium radius, although some first radius set track Insulfrog points are used where storage space is at a premium.

OPERATORS AND SHOWS

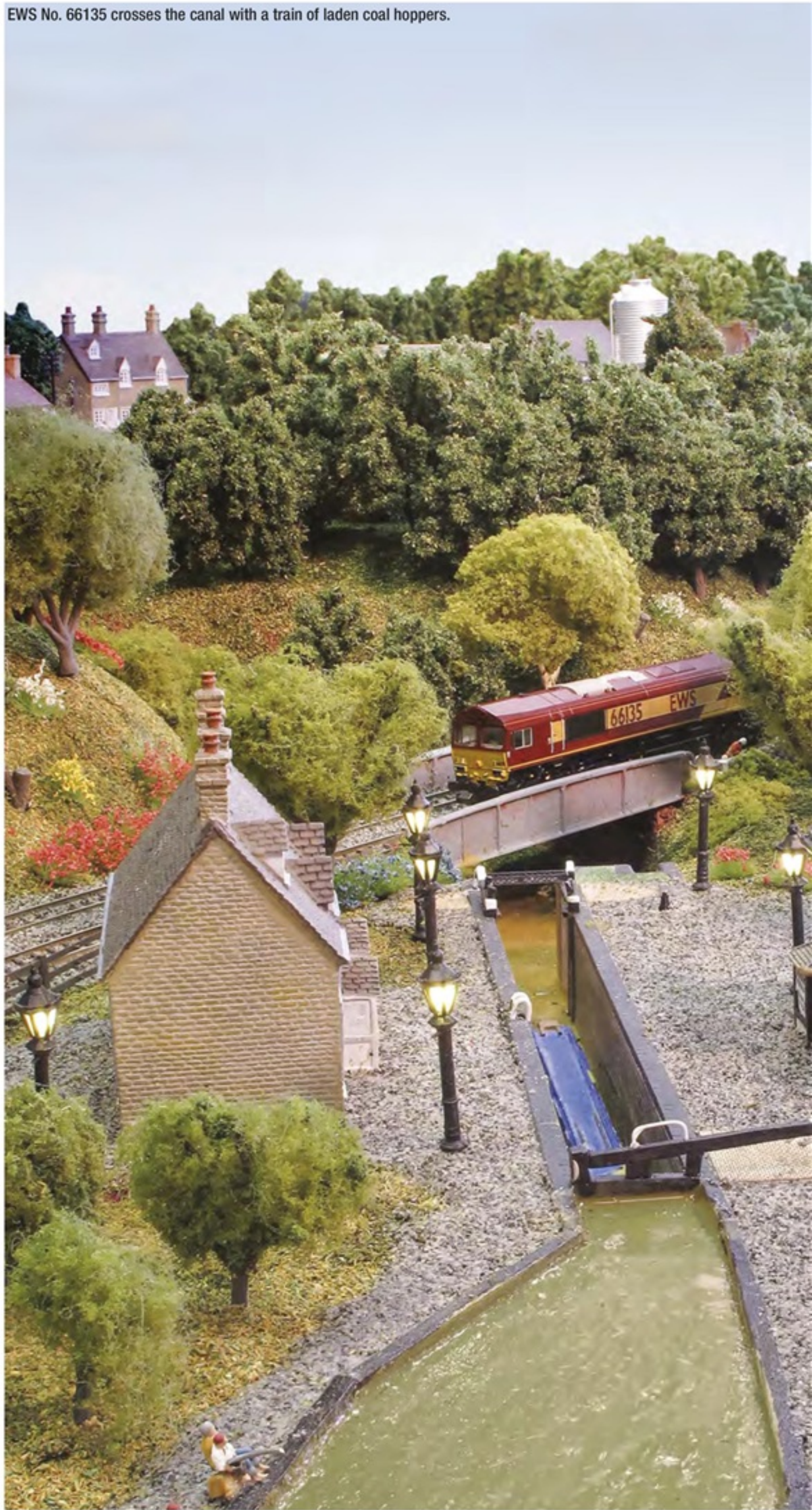
Although one person can operate the layout, it's much better to have two; one for each direction. This is particularly advantageous when engaging with the public, which I'm keen to do, as distractions can lead to operational inexactitudes.

In addition to the passing loop-style storage lines, each line also has a wing with more storage tracks where another six two-car DMUs can be brought into play in each direction. By using isolating sections in the loops, I can have over 20 trains at my disposal. This fits in perfectly with my philosophy of having a constant stream of different trains running at model railway exhibitions.

Although anyone designing a layout has the interests of the operators in mind, a purpose-built exhibition layout is primarily to present to the public. With all this in mind, my layout was conceived and built over a two year period.

I decided against having stations, sidings, shunting and junctions in the scenic area, favouring instead continuous running along the length of the layout. There are plenty of other first-rate layouts with those features at shows for the public to view. This doesn't mean that we're left with a flat featureless

EWS No. 66135 crosses the canal with a train of laden coal hoppers.





A Freightliner Class 70 hauls a train of containers past a Permanent Way gang working on the down line.

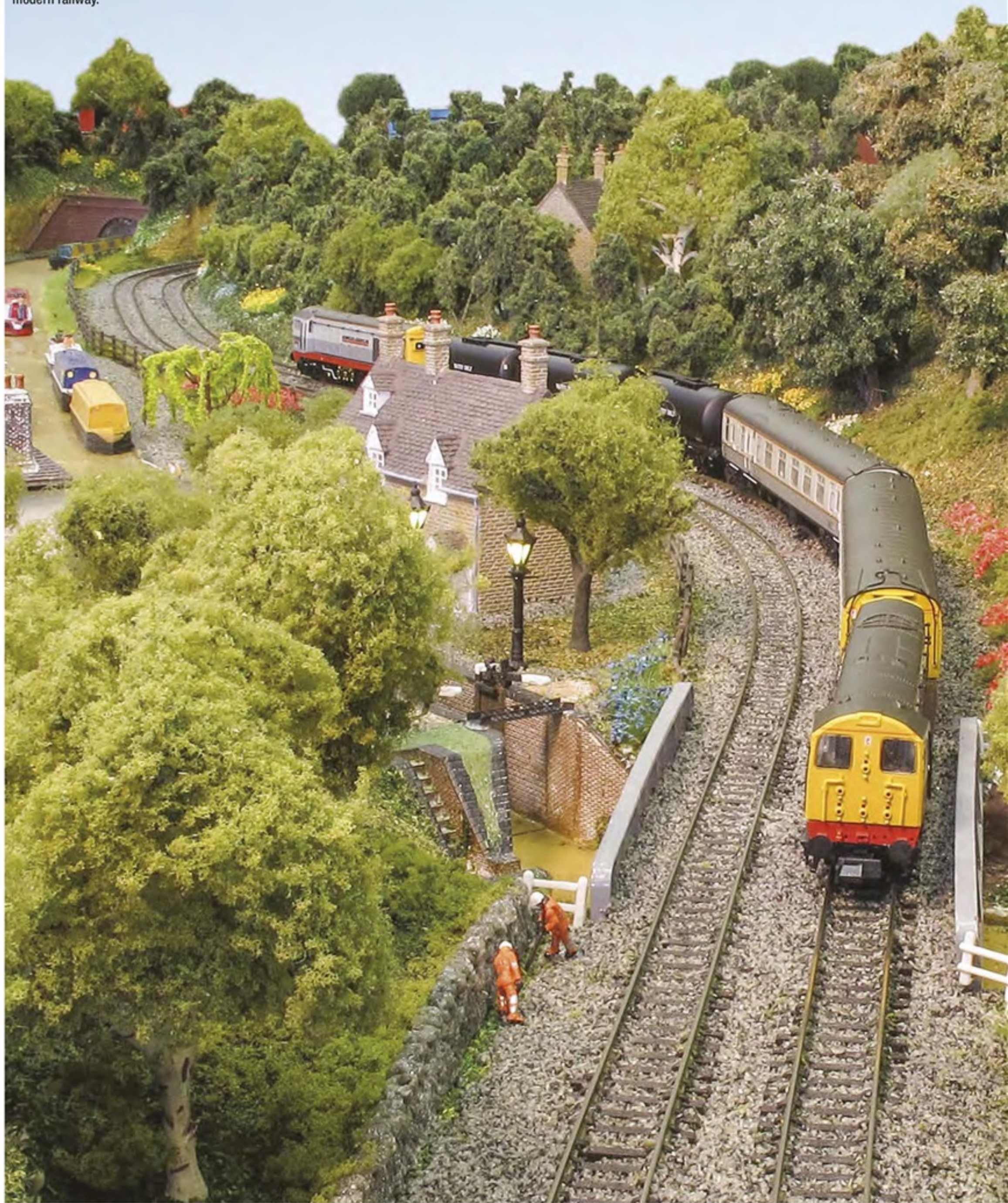


Central Trains' Class 150 DMU, No. 150125, with its distinctive livery, allows its passengers to gaze at holiday-makers enjoying the more leisurely pace of the canal.



LAYOUT FOCUS

A pair of Class 20s (Nos. 20906 and 20904) in Hunslet-Barclay livery take a weed-killer train on the up line over the canal. The layout features an impressive quantity of trees and undergrowth; something we see wherever we look at the modern railway.





roundy-roundy, as the scenic section abounds with wooded areas, agricultural activity and busy road traffic.

It was this shaped polystyrene and foam based hill-side topography that gave rise to the name of the layout: the cutting through which the line runs into the left hand tunnel is awash with bluebells.

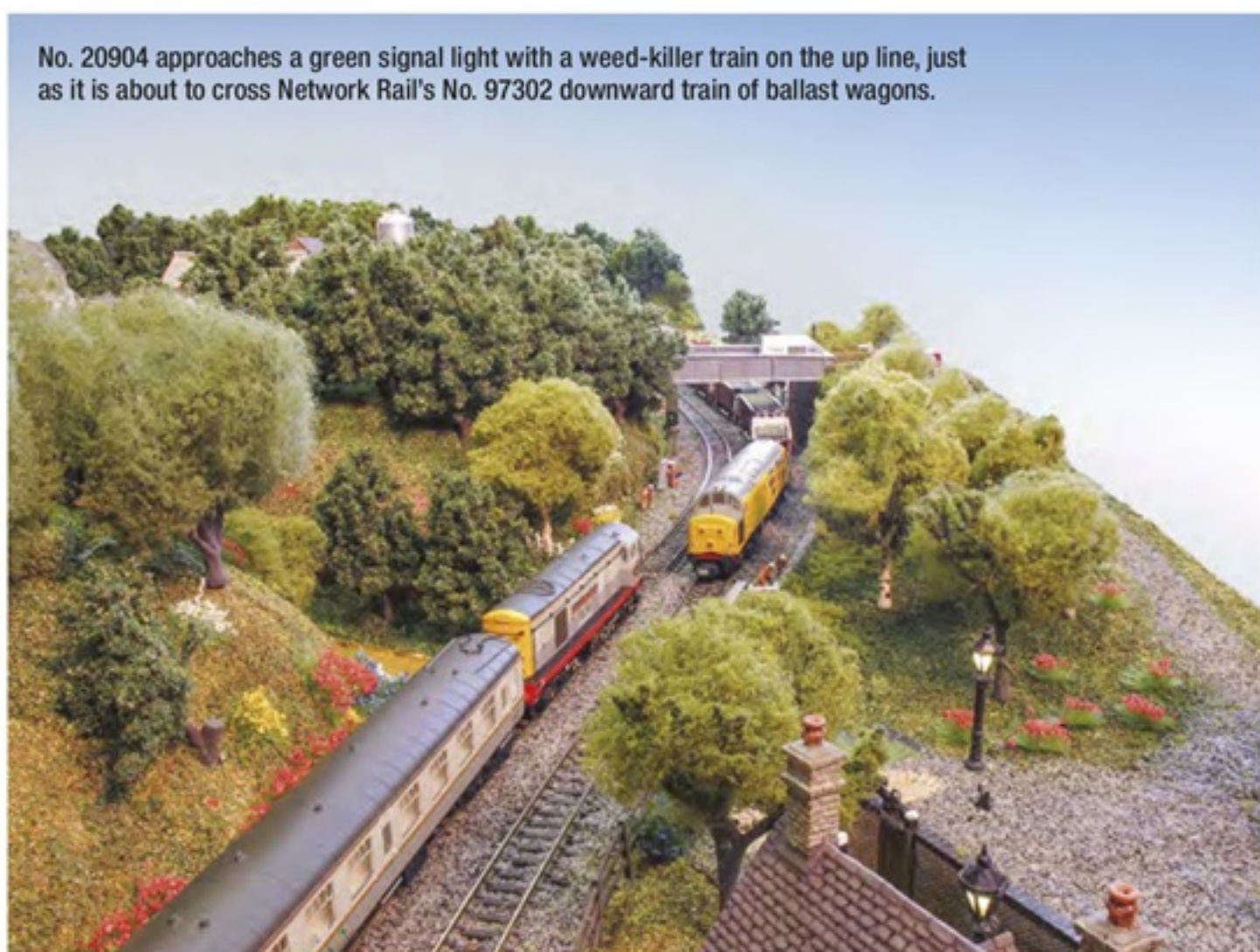
This eponymous feature does, however, come with a cautionary warning to other modellers. John Cox had sourced some nicely blue coloured scatter to represent the bluebells and to fix it firmly in place I used diluted PVA, which promptly bleached the bluebells of all colour. Enter the ARA club Chairman Andy Small who, fortuitously, is a weathering expert and the bluebells were restored to pristine blue, and the need to re-name the layout was averted.

ENTERTAINING FEATURES

The main central eye-grabbing feature is the canal. Although Bluebell Cutting is a fictitious location, the canal tunnel and the colour of the water were inspired by the Trent and Mersey at the northern portal of Harecastle Tunnel, leading to the locks of Heartbreak Hill. The level of interest in the scenery and non-railway features is very encouraging and operators hear the public pointing out different things to each other, with children noting the Eddie Stobart lorries, fire engines, sunbathing narrow-boaters, AA and RAC vans.

I've opted for ready-to-place buildings, vehicles and people. This was a direct

No. 20904 approaches a green signal light with a weed-killer train on the up line, just as it is about to cross Network Rail's No. 97302 downward train of ballast wagons.



Class 20 meets Class 97 as dusk falls at Bluebell Lock. Exhibition goers have suggested the lock-keeper's cottage would make an excellent pub; called the Blue Bell Inn, of course!



response to the pressure we were under to complete the layout in time for pre-booked exhibitions. Notable, however, is the use of ballpoint pens with the ink removed as the point-changing probes, with a wire soldered to the inside of the nib. Having repaired the club's layout probes in this manner, and finding them robust, I employed this style right from the start on 'Bluebell Cutting'.

CROWD PLEASING

Not having a location has the advantage of allowing a more liberal choice of locomotives, liveries and rolling stock. There are no overhead catenaries, so locomotives are restricted to diesels. A variety of liveries results in people being able to identify their local services. Positive comments are very satisfying, with the highest accolade being that people feel entertained. That must be the best vindication for any purpose-built exhibition layout.

A DRS Blue Compass liveried Class 66, No. 66434, pulls a train of oil tanks up the main line past a narrowboat accelerating up a top speed of 4 mph as it emerges from the canal tunnel portal.



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CUSTOMISE YOUR WAGONS

Phil Lewis' collection of wagons required a few sources of inspiration and some creativity.

There are many aspects of model railways that interest me, but I believe models should be appropriate to your chosen location. I'm highlighting some of my modified kit-built or scratch-built wagons and the methods I've used to customise them. Many use parts from RTR wagons and so can be made cheaply.

I operate my layout from the front and it's a real pleasure to discuss models and share knowledge with the public. One chap came back to a show the following day to show me

his wagons that were similarly built. Youngsters love to see the vivid colours from pre-grouping days. The symbols on wagon sides helped identify company owners. Covered vans on the Lancashire and Yorkshire were painted blue for butter, reddish pink for meat or white or pale green for fish. I've chosen seven wagons from my own fleet of various origins to show you how they were adapted to look different from other everyday items of rolling stock that you might have on your layout.

Six-wheel milk van

This Lancashire and Yorkshire (L&Y) milk churn van is scratch-built using plans given to me by a member of the L&Y Society. The OO gauge plans made an ideal template and construction is from wood strip bought many years ago of North American origin, but I've since lost the details. Fine quality ply would do an equally good job. The floor is built from thicker ply and the van is brush painted using with Precision Paints ready-mixed L&Y colours. I hand-lettered the sides with Humbrol yellow paint. The prototypes were used across the L&Y to carrying milk before the introduction of bespoke tank wagons. It's a light-weight wagon, so I stuck thin car wheel balance weights underneath for ballast.



Gathering research

I find the following sources of information particularly useful when working on wagons:

1. Private owner wagon books by Bill Hudon
2. Books relating to the location being modelled e.g. *The Cromford and High Peak line* or Dave Larkin's books on BR wagon stock.
3. Information from societies such as the Lancashire and Yorkshire Railway Society.
4. Working from photographs in print and online.

Seven plank SPC, Dearne Valley and Barnsley Main wagons

These three wagons were built in the same way using plywood bodies given to me by a trader who had a model shop at Greenfield, Oldham.

I finished them using Kenline fittings - you can still find these at swap meets - alternatively, use fittings from Parkside Dundas. I mounted the bodies on Bachmann wagon underframes.

They're all from Yorkshire. The Barnsley and Dearne Valley wagons are pit-based and would travel all over the system.

For painting and lettering I recommend four books written by Geoff Kent and John Hayes - *The 4mm wagon* (parts 1-3) and *The 4mm Coal Wagon*, respectively. They're all excellent practical guides and are where I found my modelling techniques.

Having found the appropriate picture I copied a 4mm plan of a seven-plank wagon as a template and marked out the lettering with a pencil. A base coat is applied by brush to the wagon and, once dry, ironwork is picked out with a fine brush. I then mark out the wagon using a fine pencil until I'm happy with the spacing. The planking is an excellent guide, but if I need a different guide I use Tamiya masking tape.



The lettering is achieved with diluted acrylic white paint and a calligraphy pen. I find it easier with others to use a brush. Draw the straight letters first, choosing a simple name like B W C before trying more difficult lettering. Allow to dry before you correct errors using a fine scalpel blade. Once satisfied, I lightly spray with satin varnish to seal.



The SPC wagon is Bradford-based and typical of a local coal merchant, travelling much nearer to home. The logo shape was first masked with tape and Humbrol Maskol before the black base coat was applied. The masking was removed and the area cleaned before painting the background yellow. Letters were added as before. The tiny words were painted using a needle and patience.



Seven plank private owner - Wigan Coal

This is an ABS kit. Wigan coal had a large fleet of wagons, which were seen across the north. I applied the red shading with a pen and wobbles were tidied with a fine blade before varnishing.

L&Y goods vans

These typical L&Y butter and fish wagons are made from David Geen kits. They're high quality and come with comprehensive instructions. They are both of soldered construction, with superglue being used for the smaller parts. Both vans were painted with acrylic paint - the blue is Citadel Caledor Sky and matt white for the fish van. The transfers are Pressfix from the HMRS range. Both were brush painted with the roofs painted matt grey. The weathering on the fish van was applied with a fine make up brush. The canvas roof is made from tissue paper laid onto wet grey paint and gently pushed down with a finger. I allowed it to dry before gently painting it grey.



These vans ran in rakes from ports such as Hull or Fleetwood were painted distinctive colours for ease of recognition. The fish van has the L&Y illiterate sign - a black circle around a black triangle. The strapping was carefully painted with a fine sable brush. Both van sides were varnished with satin clearcoat.

A TIN TURTLE IN NO MAN'S LAND

Modeller Chris Hopper creates a convincingly bleak diorama for this unusual wartime transporter, itself something of a rarity in garden scale.

This is a Swift Sixteen 16mm scale 'Protected' Simplex (or Tin Turtle) from the two-foot gauge World War I War Department Light Railway (WDLR). The kit includes brass and resin parts and came with the motor and chain-driven chassis ready-made. The kit is based on locomotive number LR3090, which can be found at the Apedale Heritage Centre near Newcastle-under-Lyme.

The locomotive is built for radio control and has a simple sound card fitted. The Radio Control system consists of a very nice hand-held controller, a URX 1 Receiver and a URC 1 controller – the last two components are installed in the locomotive. I also decided to include basic sound, sourced from ACME Engineering. I added a 12V AA 2300 Ah Strikealite rechargeable battery pack, also bought from Swift Sixteen.

The purchase of this model has led to the construction of wagons, which are great fun to build, after which I decided I needed somewhere to run them. The solution was a small layout using Peco SM32 track, which is relatively unusual in this scale. This small module is the first section of what will effectively be an 'Inglenook' shunting layout, capable of use for both R/C and DCC locomotives.

The section shown includes a simple wooden girder bridge made from stained balsa sections, which gives a bit of height to the scene and provides easy access to the on/off switch if the locomotive is left on the layout. The first layer of ground cover was made using cheap DIY filler, prior to painting with emulsion paint that was selected to match the terrain of the Somme area.

The water is a sheet of acrylic sprayed a murky green on the reverse. The ground cover is a mixture of Woodland Scenics

ballast and some chippings and sand sourced from various suppliers and foraging trips. The little details include homemade duck boards and ammunition boxes from the Red Star Steam Packet company. The rather stark tree is a suitable twig, but I think it's effective.

I'll be adding a fully 'Armoured' Turtle to the roster as soon as Swift Sixteen releases it and that locomotive will be built for DCC control, made possible with the chassis provided with the locomotive kit.

The current increase in interest in the ongoing centenary of WWI and the proliferation of high quality kits for the locomotives and rolling stock of the WDLR makes this a viable and interesting project. There's a lot of research material available, including the superb WDLR Album by Roy C Link (£31.95, RCL Publications), which includes masses of modelling inspiration.

Finally, the build of the locomotive was made easier by an article in the August 2014 issue of Garden Rail by David F Williams, to whom I am very grateful.



When I saw Chris's model it looked amazing – in a large and busy show, it was eye-catching. Working to such a high standard in garden railway scales is rare and I really look forward to seeing the layout in the future.





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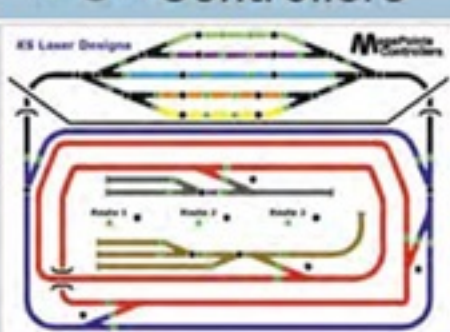
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The 2011 RMWeb Challenge forced me to focus on a small project over a short period with an enforced deadline. The result, 'Woodmores Scrapyard', was very satisfying to me as a modeller.

KEEP MOTIVATED

Motivation is crucial when seeing modelling projects through to completion. In a bid to prevent unfinished projects, Michael Russell offers helpful advice.

Not finishing what we start can be a significant source of demotivation, as we don't experience the joy of standing back to admire the fruits of our labours. My biggest modelling thrill is waking up and going to see how yesterday's work has turned out after the paint has dried. I can only do this if I continually have new projects to tackle.

Ultimately, having lots of unfinished projects sat around can make you feel under pressure and surveying a scene of half-completed projects is likely to scream failure

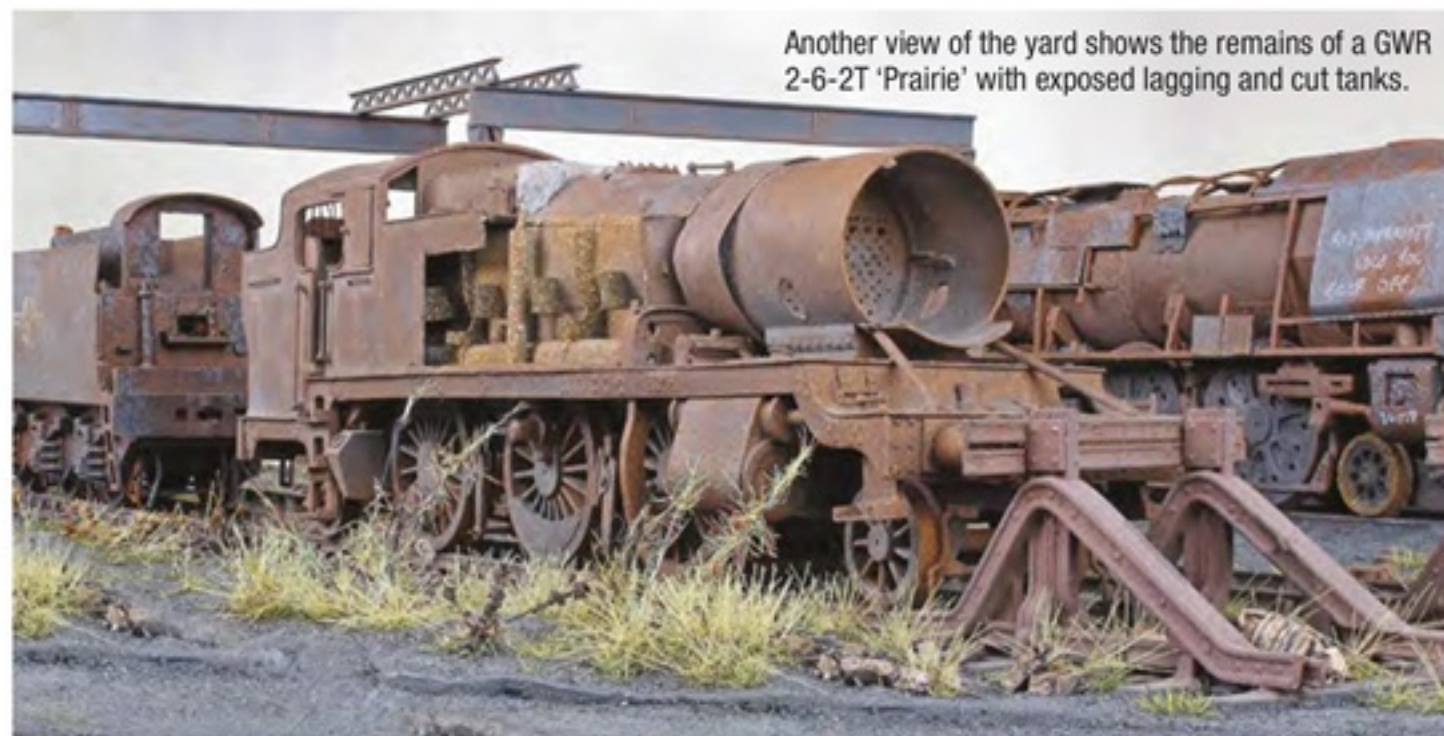
at us. Anything to avoid this situation is worth considering.

Modelling is best tackled using project management skills. Of course, this is a hobby – it's supposed to be escapism – therefore, I wouldn't recommend full project management methods unless you are completing a project to a deadline and perhaps involving many participants. Having said that, we can apply some of the basic tenets of project management without making it seem like a highly structured military exercise.

A project comprises of three things: scope, money and resources. Scope is the extent of the project; so consider what you want to build and draw plans. Estimate how long you think the project will take to complete. Experience helps here, but if in doubt, give it your best guess and double the figure. Now consider how much time you have available for modelling. Don't worry if it's a few hours each week. Modelling lends itself to this type of scheduling, because you often have to wait for glue to set or paint to dry.

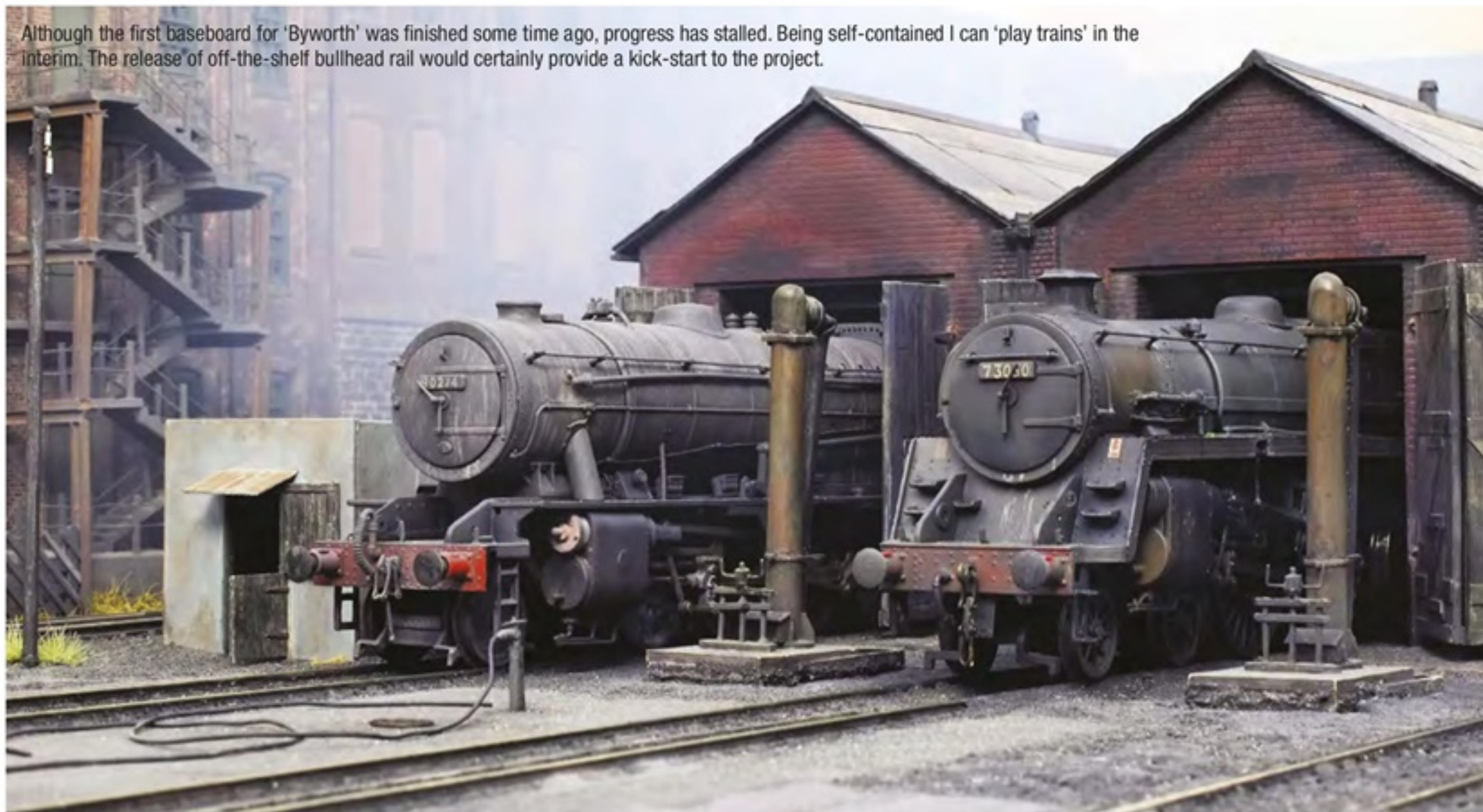
Ensure you pick a project you can complete in a reasonable timescale. You may need to make adjustments to the scope and limit or swap projects. I recommend a project timescale of less than a year in duration to avoid losing interest part way through.

Now consider how much money you have to spend. Choose a budget. You can trade time for money and vice versa. Of course, you could buy everything off the shelf and the project may then be just an exercise in assembling them. There's nothing wrong with that and with the quality of items now available it's possible to build a very convincing railway layout taking this route.



Another view of the yard shows the remains of a GWR 2-6-2T 'Prairie' with exposed lagging and cut tanks.

Although the first baseboard for 'Byworth' was finished some time ago, progress has stalled. Being self-contained I can 'play trains' in the interim. The release of off-the-shelf bullhead rail would certainly provide a kick-start to the project.



Lastly, you need resources. This encompasses space and equipment, but even more important are your skills. If you don't have the skills necessary, I recommend acquiring them before you start or the project will be put on hold whilst you learn them. Building a diorama is a good project to acquire skills.

You can improve your enjoyment of our hobby by making a few simple adjustments. I hope I've given you ideas to further that enjoyment, or if you haven't started modelling, the incentive to take the plunge.

PROJECT MANAGEMENT

Structure: A complex task is easy to complete when made into smaller more manageable portions. Break your modelling project into small activities.

Prioritise: Prioritising activities avoids delays and employs resources to best effect.

Create a chart: Plan your main project steps to monitor progress once work has started. A quick glance will tell you the current position.

MICHAEL'S TOP TIPS...

- Don't compare your work to other peoples'. The only person you have to please is yourself – if you're happy that's all that matters.
- Build a layout using a modular approach so you can complete each section as a project. It gives something to operate while you build the next section.
- Maintain your interest by doing something new or different. How about building a monorail? What about a futuristic Maglev layout?
- Keep looking at inspiring material. A subscription to **BRM** exposes you to new ideas and fresh modelling techniques.
- Railway modelling has a social side too, and enthusiasm is contagious. Consider joining a club, an online forum such as RMWeb and attending exhibitions. Don't be afraid to ask questions – most modellers are only too delighted to help if you show an interest in their work.
- Avoid the temptation to spread your interest too thinly. Perhaps you are modelling in OO gauge, so why buy an O gauge kit? Complete one project at a time before moving onto the next.
- Get the balance right between building and operating. Some modellers continually build but hardly ever operate their layouts, while others are the reverse.

Who doesn't have unfinished models lying around, or maybe projects we haven't started, going back many years?



UP THE JUNCTION

Putting atmosphere at the forefront of his design, Mike Lynch's budget layout reflects his passion for the transitional era around the Southern Region.



Factfile

Layout Name: Up the Junction
Scale/Gauge: OO gauge
Size (to include any fiddle yards): 9ft x 3ft 8in
Era/Region: Southern Region 60s/early 70s
Location: Battersea
Layout Type: Split-level continuous loop
Power/control: DC
Words: Mike Lynch
Photography: Andy York

Being a fan of micro layouts it's rare to see any of the stock to do much more than move up and down a few feet at any time. There's a circle of third radius track to run in new trains, but after a few circuits things get more than a little boring.

Given that I'd always wanted to see them glide along a decent scene at a good lick, I decided to find a few spare feet of space to set up a modest run around. I don't like tight radius curves on layouts, so decided on a modest 4ft x 2ft urban section; the feeding loops being placed out of sight behind the

back scene. To offset the lack of running space and for operational interest, a small shunting yard was planned for the front of the layout with the main lines placed atop a viaduct behind.

GATHERING IDEAS

The BR transitional era setting would be loosely based on the area around Battersea, inspirational photos of which were found in David Larkin's brilliant series of British Rail Wagon books. This dictated a Southern theme, but because a Victorian railway

viaduct is something that is found in most cities the layout could be more generic. Therefore, many locomotives from many regions - including a beloved HST set - could run through it whenever desired. The 'Yard' was thus initially conceived and construction began in earnest.

MOOD SETTING

I'm more interested in atmosphere than accuracy; something that's reflected in most of my layouts. However, a scene still has to be convincing so there's a heavy reliance

the layout reflects my fascination for the transition era. I get a great deal of fun mixing up coaching, wagon and train combinations; even though not entirely prototypical

Interested in wagons?

Discover more with the prototype images and informative captions in the pictorial survey series of wagon books by author David Larkin. Split into volumes by freight traffic type and covering the Big Four, British Railways and British Rail eras, there's a wealth of information to the modeller. Keep alongside your modelling bench when adding detail or weathering.



on photorealistic textures and good quality card kits to help achieve this. Several Arched Bridge kits from Scalescenes were used for the main viaduct; joined together in an 'L' shape formation. The configuration neatly provided the scenic break for the lower yard. Scenic breaks are the bugbear of all micro layouts and it's always hard to disguise these ugly openings successfully. After careful planning, a freelance factory building, water tower and a Scalescenes signal box hid these to the left.

CHANGE OF PLAN

The flats are quite deep and I found myself adding an extra ten inches to accommodate them. This created a dilemma about what to do with the rest of the empty space at the rear. I'd already inserted a small scrapyard scene under the first two arches and had intended to place low-relief structures behind this, but this arrangement would jar with the tower block. I then had the bright idea to add an additional Scalescenes viaduct running from behind the water tower and along the back of the flats. The layout had now suddenly morphed into a junction cameo and allowed for three trains to run in addition to the shunting yard - plenty of scope for playing trains. The new arrangement also created a greater sense of depth for the operator and viewer.

A beloved HST emerges from the Scenic Break on the left-hand side and demonstrates that the layout can accommodate any BR period train from any region. It's unbelievable to think that the Class 43 is still running after 40 years faithful service. In a recent article celebrating the anniversary it was suggested that the Class has another 20 years useful service yet to come!





Watch more...

**00
GAUGE**

I'm more interested in atmosphere than accuracy. This night time running picture captures the orange glow of Sodium street lights in an urban setting. The illumination for the block of flats is provided by an ordinary light bulb – a much easier way to light a building instead of messing about with individual LEDs.



A Hornby Class 20 pairing about to shunt a Hornby Steam Crane; the crane has been detailed and given a new jib runner. These runners were often converted from old coach stock.



KEY DETAILS



The Warehouse

A freelance warehouse with a rail-served loading bay was constructed to the right. This was placed in front of the viaduct and, provided the necessary cover for the yard.



“the layout was extremely cheap and quick to construct. With money saved, maybe the financial controller will let me purchase that much desired Hornby Q1 to complete the scene



Hornby 2-HAL, Bachmann Class 416 and Lima Class 73 share the running loops on the layout.

Meet the Modeller



I grew up in Birmingham, about half a mile from Perry Barr Station, so trains are definitely in my blood. The BR corporate era was what I remember most, plus the many train trips to town at weekends with mum. New Street Station was one of the most exciting places to be and there was a great deal of pleasure had in watching AC electrics glide alongside various diesel locomotives - the blue exhaust smoke occasionally illuminated by sparks from the overhead wires.

Those visits left a powerful impression on me. However, whilst I modelled the ubiquitous Airfix kits during my youth, it wasn't until I lived in Ireland that I began to indulge a desire for model railways. Whilst my Southern scheme is an odd choice for a 'Brummie', I'm working on a micro layout for my collection of Hornby Class 86s - an attempt to recapture the magic of those childhood experiences.

STOCK

The BR Blue era stock is comprised of a Hornby 2-HAL, a Bachmann Class 416 and fabulous 4-CEP. In addition, a Heljan Class 33 and a detailed Lima Class 73 share the running lines. The motive power for the yard is a Bachmann Class 08 with the occasional appearance of a pair of Hornby Class 20s. With a simple change of advertising hoardings and correct period cars, the layout can accommodate stock from the early sixties and a Green Hornby 2-HAL runs alongside a Heljan Class 33 whilst a Heljan Class 16 shunts in the yard.

KEY DETAILS



The flats

Behind the arches, to take care of empty space, a block of flats was used. This was sourced from Kingsway Models who carry a fantastic array of card buildings. The kit is brilliantly proportioned, although a little bland, and provided me with a bit of scope for detailing.

The outside was sprinkled with fine sand to convey a concrete finish; this was glued down with a watery mix of PVA. I also wanted the flats to light up during night time running, so the window openings were cut out and interior details created using various Scalescenes textures. Holes, of various diameters, were cut into the back of the interior walls for lighting. The light source was provided by an ordinary light bulb, sealed inside a box, and affixed to the back of the interior wall section. It's a method that saves a lot of time, expense and messing about with LED circuits.

BEST OF TIMES

The layout reflects my fascination for the transition era. I grew up during the period and new tower blocks seemed to be rising up from the rubble of old Victorian areas nationwide. Britain was still emerging from the austerity period, yet was still leading the way with innovation in technology and industry seemed to continually turn out stunning engineering firsts - the development of the HST being just one example. It felt like a much more hopeful time and the future looked brighter somehow. But maybe I'm being a little too nostalgic.



Howard says...

Look at many layouts that grab your attention and see what sets them apart from the rest. Is it the detail? The authenticity? The atmosphere? Mike's layout uses the latter to its best advantage and he's successfully built a layout to a budget by making the most of printed card kits. The Southern Region is captured with railway arches and high-rise flats, whilst a nod to an extinct era of the railways is provided with the disused goods shed and water tower.

FIGURE PAINTING MASTERCLASS

Whether you're familiar with the 'Warhammer' game or not, it certainly boasts some fantastic figure painters. Here, one of its prime exponents shares some of his award-winning techniques.

Railway and scale modellers are often experts at creating lifelike representations of vehicles and equipment in small scales. However, it can sometimes be the case that any figures used are either pre-painted or are painted in a hurry, where they can detract from scene in which they're displayed.

This article will provide modellers with a strong foundation to create realistic figures, in keeping with the theme of their dioramas and track layout locations. What follows are basic and intermediate tutorials, allowing you to see how a few skills with a brush can lead to some pleasing results.

Paint and Tools

Paint technology has come a long way in the last 30 years. Acrylics, in particular, have many advantages in terms of their lack of toxicity, easy clean-up and large range of colours. In these tutorials I am using Games Workshop's 'Citadel' paints (names in inverted commas). Paints should always be thinned a little with water beforehand, as it is often too thick straight from the pot.

Shopping list

- | Micro File
- | Craft Knife
- | Pin Vice and suitable bit
- | Clippers
- | Super Glue
- | Games Workshop Citadel paints
- | Fine tipped paint brushes

Preparation and Assembly



Before painting, many figures may require some clean up and perhaps assembly. Most have what is known as flash – thin bits of metal or plastic that show the moulding lines. These need to be scraped away with a craft knife or a micro file. Once the flash has been removed, any individual parts can be superglued together.

Once the figures are fully assembled, I drill a shallow hole into each sole then insert a short length of brass wire that is same size as the hole with a dab of superglue. This allows the figure to be pushed into a cork for easy handling during painting. The wire can be cut off later as required.

Undercoating

Undercoating is very important in figure painting. On a basic level it creates a strong key for the paint. It can also be used to show how a figure will look when lit from certain angles. This process is called 'Zenithal', where you spray a lighter colour (usually white) in the direction you would want light to appear from. This is usually from above or at an angle down towards the face. The figures I used in this tutorial have all received a base coat of black spray-paint. Once dry, I sprayed a light haze of white paint aiming down towards the head/face and shoulders, giving the impression of shadows.



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BASIC LEVEL

Great Coat Civilian

I have used a model of a travelling civilian to show how you can get a good quality and realistic finish quickly.



1

The coat of the figure received two thin coats of 'Mechanicus Standard Grey' (a medium shade) and the trousers received two thin coats of 'Abaddon Black' (matte black).



2

Once dry, apply 'Cadian Fleshtone' (a medium pink skin shade) to the face, hands and neck. Then apply 'Rhinox Hide' (dark brown) to the boots and 'Gorthor Brown' (a slightly lighter shade) to the suitcase.



3

Apply 'Kantor Blue' (a dark blue) to the top of the hat and 'Macragge Blue' (a slightly lighter shade) to the scarf. Once those are dry apply a thinned wash of 'Nuln Oil' (black) to the coat, trousers, boots and hat – this paint is designed to run into nooks and create depth. Then apply a similar wash of 'Agrax Earthshade' (a dirty brown) to the flesh areas and the suitcase. Apply 'Celestra Grey' (a medium silvery shade) to the hair and beard.



4

Once dry, apply a 50:50 mix of 'Administratum Grey' (a slightly lighter shade) and the original coat colour to the figure on just the edges and folds of the coat. Use a fine-tipped brush and take your time. This will create a greater sense of depth.



5

Apply 'Steel Legion Drab' (a medium brown) in thin, light brush strokes to the edges of the suitcase and in random areas to create some depth and along the edge of the toe area of the boots, where light would show on polished shoes – you are aiming to make it look where light would reflect the most. Apply 'Kislev Flesh' (a pale skin shade) to the raised flesh areas, such as the nose, cheeks and the tops of hands and fingers. Leave a little of the original colour still showing at the edges and shadows to add depth.

Finally, apply Abaddon Black to the handle of the suitcase and 'Retributor Armour' (metallic gold) to the buttons of the coat and on the clasps of the suitcase. For the eyes, apply a small amount of Abaddon Black then in the corners of each eye place some spots of 'White Scar' (which is designed to layer over other shades). This is to show glints of light in the eyes.

INTERMEDIATE LEVEL

In these tutorials I add a little more detail and depth, giving your figures a bit more presence and realism, but not getting too complicated if you just want them to add a story element or a visual interest to a display.

Hiker



1

The model has been undercoated and pinned to a cork base for handling. This is to avoid touching the surface you are going to paint, as oil from skin can cause paint to not stick.



2

Apply base colours to the main areas of the figure as before. Use 'Deathworld Forest' (a woody green) for the shirt, 'Stormvermin Fur' (mid grey) for the trousers, 'Thousand Sons Blue' (bright blue) for the backpack and straps and Gorthor Brown for the socks.



3

The secondary areas now get base tones, 'Cadian Fleshtone' for the skin areas, 'Dryad Bark' (a dark brown) for the shoes and hair, Steel Legion Drab for the staff and 'Castellan Green' (dark green) for the bedroll.

4



Give the model a wash with Agrax Earthshade and let dry. Apply a mix of 'Nurgling Green' (pale green) and 'Deathworld Forest' (olive green) to the shirt. Use thin paint and build up in light layers. This is known as feathering, where you leave some of the darker base tone showing. Apply the base grey tone to the trousers where light would touch - creases etc.

5



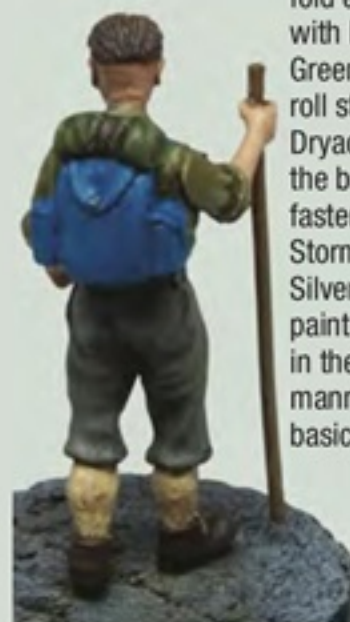
Apply a 50:50 mix of Cadian Fleshtone and Kislev Flesh and apply to the upper surfaces of the skin. Apply 'Ushabti Bone' (cream) to the socks. Lightly drybrush, using a brush that has most of the paint rubbed off, and apply the paint to the area. Use Steel Legion Drab with a little White Scar added for the staff and hair of the figure.

6



Highlight skin areas with pure Kislev Flesh on the highest points. This gives illusion of a light source. Paint thin layers onto the highest parts of the backpack and straps with 'Ahriman Blue' (aquamarine), leaving the lower sections the original colour. Paint the laces with some Ushabti Bone, drybrush the socks with 'Screaming Skull' (a paler cream) and paint the belt 'Stormhost Silver' (a metallic silver).

7



Finally paint the bedroll fold edges with Nurgling Green, the roll strap with Dryad Bark and the backpack fastener with Stormhost Silver. Then paint the eyes in the same manner as the basic figure.

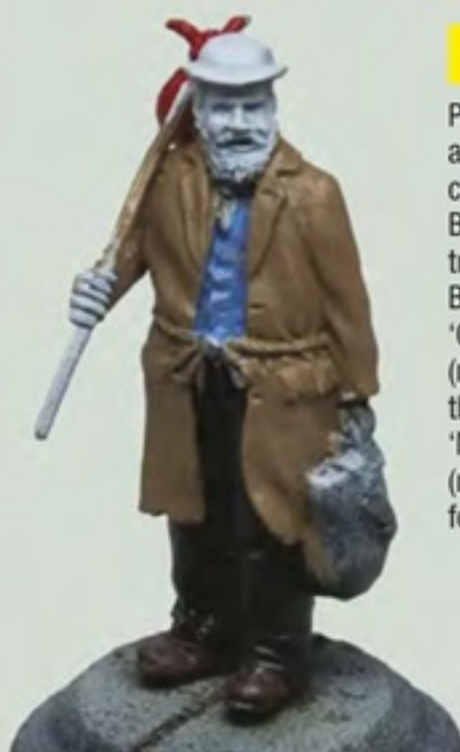
Old Hobo

1



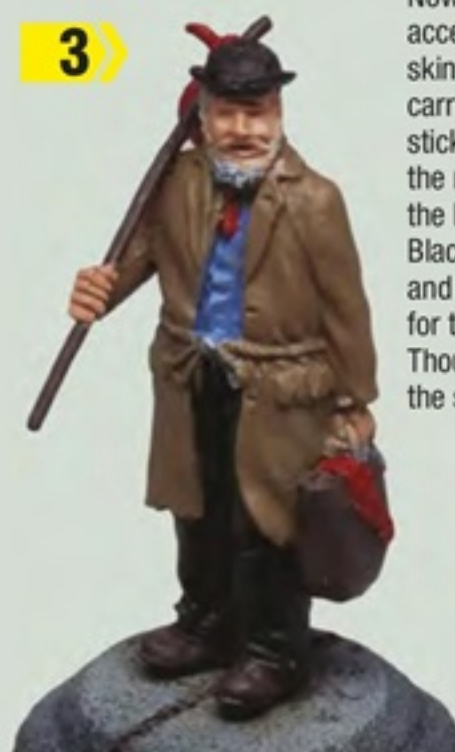
Apply a base coat of Steel Legion Drab to the coat in two thin layers.

2



Paint the secondary aspects their base colours. Abaddon Black on the trousers, Dryad Bark on the shoes, 'Calgar Blue' (medium blue) for the waistcoat and 'Mephiston Red' (matte medium red) for the bindle sack.

3



Now paint the accessory parts and skin. Dryad Bark for the carry bag and carrying stick, Mephiston Red for the necktie and sock on the bag. Use Abaddon Black for the bowler hat and Cadian Fleshtone for the skin and then Thousand Sons Blue on the scarf on the bag.

4



Apply a wash of Agrax Earthshade over the jacket and skin areas, a Nuln Oil wash on the hat, trousers and shoes, then a wash of 'Carroburg Crimson' (pinkish red) on the bindle sack, sock and necktie and a 'Drakenhoff Nightshade' (ink blue) wash onto the waistcoat and scarf in the bag. Once these are dry, apply a highlight to the coat of Steel Legion Drab with some 'Zandri Dust' (beige) mixed in (50:50) onto the high points. Paint the rope belt with pure Zandri Dust and the beard and hair with Dryad Bark.

5



Further highlight the model with applications of 'Evil Sunz Scarlet' (blood red) onto the raised areas of red colour, especially on fold edges. Highlight the scarf with Ahriman Blue and the waistcoat edges with some White Scar mixed into the Calgar Blue basecoat, leaving the darker colour in recesses. Apply a highlight of 'Stormvermin Fur' onto the trouser raised edges and bowler hat. The flesh areas can be highlighted with Kislev Flesh mixed with Cadian Fleshtone, again keeping to raised areas. The boots and stick can be highlighted with some Zandri Dust mixed with the Dryad Bark base.

6



A few final highlights and details are added to finish the model. The flesh areas have a highlight of Kislev Flesh, the carry bag's handle is painted Abaddon Black and highlighted with Stormvermin Fur. The rope belt gets a wash of Agrax Earthshade. Once dry, pure Zandri Dust is carefully applied with a fine brush in lines to give the effect of rope texture. The beard and hair is dry-brushed with Zandri Dust. The eyes are added using Abaddon Black and White Scar dots at the edges as before. As a final touch small dots of pure White Scar are placed onto the bindle sack to add some interest to the flat area.

The completed figures (plus one that I painted earlier) ready for insertion into a display.



it can sometimes be the case that layouts use figures that are either pre-painted or are painted in a hurry, where they can detract from scene being modelled

Meet the modeller

Richard Rose has lived in the north east of Scotland for 35 years and has been a figure painter for over 20 years. Originally just playing Warhammer, he has moved on to many different fields of modelling. He now operates an independent commission studio for figure painting and scale model work. To see more visit www.pictishminiaturepainting.co.uk.

What we think

Richard makes liberal use of Games Workshop's 'Citadel' paints. The peculiar names notwithstanding, many railway modellers have already discovered this diverse array of colour options. Other acrylic paints are available too, of course. If the thought of entering a shop full of wargaming youngsters fills you with dread, as it does us, there's always the internet – see www.games-workshop.com. Suppliers such as Humbrol also supply acrylic paints, which can be colour-matched as needs be and used in exactly the same way.



Factfile

Layout name: Ebridge Mill
Scale/gauge: 4mm: 1ft/00 gauge
Size: 10ft X 1ft 6in
Era/region: BR Eastern Region 1965
Power control: DCC
Location: Norfolk
Layout type: Fiddle yard to goods yard
Photography: Andy York
Owners: Graham Tandy, Mike Duffield

EBRIDGE MILL

An old mill with a rich history in the Norfolk Broads was the subject for Graham Tandy and Mike Duffield's layout, set in the swinging sixties.

Ebridge Mill is a small Hamlet between North Walsham and the North Norfolk coast line. The Mill was built in the late 1800s and was owned by a family called Cubbitt Walker from 1869 to 1998. It is a five-storey building with a two-storey building adjoining, both constructed of brick. The main roof was slate, but the smaller building was asbestos. At the rear, there were cottages and numerous buildings, the latter were for the workers.

Alongside the Mill is the River Ant, which later became the North Walsham & Dilham Canal. This was to be the only official canal in Norfolk - wider than most to accommodate Norfolk Wherries [traditional transport vessels used around the Norfolk coast to further afield]. There were ten wide locks to navigate. Its eight and three-quarter mile length was opened in July 1826 at a cost of £32,000. The cargoes were timber, farm produce, coal, corn, fertilizer and flour. The last Wherry to sail with cargo was Ella in 1934.

The small Hamlet had potential for a fictitious branch line from North Walsham (Norwich to Sheringham on the old Midland & Great Northern Line). The model we've created illustrates the buildings, canal and basin of Ebridge Mill as it was in 1965. The Old Mill has been brought back to life in model form.

A SOLID BASE

The layout has three boards measuring 4ft, 3ft and one at 2ft 9in with hidden sidings. All the timber is softwood at 2in x 1in. I must apologise - I can't work in metric!

The boards have Sundeala tops, with a cork underlay that sits on the softwood frame. It all rests on two trestles giving a total height of 3ft 9in. The backdrop is 1/4in plywood and the backscene is 'Open Fields' from Gaugemaster, pasted directly onto the board.

Read on

To discover more about the interesting history of Ebridge Mill, its workers and its products - visit www.brmm.ag/EbridgeMill



MIX 'N' MATCH

The trackwork is from SMP Finescale and the points are Peco Code 75. There are seven points on the layout - six medium and one small radius. The track is laid on cork,

Background History



Not long after deciding to make this layout, Ebridge Mill was sold and changed into a residential development. Currently, the two-storey building is two separate high-specification dwellings. The machinery which was used in the mill has been restored and features in both properties which look stunning. I wonder what the employees of Cubitt Walker would think?

The construction of the mill was made easy because, not living too far away, I could visit to make drawings and take photographs.

A siding alongside the mill is ideally placed to be dedicated to the loading of grain. A Bachmann Sulzer Type 2 awaits completion of loading.



pinned, glued and suitably painted with rust colouring. Copper-clad sleepers are pinned and glued to the ends of each board and the track is soldered accordingly.

ARCHITECTURAL ALTERATIONS

I had to research buildings because everything at the rear of the mill had been demolished. The Farmhouse at Ebridge is up the lane and was built as a bungalow in the 1950s. A second floor was added in the 1960s, which didn't appeal to me, so the one on the layout is a farmhouse and barn which is located in the village of Happisburgh where I live. I spoke to the farmer and received his permission to model their buildings.

The only building which is fictitious is 'Ebridge Fabrications'. I decided to have working narrow boats and not wherries, so I thought it would be an idea to have a firm of narrowboat builders. On the layout a new boat shell build is in progress. Within sight of the mill is 'Bacton Woodcovering', which I've only been able to show in a tiny replica.

VEGETATION

Bushes and grasses came from Model Scenery Supplies and Woodland Scenics; the trees for the small wood were from CM3 Models. The roadway uses Wills Cobblestone and the fencing is Ratio. There are two road vehicles, both are Coopercraft. The two working narrow boats are both scratch-built – the one in the basin is easily

recognisable, but the one in the canal is a tug boat which was used for towing and occasionally ice breaking.

There are several busy workers on the layout together with locals and holidaymakers in the camping coach. I mustn't forget my trademark; our two cats - Sooty and Smokie, unfortunately long gone, but not forgotten.

THE ELECTRICS

It was decided from the outset that 'Ebridge Mill' would be a digitally controlled layout. Our choice was the NCE Power Cab, and it would control both the locomotives and point motors. The latter were Peco 10E motors with frog switches glued to them. The heart of the layout is the DCC bus,



KEY DETAILS

Camping Coach

A small caravan site for five vans is close-by and I've illustrated this with a camping coach on a siding opposite the wood. It's an old Triang coach, which has been given a new life. The canal basin has a lock gate which would have led to the old canal, but for space I chose to have the canal in the centre of the layout, to have further interest of having a girder and road bridge.



Refrigerated Conflat containers may well be laying over at Ebridge Mill from nearby Great Yarmouth and the well wagon hints that something substantial may have been sent to the goods yard here.



which is two 1mm diameter copper wires mounted underneath the baseboards and fed along the entire length of each one. The Power Cab DCC output was then connected to the bus wires. Every piece of track, however short, was directly wired and soldered to the bus. Stranded wire was used throughout the layout to limit any possible track voltage drop. The accessory decoders to operate the points were one Lenz LS150 (six-channel) and a single-channel unit by Train-Tech. An eighth point on the layout isn't used, and the two points in the fiddle-yard are operated via 'wire in tube', with the operating switch changing the frog polarity.

A transformer with two 15 volt ac. outputs was installed to operate the street and yard lights (Kytes Lights). Each group of lights

Ebridge Mill is a short distance from the Norfolk Broads on the North Walsham and Dilham Canal. A canal basin provides an opportunity to model paraphernalia and supplies.



KEY DETAILS

The Canal

To colour the canal, I used Humbrol medium brown paint and, when dry, I poured in Woodland Scenics Realistic Water to a depth of 1/4in. After a period of two to three weeks a further application was added. I'm really satisfied with the result, it looks real.



A Bachmann English Electric Type 3 enters the scene from the fiddle yard beneath a road bridge.



Stock Roster

Ebridge Mill is DCC and operates with sound. It operates with the following locomotives and rolling stock:

Bachmann Class 37 with Legomanbiffo
DCC sound on a Loksound decoder
Bachmann Class 25 Bachmann DCC
sound
Bachmann Class 20 Bachmann DCC
sound
Hornby Class 08 with Howes DCC sound
WAGON FLEET
Bachmann 12 Ton planked vent van
plywood doors (x4)
Dapol grain wagon (x3)
Bachmann bogie bolster BR Departmental
Black
Bachmann one plank with two conflat
loads
Hornby coal wagon (x2)
Dapol BR Fruit Mex.

were connected in series and then to one of the two transformer outputs. Wiring in this way reduced the brightness of the lights, which are 'grain of wheat'-type bulbs. This makes the voltage drop across each bulb less than the rated 12 volts, and extends their operating life.

Once the track was wired it became apparent that we were spending more time fiddling with the controller buttons setting routes, even when using the programmed macros. This led to less locomotive running time, which is not ideal for an intended exhibition layout. After some serious discussion, the decision was made to change to analogue control of the point motors via the use of a Capacitor Discharge Unit (CDU). This was done with the spare transformer output powering the CDU. With the control panel only having four switches, the points could be operated with one hand while the other hand controlled the locomotive. Locomotives now run constantly on the layout, which is what exhibition visitors like to see.

THANKS

Ebridge Mill' is jointly owned by me and Mike. I'd like to thank him for all the work and help he has put into this project. Many thanks to both our wives, Ros and Karen, for their help and encouragement. A special thanks to Karen for making the curtain and ongoing help.

Our thanks also to Kelvin Barnes for the superb weathering of the stock, Ian Taylor for the building of the framework and trestles.

ON TOUR

'Ebridge Mill' has been to two exhibitions so far – Waveney Valley MRC's Southwold show in August 2016 and Doncaster this year. Forthcoming bookings are Broadland MRC's Aylsham expo on October 7, The National Festival of Railway Modelling at the East of England Showground in Peterborough on October 14-15 and the Warley National Model Railway Exhibition at the NEC on November 25 -26. We look forward to seeing you!

Discover how Lime Street Hotel was designed and built with modern technology in the March 2017 issue of **BRM**. Download it as a digital edition today, visit www.pocketmags.com/BRM

How to...

WEATHER A BUILDING

Rob Harrison shares how he spent eleven weeks adding years of grime to this model of Liverpool Lime Street's North Western Hotel.

The day the hotel arrived for me to weather from Les Green, all other modelling activities ceased. The sheer bulk of the model prevented me getting to my workshop facilities. My weekly hosting of the 'codgers' - like-minded model makers, but all free bus-pass men - had to be abandoned due to lack of space and the possibility of damaging the model.

MAKING A START

The metal fittings and the window frames were removed from the structure and the basic colours, sandstone for the stonework and cream for the glazed brickwork were applied using Humbrol enamels. My first weathering task was to apply a wash of grime using thinned-down acrylic black paint and a fairly wide brush. The wash darkened the walls and roof and also identified the horizontal surfaces where grime would accumulate and where further weathering would be needed. I use acrylic paint because of its fast drying time, which is important on a project this size as mistakes can be quickly removed.



I began work on the architectural details with horizontal surfaces, applying additional washes with small paint brushes, building up a good depth of colour. The chimney stacks, 40 in all, were treated to extra coats of colour, as were the chimney pots, almost 800 of these, because of their location and function. Because they're made from white plastic, the window frames needed darkening to imitate the well-worn look.



Prototype Inspiration



Taken in 1926, this period photograph shows the London, Midland & Scottish Railway's Liverpool North Western Hotel, designed by Alfred Waterhouse and built in 1871 to accommodate London & North Western Railway passengers. For a time it proved popular with passengers arriving or departing from Liverpool on transatlantic liners. The hotel closed to the public in 1933.

a light-hearted comment by a member of our group before starting suggested I take a large brush, a tin of matt black paint and cover the lot!



SELECTIVE WEATHERING

Happy with the overall appearance of the model, I started the detailed weathering. Faced with the size of the model I decided that I'd view it not as a whole, but as a collection of individual parts, treating each as a separate project. This would start with the chimneys and roof. Armed with my trusty acrylic wash and a selection of pencils, charcoal, felt-tipped pens and small paint brushes, I altered the tone of individual stones and darkened the mortar courses surrounding them. Detailing the chimney pots to produce a sooty effect came next – with so many to do I thought stamp collecting might have been a better option. Streaks of dirty rain water and grime were added too, plus bird droppings down the chimney stonework.

ROOF AND TOWERS

Detailing the roof required picking out individual tiles to change their tone, highlighting flashing and applying lead staining and water runs. I picked out individual stones on the towers and emphasised the horizontal surfaces with additional colour washes. Vertical grime runs were added below the decorative stone work, some of the runs being applied with felt pens, others by extra washes. The front and end walls are much more ornate in architectural terms than other parts, and consequently far more time consuming.



PRACTICAL BRM

The elaborate stonework surrounding some 120 windows required working with fine brushes. One end wall has 28 pillars supporting decorative stone work, each weathered with staining and in some cases a suggestion of damage to the surface – a day's work creating the right effect. The back wall of the hotel is comprised almost entirely of glazed brickwork, far simpler in appearance than the rest of the model, but it still needed weathering. Although not all visible when the model is on the layout, there are approximately 90 windows along the length of the wall, each has a sill and stains.

Bricks with damaged glazing or replaced with common brick were painted in variations of brick red, and areas of newly replaced mortar were given a lighter finish than the surrounding darker courses. Imagining where new mortar was applied, vertical stains were added with dry brushing, grey artist's pencils, and on occasions, white felt pens, the white suitably smeared with the aid of a well-manicured finger end.

Along the bottom of the wall certain areas were painted mixed shades of matt-green to represent the damp mossy growth often found in such locations.



METALWORK

The most prominent metal items on the building are the six lightning conductors mounted on the roof of each tower. These were previously painted, so thinned Humbrol enamel was used to suggest the presence of copper on the upper section of the conductors and a wash of rust applied to the lower iron parts.

The rust wash was also used on the front railings, the pedestal-mounted lamps, the brackets holding the drain-pipes in place, the canopy surrounding the main entrance and the letters making up the wall-mounted advertisement.

The windows on the top floor of the building are fitted with iron safety bars attached to the window sills, rust was applied to the bars and streaks on the sill and down the stone work.

My final foray using rust washes was focused on the two fire escapes fixed to the towers on each end of the rear wall. A thin wash was applied to all the metalwork, steps, safety railings, fixing brackets and allowed to settle in areas where a build-up of rust may have occurred.

Gray and brown streaks were added to suggest rainwater runs, peeling paintwork,



and general grot. To create the rust tones I used a blend of Humbrol enamels, including bauxite (Humbrol 133), orange (Humbrol 82), leather (Humbrol 62), and matt black, the intensity of the wash being governed by the quantity of thinners used.

Sooty stains on the roof were applied with a brush and finger, Humbrol Light and Dark Rust weathering powders added around metal fittings, and Humbrol Dark Earth powder used to tone down the brickwork, particularly at the base of the walls. The entire model was sprayed with matt varnish



to fix the powders.

After 11 weeks my contribution to the model was finished. Once into my stride I found the work absorbing. I have attempted to compromise with the weathering, not too dark, but sufficient to achieve the looks of a building in need of refurbishment.

A few humorous postings on RMWeb suggested photographs were the real hotel and not the model - that says it all to me!



MEET THE MODELLER - ROB HARRISON



The influence of my late father, a modeller and railway artist, created my life-long interest in model railways. Starting in my schooldays with Hornby Dublo, I progressed into layout building and eventually scratch-building.

My first experience of exhibiting was the building and operating of a 7mm layout based upon a heritage line, an involvement which lasted almost 14 years. In addition to the exhibition layout, I was building

my own, and much of my spare time was centred around track building and laying, scenic work, both indoors and outside and the construction of locomotives and rolling stock. All of which has kept me occupied for the last 15 years.

On joining the 'Lime Street layout boys' I've upgraded the scenics, detailed the back scene, weathered the buildings, road vehicles, locomotives and rolling-stock. I'm now an operator when we attend exhibitions.



How to...

RUST YOUR WAGONS

Painting older items of rolling stock to look more authentic is more important than their level of detail, says Michael Russell as he improves a vintage mineral wagon.

The most important thing in achieving a realistic model railway isn't the accuracy of the models or the level of detail, but the weathering. Even a model railway built from cheap, off the shelf items can be made to look impressive if it's well weathered. Despite this, it's surprising how few railway models get this treatment. Look at the sale lots on auction websites like eBay – most are in factory condition, depicting locomotives and rolling stock as clean as when they left the manufacturer.

Weathering is perceived as being difficult because mistakes can be embarrassing or hard to rectify, not to say costly. Nevertheless, I encourage everyone to have a go. The easiest way to start is on a cheap goods wagon such as a mineral wagon. These were always dirty in service and it's

difficult to overdo the weathering effects on an item of rolling stock that was never cleaned in reality. Once you've mastered this technique you'll have the confidence to try something more challenging, taking a factory item and turning it into a unique piece of rolling stock that you'll be proud to display at the front of your layout.

**see how easy it is?
Before long you'll
be weathering
locomotives with
confidence**

Shopping list

- Cheap paint brushes
- Cake trays
- A file
- Airbrush
- Sketching/charcoal sticks
- Humbrol 67 & 98 enamel paint
- Indian Ink
- Cardboard
- Diluted car screen wash
- Cotton buds
- Burnt Umber Gouache
- PVA glue
- Newspaper



Start with a mineral wagon kit or RTR item. The ones I work with, as pictured, are 1980s Jouef or Playcraft items that I've upgraded.



Spray the inside of the wagon with Humbrol 67 and below the solebars with Humbrol 98. Use a piece of cardboard as a mask for the body. If you don't have an airbrush then hand paint, but thin the paint from the tin.



Make up a mix of Indian ink and car screen wash in a ratio of 1:5 – don't make the mix stronger as the former is quite potent. I bought 2.5 litres of ready diluted screen wash in a pound shop.



Paint the mix onto the wagon, aiming for an even coverage.



Wipe off excess with cotton buds using vertical strokes. Leave more residue in the corners and edges, then leave to dry.



If you want a wagon that's just entered traffic and hardly used, you can stop here. Even weathering to this limited degree makes your model look more realistic.



Apply neat Burnt Umber Gouache from the tube onto a cheap hog's hair brush. The bristles are stiff and must be spread out for a random distribution of paint. Manipulate the bristles with your fingers to achieve this.



Now stipple the brush onto the wagon sides aiming for an even random coverage. You'll find the mixture dries quickly so you'll need to keep applying more paint to the bristles. The model won't take long to dry.



Take a flat brush and dip into car screen wash. Brush this lightly down the body and immediately go over the same area with a second stroke. Keep doing this, working around the model until you have covered the entire body.



Using a fresh cotton bud dipped in water, remove excess rust colour from the wagon numbering. Leave the model to dry.

11

Take a black pastel and grate it onto a file to get fine powder. Brush this on using a cheap, dry hog's hair brush. Apply to the model around the side and end doors. Brush light browns and greys onto the running gear to get contrast.



You've seen how it's done, now show us what you can do. Post your pics to rmweb.co.uk



12



Make a 1:1 mixture of PVA and screen wash with a drop of Indian Ink. Evenly coat the inside of the wagon until the surface is damp. If you add too much mixture, use a dry brush to soak up excess. Leave the corners damper so they hold a higher accumulation of material.

13



Using a file, grate together a mix of black and dark grey pastel and using a loaded large soft brush, dust the powder inside the model. Work over newspaper because this is messy. Tap the model upside-down on the bench to shake-off loose material.

14



If the accumulation of coal is too heavy for your taste, use a stiff hog's hair brush to remove some of it. Again work over newspaper to catch loose material and re-use it.

Michael's top tips

- Use old/cheap brushes for a project like this.
- If a brush sheds bristles in use, remove them from the model once it's dry. Avoid the temptation to remove hairs when the model is still wet.
- Rust patches look better when they're random, or they'll looked contrived. Avoid large solid patches that give a 'Holstein Friesian cow' effect. I use aluminium cake trays (the Mince Pie type) as mixing bowls because they're easy to bend when you want to form a spout for pouring liquids. Wash them out for re-use and put them in the recycling when life-expired.



The techniques demonstrated here are within everyone's reach. They're quick, which is important if you have a rake of perhaps a dozen wagons to weather. You too can produce great results if you follow these instructions to the letter. The most important thing to remember is not to fiddle with the affects you achieve. Give the model a chance to dry and see what it looks like before passing

judgement. If you don't like the results you can always wash them off and start again. Fix the results with clear varnish, but admittedly I never bother with that step.

Have a go to see how easy it is and before long, you could move on to weathering other subjects such as locomotives with confidence. ■



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↓ The BRM team hosts a number of top class events throughout the year, and next on the calendar is the National Festival of Railway Modelling in Peterborough.

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city of Peterborough does the National Festival of Railway Modelling take place? a) East of England Arena, b) Kingsgate Conference Centre, c) Bushfield Sports Centre. Winning answers will be put into a draw, with successful entries selected at random. You've got to be in it to win it, so head to www.brm.ag/pboroshow to input your answer ASAP. Good luck!

REVOLUTION HAS TWINS

↓ Revolution Trains has announced Cargowaggon 'twin' ferry vans as its next N gauge project.

Cargowaggon GmbH of Frankfurt originally ordered the ferry vans from wagon builder Duewag for traffic between Britain and the continent. The first 100 were built in 1986, with further builds in 1989 and 1991, and nearly the entire fleet remains in service today carrying goods as diverse as mineral water, newsprint, bagged clay/cement, Scotch whisky, cider and pet food.

As with previous Revolution releases, the wagons will feature high levels of

detail, with one version offering a battery-powered flashing tail lamp. Ben Ando from Revolution Trains said: "These wagons are suitable for the BR Blue period right through sectorisation to the post-privatisation era, and whether in a block train or in ones or twos we believe they will be a great addition to the wagon roster for many of our supporters."

The models will be produced in both single and triple packs. The guide price is £38 for each twin, £108 for a triple pack and £40 for the single twin with the battery-operated flashing tail lamp. See www.revolutiontrains.com for more.

TIN TOY AUCTION

Vectis Auctions Ltd is selling approximately half the entire collection of the tin-toy train authority, Michael D. Foster.

The auction will comprise all of the toys featured in books one and two of his excellent four book series. If that seems like a lot to get rid of, Foster says it was always his intention to sell and space to store/display his substantial collection was becoming an issue.

The auction takes place on July 21st at Vectis' auction rooms in Stockton-on-Tees. Online, postal and telephone bidding are options for those who don't fancy a trip to the North East. See Vectis.co.uk to register your interest and bid on the day.





Watch more...

BACHMANN ON THE BUSES

Bachmann has declared the arrival of the first vehicles to be ordered by the company since it acquired the 'Exclusive First Editions' brand last October, with a twin pack of buses commemorating the Aldenham Works open day from 1983.

Aldenham Works was originally built as part of the 1930s Northern Line rail extension to Bushey Heath, which was never completed due to the outbreak of WWII. With the plans abandoned, London Transport used the works as a bus overhaul facility, opening for operation in 1956. Aldenham Works eventually closed in 1986.

Back in the present day, the new pack will include two Leyland 'Titan' vehicles, with T112 in a London Buses livery & T66 in London General Aldenham Diplomat livery. The launch is pencilled in for October at an rrp of £59.95. See the usual Bachmann stockists for pre-orders.

MICKLEOVER MONSTER

➔ Your author confesses an admiration for hulking diesel locomotives. Imagine, then, his excitement at the news of a new Class 37 model.

Enter Mickleover MRG, which has commissioned Bachmann to produce an exclusive OO gauge model of class 37/0 No. 37114 'Dunrobin Castle'. Displayed in pristine condition, it will feature the large logo blue livery, complete with the Highland Rail emblems of Inverness depot. Other highlights include the correct 37/0 bodyshell, open boiler port, split headcode boxes, gangway doors and working tail and cab lights. Only 512 of these desirable locomotives will be produced, each supplied with a numbered limited edition certificate.

The anticipated rrp is £149.99, plus postage and packing. Delivery is expected in late-2017/early-2018. We're advised that purchase is on a strict first come first served basis, so head to www.mmr.org.uk to secure your model. No deposit is required at this stage, but you will be contacted before the models arrive to arrange payment.

OXFORD MOVES INTO PROPERTY MARKET

Oxford Diecast has announced a selection of new models and a new line in ready-to-plonk buildings.

Space, or the lack thereof, means we can't cover everything right now, but we're urged to highlight the new range of OO 'Warwell' carriers, which arrive with or without a Sherman Tank. The prototypes we saw showed light weathering and a decent level of detail, and the 'steel carrier' option had a silvery metallic finish. The Warwells launch in Q3, costing £29.95 for the tank-less options and £39.95 with the Sherman atop.

Elsewhere, new tooling and increased production capacity means that Oxford is catching up on back orders and its release schedule is looking good going forward. June sees 6-plank, 7-plank and cattle wagons in a variety of colourful liveries, a BR Carflat and Dean Goods No. 2309

hitting the shelves – options for the latter including DCC sound and a substantial snowplough.

Later this year Oxford steps into the property arena with the announcement of its new 'Structures' line. The initial run of these resin buildings is inspired by the Great Western Railway. A typical station, signal box, goods and engine sheds, a water tower and three platform choices making up the 'At the Station' range. A church, pub, butchers, newsagents, bungalow and cottage comprise the 'Town and Country' selection. We imagine other buildings will arrive in due course, but these are pretty good for starters and they're lightly weathered too. Prices and release dates are tbc for the moment, but keep an eye on www.oxforddiecast.co.uk for further information.



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BACHMANN 66711 SENSE GBRF AGGREGATES LIVERY 32-738

Outshopped in GBRF Aggregates livery from Eastleigh Works in March 2015, 66711 Sense is the latest livery applied to Bachmann's Class 66, fitted here with a 21-pin decoder socket. The metallic silver finish accented by wide bodyside blue and turquoise stripes has been beautifully applied with sharp edges. Particularly impressive is the lettering, adjacent to the logo where a carefully-applied mask has resulted in a neat finish. Wheel tyre edges, handrails and buffer head edges too are prototypically painted white, but these soon weathered in traffic - think about subtle weathering to disguise. Included are etched nameplates, bufferbeam extensions and air pipes. The prototype has run without the Europorte outline 'halos' around the cabside GB Railfreight logos since sale of the company late last year. Modellers looking for extra authenticity in the present era might wish to carefully remove these.

Price RRP £154.95

W www.bachmann.co.uk



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BACHMANN 13 TON OPEN WAGONS S&T CABLE 38-326Z AND ST BLAZEY DEPOT 38-328Z

Exclusive to model rail shop Kernow Model Rail Centre, these two wagons branded 'S&T cable wagon Guildford', numbered DB479526 in BR bauxite with a repainted c.1971 and AME St. Blazey stores wagon ADE282721 in BR bauxite with weathered finish and chalk markings c.1979 are both limited to 512 pieces. The latter wagon was the last project the model shop collaborated on with Merl Evans at Bachmann, sadly now passed away. A commemorative card is included to reflect this.

Price RRP £24.95

W www.bachmann.co.uk

GRAHAM FARISH 377-103 JGA BOGIE HOPPER VTG WEATHERED

The current trend for manufacturers to factory weather locomotives and rolling stock continues with this Graham Farish release of its JGA in weathered VTG livery. Also available in weathered RMC livery, the wagons are ideally suited to running in block trains behind its Class 60 or 66. Introduced from 1984, the TOPS code 'JGA' has been applied to four wagon batches, each batch a subtle evolution of the previous. This model represents the final batch of JGAs, introduced from 1997, built by Tatrasroj Poprad and built in Slovakia. The weathering authentically brings out the detail on the fabricated Y25 bogies.

Price RRP £34.95

W www.bachmann.co.uk



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GRAHAM FARISH 374-136 BR MK1 GUV BR BLUE

Now available with Graham Farish stockists nationwide in three liveries, BR Blue, SR Green and red/yellow Safink, these models won't be difficult to justify on layouts spanning eras from the 1960s to 1990s. Depicted here is its GUV in BR blue, carrying Eastern Region number E86380 - an ideal candidate for use in parcels trains of the 1970s. Included in the pack are two dummy coupling hooks, two dummy bukeye couplings in the raised position, two in the dropped position and vacuum pipes. Great for using with CCTs, Mk. 1 BGs, PLVs and PMVs.

Price RRP £30.95

W www.bachmann.co.uk

BACHMANN LMS 'JUBILEE' No. 5588 KASHMIR

Depicting Class member No. 5588, Bachmann's new release is ideal for layouts depicting the North West, this locomotive being stabled at Blackpool from September 1937. Now equipped with DCC sound, this single chimney smokebox with shorter LMS-style number plate is enhanced with opening smokebox door. Paired with a Stanier 4000-gallon tender with welded sides, the model comes with brake rodding, a shorter drawbar, optional fit cab windows and doors, front steps, cylinder drain cocks and front and rear vacuum pipes. Three whistle sounds, injector and drain cocks being operated, a guards' whistle, coal shovelling, water filling, coupling up, brake squeal, standing start, coasting and shunting speed feature sounds are included. Basic sounds run on DC control too and with its five-pole motor, operation won't disappoint.

Price RRP £239.95

W www.bachmann.co.uk

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Announcing the...

0-6-0 Dean Goods

The 0-6-0 GWR 2301 Class was designed by William Dean with all being built at the Great Western Swindon railway works between 1883 – 1899. In all 260 were constructed and although they were originally intended as freight locomotives many were later to be used for passenger services most notably in Wales.

Several of the Class were shipped to France and other countries during both World Wars with many returning to the UK after the hostilities had ceased. By 1955 only two of the Class remained with No. 2516 being selected as part of the National Collection.

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OR76DG003/XS GWR (Unlined) 0-6-0 Class 2301 Dean Goods No. 2475



OR76DG005/XS GWR (Unlined) 0-6-0 Class 2301 Dean Goods No. 2534 with Snow Plough

All models shown are available DCC Ready or with DCC ESU Sound.

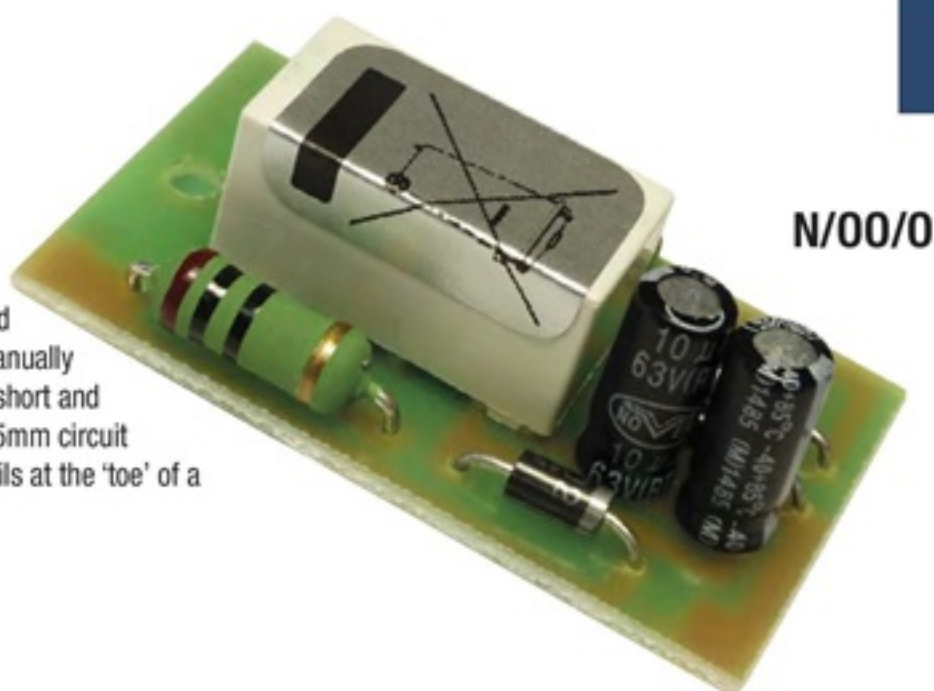
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N/00/0

NOCH 36276 RAILWAY CONSTRUCTION GROUP

Listed as railway construction workers, this set of six figures with different poses and tools are equally suitable for a building site or road works cameo on your layout. Holding a shovel, a pair of spanners, a jack hammer, a pick and a red sack to pose around them, they can add some bright high-vis orange colour to an otherwise dull area of your layout.

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This pack of six deckchairs from etched-brass layout accessory specialists Severn Models will liven up a beach or garden scene. Each chair must be folded with the seat front superglued to the legs. The chairs measure just 8mm in length, so magnification when folding is advisable.

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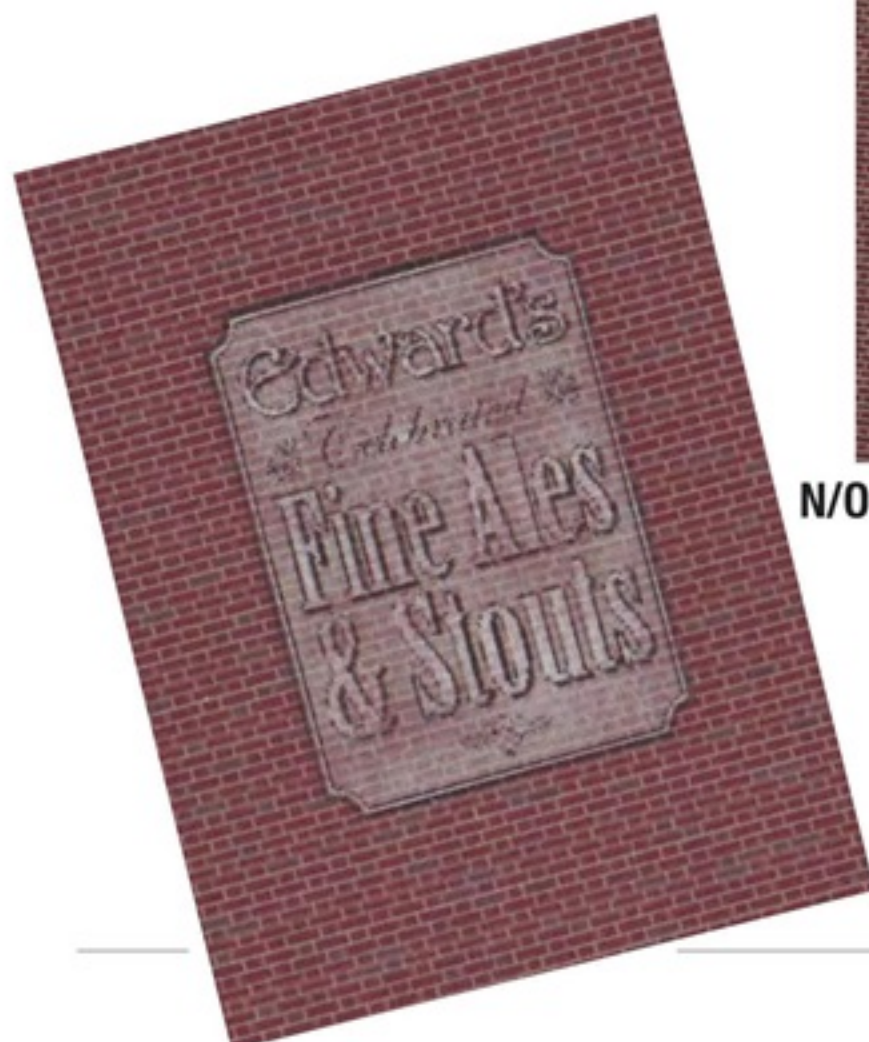
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N/00



Service History: BR CLASS 71

Modern traction historian Simon Lilley offers a brief history of this powerful, but short-lived class of Southern Region electric locomotives.



British Railways announced its Kent Coast Electrification Scheme as part of the 1955 Modernisation Plan. Whilst passenger traffic would largely be handled by EMUs, it identified a requirement for 24 Bo-Bo 2,500hp electric locomotives for freight and parcels traffic, plus the still-important 'Golden Arrow' and 'Night Ferry' boat trains.

The locomotives were ordered in two batches, the first for 13 locomotives, the second for the remaining 11. They were designed at Brighton Works under the guidance of the Mechanical Engineer (Design) R.G. Jarvis. Body design and styling were completed by Professor Mischa Black of the Design Research Unit, who also

worked on several Western Region diesel-hydraulic classes.

The locomotives, designated as 'HA' under the Southern Region's classification system, were built at Doncaster Works in 1958-60. A single skin non-stress-bearing body consisted of a central compartment containing the main electrical and other equipment, with a cab at each end. On one side of the central compartment were the booster, traction motor blower, and booster starting resistor air intakes. The roof was divided into three sections, with removable outer sections, allowing equipment to be lifted out. The centre section contained a well for the pantograph.

REGULAR DUTIES

The majority of their duties were goods trains to and from various locations across Kent. When electrification was undertaken, some sidings and yards were equipped with a basic catenary system rather than third-rail, for staff safety reasons. To operate in these yards, the 'HAs' were equipped with pantographs. Locations included Hoo Junction, Hither Green, and Shepherdswell.

Regular goods duties included block trains of continental ferry vans between Dover and Hither Green, general merchandise trains and coal trains from the Kent coalfield formed of rakes of BR 16t mineral wagons.

When first built, they were used on a number of passenger services until the full



electric service using EMUs began in 1962. Their first prestige work was the heavily loaded 'Night Ferry' international sleeper, with the class making its debut on June 8 1959. The daytime 'Golden Arrow' became a booked 'HA' duty in 1961. An immaculate E5015 hauled the first electric 'Arrow' on June 12 of that year. Unfortunately, a series of delays led to a 13-minute late arrival at Victoria. The 1961 electric timetable saw the 'Golden Arrow' accelerated, reaching Dover Marine in 82 minutes and Dover-Victoria in 85 minutes.

They also saw regular use on various parcels, mail, and newspaper trains, some of which had limited passenger accommodation, right through their career.

LIVERY HISTORY

Their first livery was SR carriage green bodysides with a 2¼in wide white/red/white waistband between the cabs. The area between the buffers was red, the bogies black, and the roof mid-grey. BR totems were placed centrally on both sides, though as built, E5000 and E5001 had theirs placed higher on the air intake side between two grilles at the No. 1 end. Cabside number positions also varied at first - either level with or below lining band height.

The initial livery didn't last long; in May

Typical Class 71 Train Formations

DATE	TYPE OF TRAIN	TRAIN FORMATION
1961	'Night Ferry' Victoria-Dover	Mk 1 BSO Mk 1 RB Mk 1 CK Converted Maunsell RKB S7878S Mk 1 RSO 6 x Wagon-Lits sleeping cars (Paris) 1 x Wagon-Lits sleeping car - (Brussels) 1 x Ferry Brake Van DQD2 2 x Luggage Van DZD2
1961	First electric-hauled 'Golden Arrow'	2 x SR CCTs, 8 x Pullman Cars 2 x Ordinary coaches.
1963	Dover Marine to Hither Green Continental Depot	24 x loaded continental ferry vans 1 x 'Queen Mary' bogie brake van
1967	Ashford to Willesden Class 5 freight	26 x continental ferry vans 1 x BR 20-ton brake van
1972	Last 'Golden Arrow'	Mk 1 GUV S86731 Mk 1 TSO S4376 Mk 1 TSO S4065 Mk 1 SK S25934 Mk 1 SK S25944 Mk 1 BSK S35023 Mk 1 TSO S3773 Pullman Cars S306S, S302S, S307S and S308S
1974	Newspaper train from Victoria	1 x Mk 1 BSK 3 x Mk 1 BGs 3 x SR PMV 3 x CCT
1974	Tonbridge to Chatham Gypsum train	26 x 16t mineral wagons.
1976	'Night Ferry' Dover-Victoria (last weeks of Class 71 operation)	2 x Luggage Vans 4 x Wagon-Lits sleeping cars 2 x BR catering vehicles, 1 x Mk 1 BCK



1961 the red and white waistband was omitted from E5004.

- From 1962, BR policy was for diesel and electric locomotives and multiple units to carry a yellow warning panel. The SR was slow to adopt this policy. A number of Class 71s ran for several years after 1962 in original green livery, without warning panels.
- E5003 was sent to Crewe Works for rebuilding as an electro-diesel in February 1967, still in all-over green.
- Standard BR locomotive green adopted in place of SR carriage green by the mid-1960s. Some examples gain small yellow warning panel of varying size and shape.
- In April 1966 E5012 was outshopped from Eastleigh in all-over dark green with a grey roof. Its yellow warning panel finished some 2ft from the bottom of the cab front – a scheme it retained until painted BR blue. E5001 also had the same shaped panel.
- The first BR Rail Blue example was E5007.

Another early recipient was E5004, ex-works from Eastleigh in April 1967. All the '71s' received the livery with either their original E50xx or TOPS numbers. In the post-1973 TOPS period, the number only appeared on the body on the driver's side. The BR symbol was placed centrally low down on the bodyside.

SERVICE MODIFICATIONS

The Class 71s underwent several modifications during their lives, including several soon after entering traffic. The Electric Train Heating (ETH) jumper cable was moved from the cab front to a position on the bufferbeam, behind the left hand buffer. Large size headcode numerals were changed to smaller characters and on the bodysides, brackets were fitted near the cab doors to hold the 'Golden Arrow' arrows when working that train.

E5004 and E5011 had changes made to the bodyside louvres. Several were removed, and the louvres were altered to vertical on

those remaining. E5004 returned to traffic on May 13 1961 with this modification after overhaul at Eastleigh Works.

Along the roof line and onto the cab roof rainstrips were added. This modification was first seen from the second half of 1963 onwards. E5024 was an early recipient being seen with the strips in July 1963. Another mid-1960s alteration was from round to square sandbox fillers.

Over time, solid disc wheels were fitted in place of the original spoked wheels, although the latter were never entirely replaced. After problems with loose tyres on some wheelsets, monobloc wheels were tested on several examples. Preserved E5001's No. 1 end bogie has spoked wheels, while the other has disc wheels.

A very late modification to some locomotives was the fitting of an additional ventilator to the outer cab windscreen pillars. Examples so fitted included 71001/003/004/009/011.

Aside from these changes, ten locomotives

were taken out of service in 1967 and sent to Crewe Works. They were rebuilt as electro-diesel locomotives with standard SR push-pull equipment to provide additional traction for the Bournemouth electrification scheme and eventually became Class 74. We'll look at this small fleet in a later article.

As built, the original number series was E5000-23. In December 1962, E5000

was renumbered E5024. Following the conversion of ten locomotives as electro-diesels, several of the remaining '71s' were renumbered in late-1968, consolidating them in the E5001-14 series. At this point they also became known as Class 71. Under the TOPS computerisation scheme they were renumbered 71001-014 between December 1973 and January 1974.



Class 71 History

PRE TOPS NOS	TOPS NO.	TO STOCK	WITHDRAWN	SCRAPPED	DISPOSAL
E5000/E5024	-	24/12/1958	-	-	Converted to Class 74
E5001	71001	31/01/1959	26/11/1977	-	Preserved NRM
E5002	71002	24/02/1959	26/11/1977	01/79	J. Cashmore Ltd Newport
E5003	-	20/03/1959	-	-	Converted to Class 74
E5004	71004	16/04/1959	26/11/1977	01/80	BREL Doncaster
E5005	-	12/05/1959	-	-	Converted to Class 74
E5006	-	02/06/1959	-	-	Converted to Class 74
E5007	71007	19/06/1959	26/11/1977	11/78	J. Cashmore Ltd Newport
E5008	71008	17/07/1959	26/11/1977	10/78	J. Cashmore Ltd Newport
E5009	71009	08/08/1959	26/11/1977	09/79	BREL Doncaster
E5010	71010	04/09/1959	26/11/1977	08/79	BREL Doncaster
E5011	71011	30/09/1959	26/11/1977	12/79	BREL Doncaster
E5012	71012	27/10/1959	26/11/1977	10/78	J. Cashmore Ltd Newport
E5013	71013	08/12/1959	26/11/1977	11/79	BREL Doncaster
E5014	71014	20/02/1960	26/11/1977	09/79	BREL Doncaster
E5015	-	20/02/1960	-	-	Converted to Class 74
E5016	-	05/04/1960	-	-	Converted to Class 74
E5017	-	24/03/1960	-	-	Converted to Class 74
E5018/E5003	71003	27/04/1960	26/11/1977	03/80	BREL Doncaster
E5019	-	17/05/1960	-	-	Converted to Class 74
E5020/E5005	71005	15/06/1960	26/11/1977	11/78	J. Cashmore Ltd Newport
E5021	-	27/07/1960	-	-	Converted to Class 74
E5022/E5006	71006	31/08/1960	26/11/1977	10/78	J. Cashmore Ltd Newport
E5023	-	25/10/1960	-	-	Converted to Class 74

TRAFFIC DECLINE

In later years, the Class 71s suffered from a shortage of work. Freight tonnage on the Southern Region declined as the country went through a long period of economic turmoil and uncertainty in the 1970s. Other work was lost to road haulage or disappeared entirely as Kentish collieries closed.

The final 'Golden Arrow' ran on September 30 1972, hauled by a specially-prepared E5013. That famous headboard was carried once again with the UK and French flags. Bodyside golden arrows, not used for some time, were affixed to both sides of the locomotive's leading end to mark the sad occasion.

The 'Night Ferry' survived longer and was Class 71 hauled until their demise. On August 26 1976, 71010 was in charge. By this time, the train consisted of just nine BR and SNCF vehicles. The 19-coach loadings of yesteryear were long gone. The whole class was placed into storage on September 23 1976, with Class 73s taking over what duties remained, including the 'Night Ferry'.

On November 26 1977 the entire class was withdrawn en masse. After a period of storage at several locations, they were sent for scrap at either BREL Doncaster or Cashmore's yard in Newport (Gwent).

Fortunately, 71001 was claimed for the National Collection and taken to Doncaster Works for restoration in June 1978. It was repainted in original green and first displayed at the National Railway Museum on March 19 1979.

It remained there until 1988 when it was made available for display at open days and other external events. Thoughts then turned to the locomotive returning to active main line use and it was sent to Ashford Chart Leacon works on May 14 1992 to be restored to full working order. On August 28 E5001 hauled a successful test train between Ashford to Dover Western Docks and back. Its first passenger outings for more than 15 years ran from Waterloo to Bournemouth in connection with a depot open weekend in the Dorset seaside resort.

Over the next three years it hauled numerous railtours, but as the railway changed in preparation for privatisation, such operations became more difficult and E5001 was once again retired to the NRM. Since the mid-1990s it has been a static exhibit again, firstly at York, then at Locomotion in Shildon and more recently at Barrow Hill Roundhouse. It remains to be seen if it will ever run on the main line again.



There are hints of a David and Goliath story with DJ Models' Class 71. It announced in July 2014 that it wished to produce the model, but that crowd-funding was needed. Backers paid £125.00 deposit per locomotive to model shop Kernow Model Rail Centre who underwrote the project. In November 2014, Hornby announced it too was to produce a Class 71 - could two manufacturers succeed in making a model of a niche-interest locomotive?

Design revisions with input from RMweb contributors and finances impacted DJ Models' delivery aims and Hornby beat it to market with the release of its model in July 2016.

FIRST IMPRESSIONS

DJ Models' Class 71 arrives in a sturdy cardboard box, foam-lined with a plastic tray. The model is well-finished, with a good weight and significant detail.

The model measures up well to prototype dimensions. Complex shapes, particularly around the nose with its angles and curves entailed some re-design and re-tooling once the first EP samples were run. Prototype photographs accentuate different aspects depending on the angle they were taken from, the light falling on it and the focal length of the lens used. The best comparison I've seen is a Colin Marsden image of a locomotive under construction at Doncaster works. I feel DJ Models' Class 71 has captured these areas well.

The ventilation grilles to the sides are finely executed, panel lines and jointing strips are correct and fine rivet detail is present where appropriate.

Despite moulded conduits in the pantograph well, the detailing on the pantograph, its mounting and the springing is excellent. The cosmetic pantograph is manually posable and care in handling the model is advisable. The edges of the windscreen windows feature a black gasket with a lit centre panel for the headcode. The bodyside window is of a non-transparent glossy black plastic, unlike the Hornby



FACT FILE

MODEL 0071-005 DJ
Models Class 71 Electric
Locomotive E5010
PRICE RRP £139.95
WORDS AND
PHOTOGRAPHS
Andy York

DJMODELS 'HA' CLASS 71



model there's no representation of the internal booster workings on the chassis block inside. The model features etched makers' plates to the cabsides and printed chequer plate kickboards below the doors.

The bogie detail is superbly moulded with cabling runs and plausible helical springs. Sufficient space behind the bogie sides will make an easy EM/P4 wheelset conversion. The bogie proportions look good, filling the width out to the bodyside – a noticeable difference to the Hornby model.

There are small differences in Class 71 locomotives through their life. As introduced, there was no rain-strip to the cant rail and over the doors, so a locomotive in the early livery without warning panels and a red and white bodyside stripe should seldom feature these. However, the DJ Models correctly features the later style of wedge-shaped corner pillar vents which only appeared on later versions. Both Hornby and DJ Models have incorrect permutations on the earliest livery. As-built, the sandbox filler caps should be round rather than the later rectangular pattern featured on this model.

DETAILING

Below bufferbeam level the width of the corner valances is well replicated and the front valance supplied in the detailing pack smoothly clips into place without a visible join. The piping supplied fits well into the relevant holes, although gluing into place is recommended. A cosmetic

screw-link coupling completes the appearance. The same applies to the collector shoes to be mounted onto the bogie sides. It seems a shame to restrict the view of the distinctive spoked wheels, but they're worth fitting. The lifting hook extensions from each bogie are a customer fit. Their position is variable to accommodate curves and pointwork. Inside, the cab interior is removable to fit a driver and reveals a dashboard panel with instrumentation transfers.

The directional marker lights are a subdued warm white. Double red panel headcodes should be used in the central window headcode panel for the taillights on these locomotives. Alternate headcodes are provided in the detailing pack with different fonts subject to the age of the locomotive portrayed. These are fitted by sliding the plastic headcode into the





slot behind the headcode window whilst the body is removed. On the underside, there are switches for the cab lights and marker lights.

TRACK TESTING

The model is powered by a comparatively small coreless motor driving the gears to each bogie via cardan shafts. Under testing, performance was sufficiently powerful to draw a rake of ten Mk.1 coaches with ease and excellent slow-speed control. There was a little gear noise until run in after lubrication.

DCC PROVISION

Inserting fingernails between the body and chassis near the centre releases the bodyside clips. A 21-pin decoder socket is mounted above the chassis block with space for a large DCC sound speaker.

OPINION

The bodyside window and early livery rain-strip are my only criticisms. In all other respects I think this is a very, very good model. Well done to those who backed the project and saw it through its delays. The Hornby and DJModels models are largely equal in performance, but the DJModels version is ahead in the detail and DCC consideration areas. Hornby will sell more Class 71s but I hope the DJM version has a future. A crowd-funded Class 74 model has yet to get the go-ahead. Hopefully the outcome of the Class 71 project will stimulate further interest in this.

Inevitably, some backers pulled out of the project and there are a limited number of models still available through Kernow's website at £139.95. If you waited to see which model came out better, now is the time to act. I believe that some of the production runs in certain liveries are very small, so you may also have a bit of a collector's item on your hands. ■

Kernow also has exclusive weathered limited editions of the Class 71 in early red stripe green livery, simplified green livery and BR Blue with full yellow ends. The weathering by Mercig Studios brings the bogie detail to life and these limited runs of 100-150 models are available at £144.95 on its website.



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datafile

BASICS

Manufacturer: DJModels Ltd.

Catalogue Refs:

OO71-001 DJ Models Class 71 Electric Locomotive E5003 – GSYF

OO71-002 DJ Models Class 71 Electric Locomotive E5004 – Early green

OO71-003 DJ Models Class 71 Electric Locomotive 71 009 – BFYE

OO71-004 DJ Models Class 71 Electric Locomotive 71 013 – BFYE

OO71-005 DJ Models Class 71 Electric Locomotive E5010 – GFYE

RRP: £139.95

Gauge/scale: 16.5mm gauge, 1:76 scale OO

Era: 5 to 7

Company/Operator: BR(S)

Region: BR(S)

Weight: 322g

Body: Plastic

Chassis: Die-cast metal and plastic

Minimum Curve Radius: 438mm (R2)

Wheel Profile: RP25

Couplings: NEM mounted tension lock

Accessories: Buffer-beam valances and detailing, headcodes and cosmetic screw couplings

ELECTRICAL/MECHANICAL

Power System: 12V DC

Motor: Coreless motor to shaft drives

DCC Provision: 21-pin socket

Pick-ups: Brass plate contacts to axles

Lighting (exterior): Marker lights and headcodes

Lighting (interior): Cab lighting

Drive System: Shaft drive to bogie gears

Flywheel: None

Traction tyres: None

SERVICING

Body Removal: Unclip centre of body from chassis

Lubrication: Access to lubrication points in bogie bases

Packaging: Plastic trays within cardboard outer and foam lining

Instructions: Exploded diagram sheet for maintenance

Spares/warranty: djmodels.co.uk

VITAL STATISTICS

Dimension	1:1	1:76	Model	+/-
Length (over buffers)	50' 7"	202mm	202mm	0
Height (pan down)	13' 1"	52mm	52mm	0
Width	8' 11"	36mm	36mm	0
Wheel diameter	4' 0"	16mm	16mm	0
Wheelbase	37' 6"	150mm	150mm	0
Wheel Back-to-Backs			14.4 to 14.5 mm	

WHAT YOU THINK

Watch some of your video reviews from RMweb:

www.brm.ag/DJModels71Review1

www.brm.ag/DJModels71Review2

DAPOL GLOUCESTER RC&W CLASS 122 RAILCAR



Dapol's Class 122 features great detail including wire handrails, separate exhaust pipes and excellent printing over a good rendition of BR Blue. Over 100 destination blinds are included for the modeller to choose ones which are appropriate for their layout.



In 2012 Dapol announced it was to produce the Class 121 and Class 122 railcars. Class 121 cars were manufactured by Pressed Steel at Linwood, predominantly working on Western Region branch lines in the south-west and distinguishable from the Class 122 by their four-character headcode box.

Gloucester RC&W built 20 Class 122 railcars, delivered from 1958. Initially, they were concentrated around the West Midlands area on services to Leamington, Stratford, Dudley and Stourbridge Town. Additional cars were then used on branch services to Windsor and Henley-upon-Thames and their use eventually spread around parts of the south-west and south Wales. In the late 1960s several units were re-allocated to the Scottish region featuring on services around Ayr and Kilmarnock and three of the units, 55013/4/5, were converted into parcels units and re-classified as Class 131.

All of the cars, as built, had a two-character headcode panel to the cab end. These were later plated over or given a flush finish upon works visits.

DAPOL'S DETAIL

Our review sample is painted in the correct shade of BR blue and numbered as SC55013. Unfortunately, 55013 was converted into a parcels car whilst carrying BR green livery and two-character headcodes on the front panel, with an additional double-door for loading at the non-guard's end. Dapol's model has flush cab ends without a two-character headcode box. Even in parcels and later departmental use, 55013 had a visible panel in this area. For this reason, the number chosen isn't suitable for the model. Some modellers might wish to renumber the model.

FACT FILE

MODEL 4D-015-004
Class 122 Gloucester
RC&W railcar SC55013 in
BR Blue
PRICE RRP £145.00
**WORDS AND
PHOTOGRAPHS**
Andy York



Application of livery details is precise with small data information clearly defined on the cab-end. The dimensions and shape of the model capture the look of the prototypes and the separately-fitted handrails, exhausts and wipers have a fine appearance. There's a wealth of component detail beneath the solebar, with minimal intrusion of underfloor motor housing to spoil the appearance of the central underfloor area. Much of the equipment detail is picked out in colour in ex-works splendour.

Although the wheels appear small they are at a scale 3ft and the bogies look good in all respects. Necessary gaps between the body and bogies are provided for the model to navigate the curves on most layouts.

Looking inside, the seat cushions and backs are picked out in a mid-blue, but it's evident the floor is higher than it should be. This is because a 5-pole motor with twin flywheels partially intrudes into the passenger area. With its 345g mass, I am sure this model would capably pull a substantial rake of coaches.

There is much to commend this model with its quality feel, but choice of the prototype number is a missed opportunity. Its additional detail packs are welcomed, but the model is still ready to use for those who don't want to make alterations. ■

 ELECTRICAL/MECHANICAL

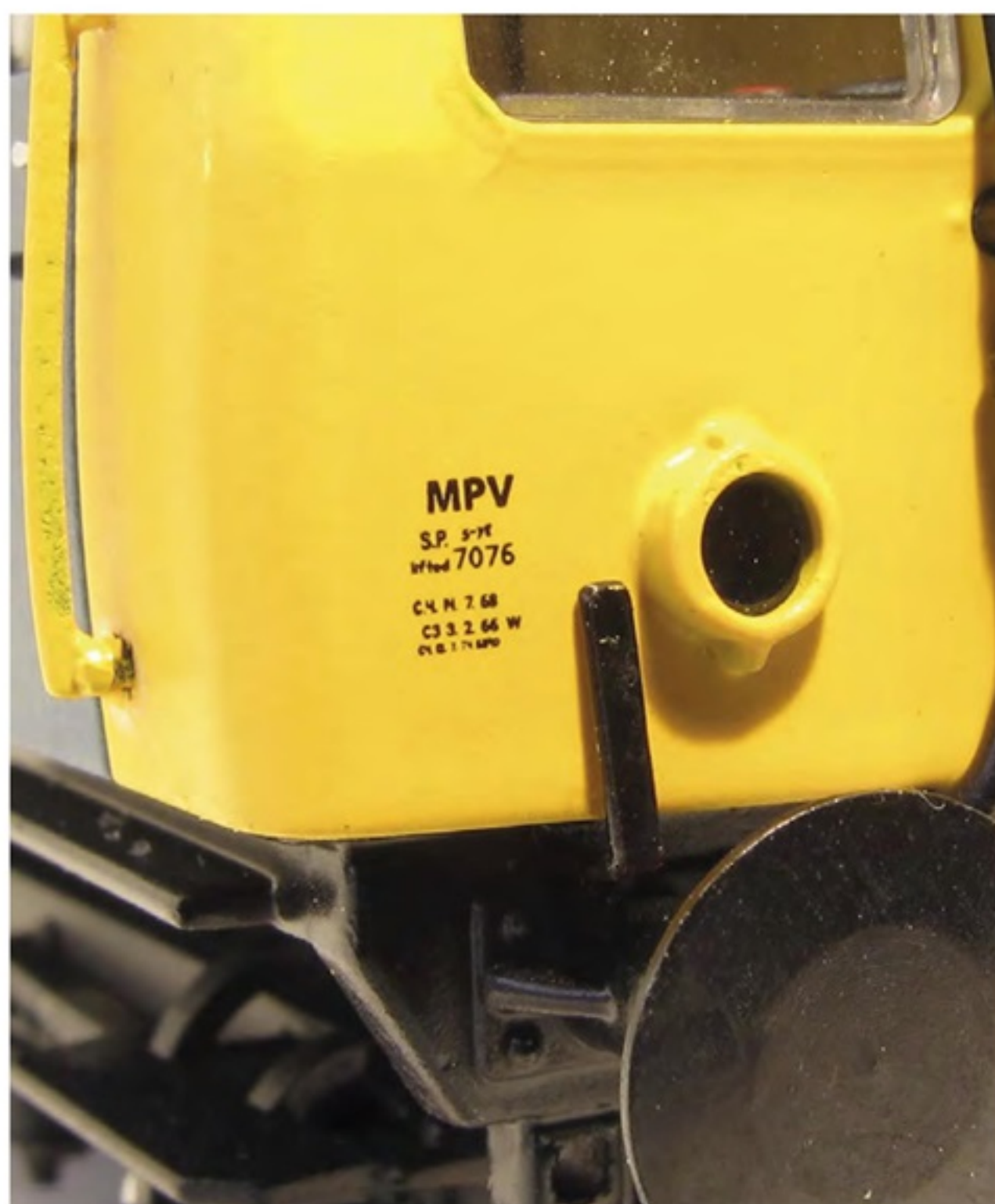
Traction tyres: None

 SERVICING

Spares/warranty: 24 month no quibble warranty

VITAL STATISTICS

DIMENSIONS	1:1	1:76	MODEL	+/-
Length (over headstocks)	63'5"	252mm	252mm	0
Height (to vents)	12'8"	51mm	51mm	0
Width	9'0"	36mm	36mm	0
Wheel diameter	3'0"	12mm	12mm	0
Wheel to Back-to-Backs	14.4 to 14.5mm			



The printing of the model's data panel on the cab front at the guard's end is excellent and the permutations of selectable lights on DC operation is commendable.

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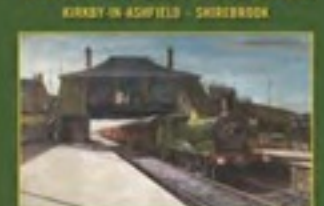


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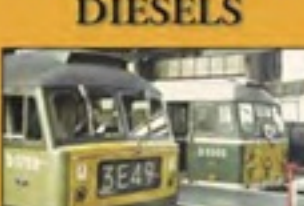


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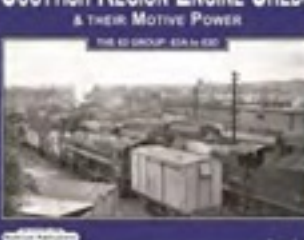


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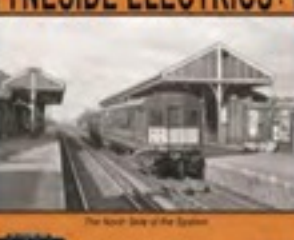
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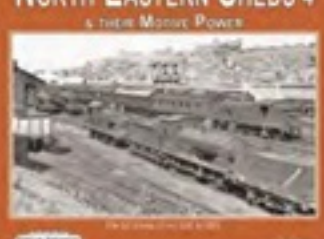
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there aren't more military themed models inside – that's apparently because the additional content would add too much to the already substantial 208 page extent. Perhaps that's something for further editions in the planning. In the meantime, the British Toy Train series has been a pleasure to thumb through so far. Indeed, the books seem to be constructed with casual reading in mind, with large, well-

taken colour pictures, assorted marketing materials from the period and an editorial style that allows the images to do most of the talking. Readers are thus bound to pick the books up and revisit them frequently. That's how we've been enjoying them, anyway. Highly recommended.

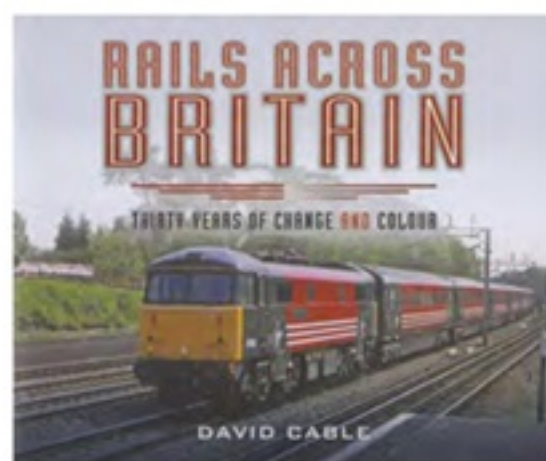
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VARIOUS – AMBERLEY

Amberley rarely disappoints in terms of the volume of books that it publishes every month and their quality. Its books are certainly affordable too, which is always a bonus. We begin this month with 'The British Railways Pilot Scheme Diesel Locomotives' by Colin Alexander. Priced £14.99, this book charts the somewhat hurried introduction of a variety of diesel locomotives during the Modernisation Plan of the 1950s, and the measures employed following the realisation that they hadn't been designed or tested properly. A fascinating tale, which is largely told through brief but informative captions and a selection of monochrome and colour photos. Allen Jackson's 'Signalling and Signal Boxes along the LSWR Routes' (£14.99) is somewhat wordier, but is a useful companion to his previous book about signal boxes on SE&CR Routes. This volume focuses on lines running in the Home Counties and through to Plymouth and Cornwall. The notion that the LSWR was effectively racing with the GWR is an entertaining concept too. By the same author, and with the same price, 'Great Western Railway Stations' takes an affectionate look at what remains of GWR stations and associated architecture. Much has changed from their original building to the 21st century, but there's plenty of modelling inspiration here nonetheless. Finally, 'Doncaster's Railways' by photographer John Law (£14.99) looks at railway activity in and around the town from the end of steam to the present day. Doncaster itself is on the East Coast Main Line, of course, so sees plenty of locomotive traffic. Much of which is documented here.

W www.amberley-books.com



RAILS ACROSS BRITAIN: THIRTY YEARS OF CHANGE AND COLOUR

Author David Cable has done a splendid job in documenting the years spanning the demise of British Rail to the colourful-liveried locomotives of the present day. While that might present itself as the subject of a more scholarly tome, Cable conveys this intriguing history with a brief introduction, large photographs and economical descriptions. A substantial work it most certainly isn't, but as a pictorial reference it's rather more successful.

Price £25.99 W www.pen-and-sword.co.uk

FLYING SCOTSMAN: A PICTORIAL HISTORY

Doncaster Works' most lauded locomotive needs little introduction and most certainly doesn't require much more to be written about it. With that in mind, Fred Kerr and Keith Langston's book sensibly follows a more illustrative route, telling the history of Flying Scotsman from its earliest days – before it had even acquired its iconic name – to preservation and re-introduction in the present. The photography is crisp and well-chosen and captions are brief throughout. However, each chapter begins with a rather more informative introduction. All in all, this is a coffee table book for fans of Flying Scotsman, and in that regard we have no complaint.

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EVENTS

EXHIBITIONS

JULY 01 - JULY 02

The EXE Model Railway Society Model Railway Exhibition Exeter Matford Centre, Matford Park Road, Matford Business Park Marsh Barton Trading Estate, Exeter, Devon EX2 8FD
Opening Times: Saturday 1000 - 1700 Sunday 1000 - 1600
Prices: Adult £7.00 Concession £6.00 Children Free when Accompanied by a paying Adult **T:** 01392 421906

Basildon 38th Model Railway Exhibition James Hornsby School, Leinster Road, Laindon, Basildon, Essex SS15 5NX
Opening Times: Saturday 1000 - 1700 Sunday 1000 - 1600
Prices: Adult £5.00 Senior £3.00 Child £2.00 Family £12.00 (2+2)
T: 01268 411603

JULY 29 - JULY 30
St Johns Charity Model Railway Exhibition St John's Primary School, Wheatly Avenue, Stoke-on-Trent, Staffs ST4 6SB
Opening Times: Saturday 1030 - 1700 Sunday 1030 - 1630
Prices: Adult £4.00 Child £2.00 Family £10.00 (2+2)
T: 07747 087050

CONTACT US

DIARY DATES are now **ONLINE!**

As of the December 2016 issue of BRM, only a select number of Events will be listed within the magazine. For an extensive list of all Diary Dates please visit our website at the address below.

www.brm.ag.brmevents

WEBSITE

Enter your event on our website
www.world-of-railways.co.uk

Closing date for the September issue is July 18th

Suitable for disabled visitors.

OTHER EVENTS

JULY 08 - JULY 09

Amberley Museum & Heritage Centre Rail Gala Weekend Station Road, Amberley, Arundel, W. Sussex BN18 9LP
Opening Times: Saturday/Sunday
W: www.amberleymuseum.co.uk

JULY 10

UK Specialist Toy & Model Auctions Craxton Wood Hotel, Parkgate Road, Ledsham Ellesmere Port Cheshire CH66 9PB
Opening Times: Monday Viewing 0930 Auction 1130
T: 01513343362 / 01270652773

TRAIN & TOY FAIRS

JULY 01 - JULY 02

Locomotion - Toy Fair The National Railways Museum, Shildon, Co Durham DL4 1PQ
Opening Times: Saturday & Sunday 1000 - 1700
T: 01535 642367

JULY 02

SRP Toy Fairs - Bexhill-on-Sea Glenleigh Park Academy, Gunters Lane, Bexhill-on-Sea, East Sussex TN39 4ED
Opening Times: Sunday 1000 - 1400
Prices: Adult £2.00 Child Free
T: 0773 9998012

JULY 05

Joe Lock Toy & Train Fairs - Selsdon St John's Community Hall, Selsdon, Croydon, London, CR2 8DD
Opening Times: Wed 1800 - 2000
Prices: Admission £1.00
T: 07866 641215

JULY 08

SRP Toy Fairs - Hawkinge Hawkinge Community Centre, Heron Forstal Ave., Hawkinge, Folkestone, Kent CT18 7FP
Opening Times: Saturday 1000 1400
Prices: Adult £2.00 Child Free **T:** 0773 9998012

JULY 09

SRP Toy Fairs - Midhurst The Grange, Bepton Road, Midhurst, West Sussex GU29 9HG
Opening Times: Sunday 1000 - 1400
Prices: Adult £2.00 Child Free
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JULY 16

SRP Toy Fairs - Worthing Charmandean Centre, Forest Road, Worthing, West Sussex BN14 9HS
Opening Times: Sunday 1000 - 1400
Prices: Adult £2.00 Child Free
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JULY 20

Joe Lock Toy & Train Fair - Theydon Bois Village Hall, Coppice Row, Theydon Bois, Epping, CM16 7ER
Opening Times: Thursday 1900 - 2100
Prices: Admission £1.00
T: 07866 641215

JULY 23

SRP Toy Fairs - Orpington Crofton Halls, Station Road, Orpington, Kent BR6 8PR
Opening Times: Sunday 1000 - 1400
Prices: Adult £2.00 Child Free
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JULY 25

SRP Toy Fairs - Tonbridge The Angel Centre, Angel Lane, Tonbridge, TN9 1SF
Opening Times: Tuesday 1800 - 2000
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JULY 29 - JULY 30

Joe Lock Toy & Train Fairs - Bluebell Railway Horsted Keynes Station, Station Approach, Horsted Keynes, Haywards Heath, West Sussex RH17 7BB
Opening Times: Saturday / Sunday
T: 07866 641215

JULY 30

SRP Toy Fairs - Rayleigh Sweeney Park School, Sir Walter Raleigh Drive, Rayleigh, Essex SS6 9BZ
Opening Times: Sunday 1000 - 1400
Prices: Adult £2.00 Child Free
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NOVEMBER 19

SRP Toy Fairs NEW - Northfleet Girls School, Hall Road, Northfleet, Kent DA11 8AQ
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Model Railway Show: Sunday 3rd September

www.bressingham.co.uk Bressingham Steam Museum,
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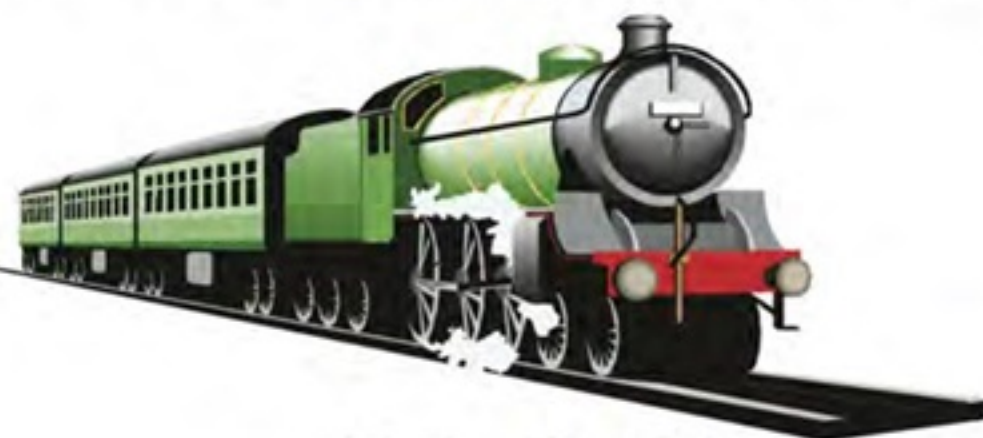
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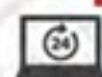
82G - O	North of England Line (NoEL) - N
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Bishopmead - OO	Redford Junction - TT
Butley Quay - 009	Salz - HO
Copenhagen Fields - 2mm FS	South Town - OO
Dovington Camp - OO	Stamford East - N
Hartshill Bank - N	The Clydach Railway - 009
Hawthorn Dene - N	Torcy (SNCF) - HO
Hinton Parva - OO	Tri-ang TT Gauge 60th Anniversary
Kirkwood - West Riding - O	Display Layout - TT
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Squires will be exhibiting at the following shows in 2017 –
 Diary updated as bookings are confirmed.

- June 24/25 - PERTH** Model Railway Exhibition, Dewars Ice Rink, Perth, PH2 0TH
 Sat 10-5.30, Sun 10-5
- July 1/2 - GUILDFORD** 50th Model Steam Rally & Exhibition, Guildford Model Engineering Society, Stoke Park, London Road, Guildford, Surrey, GU1 1TU Sat 10 - 6pm Sun 10 - 5pm
- July 9 - CARN BREA** West Cornwall Model Railway Group's, Model Railway Exhibition, Carn Brea Leisure Centre, Station Road, Pool, Redruth, Cornwall. TR15 3QS, Saturday 10-4.30
- July 29/30 - NORTH SHIELDS** RAILEX NORTH EAST, John Spence Community High School, Preston Road, North Shields. Tyne & Wear. NE29 9PU Sat 10 - 5, Sunday 10 - 4.30.
- Aug 5/6 SOUTHOLD** Waveney Valley Model Railway Exh, St Felix School, Southold, IP18 6SD Sat 10 - 5pm Sun 10-4.30pm. **Plenty of FREE Parking.**
- Aug 12 BEXHILL**, Model Railway Exhibition, St Richards Catholic College, Ashdown Road, Bexhill-on-Sea, East Sussex TN40 1SE Sat 10 - 5pm. *Plenty of FREE Car Parking on site*
- Aug 12/13 - SKIPTON** Model Railway Exhibition, Skipton Academy (Formerly Aireville School) Gargrave Road, Skipton, BD23 1UQ, Sat 10 - 5, Sun 10 - 4. www.skiptonrailsoc.org.uk
- Sept 2/3 - TELFORD GUILDEX 2017**, O Gauge Exhibition and Trade Show, The Telford Exhibition Centre, St. Quentin Gate, Telford, TF3 4JH, Saturday 10 - 5, Sunday 10 - 4. Coming to Telford??? - Why not try Sunday??? - the show is less busy - see more of the layouts AND a lot easier to get to our stand!!! :-)
- Sept 9/10 - SWINDON** Railway Festival STEAM Museum of the Great Western Railway, Fire Fly Avenue, Swindon, SN2 2EY Sat/Sun 10 - 5 Tel 01793 466646, Email enquiries: steammuseum@swindon.gov.uk
- Sept 16/17 - AYR** Model Railway Exhibition The Citadel Leisure Centre, Ayr. KA7 1JB. *Modern Venue with easy access & FREE car parking.* Sat 10-5/Sun 10-4
- Sept 23/24 - HALIFAX** M/Rail Ex, North Bridge Leisure Centre, Halifax, HX1 1XH. Sat/Sun 10-5.
- Sept 23/24 - WORTHING** Model Railway Exhibition, Durrington High School, The Boulevard, Durrington, Worthing, West Sussex. BN13 1LA Sat 10-5, Sun 10-4 *Plenty of FREE Parking*
- Oct 7/8 SHILDON**, Model Railway Exh, Locomotion Museum, Shildon DL4 1PQ Sat/Sun 10 - 5 *Free Car Parking and Free Entry to Museum and Exhibition - Yes that's Free Entry!!!! :-)
- Oct 7/8 - FAREHAM** Fareham & District Model Railway Exhibition, Fareham Leisure Centre, Park Lane, Fareham, Hampshire, PO16 7JU. Saturday 10-5.30, Sunday 10.00 - 16.30.
- Oct 7/8 - FOLKESTONE** Folkestone, Hythe & District M/Railway Exh, The Leas Cliff Hall, Folkestone, Kent. CT20 2DZ. Sat 10-5.30, Sun 10-5.
- Oct 7/8 - SWANSEA** Model Railway Exh, presented by Swansea Railway Modellers Group, Swansea Leisure Centre, Oystermouth Road, Maritime Quarter, Swansea SA1 3ST Sat 10-5, Sun 10-4.
- Oct 14/15 - ALDERSHOT** Farnham Model Railway Club Exhibition, Connaught Leisure Centre, Tongham Road, Aldershot, Hants. GU12 4AS. Sat 10-5, Sun 10 - 4.30
- Oct 21 - CHICHESTER** M/R Ex, Boy's H/Sch, Kingsham Rd, Chichester, W.Sussex. PO19 8AE. 10-5.
- Oct 21/22 - UCKFIELD** M/Railway Exh, Uckfield Civic Centre, Uckfield. TN22 1AE Sat/Sun 10-5
- Oct 28/29 - STOCKPORT** Hazel Grove & District Model Railway Society Exhibition, Hazel Grove Recreation Centre, Jacksons Lane, Hazel Grove, Stockport, Cheshire, SK7 5JX Sat 10 -5, Sun 10-4
- Oct 28/29 - LEEDS** The Leeds Model Railway Society, Model Railway Exhibition, The Grammar School, Alwoodley Gates, Harrogate Road, Leeds, LS17 8GS Sat 10-5, Sun 10-4.30
- Oct 28/29 - ABERDEEN** M/Rail Ex, Hallmark Hotel, Aberdeen Airport, Aberdeen, AB21 7DW Sat 10-5/Sun 10-4. **New Venue - www.facebook.com/AberdeenModelRailwayclub **
- Nov 4 - HIGH WYCOMBE - WYCRAIL** 17 Model Railway Exhibition, Cressex Community School, Cressex Rd, High Wycombe, Bucks HP12 4UD. 10-5.
- Nov 4/5 - ANGMERING** W.Sussex Area Group N Gauge Society "All Scales Model Railway Exh", The Angmering School, Greenwood Drive, Station Rd, Angmering, BN16 4HH, Sat 10-5 Sun 10-4 *Now 2 Day Show - Short Walk Angmering Station - Features various scales not just N Gauge!!!!*
- Nov 11/12 - SPALDING** Model Railway Exhibition, Springfields Event Centre, Camelgate, Spalding, PE12 6ET, Sat 10-5/Sun 9.30-4.30.
- Nov 11/12 - TELFORD** IPMS SCALE MODEL WORLD 2017 The Telford Exhibition Centre, St. Quentin Gate, Telford, TF3 4JH, Sat 10 - 6, Sun 10 - 4.00 Free Entry for IPMS Members. Coming to IPMS Telford? Why not try Sunday? The show is less busy AND a lot easier to get to our stand!!!! :-)
- Nov 17-20 - WAKEFIELD** 56th Model Railway Exhibition, Thornes Park Athletics Stadium, Horbury Road, Wakefield, WF2 8TY Friday 5.30-9. Saturday 10-5.30. Sunday 10-4.30
- Nov 18/19 - WORKINGTON** Model Rail Show, University of Cumbria, Energus Building, Blackwood Rd, Lillyhall Estate, Workington, Cumbria, CA14 4JW. Sat 10-5, Sun 10-4.
- Nov 25/26 - BIRMINGHAM** Warley National Model Railway Exh Hall 5, NEC Birmingham 40 1NT. Sat 9.45-6pm, Sun 9.45-5pm. **50th Exh** Advance Ticket Holders gain entry 9.15am both days.

EXHIBITIONS & SHOWS IN 2018

- Jan 13/14 - BOGNOR REGIS** M/Railway Exh, Felpham Community College Felpham Way, Felpham, Bognor Regis, W.Sussex PO22 8EL Sat 10-5, Sun 10-4.30 **Plenty of Free Parking**
- Jan 21 GUILDFORD** - Astolat Model Railway Exhibition, The Surrey Sports Park, University of Surrey, Richard Meyjes Road, Guildford, Surrey, GU2 7AD. Sunday 10-5. www.astolatmrc.co.uk
- Jan 27/28 KENDAL** Model Railway Exh Leisure Centre, Burton Rd, Kendal, LA9 7HX Sat/Sun 10-5
- Jan 28 BRISTOL** - Bristol 'O' Gauge Group Exhibition University of the West of England (UWE Bristol), Conference & Exhibition Centre, Filston Road, Bristol, BS34 8QZ. Sunday 10-4.
- Feb 3/4 ALTON** - FebEx 2018 Alton Model Railway Group Exhibition Eggars School, Anstey Road, Alton, Hants, GU34 4EQ. Saturday 10.30 - 5. Sunday 10.30 - 4.00.
- Feb 23-25 GLASGOW** Model Rail Scotland Scottish Exhibition Centre, Glasgow, G3 8YW. Friday 10.30 - 6, Saturday 9.30 - 6, Sunday 9.30 - 5. www.modelrail-scotland.co.uk
- Mar 3/4 - PRESTON** Preston & District Model Railway Exhibition, Sports Hall, Preston College, St Vincents Road, Fullwood, Preston, Lancashire, PR2 8UR. Sat/Sun 10 - 5pm.
- Mar 10/11 - KEIGHLEY** Model Railway Exhibition, University Academy Keighley (UAK), Green Head Road, Utey, Keighley, BD20 6EB. Sat/Sun 10-5.

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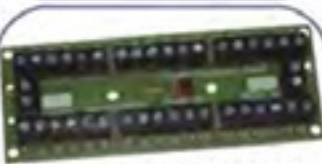
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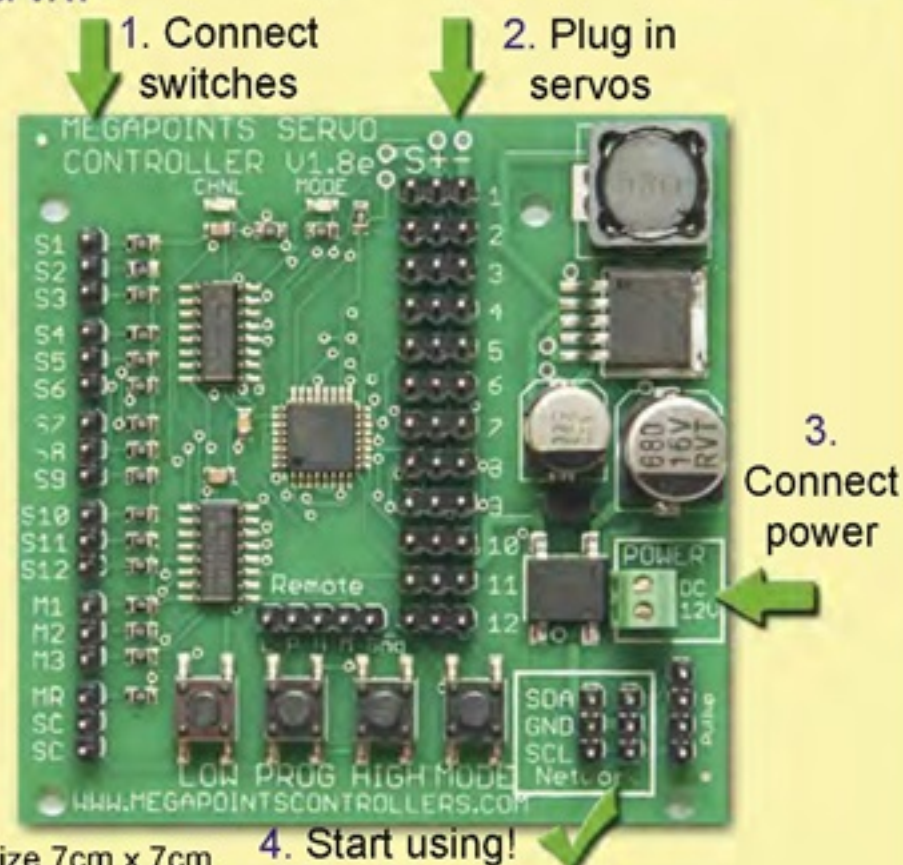
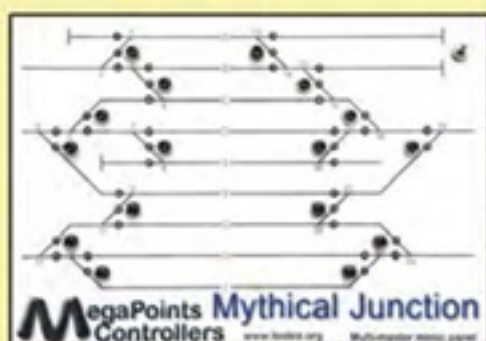
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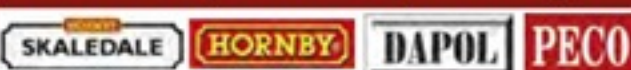
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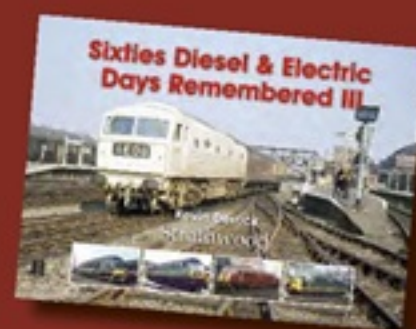
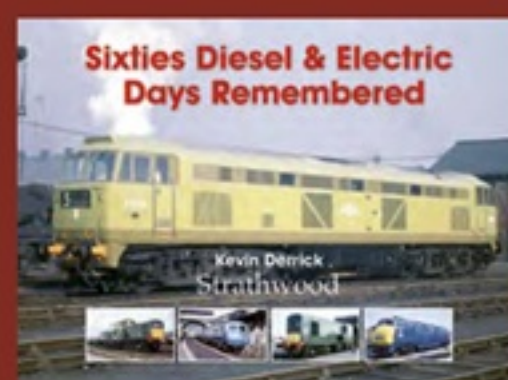


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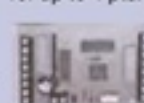
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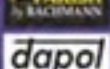
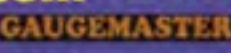
 

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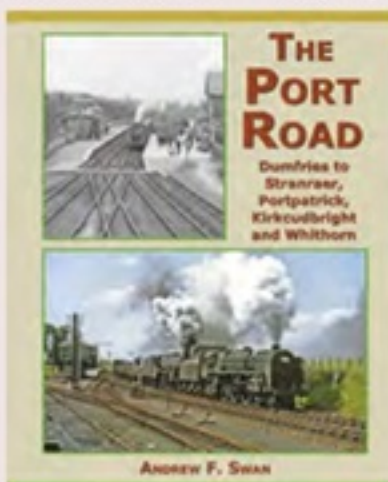
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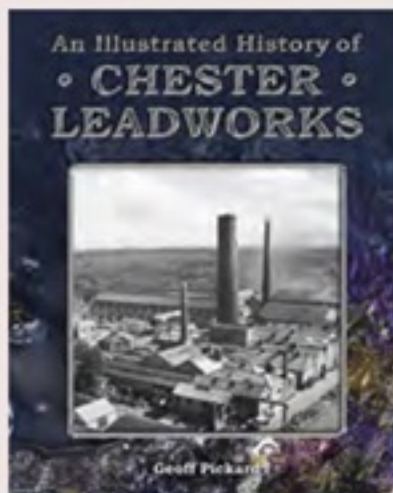
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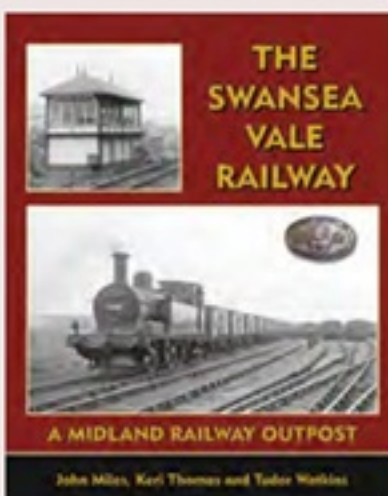
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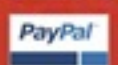
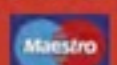
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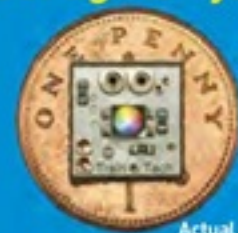
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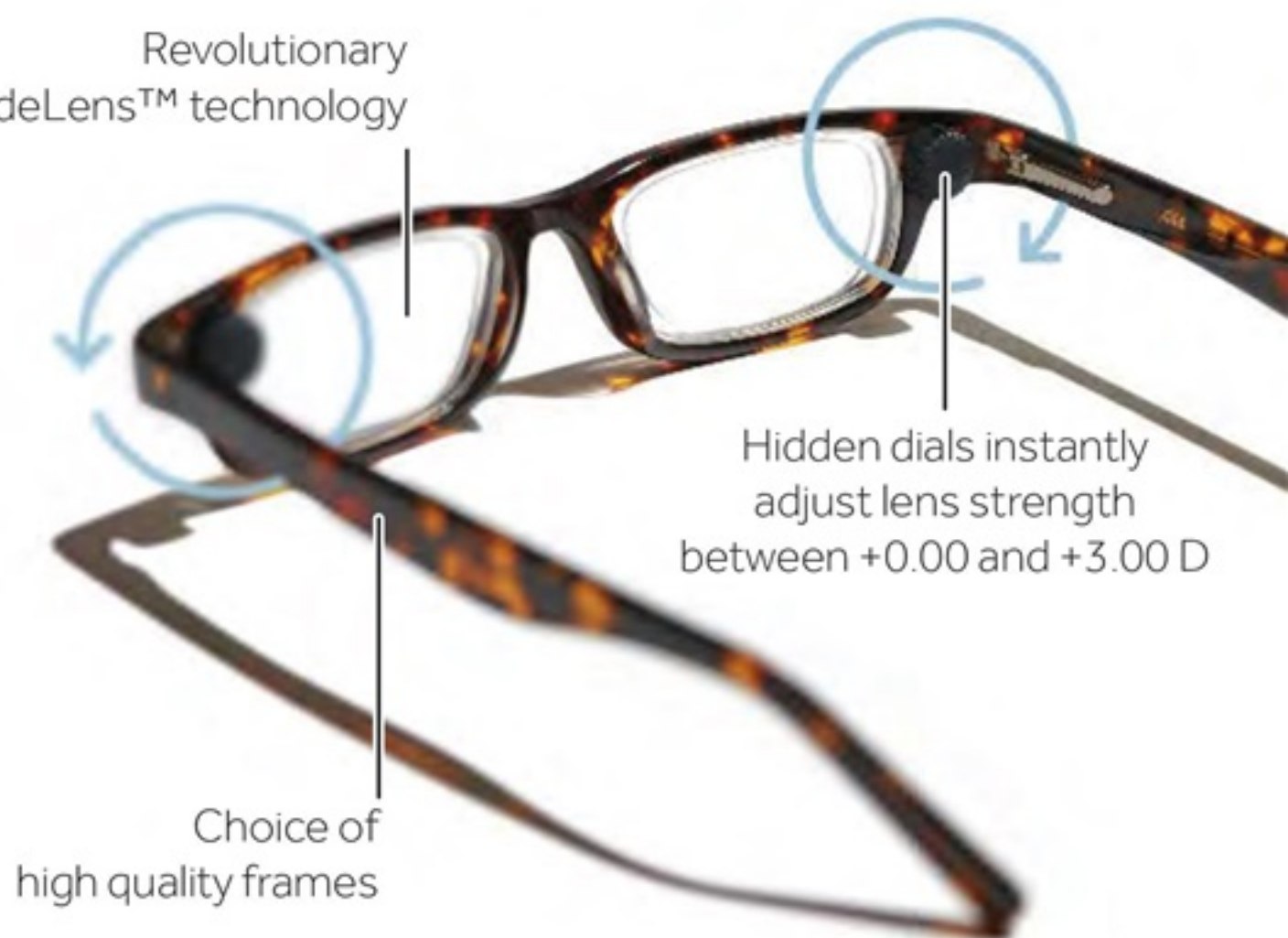
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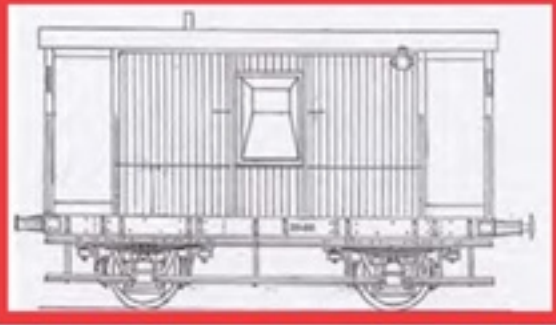
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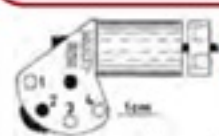
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Phil Parker suffered major laser cutter envy when talking to Geoff. However, equipment like this doesn't replace traditional methods, instead it's potentially another item in our toolboxes



# A chat with GEOFF TAYLOR

Phil Parker speaks to master model maker Geoff Taylor, whose layout 'Penmaenpool' was featured in our July 2016 issue, and discovers much about his methods and inspirations.

**L**et's start at the beginning. Geoff trained as a printer, back in the days of 'hot metal' and operating a linotype machine. This took him around the country, but, by the mid-1990s, he felt he needed a change of direction.

A member of the Manchester Model Railway Society (MMRS), just as they were starting on 'Dewsbury Midland', he expressed an interest in getting involved with the project. When asked what he enjoyed, the answer was "buildings and scenery". A challenge was set.

"I was worried, they were top notch modellers and I thought they would be really critical. Anyway, I took on a row of terraced

houses and they went down a storm!"

From there he gradually found himself in charge of all the buildings with Phil Taylor. 'Dewsbury' first appeared at the MMRS millennium show and went on to be phenomenally popular on the exhibition circuit.

Geoff's work on Dewsbury had caught attention and he began to receive commissions to make buildings. One of these was Cliff Parsons, who had his own project on the go – 'The Gresley Beat' – and Geoff found himself building a chunk of London to the highest standards for another model that would go on to star at shows around the country.

Around this time, Geoff and his wife Sharon took the decision to try to turn all this into a business. The first stage was a move to Wales.

"I didn't have 100% confidence. I thought I'd have to get a job stacking supermarket shelves while I made my models, but it never happened. I've had enough work to keep me going, and over three or four years it has really expanded."

The work spawned a couple of books 'Creating Model Buildings' and 'More Model Buildings', in which Geoff explains all his methods for others to follow. Both have sold very well and are popular guides.

Today though, there is precious little



evidence of plastic card cutting in his incredibly tidy workshop. A single bottle of Mek and some little-used cutting tools are pretty much all there is to see. In the corner is the explanation. A laser cutter.

On the table we could see a collection of buildings under construction. All are built from MDF cut to Geoff's own designs, but appear to owe little to the skills and techniques developed over nearly two decades modelling. I had to ask what had happened.

"It was a bit of a gamble. I could see that laser cutting was coming into its own. I'd seen some good and bad examples, but I thought I could improve on this. After 20 years of cutting plastic card, I'm using Mek-Pak and using blades like they are going out of fashion. You're almost cutting your hand off, and my knuckles started hurting from holding a ruler perfectly still. I just thought, this might be good for me."

The change to laser cutting wasn't as quick as casting his scalpel aside one day and firing up his new tool the next.

"To be honest, the first year, I nearly had to go and tell my wife it had all been a waste of time because I couldn't get my head around it. But I persevered for a year and I wouldn't do it another way now.

Laser cutting hasn't actually speeded up many jobs, though. While less time is spent hacking up sheet materials, those hours are now spent in front of the computer.

Another job that can't be automated is counting bricks on photos. When approached by a client, Geoff is often presented with a photo of the desired building. From this he has to design the miniature version.

"I then have to work out the sizing, which

## I thought I'd have to get a job stacking supermarket shelves while I made my models, but it never happened



is always the worst thing on a model. If you know the window or door size you can work out the rest.

Google Earth has been useful too. It's possible to walk around buildings, viewing them from different angles, and the aerial views provide details of the roof, something that is almost impossible to find in the past, but is so very visible on a model.

From this, a cost can be worked out and, if agreed, the project can join the queue. Despite all the technology, each individual

model is likely to take over 60 hours to create, with a significant part of this time being spent on the painting. I always put a primer on first. I've tried without this step, but I think you get a nicer feel this way."

Looking at the models, I wondered if they were dry-brushed.

"What I do is use a base colour. Say it's a red brick, you put your base coat on, let it dry thoroughly, and then I put mortar on. This is usually a pale stone colour, and that's dabbed off with kitchen towel. It's quite a messy job but it gives all the bricks a slightly different hue. If you look at a brick, it's not red, it's not black, it's all the little flecks in it. Then I use four or five different dry-brushings, but I do that all in one go so they blend together."

All of which will work for any of us painting buildings.

By this point Andy York had finished wielding his camera, so it was time to wind up our chat. Looking around his workshop, Geoff's model-making career has certainly seen some changes. As he says:

"I think you have to move with the times. I know people think that's everything going out of the window, but I think that it's a good idea."

You can see more of Geoff's incredible work at [www.gtbuildingsmodels.co.uk](http://www.gtbuildingsmodels.co.uk)





# TAIL LAMP

The Proclaimers might have walked 500 miles, but David Young of Ten Commandments has travelled a great many more. Here he tells us about a typical weekend road trip...

**S**hows for me start sometime on Thursday evenings. After last minute checks for things that I might have forgotten, I squeeze the van doors shut and set off again. I cross the Forth with the railway bridge looking magnificent in the evening sunshine and head south.

The first spell of driving can actually be quite pleasant, depending on the time of year. After nearly 20 years of travelling to exhibitions it's almost like being on autopilot. The roads are fairly quiet heading down through the borders; it's still daylight and it's all going nicely so far. After a couple of hours I drop onto the A1 just north of Newcastle and I start thinking about a stop for coffee, when the dot matrix signs strike...

## A1 SOUTH CLOSED – FOLLOW DIVERSION

Cones usher me off the main road and I follow the squares on the diversion signs. Well, I follow the squares until the third roundabout, at which point it seems the Highways Agency ran out of squares and decided to use triangles instead. After what seems like an eternity trundling through darkest Tyneside in a queue of lorries I'm finally allowed to re-join the main road. The cones and speed restrictions run on for another ten miles. A quick break for the delayed coffee, then onwards to Scotch Corner and parking up for the night.

I sleep ok, considering. It should be a straightforward drive to reach the exhibition venue in good time. I stop off at a services and grab breakfast at everyone's favourite bakers. Another couple of hours on the road should do it, even allowing for the usual roadworks. I arrive, get set up, then it's off to the hotel for a shower and dinner and maybe a beer. I never have problems sleeping on a Friday night.

Sunday afternoon. Fortunately, most exhibitions have seen sense and are closing at 4pm now, which makes a huge difference after five or six hours in a van. I get the

stand down and re-loaded into the van as quickly as possible and set off. Unlike the downward trip there's no time for dawdling on the way home.

Taking no chances with the A1 diversion, I opt to cross to the M6. It's relatively cone free for a change. The traffic heading south is horrific but I'm going the opposite way and it's flowing ok. Hopefully I'll break the back of the journey before fatigue starts to kick in. After my leg's gone numb for the third time I admit defeat and pull in for a burger and a stretch, and then it's back on the road again.

It's now well past *dark o'clock* and the driving's getting tedious. The hardest stretch is between Johnstonebridge and Abingdon services, where there's barely a light for 27 miles. Fortunately, there's a copy of Motorhead's greatest hits in the van. I decide it'd be better to be driving and I pull off the motorway to head across country.

## A720 EDINBURGH CITY BYPASS - JOURNEY TIME 43 MINUTES

Is that a helpful guideline or a challenge? It depends how you look at it. An hour or so later I pass the last roadworks of the weekend. I made decent time this evening. I might even make it home in time to catch Kilmarnock on Sportscentre highlights, since we ALWAYS seem to be the last game on. I pull into the driveway, turn off the engine and climb out of the van. Both legs have gone numb now. I hobble down the path and let myself in.

That's another trip over and done with, although I've cut down the shows I attend considerably from a few years ago. I actually did 42 one year, which would have been a mileage of around 35,000. Even reducing the number to 20-odd I'm still clocking the best part of 20k miles a year. Perhaps more if the Highways Agency has its way... ■





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- ND116E/D - Class 142 Tyne & Wear PTE 142021/DCC

### HST



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- 2D-019-005 - Class 43 HST Blue/Grey ER 43193/E43119
- 2D-019-006 - Class 43 HST East Coast 43309/43306
- 2D-019-007 - Class 43 HST Virgin East Coast 43311/43312
- 2D-019-008 - Class 43 HST GNER Blue 43106/43109
- 2D-019-009 - Class 43 HST GWR Green 43187/43188



2F-038-028 - Bulk Green - BR 885325



2F-038-030 - Bulk Green - BR 885325 Weathered



2F-071-022 - 7 Plank - Ton Phillip Rhonda 277



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7P-004-001 - Autocoach GWR Crest Chocolate & Cream



7P-004-005 - Autocoach BR Crimson

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- 7F-053-005 - 5 Plank wagon Corrugated End BR Diagram 44 Bauxite B485971
- 7F-053-006 - 5 Plank wagon Corrugated End BR Diagram 44 Bauxite B498136
- 7F-054-001 - BR Meat Van Crimson 870060
- 7F-056-005 - BR Standard Plywood Van Diagram 213 Bauxite B766440
- 7F-056-006 - BR Standard Plywood Van Diagram 213 Bauxite B775624
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| LNWR Webb coal tank 0-6-2T                                                        | <a href="http://hattons.co.uk/wct">hattons.co.uk/wct</a>               | £101.96      | Sep 2014       |          |            |             |                   |               |               |          |
| Class 450                                                                         | <a href="http://hattons.co.uk/cl450">hattons.co.uk/cl450</a>           | from £271.96 | Mar 2015       |          |            |             |                   |               |               |          |
| SECR Birdcage Coaches                                                             | <a href="http://hattons.co.uk/bc">hattons.co.uk/bc</a>                 | £55.21       | Mar 2014       |          |            |             |                   |               |               |          |
| Warflat Bogie Flat wagon                                                          | <a href="http://hattons.co.uk/warflat">hattons.co.uk/warflat</a>       | £42.46       | Mar 2013       |          |            |             |                   |               |               |          |
| Class H2 Atlantic 4-4-2                                                           | <a href="http://hattons.co.uk/h2atlantic">hattons.co.uk/h2atlantic</a> | £152.96      | Mar 2013       |          |            |             |                   |               |               |          |
| Baldwin Class 10-12-D 4-6-0                                                       | <a href="http://hattons.co.uk/baldwin460">hattons.co.uk/baldwin460</a> | £123.21      | Jul 2014       |          |            |             |                   |               |               |          |

|  | Link                                                                     | Price        | Date announced | CAD done | In Tooling | Seen 1st EP | Decorated samples | In production | On Board Ship | Released |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------|----------------|----------|------------|-------------|-------------------|---------------|---------------|----------|
| Class 68                                                                          | <a href="http://hattons.co.uk/c68">hattons.co.uk/c68</a>                 | £123.72      | April 2014     |          |            |             |                   |               |               |          |
| Class 121/122                                                                     | <a href="http://hattons.co.uk/dapolbubble">hattons.co.uk/dapolbubble</a> | £123.25      | Dec 2012       |          |            |             |                   |               |               |          |
| GWR Streamlined Railcar                                                           | <a href="http://hattons.co.uk/gwrrc">hattons.co.uk/gwrrc</a>             | from £119.43 | Jul 2014       |          |            |             |                   |               |               |          |
| Class 59                                                                          | <a href="http://hattons.co.uk/dapol59">hattons.co.uk/dapol59</a>         | from £121.13 | Oct 2015       |          |            |             |                   |               |               |          |

|  | Link                                                                           | Price    | Date announced | CAD done | In Tooling | Seen 1st EP | Decorated samples | In production | On Board Ship | Released |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|----------|----------------|----------|------------|-------------|-------------------|---------------|---------------|----------|
| Class 14xx 0-4-2T                                                                   | <a href="http://hattons.co.uk/14xx">hattons.co.uk/14xx</a>                     | £99      | Sep 2014       |          |            |             |                   |               |               |          |
| Golden Arrow Class 71                                                               | <a href="http://hattons.co.uk/goldenarrow">hattons.co.uk/goldenarrow</a>       | £139.95  | Jun 2016       |          |            |             |                   |               |               |          |
| 50t Warwell Wagon                                                                   | <a href="http://hattons.co.uk/warwell">hattons.co.uk/warwell</a>               | from £33 | Jun 2016       |          |            |             |                   |               |               |          |
| O Gauge Class A3/A4                                                                 | <a href="http://hattons.co.uk/recordbreakers">hattons.co.uk/recordbreakers</a> | £750     | Aug 2016       |          |            |             |                   |               |               |          |

|  | Link                                                         | Price     | Date announced | CAD done | In Tooling | Seen 1st EP | Decorated samples | In production | On Board Ship | Released |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------|----------------|----------|------------|-------------|-------------------|---------------|---------------|----------|
| O Gauge Class 45 'Peak'                                                             | <a href="http://hattons.co.uk/hel45">hattons.co.uk/hel45</a> | £550      | Jun 2013       |          |            |             |                   |               |               |          |
| Class 47xx 'Night Owl' 2-8-0                                                        | <a href="http://hattons.co.uk/47xx">hattons.co.uk/47xx</a>   | £154      | Nov 2014       |          |            |             |                   |               |               |          |
| Class 07 Shunter                                                                    | <a href="http://hattons.co.uk/cl07">hattons.co.uk/cl07</a>   | £99 (EST) | Jan 2016       |          |            |             |                   |               |               |          |
| O Gauge Class 50 (Refurbished)                                                      | <a href="http://hattons.co.uk/hel50">hattons.co.uk/hel50</a> | TBA       | Apr 2017       |          |            |             |                   |               |               |          |

|  | Link                                                                 | Price        | Date announced | CAD done | In Tooling | Seen 1st EP | Decorated samples | In production | On Board Ship | Released |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------|----------------|----------|------------|-------------|-------------------|---------------|---------------|----------|
| Merchant Navy 4-6-2                                                                 | <a href="http://hattons.co.uk/mn">hattons.co.uk/mn</a>               | from £153    | Mar 2015       |          |            |             |                   |               |               |          |
| Class H Wainwright 0-4-4T                                                           | <a href="http://hattons.co.uk/hclass">hattons.co.uk/hclass</a>       | from £90     | Sep 2016       |          |            |             |                   |               |               |          |
| Mk1 FO & BSO                                                                        | <a href="http://hattons.co.uk/hornbymk1">hattons.co.uk/hornbymk1</a> | £31.50       | Oct 2016       |          |            |             |                   |               |               |          |
| Class 8P Princess Coronation 4-6-2                                                  | <a href="http://hattons.co.uk/duchess">hattons.co.uk/duchess</a>     | from £171    | Nov 2016       |          |            |             |                   |               |               |          |
| Hillachi IEP Class 800                                                              | <a href="http://hattons.co.uk/IEP800">hattons.co.uk/IEP800</a>       | from £229.50 | Nov 2016       |          |            |             |                   |               |               |          |

|  | Link                                                                 | Price | Date announced | CAD done | In Tooling | Seen 1st EP | Decorated samples | In production | On Board Ship | Released |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------|----------------|----------|------------|-------------|-------------------|---------------|---------------|----------|
| Class 2301 Dean Goods 0-6-0                                                         | <a href="http://hattons.co.uk/oxdg">hattons.co.uk/oxdg</a>           | £95   | Jan 2016       |          |            |             |                   |               |               |          |
| YEC Janus 0-6-0 Shunter                                                             | <a href="http://hattons.co.uk/janus">hattons.co.uk/janus</a>         | £74   | Nov 2015       |          |            |             |                   |               |               |          |
| 60' Carflat Car Carrying Wagon                                                      | <a href="http://hattons.co.uk/oxcarflat">hattons.co.uk/oxcarflat</a> | £25   | May 2016       |          |            |             |                   |               |               |          |
| Mk3 Coaches                                                                         | <a href="http://hattons.co.uk/oxmk3">hattons.co.uk/oxmk3</a>         | £29   | Jan 2016       |          |            |             |                   |               |               |          |

 Shows the stage the project is at based on the information available to us. CAD: Computer Aided Design. 1st EP: First Engineering Prototype. TBC: Price is yet To Be Confirmed (EST): Price is estimated.

You can view extended lists, preorder & comment on all of these projects at

[www.hattons.co.uk/projectupdates](http://www.hattons.co.uk/projectupdates)

Information correct at the time of going to press on 05/06/17.



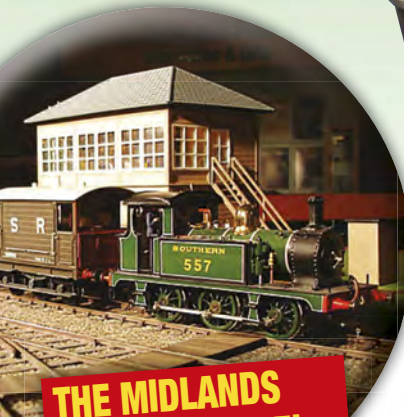
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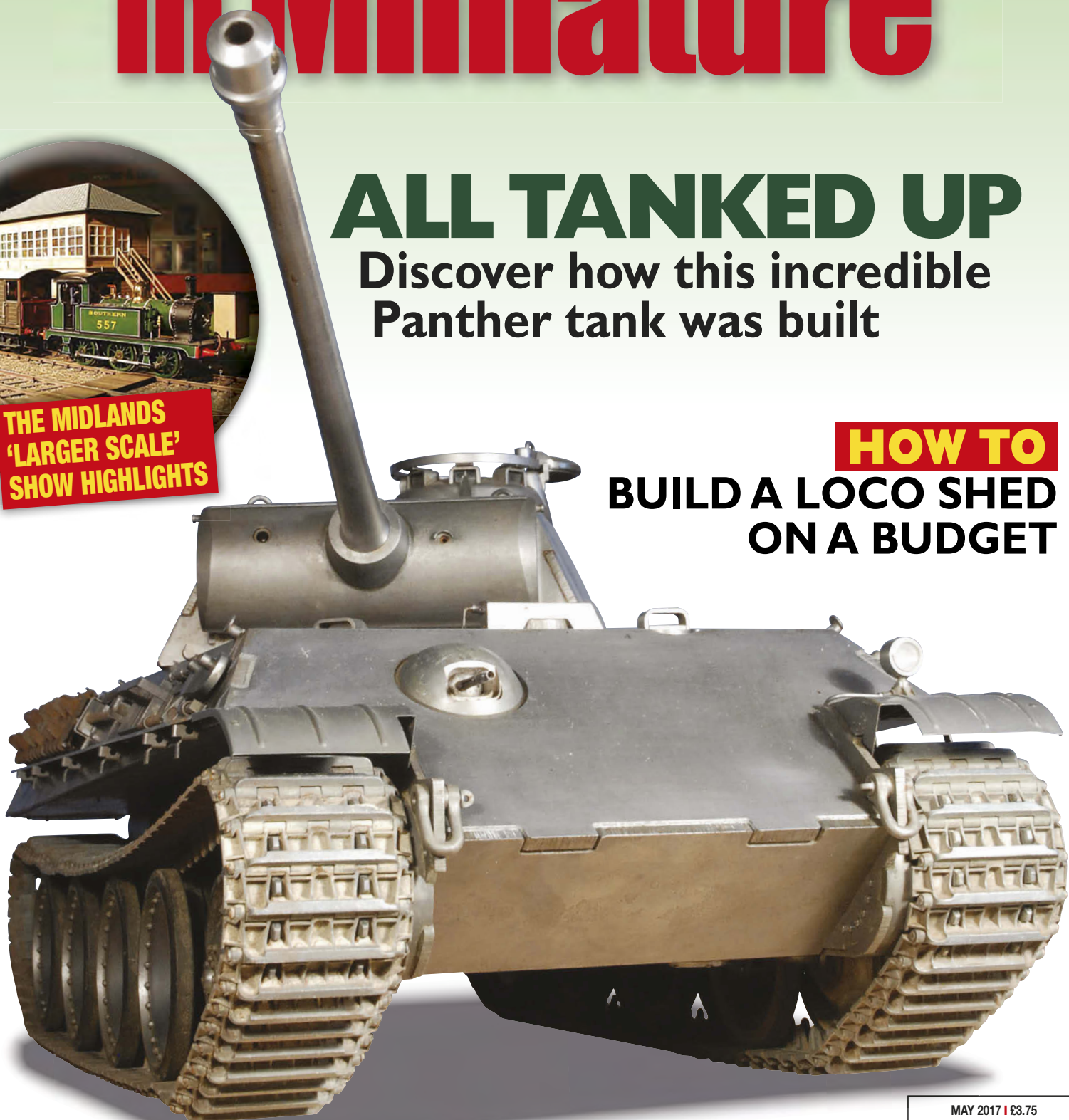
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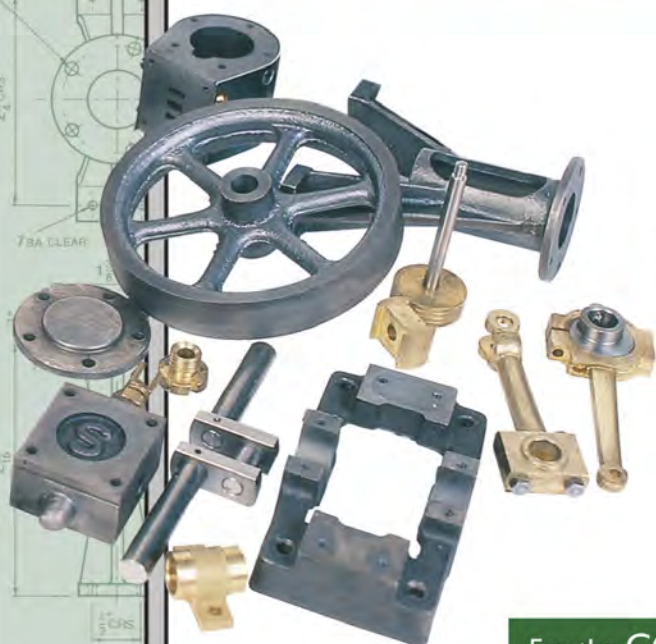
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# CONTENTS

MAY 2017 Volume 38 Number 11



## EDITORIAL

### MANORFEST

GWR no. 7822 'Foxcote Manor' is on the move! In partnership with the Foxcote Manor Society, the Kent and East Sussex Railway have booked this magnificent locomotive to run throughout May on their idyllic line. This will be the largest engine ever to operate on this railway.

On Sunday, 14th May the railway will celebrate the shared passion of full size and miniature engineering by staging a display of 5" gauge Manors on the platform at Bodiam Station. There will also be displays of other restoration projects including GWR no. 4709 'Night Owl'. Come and meet like-minded engineers from both the miniature and full-size worlds and perhaps bring your own Manor along for display (by prior arrangement through Paul Carpenter on 07958-250533).

Ride behind 7822 at a discounted fare (on production of a model engineering club membership card) and hear her bark up the 1-in-52 bank into Tenderden Town Station. Discounted fares are also available for club bookings. There is no parking at Bodiam so I would suggest travelling in by train from Tenterden.

This is a great way to share our passion with people of all ages, young and less young, and perhaps interest them in becoming involved in the wonderful world of steam! Further details may be found at [www.kesr.org.uk](http://www.kesr.org.uk)

### ABBOTS MODEL ENGINEERING

After a one year development programme, Abbots Model Engineering have introduced a new range of steel-bodied electric locomotives. These certainly look the part and come with every possible option: 5" or 7¼", kit or ready-to-run, painted or unpainted and a wide choice of colours. These powerful locomotives are made from laser cut 16g steel and come with two motors (Saturn 2), three motors (Saturn 3) or four motors (Saturn 4) – add another motor and it'll be going to the moon! You can find out more about these on [www.ametrains.co.uk](http://www.ametrains.co.uk)

### TANKS

Tanks seem to be a bit of a theme this month. Graham Sadler describes the water tank for his Atkinson steam tractor on page 29 and, on page 7, Chris Meyer will begin to describe the construction of his 1/12th scale Panther G tank. This very impressive model was on display at The Fosse in October. It is a fully detailed, accurate scale model and even more impressive on the inside than out. Chris will be taking us on a comprehensive tour of the creation of the model over the next six months.

**Martin Evans**  
Editor

*The June issue will be on sale on May 18th*

### FRONT COVER

Our front cover shows Chris Meyer's very fine 1/12th scale model of a Panther G Tank, which was displayed at the Midlands Model Engineering exhibition last October.  
*Photograph: Chris Meyer*

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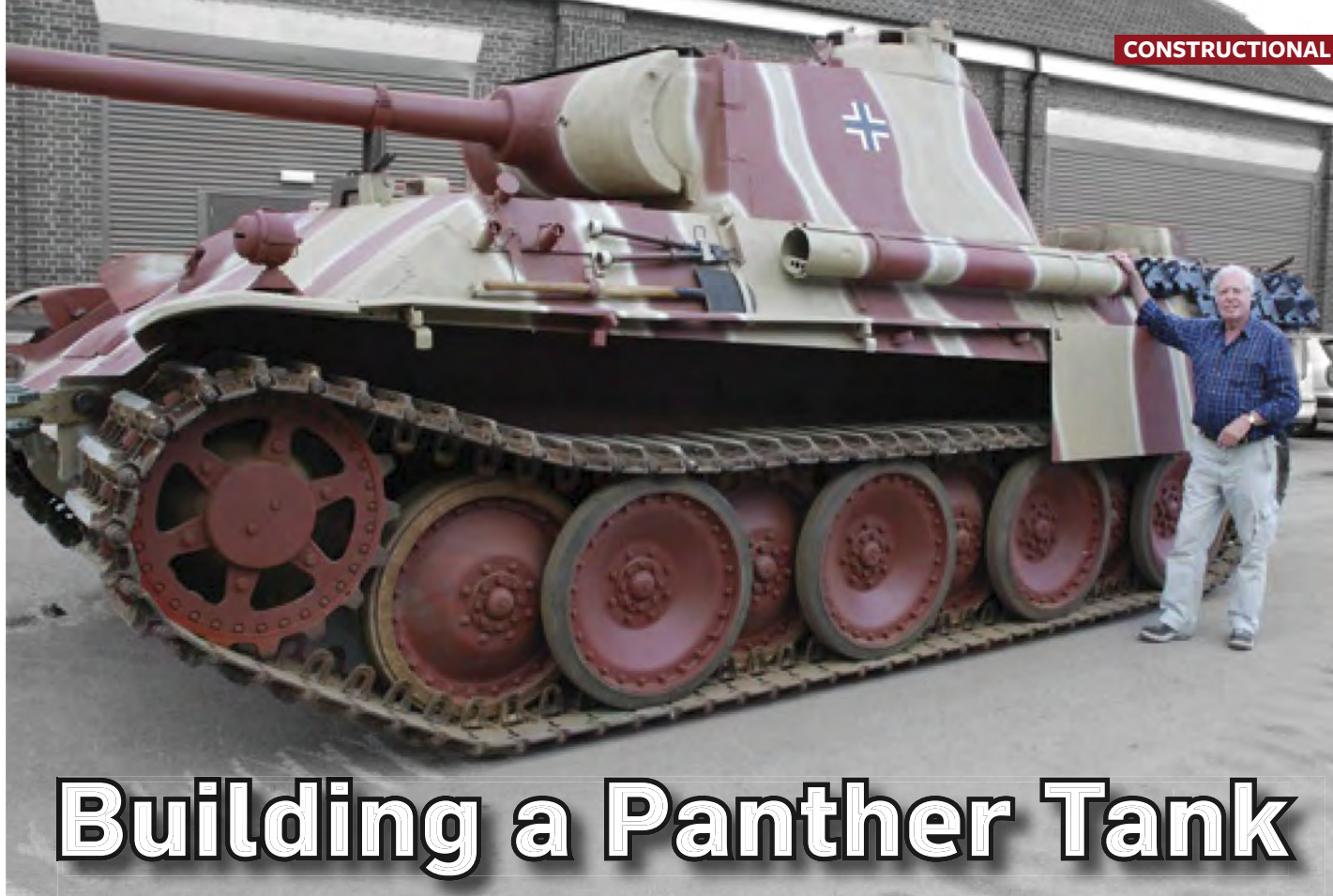
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# Building a Panther Tank

Chris begins the description of the construction of his 1/12th scale Panther G tank, which was on show at the Midlands Model Engineering exhibition last October

BY CHRIS MEYER

## THE BEGINNING

Tracked vehicles had interested me for a long time, particularly tanks, so I really fancied making a working, radio controlled model – and there were quite a few to choose from.

I thought about the Sherman, Comet and a few others but the German vehicles seemed to be more of a draw as far as I was concerned so I decided to have a go at making a Pz. Kpfw. Mk. V Panther G. I wanted to use steel, where possible, so what scale to build in? As far as I knew, the thickness of the various armour plates used on the full size vehicle were 80, 60, 50, 40 and 25mm for the hull and turret. I hoped to use plates which were as close to scale thickness as I could obtain.

The actual weight of the Panther was 44 tons so 1/10th scale would be 97lb and 1/12th scale 56lb. I settled on 1/12th scale. (The model at the moment, lacking a few external fittings and features, weighs 62lb! This includes the main 9.6 Volt batteries.) The history of the Panther stated that the original design weight was around 35 tons so M.A.N., the designers and manufacturers of all the early versions, got it wrong as

**ABOVE PHOTOGRAPH 1**  
The author with the Panther G tank at the Bovington Museum.

well! This weight penalty on the Full Size Vehicle (which from now on I will write as the FSV) led to a lot of problems, such as clutch, gearbox and final drive failures, suspension arms having to be beefed up, etc. The thing is, though, the tank was designed and built in a very short time, compared to how long it took our manufacturing

outfits to give the troops anything approaching a vehicle which could take on the Panther, let alone the Tiger.

Within the constraints of the scale I decided upon, and taking the installation of a suitable radio control into consideration, I wanted to construct the interior to look like the FSV but with the various



**RIGHT PHOTOGRAPH 2**  
A rear view of the model, showing a few of the details.



components strengthened where necessary to cope with the task required. This all led to some interesting problems during the course of the build. I had to keep an eye on the tolerances of the parts. Trying to obtain suitable sizes of material, bearings, nuts, bolts and screws etc. gave me a lot of headaches and it is even more difficult nowadays with so many companies having disappeared.

At the time I embarked on this project I had very little detailed information on this particular tank. So it required many trips to the Tank Museum, Bovington, Dorset, to try and get enough measurements to prepare basic drawings of the chassis (photograph 1). With the bogie wheels rather blocking access, it proved to be quite a difficult task to obtain the various centres and heights of the final drive, idler axle, swing arms etc. The easy bit was measuring the length, width, height and the various angles of the upper front plate (known as the glacis), lower nose, side and rear plates. Then it was a matter of reducing all these dimensions to 1/12th scale and getting them onto my basic drawings.

I did manage to get hold of an early publication by Walter J. Spielberger on the Panther, which included some interesting shots of the vehicle on the production line, although they were model A's which had some differences to the G chassis. Nevertheless, they were a bit of help providing, for instance, shots of the figure 8 shaped opening at the front end of the side plate where the final drive input was located. I spent a long time studying these photos trying to suck as much information as possible out of them – an enjoyable occupation though.

It was around this time that I was allowed to get inside the vehicle at Bovington, which enabled me to measure and photograph as much as I could at that time. So, including the inside shots in the book, I was gradually able to work up some drawings of the interior of the chassis. Some time later, a much more comprehensive book by the same author became available, containing numerous detail drawings and photographs.

## THE CHASSIS

The hull of the FSV comprises the chassis and superstructure combined as one unit (photograph 3). In the case of the Tiger and Panther, the two parts were welded together, differing from earlier German AFV's (Armoured Fighting Vehicles) which were normally joined by bolting.

The other innovation, seen in both vehicles, was to use interlocking plates not only to strengthen the joints but to aid the assembly of these heavy hulls in large welding jigs.

I copied this procedure by machining tenons on the edge of the lower front and the rear plates, with mortices milled through the side plates. This allowed me to use 10BA screws counterbored into the sides and tapped into the edges of the front



**PHOTOGRAPH 3**  
The chassis of the 1/12th scale model.

and rear plates to hold the parts together, permitting the chassis to be dismantled easily during construction. The addition of two dowels through the sides and into the edges of the lower front plate ensured correct positioning when reassembled.

As I now had the front and rear plates correctly located I could use these datums to work out the centres of the final drives, swing arm trunnion and idler bearing housings – that was the theory anyway. I had already completed drawings of the final drives so I knew the input shaft centres and was able to bore the large 'figure 8' holes in the side plates. I then proceeded to bore eight  $\frac{1}{16}$ " swing arm bearing and eight  $\frac{1}{2}$ " holes in both plates; a three-eared cap is fitted in the smaller hole – more about this cap further on. Once I had completed this operation I made drilling templates which had spigots that located in the relevant bores enabling me to drill and tap holes at each wheel station to which the gusset plates (mentioned later) would be screwed. All the bearing housing bolt holes were also drilled at this stage.

The belly plate sits in rebates milled along the bottom edge of the side plates and is screwed to the front and back plates.

As on the FSV, there are eight gusset or bracing pieces plus the engine bulkhead fitted to the belly and side plates. These gussets butt up against two longitudinal members screwed on to the belly plate,

each having eight short sleeves with brass bushes silver soldered in. These are the inner trunnion bearings which required boring out. There are also five cross members fitted between them.

I made a  $\frac{1}{16}$ " diameter flanged alignment sleeve with a  $\frac{3}{8}$ " reamed hole and, when the basic chassis was assembled, this was fitted through the larger hole in the side plate and clamped. This sleeve was long enough to reach the inner bearings. With the chassis sitting on its side on a drilling machine, I used a  $\frac{3}{8}$ " boring bar with a reduced diameter at the front end and a small bit set to cut a hole 5 or 6 thou undersize. This was followed by a parallel reamer, this procedure being carried out on all 16 bearings. Each longitudinal member was located by two dowels in the belly plate. There are also two saddles which are screwed to the belly and lower front plate. These saddles sit either side of the steering unit and clamp the large diameter end covers that are bolted to the right and left sides of the steering unit housing (this applies to the FSV as well as my project). It was very important to make sure the centres of the saddles were exactly in line with the final drive inputs otherwise the couplings would not line up. The gearbox and clutch housing are mounted behind the steering unit with a third clamp, the lower part of which is bolted to one of the cross members.

## PHOTOGRAPH 4

The interior of the chassis, showing the torsion bar suspension.







**ABOVE LEFT PHOTOGRAPH 5**  
The deck, with a view into the chassis.

**ABOVE RIGHT PHOTOGRAPH 6**  
A closer view of the turret ball race.

I will describe these parts in more detail when I get onto the description of the suspension and transmission. Hopefully some of the photographs will give our readers (the ones that have stayed awake so far) a better idea of the layout of the chassis.

When I had got only a little way into the construction of the chassis, I thought I had better consider how I might make the track links. This rather interesting process will be described in a later part of this series – something to look forward to!

## SUPERSTRUCTURE

At first sight, the superstructure gave the impression of being a pretty straightforward job. Although constructed from flat plates, it proved to be a bit more tricky than I thought. There were compound angles to deal with, the front plate (Glacis plate) being inclined at 55° and the sides and rear (backplate) at 30° from the vertical. This resulted in an angle at the joint of the glacis and side plates of 115° and at the backplate and sideplate of 102°. It was fortunate that I had the use of a vertical mill, which had a worm drive to tilt the head to the angles required to machine the mortises, tenons and cut outs in the various plates. I fabricated two angle pieces which bolted from the inside to the side and glacis plates. The backplate and sides are held together in the same manner as the chassis, with 10BA screws counterbored into the sides.

The side plates were made in two pieces screwed together. This not only gave me the right thickness, but made it much easier to mill the top and bottom edges separately to form the rebates. As on the FSV, this was the seating for the top plate or deck, as it is commonly known, and the sponsons. These are horizontal plates that are screwed to the top edge of the chassis sides and superstructure sides.

The deck plate is made up from two pieces joined along the centre line. Each plate has a semicircular cutout into which the turret bearing support ring fitted, and also the aperture for the hatch plate over the driving compartment (photograph 5). The joint along the deck is reinforced by the support ring and an angle piece that goes across the deck between the ring and the hatch plate. These bits are riveted and soldered to the deck. The deck was quite rigid after this. Incidentally, the book that I mentioned earlier by Walter J. Spielberger, "Panther and Its Variants", contained some good information and a useful sectional drawing of the turret ball race (photograph 6), traversing internal gear and support ring. There were also all the vital dimensions, diameters, numbers of teeth, numbers of balls etc. All this helped me when it came to make the turret.

Although the engine bulkhead is in one piece on the FSV, I decided to use two pieces with a horizontal joint. The top edge of the lower part is ¼" above the line of the sponsons

and is let into the upper part, the outer edges of which are bolted to the sponson plates with angle pieces. This is supported by two longitudinal bulkheads which run to the backplate. There are angles fitted to the top edge to which the engine deck plate is bolted; this plate also has a hinged cover fitted.

On the FSV the two radiator units were mounted on these bulkheads. Originally I made mine in a similar fashion, with no radiators though. At this stage, apart from photographing the model with these bulkheads in place for added realism, I knew I had start thinking about accessibility to the batteries and motor. I solved this by making a framework with suitable brackets etc. to mount the air grids and engine cover. This also meant making two new bulkheads with a cut away section and no top angle pieces. The two circular grids are bolted to plates, the inner edge butted against the engine cover and the outer edge sitting in the rebates on the side plates. The whole thing lifts clear of the rear giving good access to the vitals.

**BELOW PHOTOGRAPH 7**  
The cupola, mounted on the turret, and its seven viewing hoods.







**ABOVE – PHOTOGRAPH 8**

Parts for a torsion bar suspension unit.



**ABOVE – PHOTOGRAPH 9**

The assembled suspension unit.

## SUSPENSION

I intended to make the suspension on my model as close to the FSV as possible both visually and in operation.

There are eight swing arms on each side. Each swing arm has a long hollow sleeve at the opposite end to the bogie wheel spindle. This sleeve was normally known as the trunnion so I will call it the same from now on. The arms on the right hand side are trailing, in other words,

the wheel spindles are to the rear of the trunnion. On the left side, the spindles are leading.

There are two torsion bars of different lengths per wheel station (32 in total). The bars have enlarged heads with a flat machined on them and are locked in place using cotter pins. These have a tapered flat and are threaded at the smaller end, with a washer and nut to tighten the pins. I will give details of the bars later on.



**ABOVE – PHOTOGRAPH 10**

An outside view of the suspension.

**BELOW – PHOTOGRAPH 11**

The Panther G tank, viewed from the 'business end'.



The trunnions are supported on two bearings. The outer bearing is fitted in a housing which has a 6mm hole alongside the trunnion bore to receive the head of the shorter bar. As this hole is blanked off by the side plates, these bars have to be entered through a hole on the opposite side. This hole is one of eight smaller diameter holes which are situated between the swing arms. A three-eared cap fits into these particular openings; more about the caps later. The housings have a rim machined concentrically to the bearing bore which positively locates them in the larger diameter holes and they are bolted to the side plates.

There are eight inner bearings, fitted into short tubular steel housings silver soldered to each of the two longitudinal members. The right hand member runs the entire length of the belly plate and the left hand member finishes ahead of the number 1 bearing. Both the swing arms and the bearing housings have a vertical hole which breaks into the torsion bar bores. The longer bar is locked in the swing arm at one end and the opposite ends of both bars are fitted into a coupling block or, as it was known, the yoke. These are rectangular steel blocks with two 6mm bores and a vertical oblong hole centrally disposed. These hold a flat cotter, with taper faces on each side, a central stud, washer and nut.

The longer bar goes through the swing arms to cross the chassis into the yoke. The shorter bars are fitted from the opposite side through the previously mentioned hole in the chassis side plate and through the second hole in the yoke, crossing over to enter the bore in the bearing housing. The three-eared cap has an offset bearing on the inside which supports a short spigot fitted between the bores in the yoke. This arrangement means that as the swing arm is pushed up by a bump the torsion bar twists, causing the yoke to turn in the same direction. This twists the second bar with, of course, the other end locked into the bearing housing (photograph 9). All this allows the swing arms to move vertically by twice the amount possible using a single torsion bar.

**« TO BE CONTINUED »**



# A Versatile Stock Box for 'YORKIE'

**Peter Wood** concludes our series on 'YORKIE', the 16mm Yorkshire Engine Company 0-6-0, by describing a versatile stock box to carry it around in

BY **PETER WOOD**

**Y**our new model is finished at last. It looks very good in its bright shiny paint but how do you store it, probably transport it, and keep it safe from damage? A Stock Box of course. The bigger your model, the bigger the box needs to be. The bigger your model is, the heavier it is, so the stronger the box needs to be. The bigger and stronger the box, the heavier it becomes also. Most Stock Boxes have a carrying handle on top and this needs to be securely fixed in order to safely lift the weight. This was brought home to me while I was developing the design of this new box by Derek Crookes, the designer of YORKIE. He told me that just a couple of days previously, when he went to pick up the box containing one of his Gauge 1 locomotives from his bench, the handle tore out leaving box and locomotive, fortunately, still on the bench.

The stock boxes I have seen generally come in two designs: a 'tube' with a flap door at one end to slide the model in and out, or an open top box with a lid, needing the model to be lifted in and out. Both will probably be made of plywood and both will probably have a handle on the top. Either may have a plate or cradle, usually made of metal, for the model to sit on/ in, to aid getting it in and out of the box and on to the work area/track. Both will probably have a means of keeping the model located in the centre of the box and both may have external means of stacking boxes together. The first type of box will need a catch to hold the flap shut and the second will need very secure catches to hold both parts of the box together. If you wanted to display your model then that needed another box as well. Could I design a lighter box, with all these features incorporated, that still was strong enough? Here is how the process went.

If the box didn't have a handle on top, which could pull off, then how would you pick it up? Handles on the sides or ends? That would need both hands. You probably need to carry something else as well. From underneath! That's often not easy since many of these locomotives are heavy and therefore difficult, and perhaps

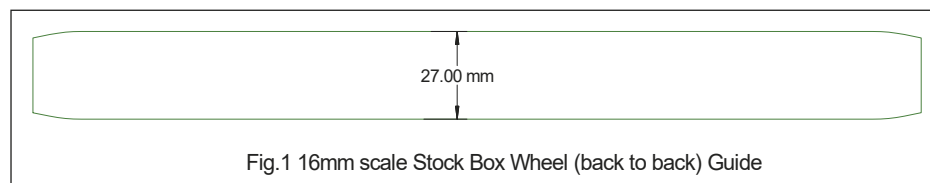


Fig.1 16mm scale Stock Box Wheel (back to back) Guide

**FIGURE 1**  
Wheel guide.

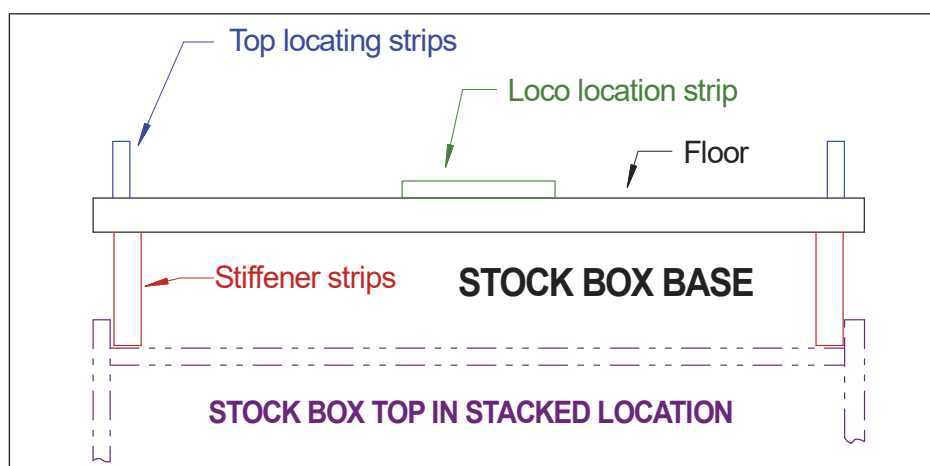
dangerous, to get your fingers underneath. However, if the weight of the locomotive could be supported and lifted from underneath, then the top could just be a lightweight cover. Also, if the base, instead of being a solid piece of plywood, could be constructed in the form of say, a channel or I section, it could be as strong as a solid base but made from thinner material and therefore lighter and, hopefully, cheaper.

I first roughed out what a base would look like if made from not very thick plywood. It would need some means of firm support from underneath its floor and something to locate the locomotive inside, and a top. I have previously used wooden battens in between the wheels instead of rails for the wheels to stand on. They can provide much deeper location than the wheel flanges. A single piece of ply in the middle of the floor would add strength and could have the ends rounded off a bit to help guide the locomotive into the box (see figure 1). Ply strips, just in from the edges,

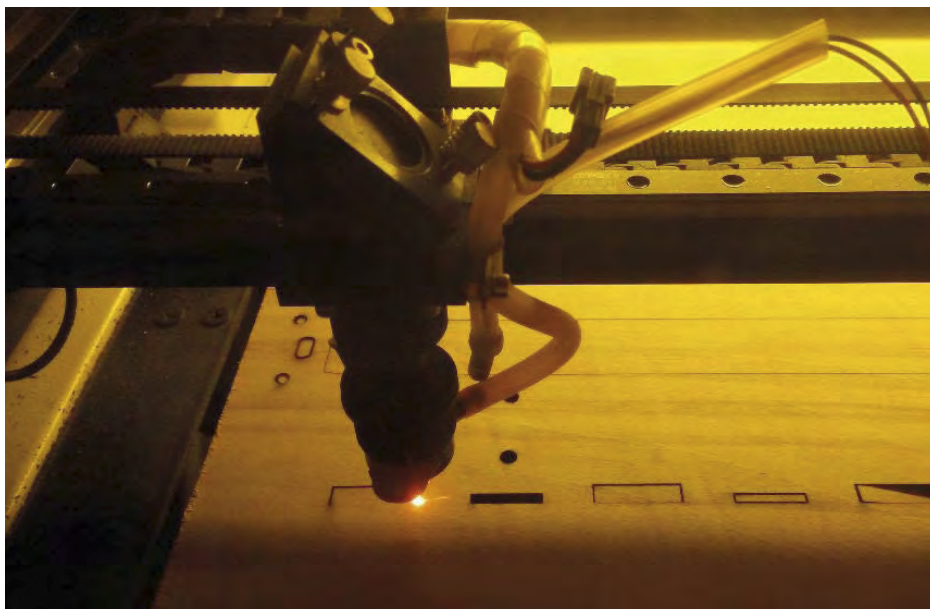
would locate the top and more strips underneath would provide the main strength forming a shallow channel (see figure 2). Since I am doing my own CAD drawings and laser cutting (see photograph 1) it was a simple job to arrange locating tabs on the strips and slots in the floor. The position of the wheel guide was also marked on the floor. This is a 'cut' operation on the laser machine, but with the power turned well down and the speed up so that the laser beam just draws a line. The drawn line can be seen in the photograph behind the slots being cut. This is the method by which plank lines and brick courses are drawn on model wagons and buildings.

The box top was easy to design – just two sides and two ends with the corners 'castellated' to fix their location and improve joint strength. Both sides and ends were extended upwards with slots for the top. The extension also forms a location with the base bottom strengthening strips for stacking the boxes (see figure 2 and

**FIGURE 2**  
Stock box base.







**ABOVE  
PHOTOGRAPH 4**  
Original lifting bar.

**LEFT  
PHOTOGRAPH 1**  
Laser cutting the base floor.

photograph 2). Since the top needs little strength it can be made from plywood, MDF or, for a display box, transparent plastic (see photograph 3). I usually use PETG as it is stronger and less brittle than acrylic (aka Perspex, but don't forget this is a trade name, not a type of plastic). Also, it can be obtained thinner, down to 0.5mm thick, whereas acrylic can usually only be obtained down to 2.0mm thick. This makes PETG much more useful particularly for things like model windows. Holes were cut in the top and the base for bolting on the usual box lid latches for securing them together.

I also designed a ramp for loading the locomotive from the track directly on to the base without lifting it but I haven't made one of these to try it yet.

The main problem all along was how to lift the box from underneath. My initial thought was, since it needed to be

a one-hand only handle, to make loops from just webbing strap. If the loops were fixed to the box they would dangle over the adjacent railway when loading and unloading – not good. If the loops were removable they would need a means of fastening them together. I just couldn't come up with anything easy and fool proof. My best idea (if you can think of a better one please let me know) was to have lugs of some sort on the base with removable straps. I searched the internet and soon found webbing strap and dog lead type trigger operated hooks and suitable lugs, loops or rings etc. for the base. The best looked to be the 'D' Rings with plates used to hang heavy pictures. However, at the time I could only find rings with a small plate attached, and with one hole in for fixing. I thought this would be likely to pull out of the floor and be no better than the top handle.

The next solution was to have a solid bar under the floor. If the bar was removable, the ends wouldn't get in the way when stacking boxes side by side. This was what I made for the prototype (see photograph 4). This worked well but it was tricky feeding the bar through the slots I had put into the floor stiffeners. It still needed some stronger fixed loops or rings to work better.

As is often the case, some months after making the prototype boxes, whilst searching the internet for something completely different, I found some 'D' Rings on long plates with three holes. I promptly bought some. They fitted the existing slots but the 'D' Ring was longer than the depth of the base stiffener strip. It stuck out nearly as badly as the ends of the solid bar. The first modification was to make the strip deeper so that the rings hung down vertically out of the way.



**LEFT – PHOTOGRAPH 2**  
Boxes stacked.

**BELOW – PHOTOGRAPH 3**  
Display box.





# Home Workshop Lighting

Mike Haughton expands on his lecture given at the 2016 Midlands Model Engineering Show

BY MIKE HAUGHTON

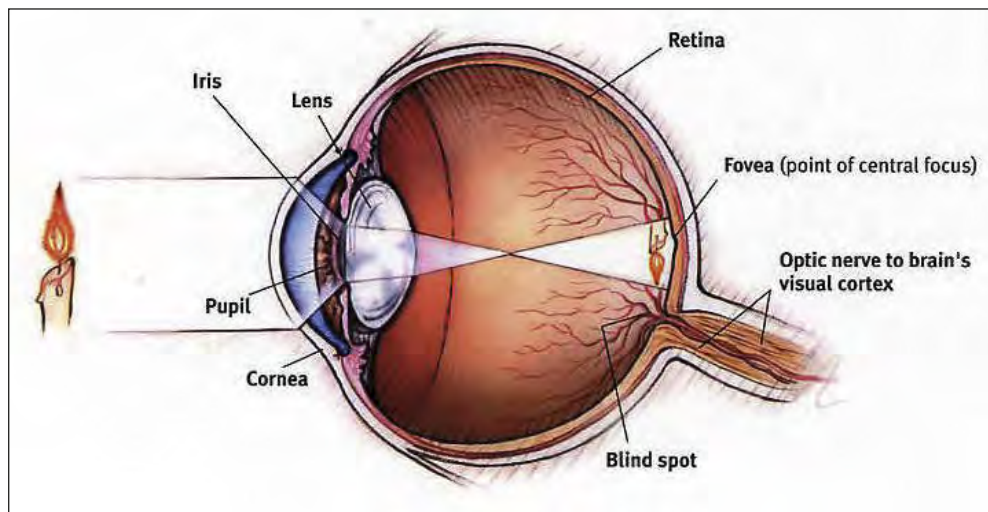
The subject of this lecture was prompted by my house and workshop move some four years ago and the subsequent conversion of a large, detached double garage, with a room above, into my home workshop. This workshop came with minimal lighting, mostly domestic 'hand-you-downs'. One of the first jobs was to strip out the old fluorescent 'battens' and to research more modern options with better, more energy efficient lighting.

## THE TRIALS OF OLD AGE!

As I get older I find that I need to wear vari-focal glasses. I need a great deal more light and I need a much whiter light in the workshop and, of course, in everyday activities. Please note I am not an optician; these are personal views!

Most of us get longer sighted as we get older. The lens in the eye becomes hardened and can no longer be pulled into shape, to change its focal length, by the eye's muscles so some sort of supplementary lens is required to bring the point of focus onto the retina at the back of the eye. Short-sightedness is called presbyopia from the Greek 'see like an old man'. The Greeks were very perceptive! I choose to wear vari-focal lenses which provide graded magnification from top to bottom. The brain corrects the resulting diverging lines back to being straight. I know that some find these lenses totally unacceptable in the workshop. Personally, I find any activities where one looks up to do detailed work extremely challenging, as the lens magnification is invariably in the wrong place! One possibility is to wear different strength contact lenses in each eye, a tip given to me by a surgeon.

For close work, like examining the points of small drills, intersections of marking out lines etc, I dispense with the glasses and use a series of watchmaker's loupes, x2 to x10 magnification, plus a closely positioned lamp for bright illumination. I have tried illuminated headband magnifiers but for me they don't do the job; could it be that I didn't spend enough?



**ABOVE  
FIGURE 1**

A section through the human eye.  
Source: the internet

**BELOW  
PHOTOGRAPH 1**

York Waggon Works machine shop, about 1900. Source: National Railway Museum.

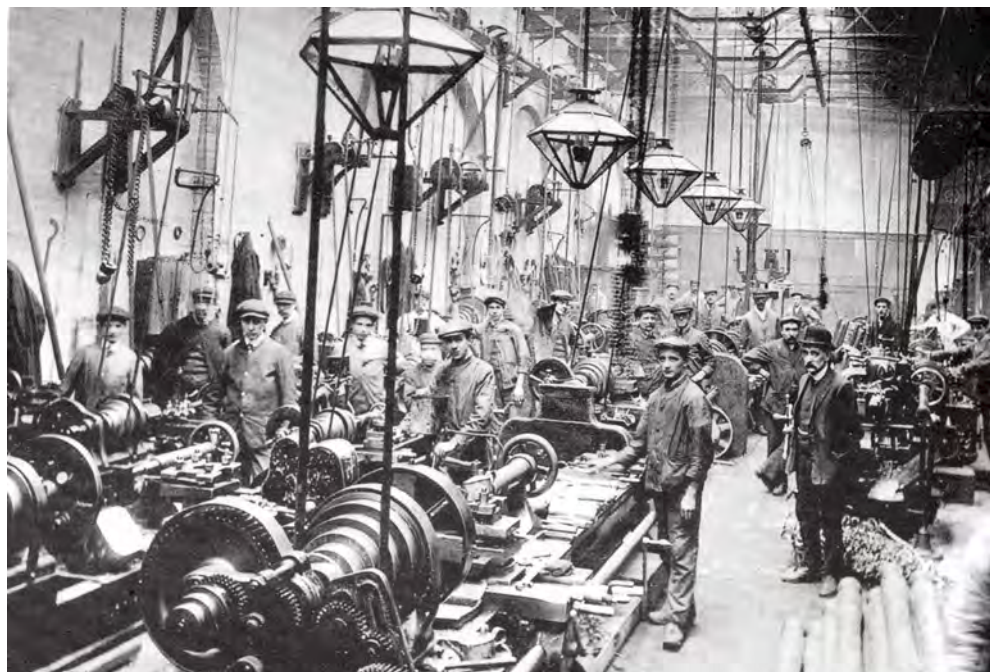
## ANATOMICAL DIVERSION

Figure 1 shows a section through the human eye. The lens is a clear, soft, variable focal length device that is pulled into a shape by muscles that focus the image, a candle in this case, onto the retina, the light sensitive part of the eye. The retina is highly complex and has two types of light receptors called rods and cones that are connected via the optic nerve to the brain.

In old age, we develop 'trombone

vision' where the comfortable book reading position moves outwards towards arm's length. A supplementary lens, e.g. glasses or a contact lens, can correct for this age-related effect.

Why do I need more light and a whiter light? Probably because my retina has become less sensitive to some colours of light. Perhaps I have the onset of cataracts, a clouding of the lens, and my irises are no longer as capable of opening and shutting as they used to be.





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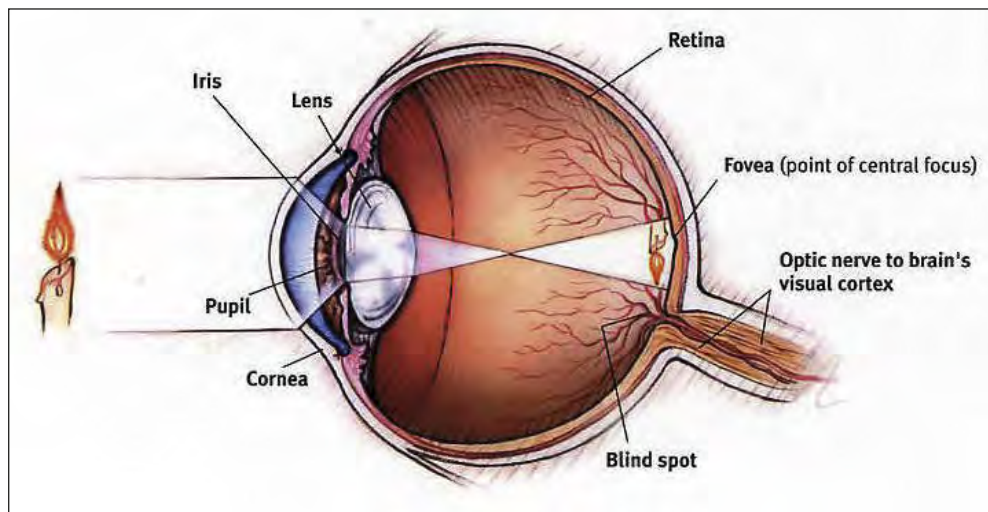
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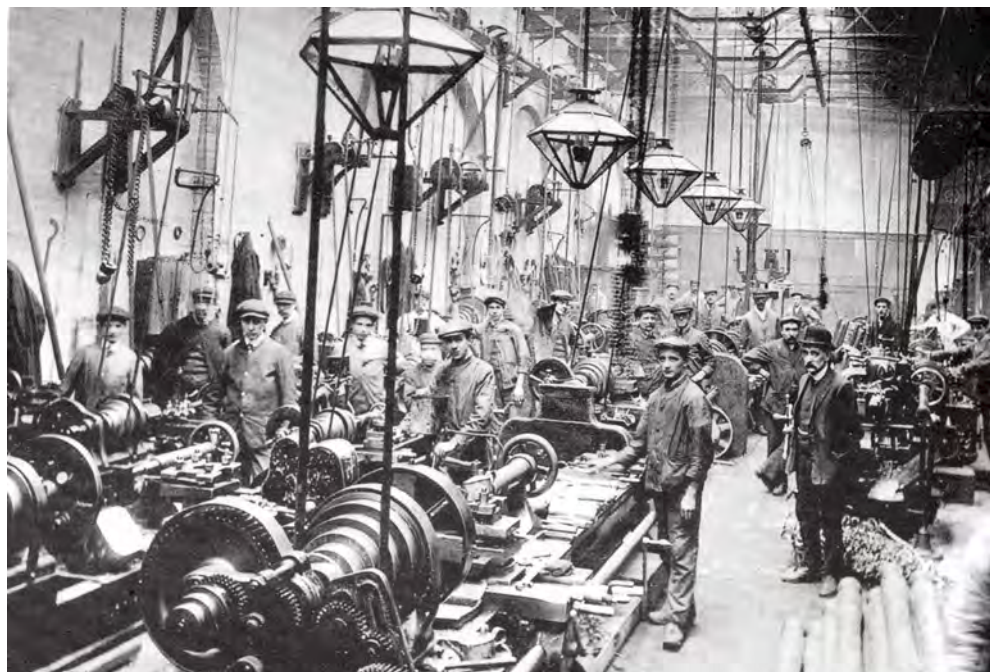
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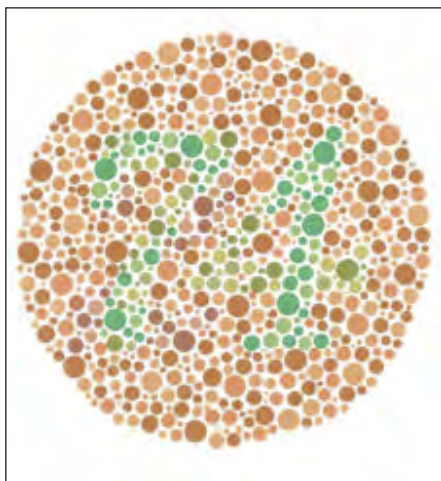
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**ABOVE – FIGURE 2**  
Ishihara colour blindness test card.

## HOW IT WAS

If we go back a century or so workshop lighting was very different from today. Photograph 1 shows a rare view of the York Wagon Works machine Shop, courtesy of the National Railway Museum, with the workmen at their machines.

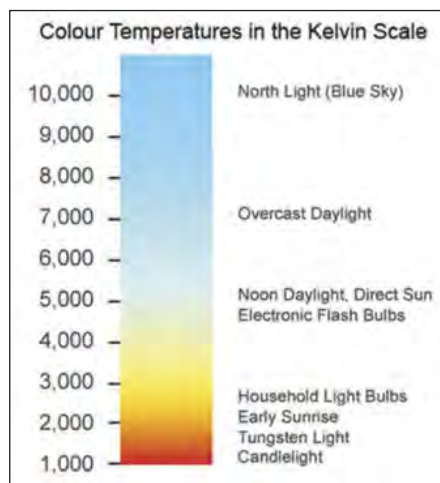
You will see that the primary overhead illumination was natural light via glass panes in the roof. The local 'machine lighting' was provided by coal gas lights strung along the middle of the shop. The works probably made its own coal gas and electricity. These old photographs of workmen always show interesting features. You can easily pick out the foreman in a suit, trilby hat and watch chain. Nobody wore glasses; perhaps because the average life expectancy for men in 1914 was 46 to 48! Note the overhead line shafts and lack of guarding. This shop was probably powered by a large DC electric motor since small AC motors were not yet generally available, and neither were practical incandescent filament lamps.

## OUR EYESIGHT

Human eyesight evolved to utilise the colour spectrum and intensity of natural sunlight but we don't see all its wavelengths e.g. the infrared and ultraviolet parts of the spectrum.

Our night-time vision is more 'shades of grey'. This is because we have different receptors in the retina, at the back of the eye, for monochrome and colour. The monochrome receptors (the 'rods') detect only the intensity of the light but are more sensitive than the 'cones', which can detect colour. As the light intensity decreases we see only in monochrome ('black and white') as the cones fail to detect the different colours.

Most humans have cones that respond to the three 'primary' colours (red, green and blue for light) but colour vision deficiency is quite common. Figure 2 shows one of several Ishihara tests used to determine the extent of



**ABOVE – FIGURE 3**  
Colour temperatures in the Kelvin scale.

'colour blindness'. As a Chemist, for whom colour changes are important, I was tested early on for these deficiencies.

As we age, and head into our 60s, we need three times more ambient light for comfortable reading than those in their 20s.

Furthermore, colour vision and peripheral vision also reduce.

## LIGHTING BASICS AND COLOUR TEMPERATURE

The colour temperature of a light source, or luminaire, is the temperature of an ideal black body emitting the same hue. Degrees Kelvin (K) are equivalent to Centigrade plus 273 because 0K, absolute zero, is about -273°C. Imagine passing a gradually increasing electric current through a carbon rod. It will appear to glow dull red, then orange, warm white, then white etc. Figure 3 shows the colour temperatures in the Kelvin scale.

The sun is a black body emitter of about 5900K above the atmosphere, 5780K below.

An artist's studio, where colour rendition is absolutely crucial, will normally have north facing windows to receive scattered sunlight for good colour rendering, rather than direct sunlight.

Sadly, our workshops, in the northern hemisphere, seldom have good natural light and we often work at night so great care is needed in the choice of artificial lighting.

**TABLE 1 –** Efficiency data for various luminaires.

| LIGHT SOURCE                                     | Light Output (lumens/Watt) | Luminous Efficiency (%) |
|--------------------------------------------------|----------------------------|-------------------------|
| Tungsten filament bulb, 2800K                    | 15                         | 2                       |
| Tungsten quartz halogen, ECO                     | 24                         | 3.5                     |
| Fluorescent T8 tube with electronic ballast      | 80-100                     | 12-15                   |
| Compact fluorescent lamp with electronic ballast | 46-75                      | 8-11                    |
| White LED with driver                            | 80-150                     | 12-22                   |

## LIGHTING BASICS: Colour Rendering Index, CRI

To match colours accurately you need good illumination, close to sunlight's spectral range. Remember the old adage - 'walk out of the shop to see the true colour'; indoor lighting is often insufficient for accurate colour comparisons.

Remember those low-pressure orange Sodium street lights that made everybody look ill? They must have had a very low CRI because they only emitted light of one colour, at two wavelengths very close to each other.

When you are choosing lighting, look at the specifications and look for lights with a CRI close to 100.

## LIGHTING BASICS: Lumens and Light Output

Light output is usually measured in Lumens and is a measure of all the visible light given out by a luminaire. Lumens per watt is a useful measure of a luminaire's efficiency. Table 1 shows some efficiency data that I have been able to find. I have not included specialised industrial lighting in this list, e.g. high and low pressure sodium, metal halide and mercury vapour, because they are unlikely to be found in a small workshop.

From an environmental perspective, a higher lumen per watt luminaire reduces CO<sub>2</sub> and is more desirable, and costs less to run, especially if the lamp lasts a long time.

I will now deal briefly with each luminaire type listed in this table.

## TYPES OF LUMINAIRES: Tungsten Filaments

A coiled coil of Tungsten wire in an Argon atmosphere became commercially available from about 1916. Although invented much earlier, in the 1870's by Thomas Swan in Newcastle, the incandescent filament bulb only became a commercial success when Tungsten wire and the coiled coil technology was developed.

The melting point of Tungsten metal limits the life and colour temperature of these lamps to 2800K (warm white) and 1000 hours' life. Increasing the filament temperature to 3200K gives you a photoflood with a reduced life of about 100 hours.

The life of these bulbs is also shortened by on/off cycles and mechanical shock.



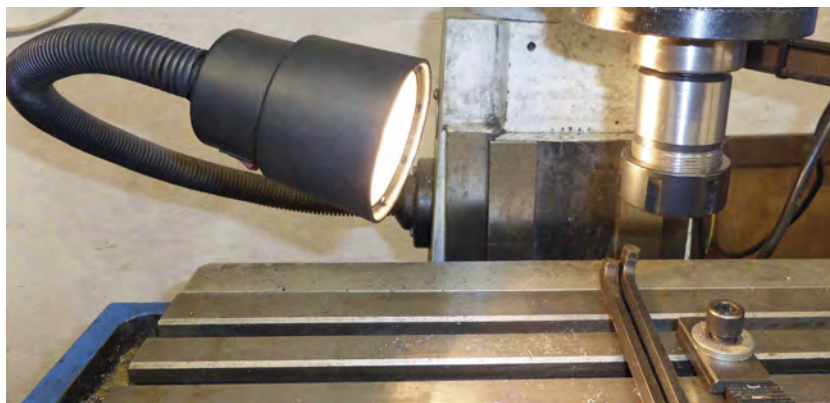


**ABOVE – PHOTOGRAPH 2**  
1960 Myford S7 with low voltage lighting.



**LEFT PHOTOGRAPH 3**  
Quartz halogen bulb.

**BELOW – FIGURE 4**  
Edison Electric Light sign. Source: the internet



**ABOVE – PHOTOGRAPH 4**  
Low voltage quartz halogen lamp on Chester 6x26 mill.

These bulbs are gloriously inefficient – lots of heat, good CRI, but warm white colour only (2700K). Only a small proportion of these ‘naughty’ lights are now allowed under UK Building Regulations.

Photograph 2 shows my 1960 vintage Myford Super 7 fitted on its original industrial cabinet and original MEMLO 24volt filament machine lamp. Millions of these low voltage lamps on friction arms must have been supplied. They were reckoned to be safer because of the low bulb voltage, derived from a transformer, but the bulb was unprotected. Their light was yellow but at least you could pull the bulb close to the work to see what you are machining. The overhead lighting is a ‘protected’ fluorescent tube or ‘batten’ – more on these later. A bit of light relief – I came across this apparently genuine sign from the early days of Edison Electric filament lights (figure 4).

## TYPES OF LUMINAIRES: Halogen Bulbs

These have a Tungsten coiled coil in a quartz envelope with Iodine gas, and were introduced about 1959.

They are compact and run very hot (>500°C at the envelope) to allow the Halogen cycle to operate. They produce UV and can be a fire risk; now they are filled with a higher pressure gas, Argon.

‘ECO’ Halogen bulbs, a recent development, have a second glass envelope or a coating and are slightly more energy efficient. In the halogen cycle, tungsten atoms boiled off the filament will react with the halogen in cooler parts of the bulb. The tungsten halide gas is then decomposed back to tungsten on the very hot filament. These bulbs don’t like grease from fingers and handling with cloth is recommended or the bulb’s life will be shortened.

Often 12V or 24V Halogen bulbs are used in industrial low voltage machine lamps. Photograph 3 shows a typical Halogen capsule. CRI at 3400K is close to 100.

It seems likely that these bulbs will be banned from 2018 in the EU because even the ECO versions use too much energy per lumen. Photograph 4 shows the low voltage Halogen machine lamp on my Chester 6x26 mill; this was original equipment in 2006. This lamp has some protection in the form of a glass disk; I find I must clean this glass regularly as oil gets burnt onto it. As you will read later I have retired this lamp in favour of newer technology. Photograph 5 shows Halogen and LED work lights that I regularly use in building work - my workshop building was very incomplete until recently. The ECO halogen bulbs are about 350 Watts each and give you a roasting, and sunburn, if you work too near them. They are fragile bulbs and won’t stand any rough treatment when hot despite the wire guards over the lighting heads.





**ABOVE – PHOTOGRAPH 5**  
Quartz halogen and LED work lights.

On the floor is a 10Watt LED work light. This is cordless with a rechargeable battery lasting about 3 hours. I don't pretend this light gives the lumens of the Halogen pair but it's much more robust and hardly gets warm. I must admit to dropping it almost 3 metres from the ceiling above without damage!

Lamp manufacturers must now provide a lot more data about their products. Photographs 6 and 7 show the sort of data given for an ECO Halogen work light bulb, like those used in Photograph 5. You should be able to find a reference to all the technical data I have discussed earlier – life, colour temperature, lumens output, etc. You can just see the double glass envelope.

### TYPES OF LUMINAIRES: Fluorescent Ceiling Lights, Battens

These are low pressure mercury-vapour gas-discharge lamps that use fluorescence to produce visible light, and have been widely available since 1938.

These tubes require a high starting voltage. A choke (ballast) and starter were initially used to achieve this. Their disadvantages include a slow start, flicker and strobe effects with rotating machinery.



**ABOVE – PHOTOGRAPH 8**  
Lighting over my Chester Craftsman 6" lathe.

More recently electronic ballasts, replacing the starter and choke, have improved efficiency, start instantly and don't flicker.

These tubes have high efficiency and long life (10,000 hours). Tri-Phosphor mixes allow the colour temperature to be varied.

Each luminaire contains Mercury, which is toxic, and some UV gets through the phosphor coating. Mercury is recovered from unbroken tubes in the UK.

Photograph 8 shows my Chester Craftsman 6" lathe with a 150Watt Halogen flood light as a machine light and a 5Foot T8 fluorescent with electronic ballast overhead.

This lighting was installed 3 years ago. If I were to install this again I would use LEDs for both the tube and floodlight. The halogen does provide useful heat in cold weather though!

The lack of reflective white surfaces in this ground level workshop is a disadvantage.



**ABOVE – PHOTOGRAPH 9**  
Domestic compact low energy bulbs.

I have built a stud wall behind the lathe, painted white, but the ceiling is just joists and would benefit from plasterboard and white paint.

The T8 tube has IP65 protection; it's 58Watt, 5220lm, comes on instantly and does not flicker. Its efficiency is about 90 lumens per Watt.

### TYPES OF LUMINAIRES: Compact Fluorescent Lamps, CFL's

These are smaller versions of fluorescent tubes with electronic ballasts built into the bulb.

Many are annoyingly slow to reach full light output and I find it difficult to get higher colour temperatures in retail outlets.

The light output appears overstated – EU politics perhaps? These are not as energy efficient as fluorescent ceiling tubes, partly because of the built in miniaturised electronic ballast. Photograph 9 shows typical domestic low energy bulbs.

*Next month I will conclude by discussing a solid state alternative to bulbs and tubes – LED lighting.*

**« TO BE CONTINUED »**

**BELOW – PHOTOGRAPHS 6 and 7** – ECO halogen data sheets.





# A 'Quick and Dirty' Loco Shed

Jan-Eric knocks up a low-cost shed for storing his locomotives between outings

BY JAN-ERIC NYSTRÖM

I don't like lifting heavy stuff – who does? Engines in 1.5" scale, ie 7¼" and 7½" gauge, are heavy indeed; you've probably heard the term 'hernia gauge'. Until recently, every time I've planned to run one of my locomotives on the home track, it had to be lifted out of storage, and back in again, unless I felt lazy and just left it under a tarp overnight. That happens – but it is something I won't do if I leave the house for any longer period of time. A locomotive under a tarp is subject to damage by condensing moisture – and vandals!

In my garage in Helsinki, where I store the engines during the winter, I have roll-away stands of a height that enables me to simply roll the engines from the trailer bed onto the stands; no lifting at all is needed. I can also tilt the trailer bed and winch the locomotives directly onto any track with the aid of a simple ramp, so no problem there either.

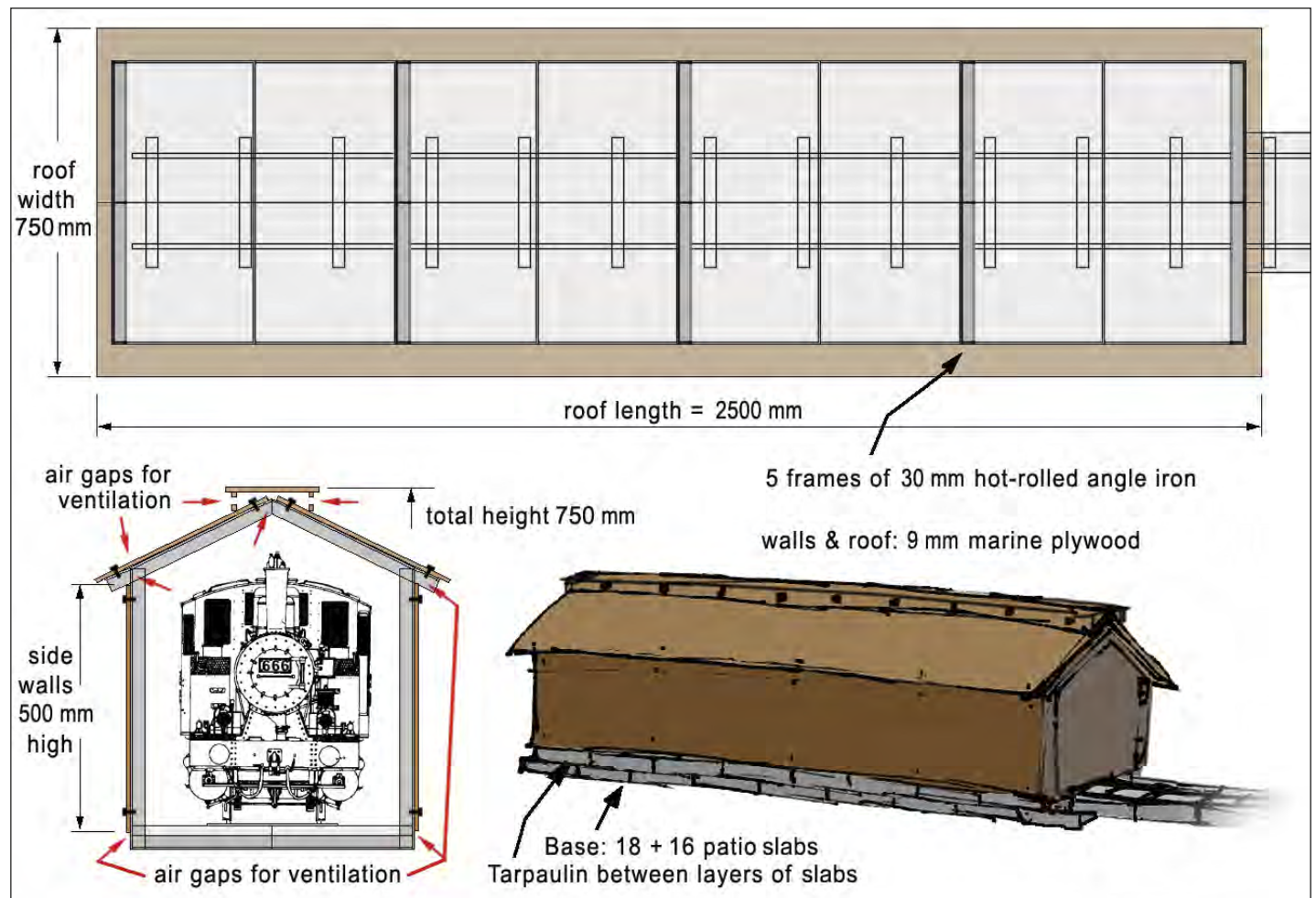
At our railway museum they've built a track ramp leading directly into a storage building – so, there, I just roll the locomotive into the shelter. However, at our summer place, where my home track resides, any rolling stock must be carried up an inclining rock slope (very slippery when wet!) into a building about five metres away from the nearest track. At least two persons are needed to lift the lighter locomotives and no fewer than four people will be necessary for the upcoming ten-wheeler.

In order to avoid doing this (I'm getting older every year, and so are all the others who usually help me lift the engines) I decided to build a storage shed, long enough to contain either the ten-wheeler by itself, or the smaller 0-6-0 steam engine together with the little 0-4-0 battery 'Quickie'. This would obviate any need for lifting heavy stuff during the

running season; the locomotives can easily be winched straight from track level back up onto the tiltable trailer bed when they are to be transported to another location.

All my cars are light, none of them weighing over 40 kilograms, so they can still easily be lifted in and out of the existing storage by two people and won't need a track-level shed of their own. Thus, I drew up the design shown below; a simple, 2.5 metre long shed built using five supporting frames made from 30mm angle iron, held in place by a foundation of 300mm patio slabs and covered with waterproof ('marine') plywood.

Building this shed took only two days, including the construction of the frames. Photograph 1 shows a little low-cost gadget I bought many years ago – a stand for holding an angle grinder, so it can be used to cut bar stock or other materials squarely or at any desired angle. Much better than





**ABOVE – PHOTOGRAPH 1**

An angle grinder stand. A1mm thin abrasive disc cuts metal squarely and quickly.

**ABOVE – PHOTOGRAPH 2**

Welding one of the five supporting frames. Note how the two stones ensure the correct width of the frame.

exhausting yourself with a hacksaw but remember that you should always wear eye and ear protection whenever you use an angle grinder!

In almost no time, I had cut the necessary pieces from which I welded together the frames, one of which is seen in photograph 2. Note that I have placed two patio stones on the workbench in order to ensure the correct distance between the frame sides. The cutting and welding of all the five frames took just a couple of hours, following the drawing and the measurements I had prepared ahead of time. On the floor at the right of the photograph are some dark-brown strips of marine plywood, already cut to size at the lumber yard.

## PREPARING THE FOUNDATION

The next task was to provide a level surface for the patio stone foundation; the lawn was quite uneven and also a bit tilted at the intended location for the shed. I decided to make a two-layer foundation, using eighteen of the 1ft square stones for the base layer, partly recessed into the lawn, and sixteen stones inside the shed as a second layer. The latter layer would hold the frames securely in place. In photograph 3 I'm removing the first shovelfuls of earth in order to prepare the foundation. I moved the pieces of lawn to the former location of the spur track. By transplanting the clumps of dirt and living grass I hoped that no trace of the old track would be seen the next summer, once some new grass had had time to grow. The new track is positioned as close to the hedge as feasible, leaving only enough room for the width of a lawnmower.

In photograph 4 I'm leveling the base stones using a long spirit level. I left a 2% run-off angle towards the left side in the photograph so that any rainwater would flow away from the entrance end of the shed. Several bucketfuls of sand were spread under the stones and tamped hard with the aid of the edge of a stone. In this

**ABOVE – PHOTOGRAPH 3**

The morning of the second day started with some digging. Note the 'repaired' former location of the spur track, best seen in the narrow space between the tracks at top.

way, I hoped the foundation wouldn't settle too much – and even if it did, the shed is constructed from easily detachable parts, so that everything can be disassembled – thus the foundation can be re-worked if it ever becomes necessary.

In order to prevent ground moisture from seeping up through the first layer of stones into the second and into the shed I placed a tarpaulin between the layers. Folded double, it should do the job pretty well.

**BELOW – PHOTOGRAPH 4**

A 1.2 metre long spirit level helped to check the flatness and inclination of the foundation as it was being built.





## ERECTING A SHED

My helpful neighbour assisted me in assembling the structure; in photograph 5 he is checking that the holes in the plywood align with the threaded holes in the frames. M6 bolts were used to fasten everything together. The shed became very rigid thanks to the stones of the top layer being placed inside the welded frames, as seen in the closeup in photograph 6. Since the frames are made of angle iron pieces, they are very effectively clamped between the four groups of four stones each.

Photograph 7 shows how far I had got by the evening of the second day; the shed is complete – only the track, and a couple of stones in front of the door to support the track, are missing. There is now a structure on top of the roof that ensures good ventilation – as seen in figure 1, I have included many gaps in the design so that air can circulate, both at the foundation as well as between the top of the walls and the roof (photograph 8). This is necessary – when you put a warm and damp steam locomotive into the shed the heat causes the moisture to rise upwards. The gap between the two roof halves allows the moist air to escape into the rain ‘protector’, which again has holes on the side for circulation (photograph 9). In this way, there will be much less condensation than in a tight enclosure. This structure of course also prevents rainwater entering the ventilation gaps.

## READY FOR THE LOCOS

Photograph 10 shows the door to the shed. Note the two tabs welded to the frame at the left, for securing the door with two padlocks. Photograph 11 shows the locked shed in the corner of the lawn; it is concealed by a hedge on two sides and, in addition, the trees reduce its visibility from the street. Since I have tried to minimize the visibility of my track I think this shed, too, is inconspicuous enough to neighbours and passers-by as well as potential vandals.

Photograph 12 shows the same corner of the yard some months later. Note how the track is camouflaged along the street; circling the large trees at top left, the track



**ABOVE – PHOTOGRAPH 5**

Aligning the pre-drilled holes in the plywood with the threaded holes in the frames was exacting work. A neighbour lends a helping hand.



**LEFT – PHOTOGRAPH 6**

The stones provide a sturdy support for the frames. In the inset you can see how the stones interlock with the angle iron frame.

**BELOW – PHOTOGRAPH 7**

On the evening of the second day, the shed is almost finished. Note the rain protector on top of the roof.



**RIGHT  
PHOTOGRAPH 8**

Many ventilation openings promote air circulation, preventing moisture from condensing inside the shed.

**BELOW  
PHOTOGRAPH 9**

The ‘rain protector’, covering the gap between the two roof halves, is perforated for air circulation.





foundation is hardly visible, since the stones are painted dark grey and thus blend into the lawn. You can clearly see the point where the bright stones end and the painted ones begin. During the winter I cover the shed with a tarpaulin to protect the plywood from ice and snow. The engines are of course not kept in the shed over the winter! This 'aerial photo' is shot with a camera mounted in a radio-controlled 'quadcopter' costing less than £100 – it is a fun toy but admittedly quite a bit harder to steer than my locomotives!

All in all, this shed has proved to be a very inexpensive and practical solution for storing my locomotives between runs. There is, of course a slight problem (photograph 13) – where does the driver go? ■

#### RIGHT – PHOTOGRAPH 10

The engine shed is ready to accept either a large ten-wheeler or a smaller 0-6-0 together with a tiny 0-4-0.

#### BELOW – PHOTOGRAPH 11

The cut edges of the plywood as well as all the bolt heads have now been painted brown. The size, colouration and location of the shed make it almost invisible in these surroundings.



#### ABOVE – PHOTOGRAPH 12

A few months later, a 'quadcopter' aerial view of the shed, here protected from the winter snow with a tarpaulin, held in place with a few stones. Note how the shed still stays virtually invisible from the street behind the now bare trees and bushes.

#### BELOW – PHOTOGRAPH 13

It is a good idea to pull on the brake and stop the train in time!



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# A Visit to the Garden Rail Show at The Fosse

The editor took a well-deserved day off to visit the 'Larger Scale' show at Leamington Spa

BY MARTIN EVANS

**M**odel engineers, for most of whom 'small scale' is 2½" or 3½" gauge, who visit the 'larger scale' garden rail show require an understanding that 'larger' is a relative term. The exhibits here focussed mainly on gauge 0, gauge 1, 16mm and 45mm. It made a pleasant change, though, from the 5" and 7¼" gauge kit that we're used to.

One layout that interested me particularly was the Vintage Tinplate Group's extensive layout, which dominated one end of the hall. This brought back happy memories of my uncle's large collection of Hornby 0 gauge tinplate with which I spent many happy hours in the extensive attics of my childhood home at the foot of the Yorkshire moors. (I wonder what happened to it?) This impressive display was the result of combining eight separate collections.

Reluctantly moving on, I found myself admiring the Newchapel Junction layout. This was a highly detailed and authentic representation of the post-grouping period, running both SR and GWR stock. The signalling system is particularly impressive. It is fully interlocked according to full-size practice, using 400 relays. Not surprisingly, Newchapel Junction buy their relays in bulk! I was told that even this number was a considerable saving on the 'full-size version' as diode arrays were used to implement the interlocking logic rather than relays, saving potentially 1500 or so relays. The railway is run in the correct prototypical fashion from three inter-communicating signal boxes. The semaphore signals themselves were beautifully made, the filament lamps being under-run to provide the authentic soft paraffin glow, which I thought was 'spot-on'.

Several G scale railways filled the rest of the hall, and nearly 40 trade stands were on hand to supply anything required by visiting enthusiasts. I was tempted but I resisted – I have enough projects 'on the go' as it is!

It was a good show and I shall go again next year and, if you fancy a change, so should you. ■



**ABOVE**  
The Vintage Tinplate Group's impressive gauge 1 display.

**RIGHT**  
Part of the busy scene on the Lewiston G scale railway.

**BELOW**  
Newchapel Junction – this finescale 0 gauge layout provided a masterclass in railway signalling and operation.





# The EIM Steam Plant – The Engine

**Martin Gearing** shows how to make a couple of fixtures for producing the cylinder covers and then goes on to mill, turn and bore the cylinder itself

BY MARTIN GEARING – PART 6 – CONTINUED FROM PAGE 35 APRIL 2017

## CYLINDER COVERS – OVERVIEW

*Refer to EAV2 (Right)*

The cylinder bore is closed at one end by a cover (Item 23) with a 0.5mm register that locates it to the cylinder bore. The other end is closed by a thicker cover (Item 14) with an identical register on one side, for location into the cylinder bore.

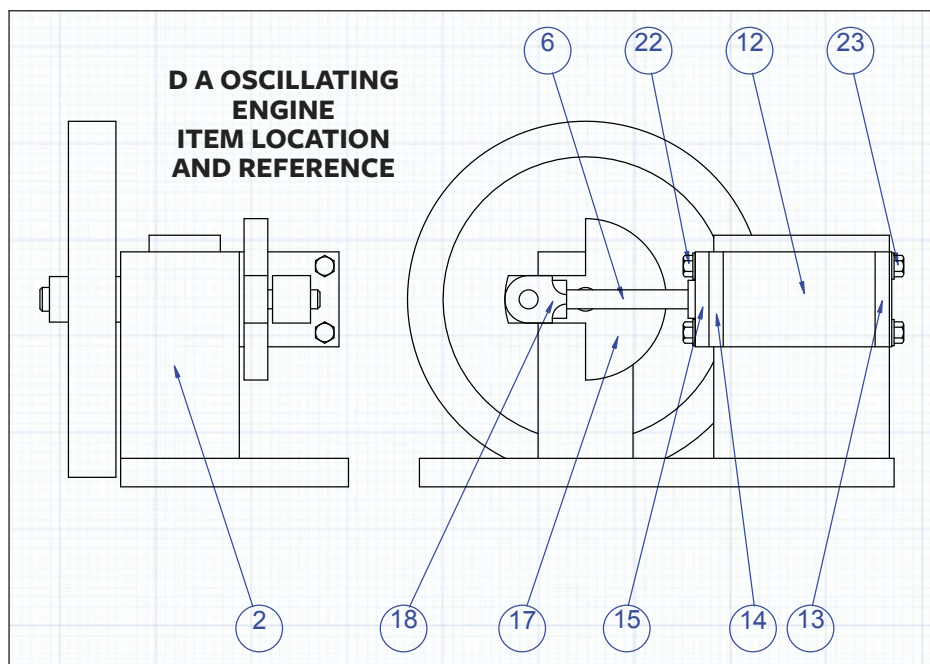
The other side on this cover has a second smaller register, into which is bored a recess that houses the rod seal in the form of an 'O' ring. The smaller register provides location for the gland cover (Item 15) that has a recess provided for this purpose. Together these two items also support and provide the bearing surface for the piston rod – hence the requirement to locate these two covers accurately together and to the cylinder bore.

Producing a shallow recess/register accurately is one of the more difficult turning jobs. Acceptable results can be achieved if a plug gauge is made first – to the maximum and minimum size specified.

To machine the recess the method suggested is to bring to size less 0.1mm, using the 'nibs' for measuring slots and inside diameters on the back of callipers, and then gradually increase the diameter taking 0.01mm cuts until the relevant minimum gauge just enters. This method ensures that you do not go out of tolerance.

You will need a 0-25mm outside micrometer to achieve the tolerances required for most of the following items.

For those interested I've aimed for



what is termed a 'Locational Clearance Fit' from the 'Hole Based' system of 'Limits and Fits' but eased the tolerances a little to make for round figures, and to give dimensions that are achievable to anyone for whom this is a new experience.

## CYLINDER COVER

**Fixture & Gauges**  
Ø30 Aluminium,  
Ø¾", Ø10 & Ø6mm Brass

### A – CYLINDER BORE & GLAND COVER GAUGE

Ø ¾" Brass  
*Refer to – Drawing E12*

This item may be used for checking the final bore of the cylinder in the absence of possessing/access to a telescope gauge. Whether you have access to a telescope gauge or not it will be necessary for the completion of the cover fixture. Cut a 35mm length from the Ø¾" brass stub remaining from the reversing valve.

Hold in a self-centring chuck with 15mm protruding. Face off. Turn Ø14±0.01mm for a length of 10mm from the face. Turn around and hold with 15mm protruding. Face off and turn Ø12

±0.01 for a length of 10mm from the face. Working to achieve this tolerance will require the use of a 0–25mm micrometer. It is advisable to stamp/engrave the diameter of the gauge in a non-critical location. See photograph E29.

### BELOW – PHOTOGRAPH E29

Cylinder bore, cover and fixture bore gauges.



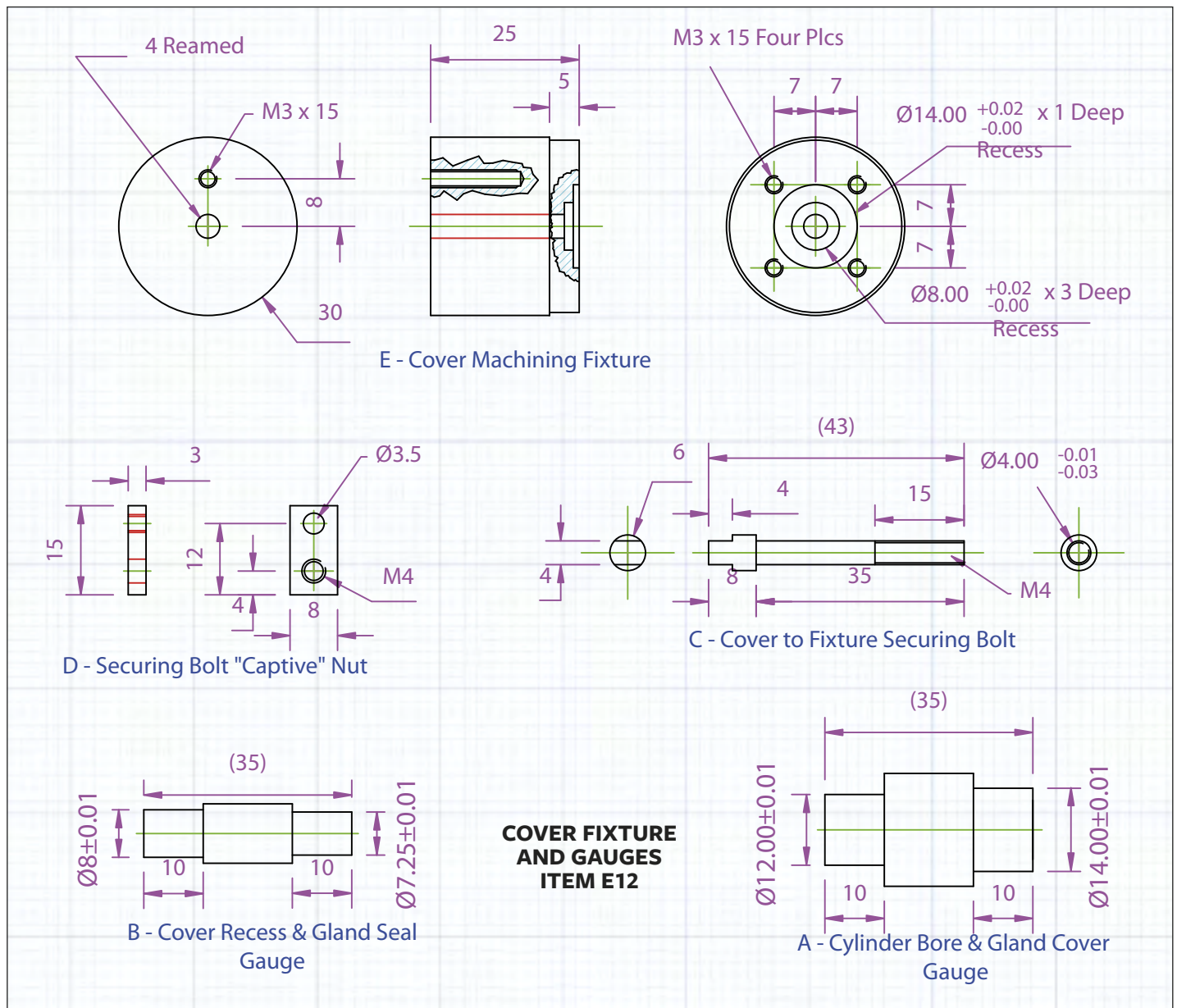
## BUILD NOTES

**Tolerances for all parts in the article – unless stated otherwise:**

- **Non-functional** (ie parts not a fit or a match): ±0.1mm
- **Functional** (ie parts having to match): ±0.02mm

**All drawing labels start with the reference letter E.**





### B – COVER & GLAND GAUGE

Ø10 x 35mm Brass

Refer to – Drawing E12

Cut a 35mm length of Ø10 brass. Hold in a self-centring chuck with 15mm protruding. Face off. Turn  $Ø8 \pm 0.01$ mm for a length of 10mm from the face. Turn around and hold with 15mm protruding. Face off and turn  $Ø7.25 \pm 0.01$  for a length of 10mm from the face. Working to achieve this tolerance will require the use of a 0 – 25mm micrometer. It is advisable to stamp/engrave the diameter of the gauge in a non-critical location, as before.

### C – COVER TO FIXTURE SECURING BOLT

Ø6 x 43mm Brass

Refer to – Drawing E12

Hold ideally in a collet, or self-centring chuck, with 47mm protruding. Using a sharp tool and taking cuts of no more than 0.2mm depth, produce the  $Ø4 +0.00/-0.02$  x 35mm. Expect to take at least three

'Spring Cuts' to bring the length parallel on a diameter this small in relation to the long length.

A 'Spring Cut' in this situation refers to taking extra passes over the work at the same tool setting. This is because of the workpiece having such a small section tending to be pushed (to 'spring') away from the tool as the cutting forces are resisted, despite using a sharp tool. To achieve consistent results when measuring it is necessary, as one gets nearer to the desired size, to take three 'spring' cuts at the same feed dial position each time after moving the tool to reduce the diameter.

Working to achieve this tolerance will require the use of a 0–25mm micrometer.

Thread M4 x 15mm as indicated and part off 43mm long. Grip lightly on the 4mm diameter and face-off. Hold in bench vice with jaw protectors, and file 1mm from opposite sides of the 6mm diameter to produce the 4mm across flats as indicated. This allows the use of a spanner when tightening the bolt. Remove any burrs, and put to one side.

### D – SECURING BOLT 'CAPTIVE' NUT

8 x 15 x 3 Brass

Refer to – Drawing E12

Other than wanting the thread to be square to the thread of the 'nut', there are NO critical dimensions on this part! In the absence of more suitable stock in-house, produce the 15 x 8 x 3 'Captive Nut' blank by parting off a 3mm thick 'slice' from the end of a Ø3/4" brass bar. Scribe a centre line and mark off the 15 x 8 rectangle. Centre punch the M4 and Ø3.5 locations at the indicated positions and complete the machining operations. Remove any burrs.

### E – COVER MACHINING FIXTURE

Ø30 Aluminium

Refer to – Drawing E12

Hold the Ø30mm aluminium in the 3-jaw chuck with 10mm protruding. Face off and turn around then hold with 10mm protruding. Face-off and skim the outside diameter just sufficient to achieve a continuous cut for a length of 5mm. The





purpose of this diameter is to enable the fixture to be aligned in the next operation and to be reused, should the need arise, by holding in a 4-jaw chuck and referencing against this diameter with a DTI stylus to ensure true running.

Centre drill, drill  $\text{Ø}3.8$ , ream  $\text{Ø}4$ .

Using a small boring tool open out the reamed hole to produce a  $\text{Ø}8 \times 3$  deep recess that can be checked against the  $\text{Ø}8 \pm 0.01\text{mm}$  cover register gauge.

Open out the  $\text{Ø}8$  hole to produce a  $\text{Ø}14 \times 1$  deep recess that can be checked with the  $\text{Ø}14 \pm 0.01\text{mm}$  cylinder bore gauge.

Transfer to a milling machine and using suitable parallels hold with the recessed end uppermost and about 8mm above the top of the jaws.

Align the spindle with the centre of the fixture – referencing off the skimmed outer diameter. At the four locations indicated drill and tap M3 x 15. See photograph E30.

Fit the cover securing bolt through the machining fixture and

**ABOVE  
PHOTOGRAPH E30**  
Threading fixture  
for M3 cover  
securing bolts.

tighten the captive nut to the plain end of the machining fixture. Using a  $\text{Ø}3.5\text{mm}$  drill 'spot' through the captive nut sufficiently deep to cut a full diameter then drill  $\text{Ø}2.5\text{mm} \times 15\text{mm}$  deep before tapping M3. Secure the captive nut using a suitable M3 bolt or set screw. Unscrew the securing bolt and check that on re-fitting the bolt it picks up easily in the captive nut. If not, slacken the retaining screw to obtain a position that allows the securing bolt to pick up in the nut easily. See photograph E31.

Carefully remove any burrs and put to one side.

## CYLINDER – ITEM E13

Cast Iron –  $20 \times 25 \times 32$

Refer to – Drawing E13

Note – Do not deburr any of the port drillings

**BELOW  
PHOTOGRAPH E31**  
Retaining screw  
for "Captive Nut"  
in fixture.

## STAGE 1: DRILL/MILL PORT FACE

Secure the blank in the milling vice with the large  $32 \times 25$  datum FACE against the fixed jaw on suitable parallels to bring the  $32 \times 20$  datum EDGE at least 2mm above the vice jaws. On this component the third datum (for machining purposes) is located centrally between the two ends, because the ports must be accurately located with reference to the central pivot point on the port face.

Zero the spindle to the fixed jaw and centrally between the two end faces of the cylinder blank. Set X-axis and Y-axis feed dials to zero.

Move the block 10mm on the Y-axis and lock the table slide.

Centre drill, drill  $\text{Ø}3 \times 6.5$  deep at (X+12.5, Y-10) and (X-12.5, Y-10)

Move the table to (X 0, Y-10) and lock the X-axis slide.

At (X 0, Y-10) drill  $\text{Ø}3.3 \times 6.5\text{mm}$  deep, taken from the drill tip. Take care NOT to exceed this depth. DO NOT TAP at this stage.

Move the work clear of the spindle and install a  $\text{Ø}10\text{mm}$  end mill.

With the cutter clear of the port face on the Z-axis, set the cutter rotating.

Return the cylinder blank to (X 0, Y-10). Lock the X-axis slide.

On the Z-axis bring the cutter just into contact with the port face. Zero the Z-axis feed dial.

Move the cutter clear of the blank on the Y-axis.

Move the cutter to Z+1mm then apply the spindle or Z-axis slide lock.

Feed the cutter slowly across the blank using the Y-axis. See photograph E32

Remove the blank, deburr and clean the vice.

## STAGE 2: MILL/DRILL & TAP 1ST END

Secure the blank in the milling vice with the large  $32 \times 25$  datum FACE against the fixed jaw on suitable parallels to bring the  $20 \times 25$  end at least 2mm above the vice jaws, and the port face to the right.

The spindle will remain referenced at zero to the fixed jaw on the Y-axis, but needs to be zeroed to the port face on the right.

Centre drill, drill  $\text{Ø}2.5 \times 6\text{mm}$  and tap M3 at the four locations shown, (X-8, Y-3), (X-22, Y-3), (X-22, Y-17) and (X-8, Y-17).

Centre drill at (X-15 Y-10). This will be used to locate the blank in a following operation.

Install a  $\text{Ø}6\text{mm}$  centre cutting/slot drill and move the blank to (X-6.5 Y-10).

With the cutter rotating raise the work until it just contacts the end face. Zero the Z-axis feed dial. Feed slowly to a depth of 2.5mm on the Z-axis. See photograph E33.

Remove the blank and clean the vice.

## STAGE 3: MILL/DRILL & TAP 2ND END

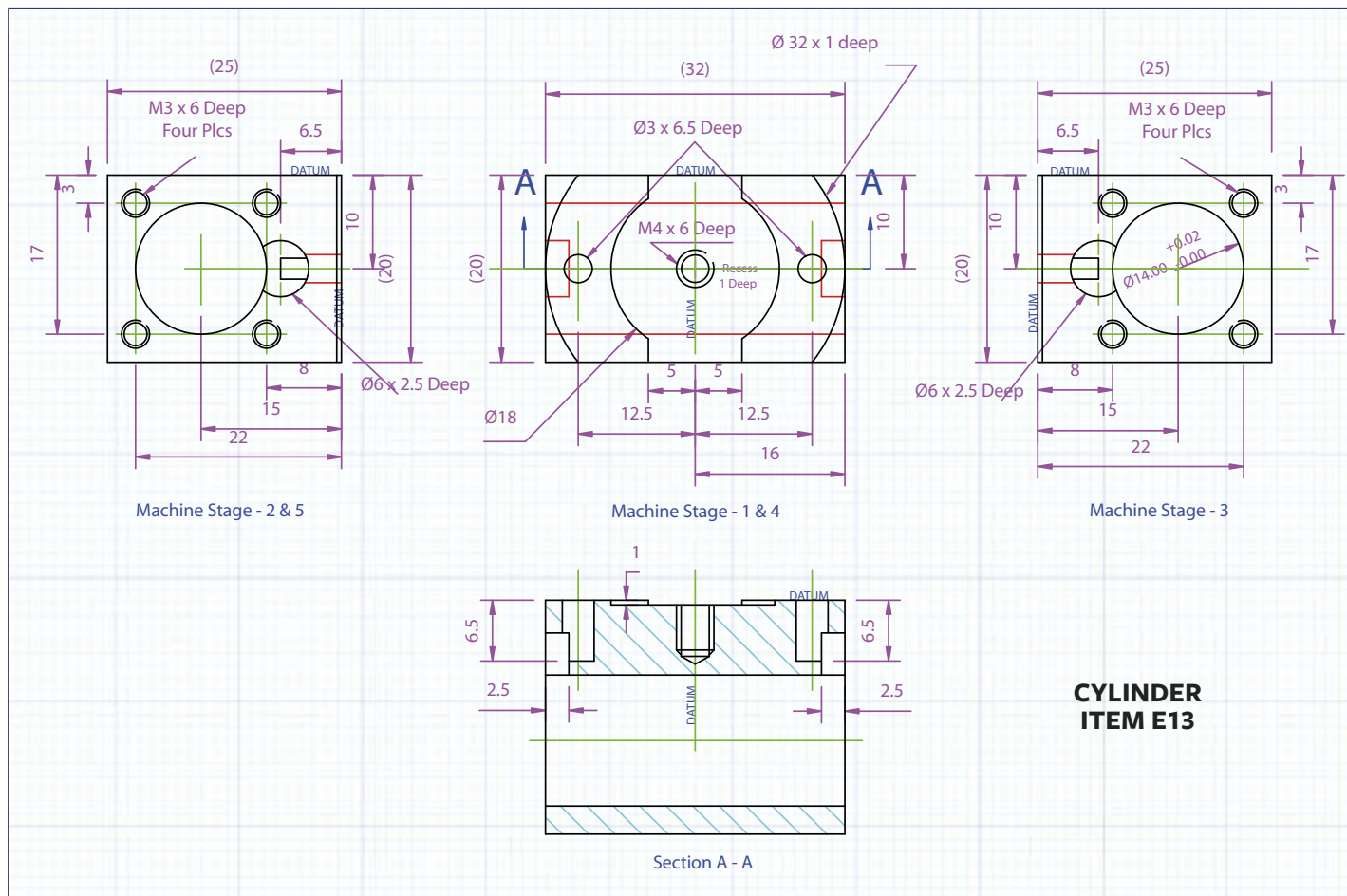
With  $32 \times 25$  datum FACE against the fixed jaw, place the end just machined on suitable parallels to bring the blank just above the top of the vice jaws and the port face to the left. The spindle will remain referenced at zero to the fixed jaw on the Y-axis, but needs to be zeroed to the port face now on the left.

NOTE: all the X-axis values now become positive, and centre drilling at the (X+15, Y-10) location is NOT required.

Centre drill, drill  $\text{Ø}2.5 \times 6\text{mm}$  deep and tap M3 at four locations shown, (X+8, Y-3), (X+22, Y-3), (X+22, Y-17) and (X+8, Y-17).







**LEFT PHOTOGRAPH E32**  
Recess in port face – milled 1st stage.



**RIGHT PHOTOGRAPH E33**  
Cylinder 1st end face, with additional bore location hole.

#### STAGE 4: TURN THE CYLINDER

For the following machining operation using a 4-jaw chuck, you will need to provide four smooth flat pieces of metal to prevent the hardened jaws marking the blank surfaces.

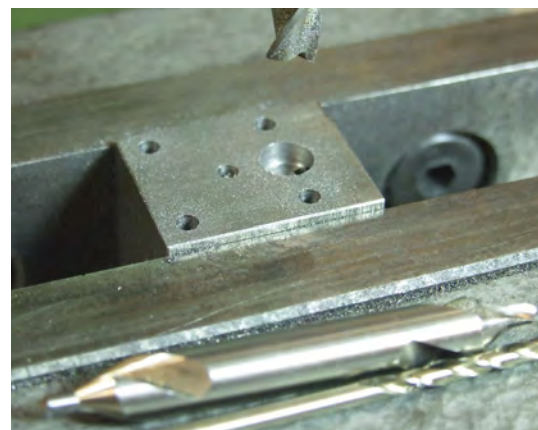
FOR COMPLETE SAFETY, setting up should be done with the machine electrically isolated.

Set the cylinder blank port face running true to the pivot hole in a four jaw independent chuck. One quick and easy method to do this is to use a 'wobbly centre bar'. If you have a spare tailstock centre that has a female centre at the small end this will serve or to give you a little more room make one up from a 100mm length of  $\varnothing 10$ mm bright rod. Centre drill one end and turn a  $60^\circ$  point on the other.

Install a centre into the tailstock and after locating the  $60^\circ$  point in the  $\varnothing 3.3$  pivot hole drilled previously support the other end of your bar/centre on the tailstock centre. Adjust the tailstock to just grip the centre/bar without undue force and set up a DTI stylus to bear on the bar close to the workpiece.

The bar will indicate the deviation of the reference hole from centre, and by adjusting the jaws to reduce the run out as indicated on the DTI the reference hole can quickly be made to run true. See photograph E34.

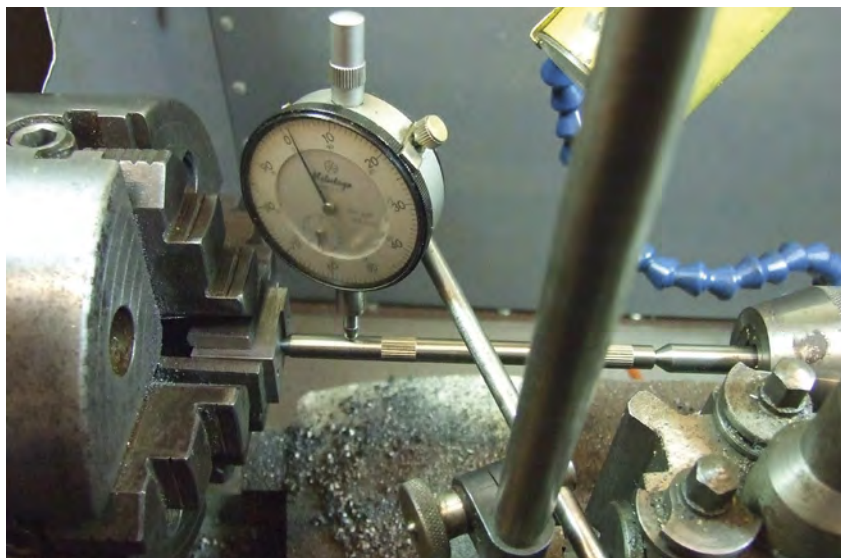
Before you commence machining make a final check on all four jaws to see that they are all tight, because it is not impossible to actually have something running true but only gripped on two opposite jaws.



Install a stiff boring tool, protruding only sufficient to clear the length of the bore (about 35mm). With the work turning bring the tool close to the centre of the cylinder block and lock the saddle. Using the compound slide, slowly advance the tool until it just shows a 'witness' of contact, then zero the compound slide. Now move the tip into the hole and using the compound slide feed into the work 0.25mm, feeding out on the cross slide until  $\varnothing 18$ mm is achieved. Go back to the centre and repeat a further three times which should result in a recess 1mm deep and of  $\varnothing 18$ mm.

Change to a right-hand knife tool and with the work turning, bring the tool close to the extreme corners of the rotating block and lock the saddle. Using





**LEFT  
PHOTOGRAPH E34**

Setting port face to run true to pivot hole.

**BELOW  
PHOTOGRAPH E35**

Checking bore size with telescope gauge.



the compound slide, slowly advance tool until it just shows a witness of contact on the port face corners, then zero the compound. Bring the tool away from the work using the cross slide and advance 0.25mm on the compound slide. Feed in slowly on the cross slide until Ø32mm is achieved, which in this case doesn't actually need measuring as the dimension is when the flat surfaces of the ends (which are 32mm apart) just disappear. Bring the tool clear using the cross slide and repeat a further three times which will result in the specified 1mm depth.

Finally, using the tailstock chuck for support, tap the M4 thread. This will ensure that the thread is at 90° to the port face.

### STAGE 5: BORE THE CYLINDER

FOR COMPLETE SAFETY, setting up should be done with the machine electrically isolated.

Using the location hole in the cylinder blank end face, drilled at stage two, set the work to run true, with strips of metal between the jaws and cylinder blank faces to prevent marking, in the same manner as before.

Remove the bulk of the waste from the cylinder bore using ordinary drills in stages. I would suggest Ø6 followed by Ø12. Set up the largest boring tool with a sharp tool having a small tip radius that you are able to enter into the Ø12mm hole, and sufficiently long to machine without interference at least 35mm length.

Be aware that putting on a cut when involved with boring holes means the tool moves away from the centre towards you, not towards the centre as happens when turning diameters, causing the feed dial graduations to count backwards.

Take a light cut and check that the tool goes through the length of the bore without any difficulties. Put on a 0.2mm cut and feed slowly through the blank. NOTE – if the machine you are using is relatively modern, a 0.2mm cut will appear as 0.4 on the cross slide dial. On older machines the dial graduations refer

to the actual cross slide movement which results in a reduction in diameter of twice as much.

Listen to the sound of the tool as it goes through the blank and in all possibility the first cut might result in an intermittent sound as drilled holes rarely run true. Should this be the case withdraw the tool, put on another 0.2mm cut and feed through again.

When you achieve the sound of a continuous cut, if all is well – something like a hiss – withdraw the tool and without altering the setting feed through again to make a 'spring' cut (as we did when making the cylinder cover fixture).

The easiest way to measure bores of this size is to use a tool called a 'telescope gauge' which comprises of two spring-loaded plungers that can be clamped in a holder. In use they are set slightly larger than the bore to be measured clamped lightly, and then 'swung' across the diameter which forces the plungers into the holder to a distance exactly that of the diameter. The tool can be removed and then measured, either with a micrometer or callipers. The use of a telescope gauge allows you to quickly rough out nearly to size with a degree of confidence that the plug gauge cannot provide. See photograph E35.

An alternative is to use the plug gauge described earlier. By a slow process of trial and error the bore is enlarged until the gauge diameter just enters, which tells the operator the specified size has been achieved. From personal experience, success is a great deal faster to achieve with a telescope gauge and they are now affordable.

If you have to use a plug gauge use the 'nibs' on the back of callipers, taking care to ensure the 'nibs' are 'settled in' whilst applying a gently pressure to the moving jaw to expand the nibs whilst getting them to lay exactly in line with the bore. This is shown as the maximum size being displayed. Note the measurement and deduct 13.90mm and remove the calculated amount from the bore.

Having got to Ø13.90mm after taking three spring cuts "Keep Calm – Don't Panic" but reduce the depth of cut put on to 0.01mm (0.02 on a more modern dial marked in diameter), taking three spring cuts after each increase, and you will arrive at a measured bore size when the gauge just enters the bore smoothly for its full 10mm depth. This will indicate that the bore is in tolerance of between Ø14.00mm and Ø14.02mm.

By only having a small depth of cut and feeding slowly, the finish off the tool should be sufficient for the application. See photograph E36.

After carefully removing any burrs, assemble the cylinder pivot stud into the cylinder block placing a drop of Loctite retainer in the thread of the cylinder block and a drop of retainer on the end of the pivot stud. Tighten securely by locking two nuts against each other on the long section of thread. Put to one side to cure.

Next month we shall go on to use the fixtures we have made to produce the cylinder covers.

### « TO BE CONTINUED »

**BELOW – PHOTOGRAPH E36**

A boring job finished!





# A Two-faced Encounter at Rippingale

DAG Brown happens across a rather unusual clock in Lincolnshire

BY DAG BROWN

I suppose that the village of Rippingale, a few miles north of Bourne, is really out of my usual territory; originally I was roped into helping them through some friends who lived in the village. Perhaps best known for their beer festival of 'Ripping Ales', nevertheless the village has plenty going on and the large church has one or two remarkable features, including its clock. Access to that mechanism is far from straightforward; high up in the tower it is reached via an obstacle course which starts with a visit to an upper room which gives access to the ringing chamber; from there a ladder takes one to the belfry in which the clock sits marooned in the middle of the floor. The position is dictated by the fact that it is arranged to drive two sets of hands on two faces of the tower; of this more in a minute.

The clock mechanism is quite the oddest which I have ever encountered: I can best describe it as a hybrid drive, since the movement is a tiny electric one, coupled directly to the hands by means of the traditional gearing; it is thus susceptible to power cuts but otherwise keeps reliable time and, being a synchronous movement, maintains its link to the grid, like a typical 1950's electric clock. I have been called in the past to sort out the odd problem with the electrics, but just a minor hiccup in a unit which otherwise functions as it should.

The strike train on the other hand is more easily recognisable as that in a traditional tower clock, with its mechanical tripping by the going train and the control of the strike rate by means of a 'fly'. The effort, however, is applied by another electric motor, which relieves them of the need for a weekly wind. Here again I have sorted out the odd problem in the strike train, occasioned by its getting out of time with the clock movement.

It must be said that the adoption of electric drive, either in this manner or by the more traditional continuous loop applied to the well tested large train of gears, relieves the mechanism of the huge weights like those which I described earlier at Greatford (see EIM,



**ABOVE**  
St Andrew's Church, Rippingale.  
Photograph: Richard Croft

March 2016). As a consequence not only does wear and tear on the movement greatly reduce but it also gets rid of the potential hazard which is normally presented by yards of wire cable and a few hundredweight of cast iron.

**BELOW**  
A pair of bevel gears of a similar type to those used at Rippingale.



I mentioned earlier that the Rippingale clock is two-faced. It is common for the time to be displayed on only one face of the tower and more often than not this is the face which the congregation sees when approaching the building. In a few instances the display is duplicated on another face or even (as at the Elizabeth Tower, Westminster) on all four faces of the building. The challenge is to make sure that all faces tell the same time, although this is not a problem if you throw money at it like the Ministry of Works!

The drive to multiple faces is achieved simply, provided that the centre line of the faces is at a level higher than the clock movement. As we discovered at Tinwell, a pair of bevel gears transmits the drive from the final shaft of the clock movement to a vertical shaft. This picture is not from a clock, rather from an old mill; it does however serve to illustrate the point. If the number of teeth is the same on both wheels then the gears are called mitre bevels (as in the Bishop's hat) and the turning speed of both shafts is the same. Now imagine the same thing at the top end of the vertical shaft and the drive is taken to the hands at the same speed as the clock shaft. Now comes the clever bit: the vertical shaft meshes with not one horizontal gear but two, each one connected to its own hands and clock face. This arrangement ensures that all sets of hands rotate in the same direction. It is an old mechanism, first used in the 18th century, but not many country clocks are blessed with the complication of more than one face.

The final connection between the gearing and the clock face is by means of a 'constant velocity joint', a crude version of the prop. shaft of a car. Provided that it is correctly aligned its drive is constant irrespective of any offset or misalignment between its two ends. The benefit of this property is that it is not necessary for the clock mechanism to be accurately in the middle of the clock chamber. I never cease to be amazed at the ingenuity of our ancestors in solving the problems of the day.

If you do spot any other two-faced clocks in the area (excluding St Mary's Stamford) I should be interested to learn of them. ■



# The Atkinson Steam Wagon

Graham constructs the water tank for his Atkinson tractor

BY GRAHAM SADLER CONTINUED FROM PAGE 25 APRIL 2017

## TANK

As the saying goes: 'Now for something completely different'. I considered making a tar sprayer or something different on the back of the lorry but I had the problem, when I started the Atkinson, that storage of a large model would be difficult. So, when I saw Atkinson's catalogue of different versions of the uniflow, the chosen one leapt out of the page. Using the tank back and making the lorry into a tractor made it considerably shorter and at the same time made something a little different.

I had to make some minor changes in the design compared with the prototype tank though. The filler, for some strange reason, was mounted in the centre of the tank which consequently could never be full! It had to be moved forward or it would be under the seat. The second change was in the position of the water lifter, which I haven't managed to get to work, so it's really a dummy. The design comes from the Blue Sentinel (?) Timber Tractor seen at rallies; in fact I got a lot of construction ideas for the tank after spending a happy hour scrambling over the engine at the Driffield Rally. The water lifter should be at the front top corner but in this correct location it's in the way of your leg so was moved back. The same goes for the water hose and its mounting that was moved back for the same reason. One thing I wish I had done is to move the whole tank back perhaps 30-40mm as the space behind the cab, which on the prototype was the main coke storage space, is, to say the least, inconvenient (you may have noticed I like to take the easy way) as the coal box slots in there plus firing tools etc. Just not enough room.

The tank provides a great mounting for the seat and, as it contains about 35 litres of water, it's good enough for a decent time on the rally field without having plastic barrels on display and is rather unusual. The front section has a dummy front cover/ hatch giving access to a space for tools and the hand pump; I wanted this to be hidden from view, not liking to see them on the footplate.

There's a lot of welding in the construction. The exact size is not important – 10-20mm higher top or bottom or on length won't make any difference, as no prototype exists to compare against. Width is important

though and should match the width of the footplate. We make the cover first then size the frame from this, making an accurate fit far easier to achieve.

Most of the rivet holes are drilled before the frame structure is finished. An important tip here. When using a pistol drill a surprising amount of force is needed to drill even a small hole in this 4.2 mm thick assembly. When you break through, even with a lot of care, the drill chuck crashes down and the jaws gouge the plate leaving an ugly scar. This is so easy to prevent. Get a 20mm long length of neoprene tube and put it over the drill bit. This protects the metal and at the same time cushions the push through reducing the risk of breaking the drill (I broke only 3 in all the tank manufacture, although 10 were ready just in case).

## BENDING JIG

The first stage is to make the angle iron bending jig, using 75 x 6mm section – see photographs 1 and 2. The ends are drilled 12.5mm in the angle for bolts and a suitable bar is drilled to provide the pressure. Mine was 60mm diameter. Dedicated 'V' blocks will need to be made



**ABOVE  
PHOTOGRAPH 1**

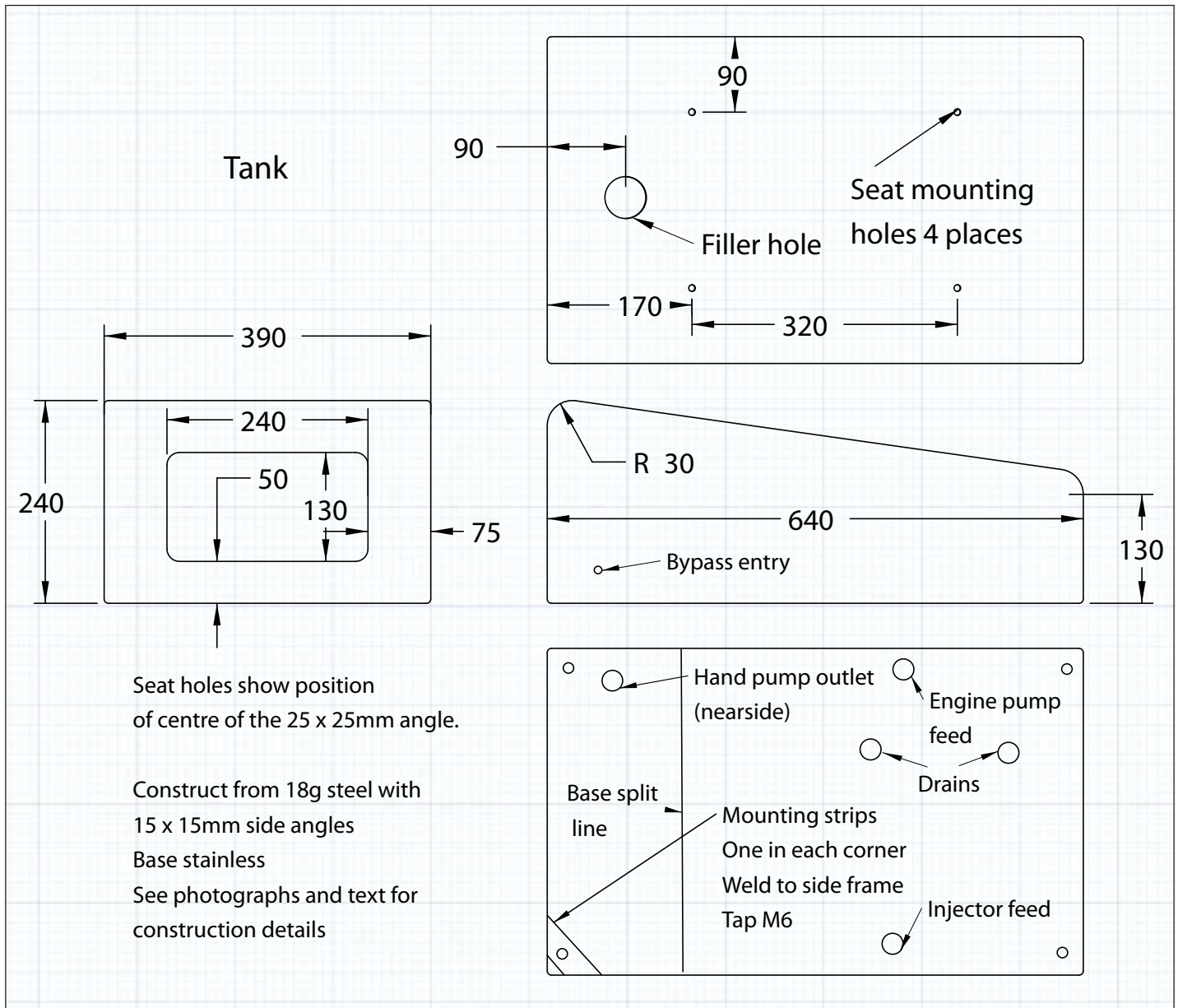
Milling the bending jig anti tipping blocks.

**BELOW  
PHOTOGRAPH 2**

Bending jig.







to hold the ends of the bolt so it doesn't move about. Later, a piece of strip was welded onto the point of the angle to grip in the vice. The inner edge of the angle must be smoothed to avoid marking the sheet. Next, using the dimensions of your jig, draw out the elevation of the tank full size on cardboard so that dimensions and angles can be easily found.

Once this is finished, get a piece of 18 gauge strip 25 to 50mm wide to do a test piece to find the radius of the finished cover – mine came guillotined when ordering the full set of plates from my local supplier. The exact positioning of the bends is not as difficult as it seems. Work out the centre position of the bend on your drawing from what will be the vertical side plus a ‘test error’. Mark this distance on the piece followed by two lines half the width across the ‘points’ of your bending jig to enable positioning then bend to your drawing and cut the ends to exact size when satisfied. We now have the correct dimensions for the side angles.

## SIDE ANGLES

Using 15 or 20mm x 3mm thick black angle (it's cheaper) cut away a section of the vertical leg in the position of the bends, heat the bar then bend it to fit the test piece produced above. Leave the vertical pieces over length at this stage. Do not round the sharp corners of the angle until after all the welding and drilling of the rivet holes are completed.

The 18 gauge outer cover is next. On the side frames, mark the lengths of the verticals from the test piece and use a tape measure to get the length of the cover plate. Check the piece you have is perfectly square and parallel then mount on the miller to drill the  $\frac{3}{32}$ " holes for the rivets. This was easy on my Bridgeport as it could all be done in one go – note in photograph 3 the slips in the table slots to ensure the cover is parallel and square. Since then dedicated blocks and a close fitting bar have been produced for this type of setup. The spacing of the holes was purely down to the pitch of the feed screw. You need an easy number to increment or there will be tears. I spaced mine at  $1\frac{1}{2}$  turns of the

handle (0.3"), using pieces of insulation tape to make the target division easy to see (photograph 4). Although I have a DRO and could use its linear spacing function the method I've described is far more certain of a perfect result, quicker and a lot less stressful as there's a lot of holes to drill. After drilling, lightly deburr by gently countersinking both sides.

Using the test piece dimensions bend the cover. Put into the former and tighten the nuts evenly until you have a right angle bend then use a piece of ply lightly clamped on each side of the cover so the bend is where you want it and thus get the over-right-angle bend until the angle matches the frame side angle iron. See photograph 5 which shows the use of a roofing square and a steel strip against the jig to ensure accuracy. Note the chipboard support nudged along the bench supporting the cover to stop it flopping about, also seen in the photograph. When happy, do the smaller back step, which is easier because it's less than 90° angle. This whole process is a lot easier than it sounds.





**LEFT  
PHOTOGRAPH 3**  
Drilling the top the cover sheet.



**LEFT  
PHOTOGRAPH 4**  
Keeping the spacing correct.



**LEFT  
PHOTOGRAPH 5**  
Bending the cover. Note roofing square to keep accuracy and the sheet of chipboard (to the left) to prevent the sheet flopping about.



**BELOW  
PHOTOGRAPH 6**  
The almost finished side. Top corner ready for drilling.

Now adjust the angle frames to fit the cover, file a bit of 3mm plate to remake the missing part of the bend and weld in position. Weld in the bottom part of the side angle at this stage as it can be correctly positioned and sized. Cut the tank side sheets to match the frames. Here the rivet holes on the radiused top corners present a problem as, unlike the lines of straight holes which can be drilled through the sheet and the frames at the same time on the miller, because of the angles, some variation in positioning will be required. So do the long top edge having previously marked out the first and last rivet positions (don't be an accuracy slave here) which will give the positions for dividers to lightly scribe the line, then step round it with the spacing you already have then continue with the miller. Don't worry if it's not quite correct at the square corners, mine isn't... Countersink all the holes in the angles on the inside for the rivets (photograph 6).

Clamp the cover to the angles being sure to maintain the 6mm step back from the edge shown in the CAD image, which makes a very neat finish compared with the cover sheets meeting at the corners. This is a lesson learned from examination of the Sentinel. I find mini mole type C clamps ideal in this sort of situation (photograph 7). Drill a few holes for the  $\frac{3}{32}$ " rivets (approx 1000 needed) and bolt together with 7BA screws, then it's on to the drill to complete all the rest of the holes. Do as much as you can on the pillar drill but as can be seen in photograph 8 it involved an interesting set up!

## MORE ANGLES

The cross angle pieces are cut from 25mm stock as they have to support the seat and you on the top which, if 3mm thick, will need a scrap of thickening for the lifting eyes. These pieces for the top, ends and verticals (15mm section) can now be very lightly tacked in place with the cover in situ and when "solid" the cover may be removed and the welds completed. In the photographs you will see a whole plethora of angle sizes. Some were, to say the least, a bit rough but they are fully hidden – I used what I had!

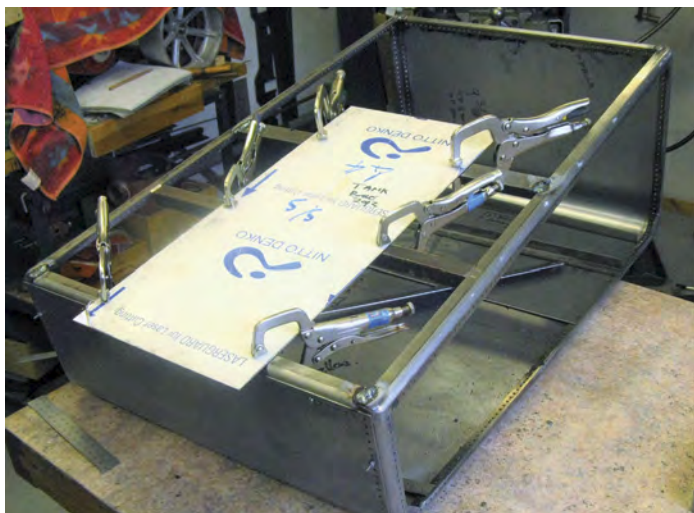
The bottom angle pieces are fitted with a flat sheet clamped in place to keep them all in the same plane (photographs 9 and 10). In the corners, strips of 30 x 3mm steel are welded in place across the angles to bolt the tank down to the chassis. At the back, aluminium blocks are securely fitted and have a blind tapped M6 hole to stop water dribbling through and rusting the fixing point. Drilling the holes for the bottom stretched my Bridgeport to its maximum (photograph 11). There was only a few mm of daylight to spare so, if you are without the capacity, drill a piece of 20 x 6mm bar about 150mm long to make a drilling jig and clamp it in place. Use 18 gauge stainless for the base. I used three pieces as I had them in stock but two would have been easier and two rows of 28 fixings would have been reduced to 6. The smaller one, which can be mild steel, is for the dummy tool space base. Drill the base holes for 6BA tapping (except the front section) but use a trifle larger than normal tapping size





**LEFT – PHOTOGRAPH 7**  
Clamping the top sheet in place.

**BELOW – PHOTOGRAPH 8**  
Drilling the holes. The end angles are not yet fitted.



**ABOVE PHOTOGRAPH 9**  
Welding the bottom angles.

**ABOVE RIGHT PHOTOGRAPH 10**  
The finished bare tank frame.

**RIGHT PHOTOGRAPH 11**  
Drilling the base fixings.







**PHOTOGRAPH 12**  
Baffles fitted.

(say 2.4mm) then it's an orgy of tapping for the round head fixing screws permanently fitted from the inside to act as studs.

The inner wall of the tool space is now prepared and fitted or there won't be access to drill the fixing holes later. Use screws and nuts.

The tank was fully baffled to stop the water sloshing about inside. 20 gauge stainless steel was used for this, each baffle fixed with 2-4 brass nuts and bolts. The baffles have crescent cut outs top and bottom to allow easy movement of water during filling (photograph 12). When all angles have been fitted go over the welded joints with an angle grinder and, in addition, this is a good time to round the edges of the angle to provide a smooth outline. This was delayed until now in order to give accurate positions for marking out and measurement.



**LEFT – PHOTOGRAPH 14**  
Setup for riveting the corners.

**BELOW – PHOTOGRAPH 15**  
Cutting out the front hatch.



## RIVETING

Riveting was not as difficult as you would think even though there is about 5.4m of riveting spaced at 0.3", amounting to about 800 for the edges, so you will need in the order of 1000. Remove the inner wall and baffles for now, carefully marking where they fit, then it's on with assembly. The cover was first which is very easy to get at. Here the use of a rivet squeezer made life very much simpler. Photograph 13 shows mine, which was made from a design published in the modelling press years ago. Insert rivet, cut very close with end snippers, squeeze and on to the next. After the first dozen or so you will be cutting the rivets to size without measuring. For the corner areas things are a bit more difficult so the tank was supported on a Heath Robinson frame of timber to maintain the angle (photograph 14). The rivet was then sat on a snap which was in the



**PHOTOGRAPH 13**  
The squeezer used for much of the riveting.

woodwork vice and the weight of the tank plus a bar of junk held it in place. It was cut off and a punch used to spread it into the countersink.

Now for the more difficult side riveting. The first one isn't too bad, as the other is open giving easy access, but the second is far more difficult. Again, the squeezer was used along the bottom edge but the ends and top are more difficult so the tank was placed on its side then packed up on the bench to get it level and stop it rocking. With the snap in the wood vice the rivet was inserted with pliers then, after carefully checking that the rivet was correctly in position, it was set down and fixed.

The front of the tank was marked out for the hatch. The corners were cut with a step drill then the jig saw made easy work of removal of the waste (photograph 15). The hatch has dummy bolts and studs fitted and two location lugs at the bottom and two catches at the top formed from 10 x 1.5mm flat and disguised as hooks for engine firing tools. The hose hook is bent from 1.5mm plate with sides. Bending the bottom was a blacksmithing job and then silver soldered together, fixed with 5BA bolts fitted into tapped holes in an aluminium plate riveted inside the tank (hidden by the hook), finished with a lady's watch strap to teach the tube who's boss.

The inside of the tank is treated with GRP and/or three thick coats of car underseal to protect it. The base is fixed with nuts onto the 'studs' formed from round head screws fitted from the inside before the coating goes on. When finally fitting the base use silicone gasket goo or, as I did, use marine window sealant.

Next time we'll finish off the tank by looking at the fittings.

« TO BE CONTINUED »



# Building the LNWR Coal Engine in 5" Gauge

**Hotspur** machines the remaining parts for the brake cylinder

PART 15 – CONTINUED FROM PAGE 17 APRIL 2017

## TURNING THE PISTON AND ROD

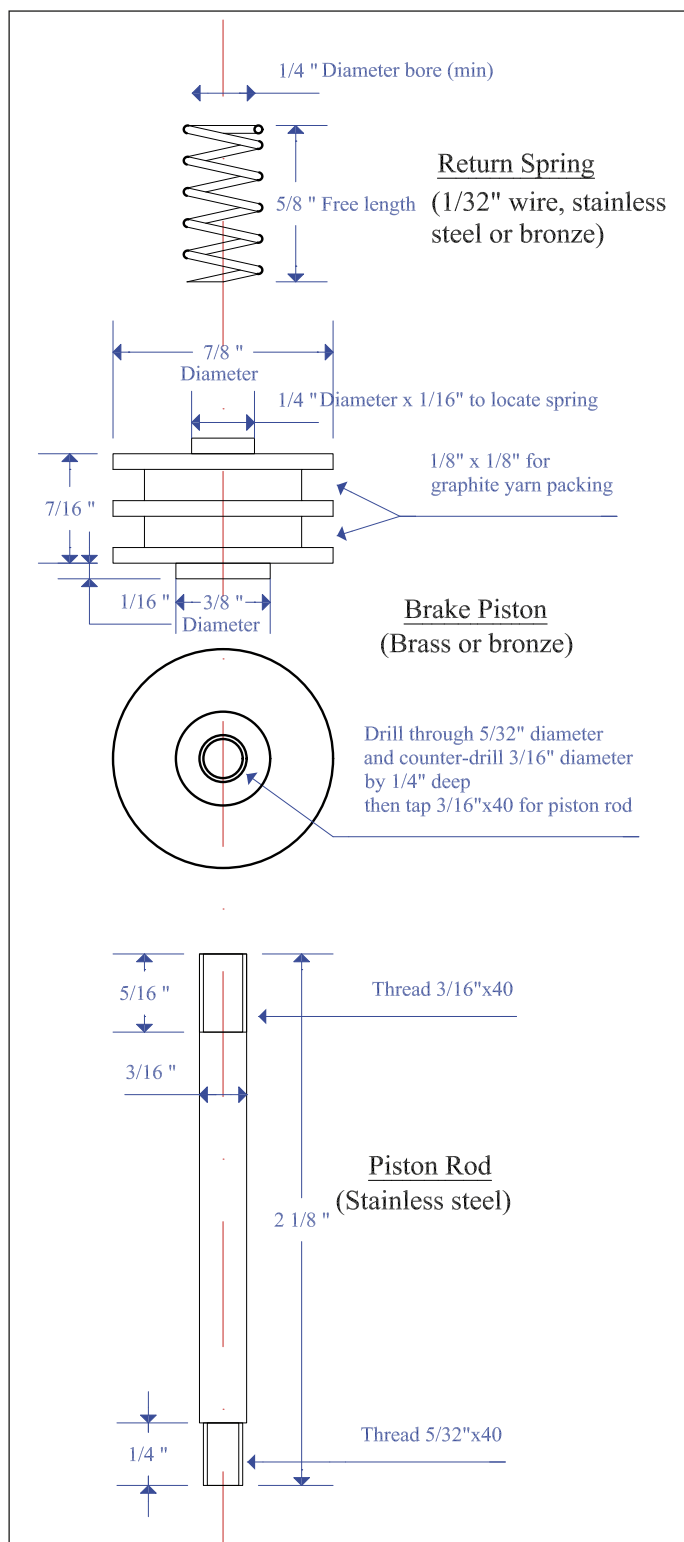
Use a piece of 1" round cast bronze bar for the brake cylinder piston. Face the outer end and turn the bottom spacer/register to give a  $\frac{1}{16}$ " shoulder. This feature is just to ensure the steam enters under the piston. Proceed to turn the outside diameter down to as near to  $\frac{7}{8}$ " as you can measure it and form the two grooves for the packing material. For grooves like this I use graphite yarn that will wrap around and fill the section so that it has to be poked in with a small screwdriver.

Now, centre drill the front face and drill in with a  $\frac{5}{32}$ " drill not less than  $\frac{3}{4}$ " deep for the  $\frac{3}{16}$ " x 40 tapping size. Counter-drill just  $\frac{1}{4}$ " in with a  $\frac{3}{16}$ " drill and then use the taper and second taps to make the threads. Do check, however, that your intended  $\frac{3}{16}$ " stainless steel piston rod will enter this counter-drilled hole. I often find that stainless rod is slightly larger than the specified size and in my case I had to use a No. 12 drill to give the necessary clearance fit. Finish the piston by parting-off from the chuck but make the shoulder for the spring and de-burr all the sharp edges before completing the operation. The thread can now be completed with a plug tap with the piston held in some soft jaws in the vice.



### ABOVE

The brake piston machined ready for parting-off and (**BELOW**) the piston mounted on its rod.





The length of  $\frac{3}{16}$ " stainless steel rod for the piston needs to be held securely in the 3-jaw chuck and the  $\frac{3}{16}$ " x 40 thread added to match the piston. At the other end there needs to be a shoulder added down to  $\frac{5}{32}$ " diameter to take the  $\frac{5}{32}$ " x 40 thread for the clevis. Make sure this shoulder is free from burrs as it has to pass down through the bottom cover and gland boss at the lower end of the cylinder and we do not want any scored surfaces. Assemble the piston and rod as tightly as possible by hand. I do this by holding the piston rod in the vice again and using a rag to turn the piston until it is tight. This will be quite sufficient for a brake cylinder.

### COMPLETING THE STEAM BRAKE CYLINDER

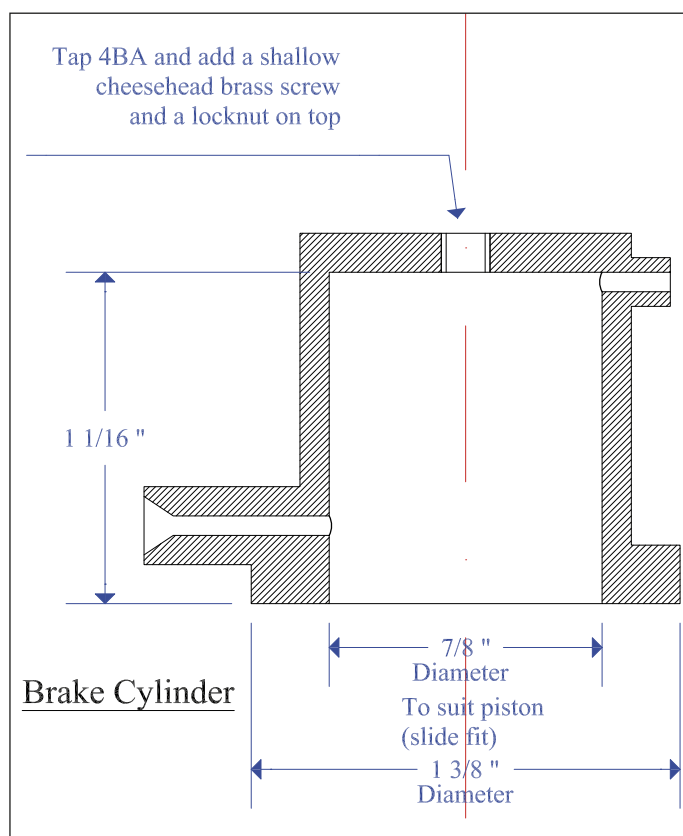
Now we can turn to the fabricated steam cylinder and make the two 6BA tapped holes in the support bosses. These threads can go in up to  $\frac{3}{8}$ " as they will be left smooth after the bore is turned. Place the cylinder into the 4-jaw chuck with some packing to prevent any markings. I used a dial gauge to make sure the cylinder flange was running true, but be sure the body is not held too tightly, as the wall thickness is only going to be  $\frac{3}{32}$ " and it may distort if too much pressure is applied by the chuck jaws. To turn the piston bore, I usually start with a pilot drill right through; make this a 4BA tapping size so a brass screw can be put into the top face later to give a location for the upper end of the return spring. Next, use a  $\frac{3}{8}$ " drill and be cautious on the hand feed from your tailstock. I suggest a depth of  $\frac{3}{4}$ " maximum at this stage. Follow this with a  $\frac{3}{4}$ " drill and adopt the same depth limit. Now you can put a boring tool onto your topslide to gradually turn the inner end of the drilling into a flat surface and you will pick up the cross hole outlet from the cylinder arranged during fabrication. Gradually open up the bore until the piston is a smooth sliding fit; do not force it in as critical surfaces may be damaged trying to get it out. My photograph shows my boring bar with distances marked by a file to judge the depth of cut. If you are concerned about boring to the full depth, do keep in mind that the upper corner of this bore does not have to be absolutely  $\frac{7}{8}$ " diameter as only the lower  $\frac{3}{4}$  of the bore will be needed for the brake effort. For all things there is perfection and there is realism, so do not try and achieve that which is not necessary.

To complete the machining, face off the lower edge of the flange and de-burr the edge of the cylinder then remove the component from the chuck. Put a 4BA thread in the hole in the top face of the body for a small brass cheese-head screw to be added inside to locate the upper end of the spring and add a locknut outside.

### FABRICATING THE CYLINDER BOTTOM FLANGE

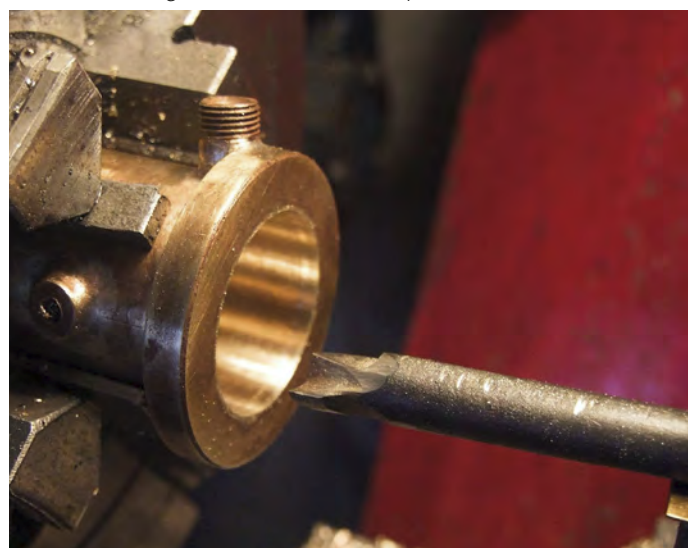
The next part is the bottom cover for the cylinder plus the steam gland. Like many model engineers, I have a box of odds and ends of brass and bronze of various grades and for new assemblies I look to see if I can 'join' bits together instead of sourcing new material at no little expense. For this bottom cover I found two pieces of phosphor bronze that would easily become the thick flange and gland boss for the cylinder. With one piece having an overall diameter of  $1\frac{1}{2}$ " by  $\frac{5}{16}$ " thick with a  $\frac{3}{8}$ " hole in it and another of  $\frac{7}{8}$ " diameter by just over 1" long, it was easy enough to enlarge the bore size to take the smaller oddment and fabricate what I needed. My pictures should show what I mean and during the cleaning up operation I also added a No 3 centre into the smaller diameter.

I also used the same technique, as used for the LO pump eccentric, to hold this fabrication by soft soldering it to another large piece of squared off brass acting as the chucking piece to carry out the machining operations. This makes it easy to off-set the material in the 4-jaw chuck for the finishing sequence. One of my drawings shows the geometry of the off-set needed for the larger curved surface of the gland boss. Place a centre in the tailstock chuck and move the work say in the direction of the No. 1 jaw of the 4-jaw chuck till the off-set is  $\frac{5}{32}$ ". Machine down the boss till the diameter being turned is  $1\frac{5}{16}$ ". This last dimension is easily noted by checking the distance between the tool and the machined surface. I suggest you keep a note of your cross-slide



**ABOVE** – The fabricated brake cylinder being set-up for the drilling and boring operations.

**BELOW** – Finalising the bore size – note the depth marks on the tool.





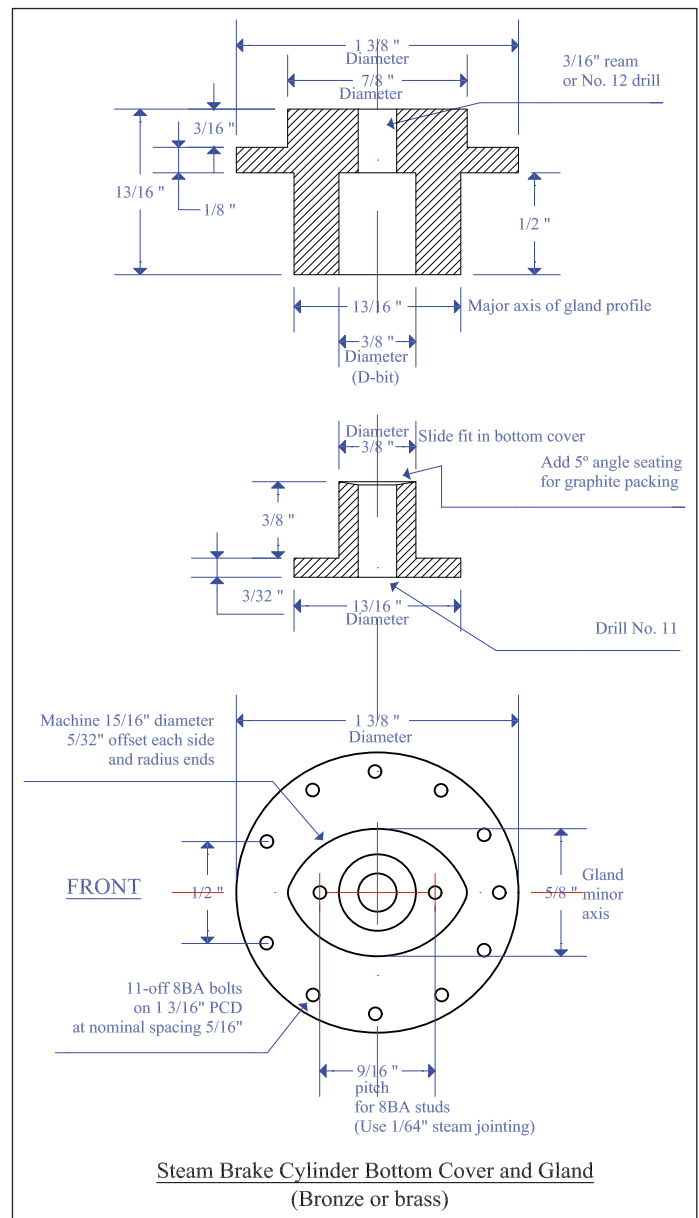
**ABOVE**

The bottom flange offset on a soldered face to form the gland housing.

reading when the required dimension is achieved as the tool should be in the same position for the second cut. Now repeat the operation for the other side and rotate the work 180 degrees in the chuck jaws with a minimum of slackening. There will be small radius to generate by hand at the ends to give the desired look to the boss. I hope my pictures make this clear. The major and minor axes shown on the drawing are quite nominal.

The next operation is to set the work up to run on the centre-line using either a dial gauge on the cover flange or the two centres method and then the hole for the piston rod can be drilled through. Here I started with the  $\frac{3}{16}$ " drill to about  $\frac{3}{4}$ " deep, but opened it up a fraction with the No. 12 drill to suit the material size as for the piston. Now counter-drill the hole  $1\frac{1}{2}$ " by  $\frac{1}{2}$ " deep before using a  $\frac{3}{8}$ " D-bit to make the gland bore.

All that remains for the moment is to machine the flange and the shoulder to suit the brake cylinder bore and part it off to leave the inner shoulder a full  $\frac{3}{16}$ " wide.

**LEFT**

The gland flange roughed out and being attached to the housing to mark out and finish the profile.

**RIGHT**

A trial assembly of the parts to confirm the sizes and the operation.





## ATTACHING THE FLANGE TO THE CYLINDER BODY

It will be seen that there are only 11 bolts holes specified for the joint; the first two are  $\frac{1}{2}$ " apart, either side of the steam feed connection position, and there is one diametrically opposite under the vent boss. Clamp the cover on a block in your vice to mark out the centres then drill all the holes with the tapping size for 8BA (a No. 50 drill). Hold the two flanges together in the correct orientation and drill the holes through the cylinder flange. Dismantle the parts and tap the threads, then open up the holes in the flange with a No. 43 drill and clean off all the burrs. Use steam gasket material for the joint which is about  $\frac{1}{64}$ " thick.

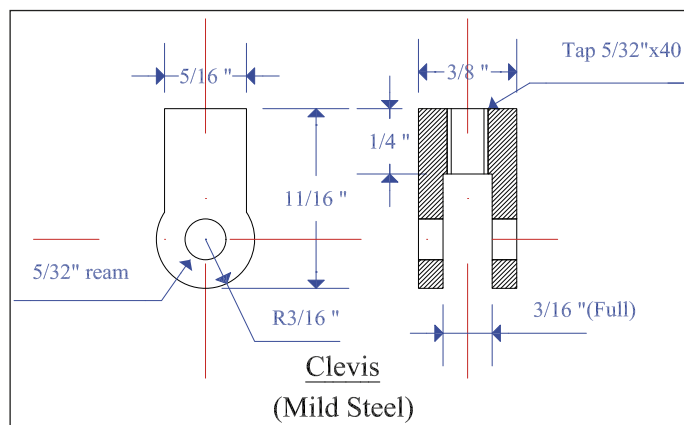
Without the joint the bolts can be  $\frac{1}{4}$ " long but for final assembly and with washers under the heads the bolts can be  $\frac{3}{8}$ " long.

## MAKING THE STUFFING GLAND BOSS

The boss can be made from cast bronze and turned to be an easy sliding fit in the bottom cover. Note that I have suggested the hole is drilled No. 11; but start with a  $\frac{3}{16}$ " drill and enlarge it to ensure good size control. This increased clearance is to hopefully prevent the piston rod from binding in the gland and like steam cylinders, the gland packing is the seal, not the gland itself. When the hole has been made, just add a small reverse taper to the gland inside face to help compress the packing. Part off the gland with a generous thickness and reverse it in a 3-jaw chuck to finish the outside. Put the holding stud centres in to spot them across to the cover housing. Tap these 8BA as well and insert a plain length of studding to allow easy fitment of the gland onto the housing as you gradually reduce the gland flange to suit the boss. I cannot suggest you do anything other than generate the elliptical form by hand so it all looks nice and tidy.

## THE BRAKE PISTON SPRING

I have drawn the dimensions for the return spring I have chosen. It will exert a nominal force on the piston when assembled and should be sufficient to push the brakes off in service.



## MAKING THE CLEVIS

A 4" length of  $\frac{3}{8}$ " square mild steel bar was carefully cross drilled  $\frac{5}{32}$ " diameter at the end and hardened filing buttons used to form the radius. Behind the radius the flat area was reduced on both sides to  $\frac{5}{16}$ " thickness and given a clean smooth surface finish; not polished because it will no doubt be painted after assembly.

To carry out the next stage the bar was held in the 4-jaw chuck to centre it using the lathe tool tip readings. When ready the end of the bar was centred and drilled  $\frac{1}{8}$ " diameter a full  $\frac{5}{8}$ " deep to ensure the tapping hole for the thread was square. Without cutting off the part from the bar, it was then placed under the lathe tool post at the right height to mill across the rounded end for the brake operating lever. On my drawing I have shown the slot as  $\frac{5}{32}$ " wide and not  $\frac{1}{8}$ " which will be the thickness for the lever. The assembly of the whole operating mechanism will be detailed shortly but I did not want the fit of the lever in the clevis to be too constrained as there are so many variables in the construction and so a little extra clearance has been incorporated. Next time I will give more details of the assembly of these parts to the chassis and show the linkage.

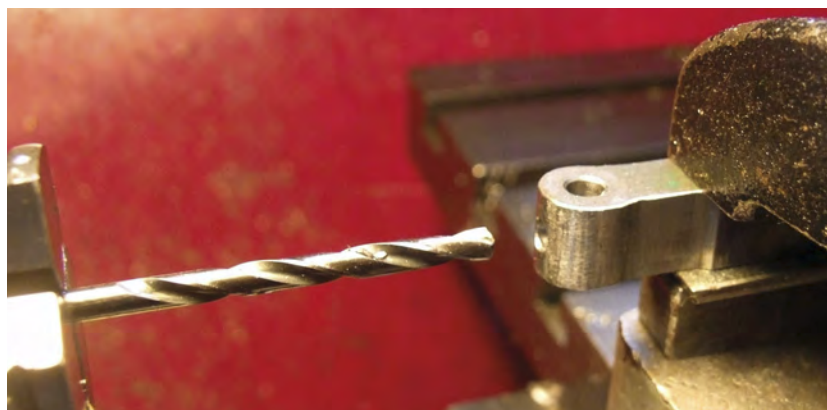
« TO BE CONTINUED »



**ABOVE** – Hardened filing buttons being used to create the radius on the clevis and the waisted area behind.

**LEFT** – The bar stock centralised with a lathe tool to drill the  $\frac{1}{8}$ " hole through for the thread.

**BELOW** – Setting up the bar in the tool post to mill the slot in the clevis.





# CLUB NEWSROUND



BY JOHN ARROWSMITH

There are a number of events planned for this month which will interest many model engineers. The main event of the month is of course the National Model Engineering Exhibition in Doncaster over the weekend of 12th-14th May. As usual it will provide an opportunity for both the serious model engineer and the casual visitor to see a wide range of top quality model engineering together with a great selection of marine and aircraft models. I look forward to meeting many of you there.

The exhibition is preceded by the Mainline Rally at the **Ryedale Society** over the weekend of the 6th/7th May where, in conjunction with the GL5 Association, the 5" gauge railway will be working to an operational time table. This entails standard gauge locomotives and rolling stock demonstrating what this branch of model engineering is all about. Following the exhibition the **Narrow Gauge IMLEC** will be held at the **Oswestry MES** track over the weekend of the 20th/21st May. This fun competition is always keenly contested and provides all the entrants with a great opportunity to demonstrate their driving skills. There is a nice trophy on offer as well as subscriptions sponsored by Warner Publications for EIM, so get your entries in now! For all these events contact the respective organisations for more details. I heard on the 12th February that the **Canterbury MES** had their entire track

ripped up and stolen on 6th February, all 720ft of it. It will be a difficult time for them to replace this amount of track in time for the new running season. I am sure they would appreciate any offers of help in this time of need. I have to say that I thoroughly enjoyed the latest exhibition in Manchester organised by the **Northern Association**. The larger venue provided a much better presentation space and, with the quality models on show, it was an excellent event.

There has been a good response from members at the **East Somerset SMEE** to join the various working parties engaged in winter maintenance both on the track and on the locomotives. The station canopy metalwork has been thoroughly prepared for painting and they are just waiting for a suitable weather period to get this completed. The signalling group have been busy with new wiring and have asked for additional help to bury the cable conduits in the digging of trenches alongside the

track. Club locomotives have also been checked out along with all the carriages having full safety checks. The club steam locomotive has been renamed 'MENDIP' and has also received a general overhaul and steam test as well as a fully loaded track test. It completed 9 full circuits of the track without difficulty. After a repaint in S & D colours it will be ready for the new operating season which starts on 30 April for the spring show at the showground.

The **Furness Model Railway Club** has a busy model engineering section who operate a multi-gauge track in Barrow's public park. Last winter saw them re-laying some track sections which had deteriorated. They normally run every Sunday from Easter until October so it was important to get the work completed ready for operations in April. They have a very nice looking signal box which also needed some refurbishment and to help with this BAE have awarded them a generous sum of money for the work. It had

Members at Kings Lynn SME in their splendid new workshop.





also been decided that both the club's steam locomotives needed new boilers. An application was made to Cumbria County Council for help with this and the club were fortunate to be awarded £3000 towards a new boiler for the 2-6-2 tank locomotive. It was ordered straight away and in the meantime the chassis has been stripped down and refurbished, including a new axle pump to supplement the injectors. New boiler fittings are being made to suit as well so by midsummer they should have almost a new locomotive to use on the track. It is good to hear that in these days of cutbacks and restrictions on almost everything some local authorities do consider the needs of their local areas and help out. With all this work and a good clearout in the workshop they really will be ready for the new operating season.

Members at the **Hereford SME** have had a busy winter with a number of maintenance and new projects to handle. The original ground level track circuit was built in 1994 so it is now 22 years old and some of the sleepers were showing their age so a program of replacement has been underway to rectify this problem. Two of the points have also been lifted and completely refurbished. A compressor house has been built so that a new compressor can be fitted to the existing system. Consideration is being given to the construction of a suitable road layout for radio controlled vehicles which, if it comes to fruition, should provide the club with another facility for members to use. The OO Gauge layout being constructed at the club is progressing very well with some excellent control panels which have been built to cover the complex layout, which is based on the station at Ledbury on the Hereford to Worcester line. Yes, it does include the 28-arch brick built Ledbury Viaduct which is quite a feature on the original line. A new 7¼" gauge 0-6-0 Romulus locomotive is under construction as the new steam motive power for the club. It is making good progress, with the rolling chassis and boiler already completed, and the tender is also well on the way to completion.

Good progress is being made at the Lynnsport site of the **Kings Lynn & DSME** with the new track circuit being completed and a trial run also having been made. It only remains now to fine-tune everything to make it ready for running and they hope to be able to open to the public in the summer. The point production is also on schedule with only two more to build. Each point has been specifically designed for its location and the fact that members have a nice new warm workshop to work in is also helping progress. Other work in hand is the manufacture of new gates for the station platform area.



#### ABOVE

A super new set of points built by members at the Kings Lynn Society.

Entry and exit gates on the platform will help to reduce congestion on the enlarged platform. They have also provided a new 'parking' place for buggies and bikes. A new ramp from the steaming bay to the ground level track has been built with modifications to one of the steaming bays which will enable larger locomotives to be unloaded straight onto the ground level track. The club enjoyed a suitably jolly festive season with Santa specials being run on their portable track in Market Street in the town. Even the local press were impressed and gave them coverage of this event.

Chairman Nick Harrison reports in the latest **Nottingham SME** 'Kingpin' news magazine that the club committee has agreed to the extension of the 7¼" gauge ground level track. It will be approximately 900 feet in length, crossing the service road and running along the edge of the woods before turning through the woods and joining up again with the existing circuit at Parkgate station. The club is currently waiting for final planning permission from the local authority which should

be completed by the end of the year. This project will involve the membership in a number of specific jobs such as ground work and track construction, to name just two. It sounds an exciting project and will give the club a very extensive and interesting ground level system. They have also just agreed an initial 7 year period extension to their lease, structured to ensure they have the right to renew should they wish to do so. This arrangement should provide them with the security for a long term occupation.

The **West Cumbria Guild of Model Engineers** is located in Curwen Hall Park, Workington and the secretary has informed me that they have changed their meeting venue. They used to hold their meetings at the Harrison Fishing and Sailing Club but, thanks to the local authority, Allerdale Council, they have now moved to a building right next to their track in Curwen Park. All their club meetings will take place here which I suspect will be much more convenient for them. They normally run on Sunday afternoons from 13:30-15:30 so if you happen to be in the area I am sure they would be pleased to see you. ■



# YOUNG ENGINEERS

BY JOHN ARROWSMITH

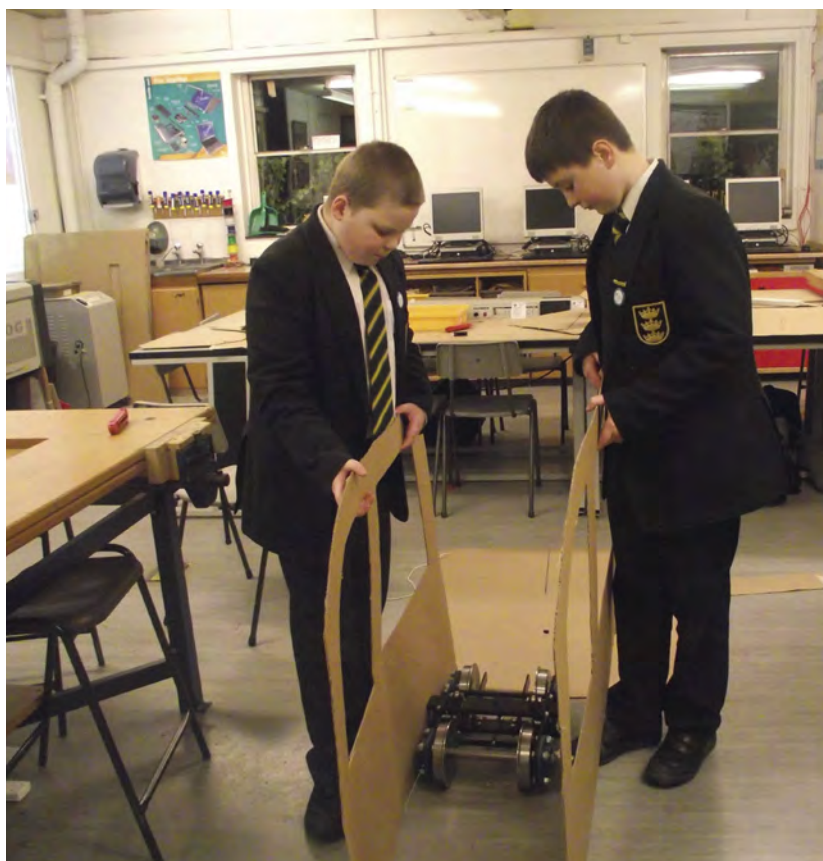
**T**he perennial problem of getting younger people interested in model engineering continues but I can see that there are developments taking place in a number of different areas that seem to be trying to address this problem. For example, up in Scotland at Stranraer a new heritage centre at the town's water front at Stranraer station will include a model engineering training centre for local young people. I hope this venture is well supported and provides a good basic training for them – I don't know if there is an existing model engineering club in the area but if there is I hope they offer some support as well.

In another new venture – well new to me anyway – a local authority in England has asked its local model engineering club to take part in a Career's Day at a local school to demonstrate to youngsters that this type of interest and learning of basic engineering skills is to be encouraged. The club involved has a number of young people as members and they have been given permission by their respective schools to take part in this day. I think this is an interesting development because not only do the students at the school have an opportunity to see what model engineering is all about but also to have a number of similar aged people doing the demonstrating will be a good learning opportunity for them all. It also shows that model engineering can be a part of young people's activities and that it is not just for the old brigade. I hope we see more of this.

Over in Lincolnshire pupils from the Boston Grammar School are taking part in a Velocipede Challenge. This will enable them to get to grips with an engineering project involving the design and construction of a vehicle that can be operated by one person and which can travel at least 50 metres. The velocipede will be built to 7¼" gauge and designed to run on a track. The school is to be supplied with a bogie with brakes and a front axle/wheels which will be delivered to the school along with a 3 metre section of track. The school will then be able to build their machine from whatever materials they feel appropriate.



**ABOVE**  
Initial project meeting of the Boston students.



**RIGHT**  
Sizing up one possible approach.



The finals are due to be held during the 2017 Spalding Model Engineering & Hobby Show on Saturday 22nd April and Sunday 23rd April, at the Springfield's Event Centre, Camel Gate, Spalding, Lincolnshire PE12 6EU.

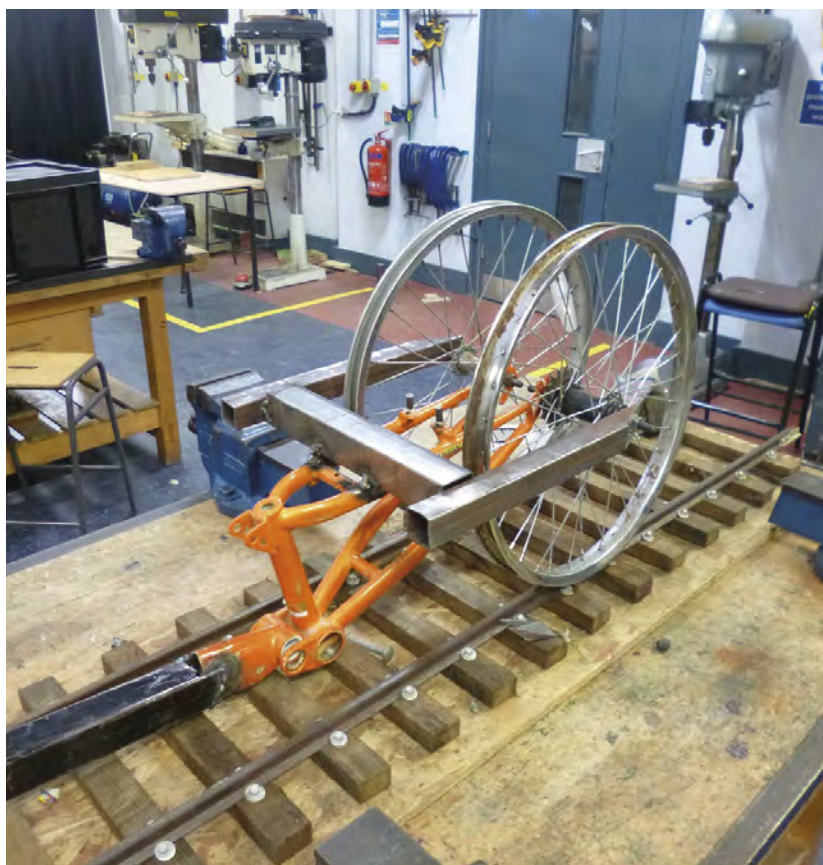
Over the course of the 2 days the velocipede will be judged on;

- distance test – maximum 50 metres
- its build quality
- efficiency/function of the 'drive' mechanism
- team work
- presentation – students will be expected to bring a diary of their project, and explain how their velocipede works
- its presentation / aesthetics (the velocipede can be any design the students choose)

Looking at the photographs of the pupils working on the project it looks like an excellent way of getting young people involved with a good engineering project, with a tangible end product that will hopefully inspire them to regard engineering as an excellent career choice. ■

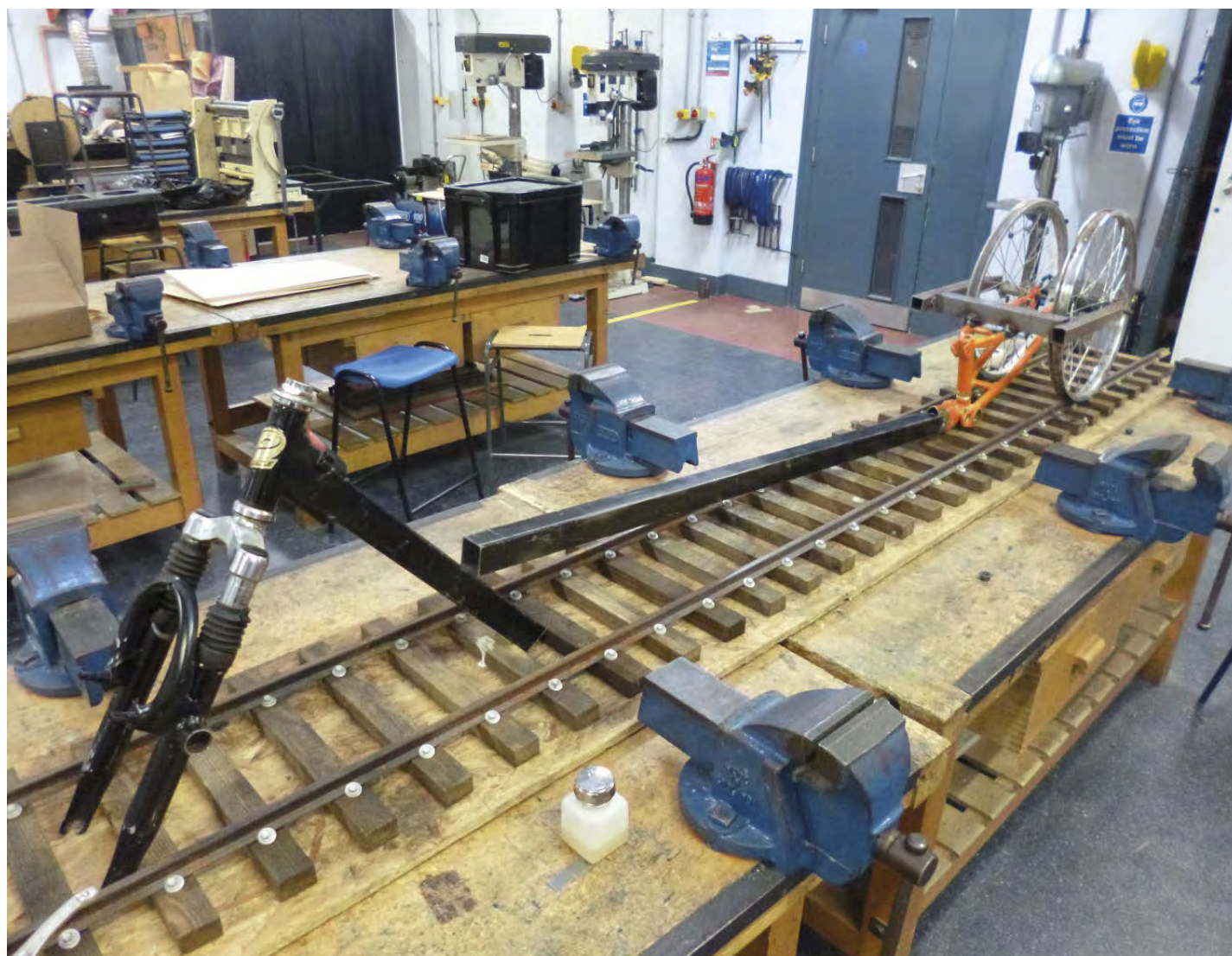
#### RIGHT

Spalding students try a different approach using readily available materials.



#### BELOW

Using a pair of bicycle wheel rims on 7¼" gauge track to provide double flanges.





# MAY DIARY

**29/30 APRIL**  
**1 MAY** Echills Wood Railway. Public running 11:00-16:00 at Kingsbury Water Park.

**29/30 APRIL**  
**1 MAY** Scunthorpe MES. Annual Model Engineers Festival & Loco Weekend from 11:00.

**29/30 APRIL**  
**1 MAY** Stoomgroep West Zuider Park International Steam Days. Contact direct for invitation.

**30 APR**  
**1 MAY** Doncaster MES. Public running at Thorne Park Railway from noon.

**1** Bedford MES. Public running at Summerfields Railway from 10:30-16:00.

**1** Belfast & County Down Light Railway. Public running at Drumahewy Jct. 13:00-17:00.

**1** Brighton & Hove MRS. Public running Hove Park 13:30-16:30.

**1** Bristol SME. Public running at Ashton Court noon-17:00.

**1** City of Oxford SME. Public running at Cutteslowe Park. 13:00-16:30.

**1** Grimsby & Cleethorpes MES. Public running at Waltham Windmill 10:00-16:00 every Sunday.

**1** Lancaster & Morecombe MR. Open Day 10:30-15:45 at Cinderbarrow.

**1** Leyland SME. Public running at Worden Park from 11:00.

**1** Northampton SME. Public running at Delapre Park 14:00-17:00.

**1** Nottingham SME. Public running at Ruddington.

**1** Sheffield SMEE. Public running Abbeydale Miniature Railway 13:00-17:00.

**1** South Downs Light Railway. Public running at Pulborough 11:00-15:30.

**1** Surrey SME. Public running Mill Lane Leatherhead 11:00-16:00.

**1** Sussex MLS. Public running at Beechurst Park 14:00-17:00 every Saturday & Sunday.

**1** Sutton Coldfield MES. Steam Up at Little Hay Miniature Railway from 10:00.

**1** Swanley New Barn Railway. Public running 11:00-17:00.

**1** Taunton SME. Public running Creech St Michael 14:00-17:00.

**1** Vale of Aylesbury MES. Miniature Steam Gala Quainton Road RC from 10:30.

**6** Burnley & Pendle MR. Public running Thompson Park noon-16:00 every Saturday & Sunday.

**6** Crowborough MR. Public running 14:00-17:00 every Saturday.

**6** Ickenham & District SME. Public running noon-17:30 UB10 8LJ.

**6** Isle of Wight MES. Open Afternoon at Broadfields 13:30-16:00.

**6** Model Engineering Society NI. Public running at Ulster Folk Museum 13:00-17:00.

**6**  
**7** Burnley & Pendle Miniature Railway. Public running 12:00-16:00 Thompson Park every weekend.

**6**  
**7** East Herts Miniature Railway. Public running 11:00-17:00 Great Amwell every weekend.

**6**  
**7** Merthyr Tydfil MES. Public running at Cyfarthfa Park noon-17:00.

**6**  
**7** Statfold Barn Railway. Giant Miniature Weekend. This is a pre-book ticket weekend only. Contact webpage for application form.

**6** Romford MEC. Public running Ardleigh Green Hornchurch from 14:00.

**6** Taunton SME. Public running Vivary Park 14:00-17:00.

**6** Tiverton MES. Steam Up at Worthy Moor from 11:00.

**6** West Wilts SME. Club Track Meeting 10:00-16:00 Coach Road Westbury.

**6** Weymouth MES. Steam Up at Chickereil Road track.

**7** Ashmanhaugh Light Railway. Public running Open Day 14:00-17:00.

**7** Basingstoke MES. Public running at Viables Craft Centre 11:00-16:00.

**7** Bournemouth SME. Public running at Littledown Park 11:00-15:30.

**7** Bradford MES. Public running at Northcliffe 13:30-16:00.

**7** Cardiff MES. Public running Heath Park 13:00-17:00.

**7** Carlisle & District MES. Public running 14:00-16:30 CA2 4PS

**7** Chelmsford SME. Open Day from 10:30 Meteor Way Chelmsford.

**7** Chingford & District MEC. Public running at Ridgeway Park 14:00-17:30 every Sunday.

**7** Coventry MES. Public running at Ryton Pools Railway noon-15:00 every Sunday.

**7** Crawley MES. Public running at Goffs Park Railway 14:00-17:00 every Sunday.

**7** Frimley Lodge MR. Public running 11:00-17:00 Sturt Road, Frimley Green.

**7** Fylde SME. Public running 13:30-16:00 Thornton Cleveleys FY5 4AE

**7** Gravesend MMES. Public running 14:00-17:00 every Sunday.

**7** Harrow & Wembley SME. Public running from 14:00 every Sunday.

**7** Kinver & West Midland SME. Public running 14:00-16:30.

**7** Leeds SMEE. Public running at Eggborough 10:00-16:00.

**7** Malden & District MES. Public running Thames Ditton Railway 14:00-17:30.

**7** Mid Cheshire MES. Public running at Blakemere Village noon-16:00.

**7** Mold MES. Public running at Celyn Wood, Coleg Cambia Northop, 11:00-17:00.

**7** Moorland Railway at Whitby Charity Open Day 14:00-17:30.

**7** Polegate & District MES. Public running at Polegate Oaks from midday at William Daly Recreation Ground.

**7** Portsmouth MES. Public running at Bransbury Park 14:00-17:00.

**7** Plymouth Miniature Steam. Public running at Goodwin Park 14:00-16:30.

**7** Reading SME. Public running Prospect Park from 13:30.

**7** Rochdale SME. Public running at Springfield Park from midday.

**7** South Cheshire MES. Public running at Crewe Road, Willaston noon-16:00.

**7** Southampton SME. Public running at Riverside Park 13:00-16:00.

**7** Teesside Small Gauge Railway. Public running Preston Park 13:00-17:00 every Sunday.

**7** Tyneside SMEE. Public running Exhibition Park, Newcastle 11:00-15:00.

**7** Urmston MES. Public running at Abbotsfield Park 10:00-16:00 every Sunday.

**7** West Cumbria Guild of ME. Public running 13:30-15:30 Curwen Park.

**7** Welling & DMES. Public running 14:00-17:00 Falconwood.

**7** West Huntspill MEC. Public running 14:00-16:30 TA9 3QE

**7** West Riding SLS. Public running 13:30-16:30 at Tingley WF3 1SD

**7** Westland & Yeovil DMES. Public running 11:00-16:30 Westland Leisure Centre.

**7** Wigan & DMES. Public running at Haigh Hall 11:30-16:30.

**7** Wimbourne SME. Public running from 11:00-16:00 BH21 3D4

**7** Wirral MES. Public running at Royden Park 13:00-15:30 most Sundays.

**12**  
**13**  
**14** National Model Engineering Exhibition, Doncaster from 10:00 each day.

**14** Brighouse & Halifax MES. Open Day at Ravenssprings Park 13:30-17:00.

**14** Cambridge MES. Public running at Fulbrooke Road 13:30-17:30.

**14** Canterbury & District MES. Public running at Fordwich from noon.

**14** Cheltenham SME. Public running at Hatherley Lane 14:00-17:00.

**14** Fenlands Light Railway. Public running 10:00-17:00 Mereside, Huntingdon.

**14** Harlington LS. Open Day 14:00-17:00 High St, Harlington.

**14** Hereford SME. Public running at Broomy Hill noon-16:30.

**14** Museum of Power, Langford, Essex. Old Tyme Rally from 10:00 CM9 6QA

**14** Ramsgate & District MEC. Public running at Ellington Park 13:00-16:00.

**14** Ryedale SME. Public running at Gilling 12:30-16:30.

**14** Worthing & District SME. Public running at Field Place 14:00-17:00.

**19**  
**20**  
**21** Echills Wood Miniature Traction Engine Rally from 10:30.

**20** Polly Owners Group Rally and AGM at the Bournemouth & District SME from 10:30.

**20**  
**21** Narrow Gauge IMLEC at Oswestry Society from 10:00. Contact club direct for more information.

**21** Chichester MES. Public running at Blackberry Lane 14:00-17:00.

**21** Guildford MES. Public running at Stoke Park 14:00-17:00.

**21** Keighley & District MES. Open Day at Morley Sports Field 13:30-17:00.

**21** North West Leicester SME. Public running Hermitage Leisure Centre from midday.

**21** Pinewood (Wokingham) MR. Public running 13:30-16:00.

**21** Rugby MES. Public running at Rainsbrook Valley Railway 14:00-17:00.

**21** Tyneside SME. Jesmond Festival 11:00-15:00.

**21** Woking MES. Public running at Mizens Railway and Visiting Loco Day 14:00-17:00.

**21** Worcester MES. Public running at Diglis 14:30-16:30.

**27** Parklands Railway Week at Hemsby, operating from 11:00-15:00.

**27**  
**28**  
**29** Ashley Hall Traction Engine Rally, Ashley, Cheshire WA14 3QA

**28**  
**29**  
**31** Bedford MES. Public running at Summerfields Railway from 10:30-16:00.

**28**  
**29** City of Oxford SME. Public running at Cutteslowe Park 13:00-16:30.

**28**  
**29** Wolverhampton MES. Public running at Baggeridge Park 13:00-17:00.

**28** Evergreens MR. Open Day 10:30-16:00 at Stickney Lincs.

**28** Harlington LS. Charity Open Day 14:00-17:00 High Street Harlington.

**28** High Wycombe MEC. Open Day 11:00-17:00 Holmer Green.

**28** Phoenix MES. Public running at Telford Steam railway 11:00-16:00.

**28** Scottish Model Engineering Trust. Public running at Wester Pickston Railway 11:30-16:00.

**28** Stroud SME. Public running at Stratford Park from noon.

**29** Brighton & Hove MRS. Public running at Hove Park 13:30-16:30.

Details for inclusion in this diary must be received at least EIGHT weeks prior to publication. Please ensure that full information is given, including the full address of where every event is being held. Whilst every possible care is taken in compiling this diary, we cannot accept responsibility for any errors or omissions.



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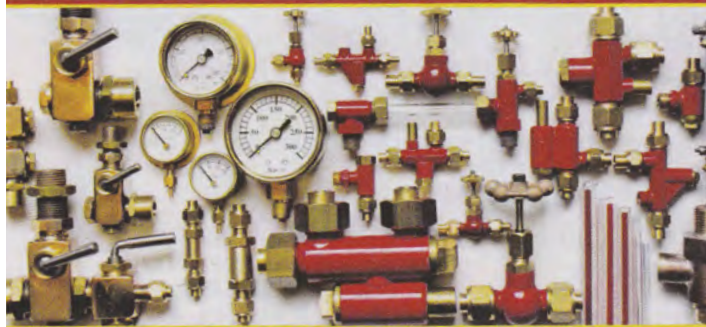


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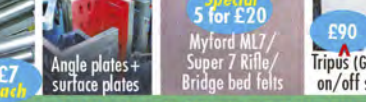
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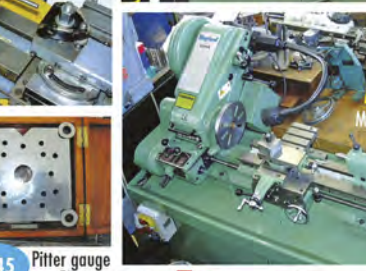
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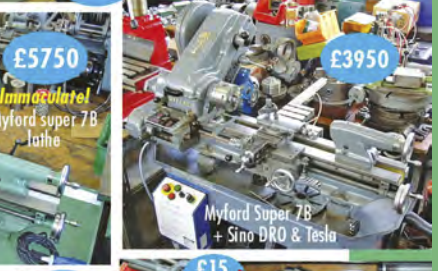
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