Welcome to Gauge 1

Starting in Gauge 1 with
The Gauge One Model Railway Association

The Gauge One Model Railway Association

Who we are

The Association was formed in Britain in 1947. Membership has grown to over 2,000 in Australasia, Europe, North America, South Africa and the United Kingdom.

Meetings, Shows and Exhibitions

We organise a Spring Show, and a Show around the Annual General Meeting in the Autumn. Local groups display at regional shows such as the Midland Garden Railway Show and G1MRA Yorkshire Group's Gauge One North, and have seasonal running at members' tracks. Winter activities include indoor running, layout construction, films or speakers

Modelling aids

- Paul Forsyth drawings for twenty live-steam British locomotives, of the 1900-1960 period.
- Cast parts for tender, wagon and coach underframes.
- Wagon and coach wheelsets.
- Track construction diagrams and cast chairs.
- Standard Dimensions for Gauge 1.

Publications

Our Journal is published quarterly in March, June, September and December; ninety-six full-colour pages of news, articles and advertisements. We publish a selection of technical books on modelling practical live-steam locomotives, coaching and freight stock.

Website

Our website **www.g1mra.com** has public access to sample copies of the Journal, and details of local groups. Members can access all issues of the Journal back to 1948, and profiles of other members with their interests and contact details. French and German texts are available under 'International'.

How to join

Joining is simple by mail, email, telephone, in person at exhibitions, or our website in minutes. Membership runs from 1 January to 31 December. You immediately get a membership directory, then quarterly copies of the Journal.

Cover: Bicknacre Junction. *Above: [clockwise] 75th Anniversary; Website; Journal; Garden track; Group indoor track.*

Getting Started in Gauge 1

Something for Everyone

Gauge 1 is where railway modelling and model engineering overlap, the best of both worlds. You can start with the basics, but as you develop you'll meet members willing to pass on advice and give practical help with your projects.

Where can I run my models?

Membership enables you to share tracks in members' gardens, clubs and exhibitions.

How much does it cost?

You can start small by building from scratch using table-top tools, or from many available kits. There's a good second-hand supply and members often trade or exchange items.

What can I model?

Vintage to 21st century, using metal, cardboard, wood, and plastic to re-create steam, diesel and electrical prototypes, powered by live-steam, batteries, and track electricity.

What scale should I model?

Any prototype from two-foot to broad gauge, so long as it runs on 45mm track. Many members use 10mm/ft. scale but new products are appearing in the more accurate 1:32.

Will my stock run on Gauge 1 track?

Most tracks take standard gauge, narrow gauge, vintage and some G-scale wheels.

What are the layout options?

Some members build raised garden tracks with detailed scenery and prototypical train movements; or just basic test tracks. Others lay track at ground level through lawns and flower beds.

How much space do I need?

Gauge 1 is compact enough to create indoor dioramas and layouts, and large enough for live-steam outdoors. See our members' examples later on in the booklet. Track with 8' [2.5m] curves can accommodate short wheelbase engines.

Learning more and meeting others

Our Journal has news, advertisements, and articles on every aspect of Gauge 1 railways. The magazine and website list over forty Groups in the UK and worldwide where you can meet fellow Gauge 1 modellers.

Local Groups

A great attraction of Gauge 1 is getting together to run trains

As well as enjoying the spectacle, we love to get involved with the preparation of engines, and help solving operating and maintenance problems. These are always social events, often with families, invited guests, and simple refreshments.

If you don't have your own rolling stock others will encourage you to assist with theirs.
If you don't have a track you can run on those of other members, group layouts or model engineering societies.

We have over twenty-five local groups in the UK, and fifteen Overseas, which meet regularly for running and social events, and welcome new members. Each Group has a representative who you can contact by phone or Email to arrange for a visit,

More details on our website at **www.g1mra.com** Give them a try. You won't regret it.

Groups at events in [clockwise from top left]: France, Denmark, Canada, Switzerland, the UK and USA.

Live-steam

Rod Clarke [Canada] found Gauge 1 live-steam to be Just Like the Real Thing.

If you come to Gauge 1 from a smaller scale, as I did, you may be surprised at the popularity of live-steam models. This has much to do with our engines being the smallest which replicate all the prototypical features of water, fuel, firebox, multi-tube boiler, regulator, steam blower, valve gear, cylinders, pistons, safety valve, exhaust jet and gauges. You become the designer, constructor, maintainer, driver, and fireman all in one.

Early models were fuelled with alcohol, but butane gas-firing is now reliable and popular. Coal-firing is considered the ultimate.

Fill the boiler and fuel tank, light the fire and watch the boiler pressure rise. Steam will move the engine in a few minutes.

These engines are driven! So, you follow them closely, adjusting the speed to the load and gradient, and adding water and fuel as needed. Just like on the footplate!

You will see individual models of an enormous range of prototypes, hand-built by enthusiasts. If you have mechanical aptitude and access to tools, such as a drilling machine and a small lathe, you can scratch-build an engine from raw materials.

G1MRA sells a wide range of locomotive design drawings from the Paul Forsyth collection, and several booklets on locomotive projects. A number of suppliers sell detail parts to help.

If you are a newcomer it's wise to start by purchasing a simple model. A practical start might be a small, moderately detailed, tank engine

Gauge 1 is a small market so the range of commercial models is more limited, but kits are available for locomotives of different sizes, complexity and cost. Commercial RTR engines are also available as kits for assembly with hand tools.

Battery-electric, radio control and electronics

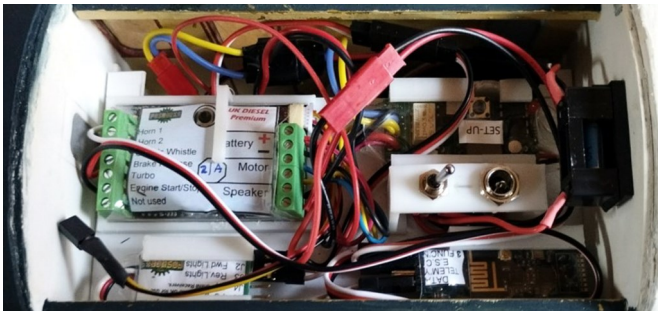
Peter Jackman and Peter Newbury, [UK] apply RC and electronics to Gauge 1.

As a newcomer to Gauge 1 you will find that there are now fewer layouts which use track power. Many of us run live-steam in the garden, and the resulting oil, dust and corrosion on the rails can cause pickup problems.

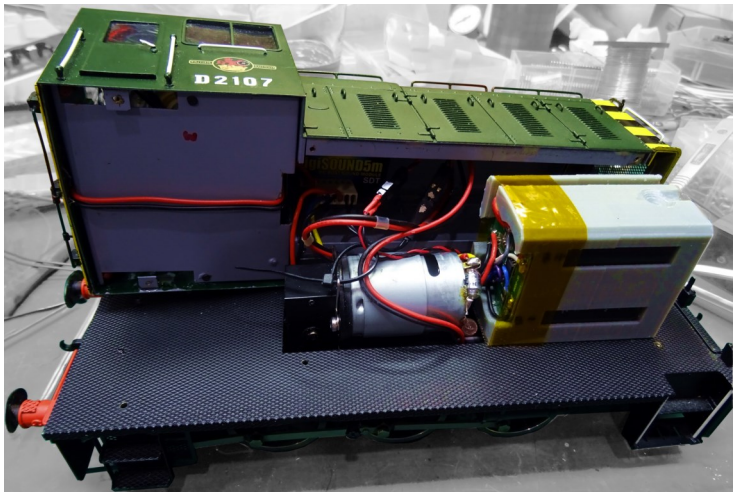
Powerful and compact lithium cell batteries have made on-board battery power practical and popular. In large diesel, multiple-unit, and steam locomotive models there is ample space for batteries. In smaller units and tank engines, you can put the battery in a coach, brake van, or wagon, coupled to the engine.

Radio control can be applied to both live-steam and battery powered models, and can be obtained in kit form or as modules to construct yourself, which is an interesting challenge. Commercial systems allow control of engines from a smartphone, or you can use a traditional control box with levers, knobs and switches.

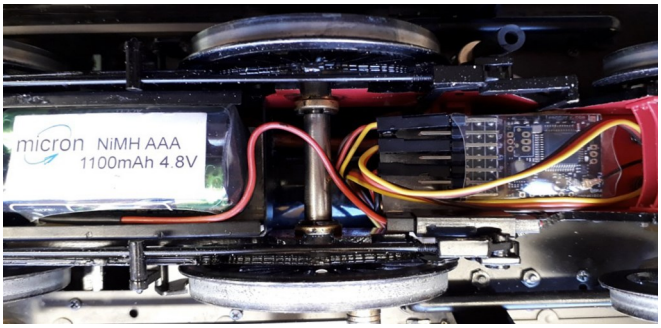
Home-built RC transmitter [L], and miniature transmitter [R].



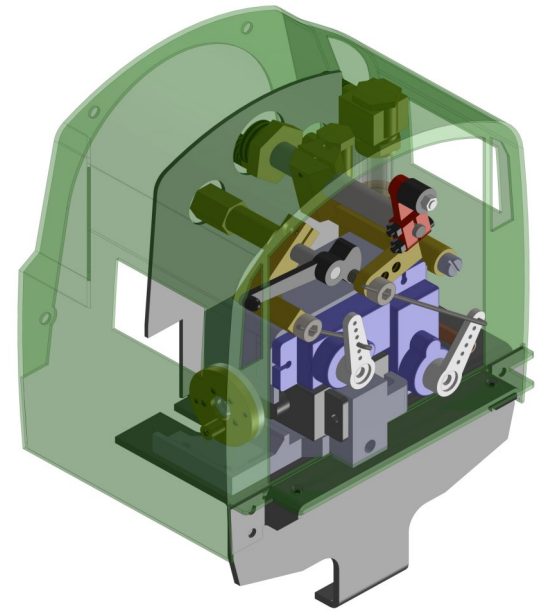
Guard's compartment of DMU. Receiver, running light card, speed control, sound card, on-off switch and charger socket.



RC installed in a small diesel locomotive, with lithium-ion batteries.



Receiver and battery between frames of a live-steam model.



Design for RC in a live-steam 'Battle of Britain' class.

Radio control of a live-steam engine requires at least one servo actuator to operate the regulator/throttle, but you can also control the steam blower and reverser. These servos are small, powerful, and readily available, as a result of their wide use in model aircraft and robotics.

Battery-powered locomotives or power units generally have an electronic motor controller, either integrated with the RC receiver, or as a separate unit if higher currents are involved. Speed and direction control are the minimum but other channels can be used for lighting and smoke, and realistic steam, diesel, DMU, brake, horn or whistle sounds created with a sound card and loudspeaker.

Another area of interest is the application of electronics and servos to control signals and track switches. There is immense scope to combine Gauge 1 railway modelling with your electronic hobbies, and obtain very realistic operation of your locomotives and railway system.

3D Printing

Adrian Johnstone [UK] and members invite you to the Gauge One 3D Circle.

Peter Jackman's 3D printed 'Deltic', as a design diagram and in the flesh

In the past you could obtain a very accurate model by buying an expensive commercial item, or scratch-building your own. Now, 3D printing achieves fine models of rolling stock and details while providing an interesting technical challenge.

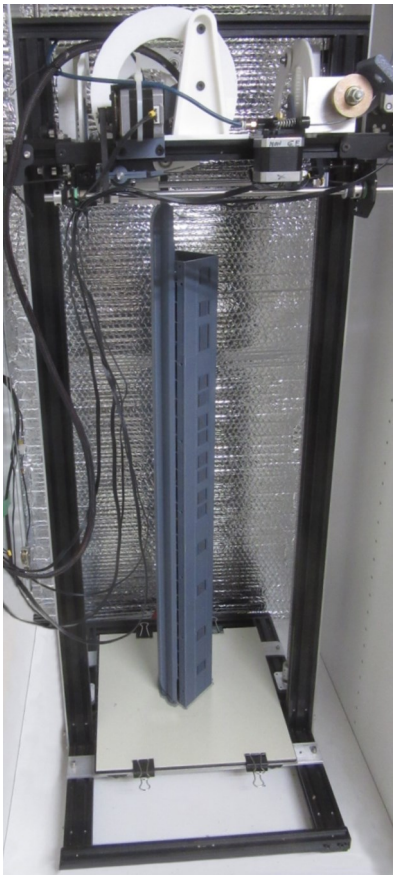
3D printing builds up structures in layers. Cheap, high-quality printers use two technologies: high temperature extrusion of plastic filament, and ultraviolet curing of liquid resin. Online 3D printing services offering more exotic processes, such as laser sintering of powders. One day home versions of these advanced machines may be feasible. Filament printers are very popular because the technology is easy to use and cheap. Home resin printers require a more disciplined approach but can produce very highly detailed models.

Gauge 1 is ideal for 3D printing: a standard coal wagon fits nicely in a home printer, and the initial investment is significantly less than the price of a train of wagons. The Gauge 1 RTR market currently offers rather few prototypes compared to smaller gauges, so 3D printing broadens the set of available models.

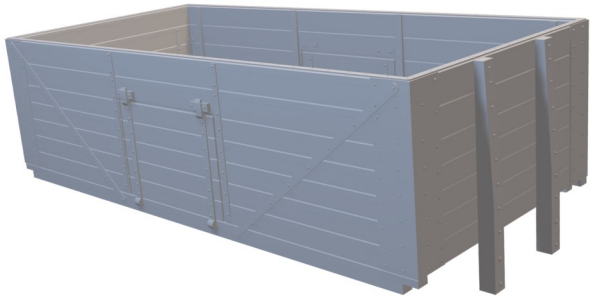
The potential is clear, but getting started can be rather challenging: many people find 3D Computer Aided Design software overwhelming, and getting the best quality results from your printer can require a lot of experimentation.

The Gauge One 3D circle are here to help. A G1MRA local group with several hundred members who share results and advice on the internet, with occasional meet-ups at shows, and a weekly video conference. Apart from sharing our experience with all kinds of 3D software and printers, our main goal is to produce publicly available CAD models that anybody can print without needing to master CAD tools.

We have an active discussion forum at **https://groups.io/g/GaugeOne3DCircle** and a site hosting our publicly available CAD models at **https://g1-3d.uk/** Discussions on the forum are also publicly visible, so feel free to dip in and see if there is something of interest there for you.



David Leech's heavily modified filament printer can print an entire coach.



Digital render of CAD model wagon designed by Adrian Johnstone.

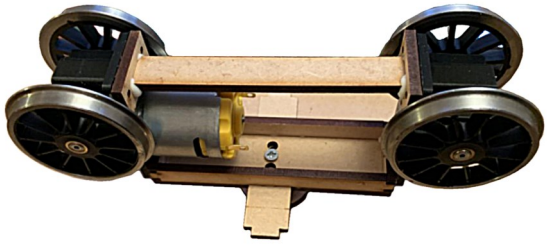
A wagon printed by Rob Kuhlman from Adrian's CAD model.

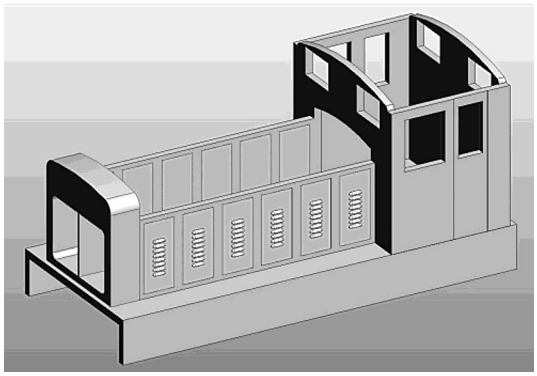
Locomotive kit building

Rob Kuhlman [USA] found a Ruston 88DS kit ideal for a starter project.

I've always been attracted to little internal combustion 'critters' and when a manufacturer introduced three very inexpensive kits for four-wheel locomotives I ordered the Ruston 88 DS shunter. Ruston and Hornsby of Lincoln were best known for their little narrow-gauge engines, but they also produced small standard-gauge shunters for industry. The 88DS [Eighty-eight horsepower, Diesel Shunter] was introduced in 1938, and many examples continued operating well after Ruston sold its last locomotive in 1970.

The kit is a combination of 3D-printed parts for complex shapes, and laser-cut acrylic pieces for flat panels. Assembly instructions are provided on the maker's website for both the locomotive and the motor assembly. I generally dislike using cyanoacrylate adhesives because they seem to lose holding ability after several years, so I used two-part epoxy for the acrylic components. The frame, hood, and cab are assembled first, and several tab and slot joins assist with alignment.





The acrylic hood side panels are pre-cut to accept the 3D-printed louvred access doors. Make sure these prints fit comfortably in the cutouts. The locomotive's body seems to sit too low on the motor block, partly hiding the wheels. So, I made a pair of 3mm tall spacers to fit between motor block and body, to raise the body and expose more of the wheels.

Construction yields a simple, sturdy engine for less than £100 - a bargain. I tried to match the prototype appearance by making details from odds and ends. The noticeably large buffer heads were represented with styrene disc overlays. Styrene strips made gutters for the cab. I free-hand turned a brass horn, and added handrail stanchions for the top of the hood. I used music wire for the hood handrails, the cab access door latch handles, and the cab grab rails. The radiator cap was soldered from brass bits, and K&S brass tubing was used for the exhaust stack. Prototype photos show frame plate details, so I added axle boxes, snubbers brake shoes, and cab steps. Sand pipes were bent from music wire and inserted into lumps of plastic glued on the side frames.

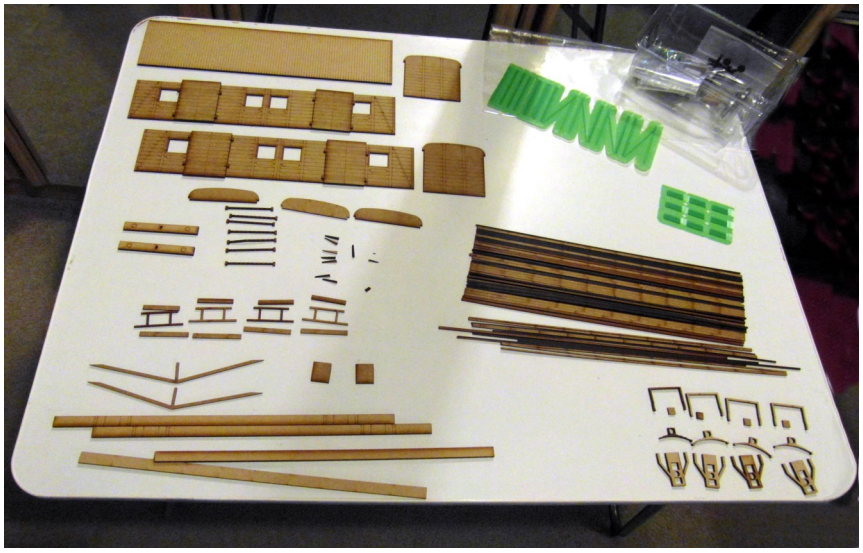
I was guided by wonderful drawings and photographs in Andrew Neale's *'Ruston & Hornsby Diesel Locomotive Album'*. Thanks to Tom Eivers of Endon Valley for the 'Ruston' transfer on the radiator, and many more to the manufacturer for seeing a need for affordable entry-level locomotive kits.

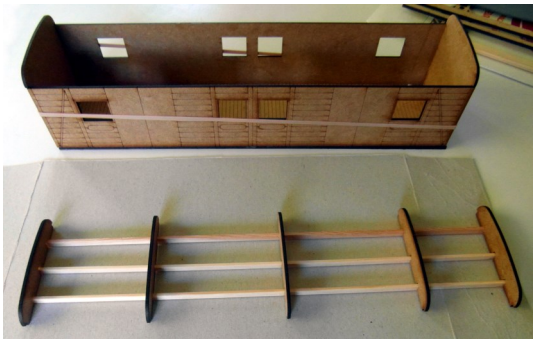
Vehicle kit building

Alan Leslie [UK] shows how he constructed a basic laser-cut van kit.

I purchased this Southern Region four-wheel, long-wheelbase, Parcels and Miscellaneous [PMV] van as a kit. As I model mainly the BR-era Scottish Region, it might seem an odd choice, but I found pictures of similar vans as far north as Wick and Thurso.

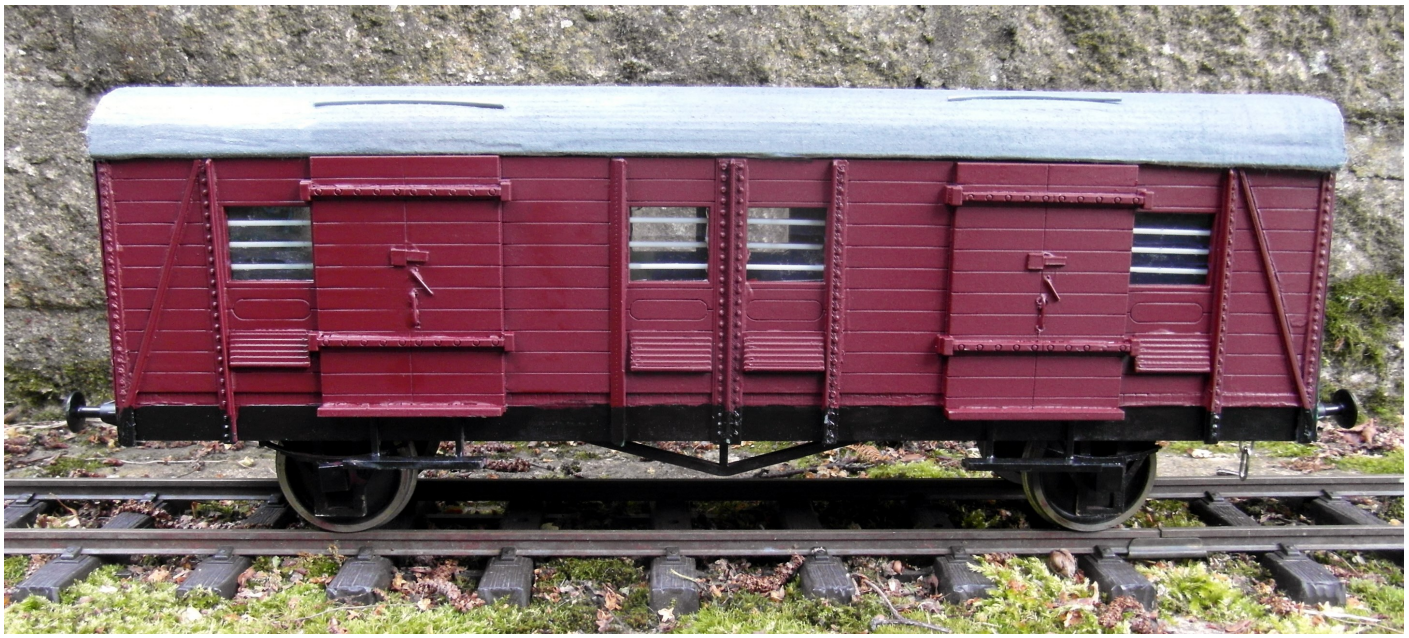
I laid the kit components out for checking prior to assembly. The MDF parts went together easily using PVA glue, as did the detailed strapping. The kit has 3D-printed buffer bodies, and drawing pins for buffer heads, but I substituted Peter Korzilius sprung buffers.





The roof construction was of long MDF slats of various widths, glued to the roof trusses and van ends. I wanted to make the van roof van removable for batteries and radio control gear, and the manufacturer kindly supplied me with some extra supports. The longitudinal trusses were strip wood. The roof slats were glued to the subframe with the narrowest slats at the edges to form the typical SR sharply curved edges.

I wanted to have bars across the windows so I used Plastruct round rod. To finish, I covered the roof with an old handkerchief and hand painted it Humbrol Matt Grey 145. The finished van was well detailed, had a prototypical roof construction method and the profile looked correct for an SR van.



Outdoor layout

Steven Cook [UK] wanted a very basic circuit in the garden.

I believe that having any garden railway is better than none. I have a flat garden measuring 22′ x 34′, and a garage leaves an L-shaped space. My first line was L-shaped, very simple and for one glorious summer day everything worked fine. I never could get it to run that way afterwards, so I was content using wireless DCC control to run stock up and down.

With the arrival of an Aster 'Castle' kit, and a shift to live -steam I thought of a simple circuit for continuous running, and a fire-up lane which would allow alternate running at get-togethers. Relocation of a garage drainpipe freed up an extra 4" of space. I sank 3" square posts into the ground, spaced at 40" centres on the straights, and 30° intervals round the curves, anchored in Postcrete. Short sections of 2" x 3" timber were screwed close to the top of the posts, to create a cross to support the horizontal framing.

The framing itself is ⅞" x 3" door jamb donated by a friend. The timbers were cut to length and notched to fit over the cross pieces, giving a tight fit which I secured with screws. Another friend offered wood that provided a stock-box storage shelf under the firing-up lane. The top of the framework was checked for level and thin sections of damp-course membrane were inserted between horizontal timbers and cross pieces to provide adjustment.

Filcris recycled plastic lawn edging planks form the running surface. The layout is more test track than scenic, and tight curves would use a lot of material for a solid surface. Eleven 12′ planks were cut to length. A simple trammel and jig kept them evenly spaced, and hid minor variations in post position. Four screws secure each plank, bracing the horizontal framework and stiffening the structure.

The track is 45.5mm widened gauge sleepers, and code 180 rail. Threading the rail through the chairs was easy, only taking about four hours. The rail was pre-curved using a home-made bender to make sure track was smooth and consistent. The trammel was modified to suit the larger track radius, and rails were carefully laid to it. Elevation wedges incline the outer rail 1mm above the inner.

A small deck was built in one corner to accommodate seating, and make it easier to step over the line. Gravel paths run inside and outside the line. The 'Castle' runs around with five coaches, although there is some slowing down on the curves. A friend bought over an Aster '9F', a 'Patriot' and electric 'Project'. All three locomotives were capable of running around the curves. Next, the pointwork and track for the fire-up lane were installed. There is also a 32mm gauge third rail because my interests include 16mm and ⅞ths scale.

I'm not sure how much smaller one could go with a continuous Gauge 1 run and support a good range of locomotives. I suspect that I'm very close to that edge. With the track surface at thirty inches off the ground, firing and running locomotives is fairly comfortable while allowing step-over access to the decking. I'm pleased to find that it works and I can steam at home.

Cross pieces on posts, provide support for longitudinal timbers.

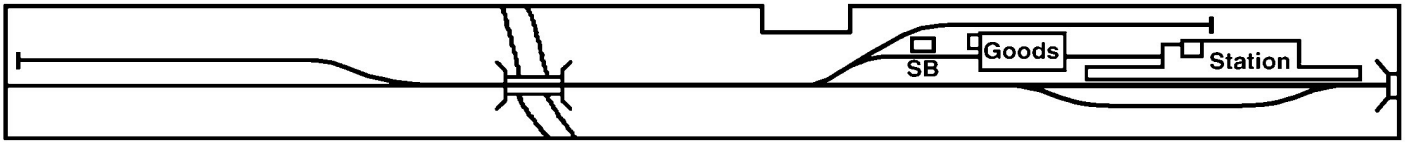
Storage shelf installed under the track.

Basic framing and running surface complete.

'Castle' and carriages on the line - what it was all about.

Indoor layout

Mike Palmer [UK] built Croft , a simple end to end layout, in his workshop.



I have a lifelong interest in GWR history. Visiting an exhibition, I watched the G1MRA layout and was enthralled by the size of Gauge 1.

I needed a layout to fit my workshop and thought I could arrange a 3′ x 30′ branch line along one wall. I prefer the pre-grouping GWR but there are few models available. So, I decided to scratchbuild everything, bought a CNC milling machine and taught myself CAD and CAM.

The model is a typical GWR branch with station, goods shed, cattle dock, yard with crane, and signal box. I needed a back scene and a friend printed several long images that I had shot.

A lot of research went into finding building examples, collecting photographs, making drawings, and experimenting with shapes to find the best positions.

The station is a standard William Clark design, made in styrene with milled details. Posters and signs are reduced internet images. A bicycle, sack and four-wheel barrow are by Neil Butcher. The goods shed is timber frame with stained card external planking and a brick paper base. The yard and water cranes are made of brass, milled and soldered. The signal box is styrene and brick paper. Track and point components were bought. For convincing ballast I used wet sand and black emulsion, mixed and left to dry to a mid-grey.

The river valley is a 30" section, dropped 12". The earthworks are plaster-of-Paris bandage over MDF forms. The styrene bridge is inspired by Victoria Bridge on the Severn Valley Railway, with stone paper covered MDF abutments. The layout was designed for two-rail, but with miniaturisation of RC equipment, some locomotives are fitted so I can operate in both modes.

I started building the layout in summer 2012. Model railways are never finished so there are always additions to be made. I want viewers to feel they are on a real railway. The size of Gauge 1 helps achieve that.

Our trading partners

Accucraft UK - 1:32 scale live-steam locomotives and rolling stock. RTR and kits.
www.accucraft.uk.com
info@accucraft.uk.com

Barrett Steam Models - 10mm scale live-steam locomotive kits.
www.barrettsteammodels.co.uk
info@barrettsteammodels.co.uk

Bowande Live Steam UK - 1:32 scale live-steam locomotives.
www.bowandelivesteamuk.com bowandelivesteam@gmail.com

Bowaters Models - 1:32 and 10mm scale model locomotive and rolling stock kits.
www.bowatersmodels.co.uk
info@bowatersmodels.co.uk

Brian Jones - Radio and electronic controls.
www.brianjonesmodels.co.uk
brian@brianjonesmodels.co.uk

Brunel Models - Model buildings and structures.
www.brunelmodels.co.uk
enquiries@brunelmodels.co.uk

Camden Miniature Steam Services - Books, DVDs.
www.camdenmin.co.uk
adamh@tantraweb.co.uk

Castle Steam Boilers - Model steam boilers.
www.castleinstruments.co.uk
info.castlesteam@gmail.com

Cliff Barker - Gauge 1 track and rolling stock.
www.cliffbarker.me.uk
cliff@cliffbarker.me.uk

Cromford Designs - Painting and lining service.
lizmarsden@cromforddesigns.co.uk

Custom Carriages - Rolling stock.
www.customcarriages.co.uk
custom carriages@aol.com

Diane Carney Nameplates - Custom nameplates.
www.loco-nameplates.co.uk
loco.nameplates@uwclub.net

Dreweatts - Transport model auctioneers.
www.dreweatts.com
vbillington@dnfa.com

Ellis Clark Trains - Model purchase and sales.
www.ellisclarktrains.com
ellis@ellisclarktrains.com

Elstow Engineering - Model railway engineering.
www.elstow-engineering.co.uk
info@elstow-engineering.co.uk

Fox Transfers - Transfers of railway insignia.
www.fox-transfers.co.uk
mail@fox--transfers.co.uk

Fred Phipps - Locomotive and rolling stock kits.
fphippsz@yahoo.co.uk

Fosworks - RC, sound systems, axle motors.
www.fosworks.co.uk
sales@fosworks.co.uk

Garden Railway Specialists - Track and RTR locomotives and rolling stock.
www.grsuk.com
sales@grsuk.com

G M Transport Books - Railway and other transport books.
gmtransportbooks@gmail.com

Just the Ticket - Model engineering supplies and locomotive kits.
www.justtheticketsupplies.co.uk
justtheticketeng@gmail.com

KBW Kits - Laser-cut rolling stock kits.
westkev58@gmail.com

Ken Martin - Lost wax castings for locomotives and rolling stock.
ken.jo.martin007@gmail.com

Marcway Pointwork - Track and track parts.
www.marcway.net

Mike Danby - Locomotive builder.
www.mikedanbylocomotives.co.uk
m.danby34@btinternet.com

Model Engineers Laser - Laser cut parts.
www.modelengineers laser.co.uk
sales@modelengineerslaser.co.uk

Northern Fines Scale - 1:32 scale wagons and rolling stock.
UK: www.chrisarundell.com
mail@chrisarundell.com
North America: gaugeonelines@yahoo.com

Peter Alliott - Locomotive construction, servicing and repair.
alliott49@btintemet.com

Peter Korzilius - Wagon kits and parts.
peter.korzilius@googlemail.com

Peter Rogers - Model coaches.
www.roger-models.co.uk
enquiries@rogers-models.co.uk

Railmodel - Laser-cut structure kits.
www.railmodel.co.uk

Rushford Barn Models - New and pre-owned locomotives and rolling stock.
www.rushfordbarnmodels.co.uk
rushfordbarnmodels@gmail.com

Special Auction Services - Railway item auctioneers.
www.specialauctionservices.com
mail@specialauctionservices.com

Steve Golding - Locomotive and rolling stock kits.
www.stevegoldingmodels.com
stevegoldingmodels@outlook.com

Strikalite Batteries - Batteries and radio control.
www.strikalite.co.uk
info@strikalite.co.uk

Tenmille Products - Track and rolling stock kits.
www.tenmille.com
trains@tenmille.com

TMS Models - Locomotive and rolling stock sales service.
www.tmsmodels.biz
terrysmith@tmsmodels.biz

Todmorden Model Supplies - Modelling tools and materials.
www.todmordenmodelsupplies.co.uk
info@todmordenmodelsupplies.co.uk

Tower Models - RTR brass locomotives and coaches.
www.tower-models.co.uk
sales@tower--models.com

Vectis - Train and collectable auctioneers.
www.vectis.co.uk
louise@vectis.co.uk

Wallis and Wallis - Specialist auctioneers.
www.wallisandwallis.co.uk
toys@wallisandwallis.co.uk

Walsall Model Industries - Castings and parts.
www.walsallmodelindustries.co.uk
info@walsallmodelindustries.co.uk

To join us

Contact our Membership Services Provider, Virginia Hauxwell by post, email or telephone at:

PO Box 363, Trimdon Station, TS29 6YU

Email: g1mra.membershipofficer@gmail.com

Tel: 07547 804142

Or see www.g1mra.com for more details, and instant joining.

Several membership categories are available:

Ordinary Membership: UK £30; Europe £32; Rest of the World £36

Family [one N&J per household] - Add £5

Junior under 18 in full time education [N&J but no voting rights] - £10