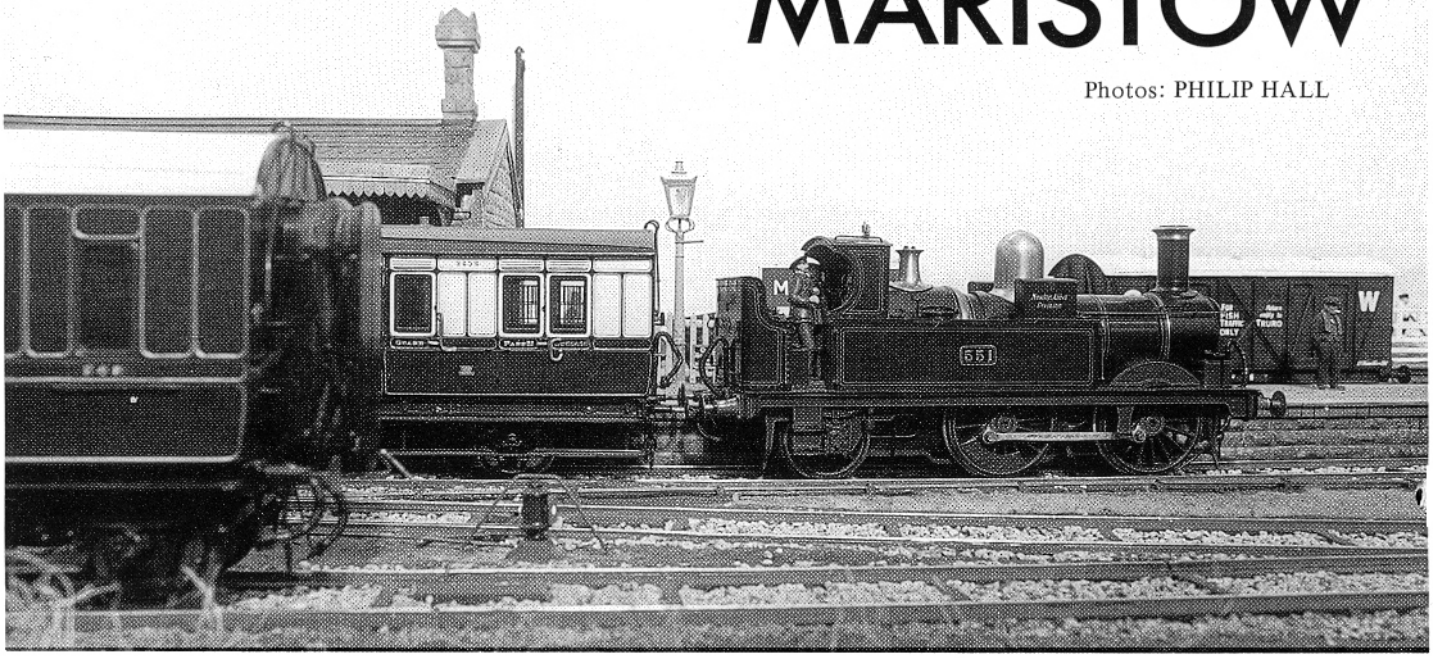
MARISTOW

Photos: PHILIP HALL



BOB HARPER describes his 'user-friendly' 7mm exhibition layout depicting the Great Western in the immediate post-Broad Gauge era. The lingering Brunelian methods and attitudes of the period presented some interesting modelling challenges, not least in the trackwork department:

Maristow is a small village on the Devon bank of the Tamar, a few miles north of Plymouth. The railway is, of course, imaginary, but sets out to try and recreate a West Country scene at the turn of the century, when evidence of the recent conversion (1892) from the Broad Gauge is still very obvious – the longitudinal track (the 'baulk road') recently narrowed from 7ft gauge, the Broad Gauge clearances on bridges and tunnels (with the track offset through the bridge after one rail was slewed over upon conversion), the height of the platforms, and the non-independent rotating ground signals, among the general period features.

About three years ago I finally took the plunge and started building Maristow, the oft-planned replacement for my old exhibition layout 'Chewton Mendip'. After fifteen years on the exhibition circuit, it was approaching its 50th exhibition, and both the layout and, more pertinently, its operators, were becoming distinctly middle-aged; so a lighter alternative to its 6ft x 4ft heavy baseboards was needed. The mechanical principles developed on 'Chewton Mendip' over the years meant that it still operated with impeccable reliability, but in terms of scenery its distinctly 1970s vintage and its haphazard extensions and rebuildings required the time-consuming and expensive hiring of a 35 cwt Luton van every time it went out.

First thought on replacement envisaged a harbour/dockside layout, and baseboard construction started on this basis, but visits to other modellers revealed several other new 7mm scale exhibition layouts all based on harbours; it would be unfortunate to spend several years building a new layout and then find that everybody was satiated with small 7mm scale docksides, so thoughts turned to my growing interest in the old broad (and mixed) gauge lines of the West Country, which left their various legacies for years after abolition. 'Sleeping' membership of the Broad Gauge Society had brought me hundreds of data sheets for all types of baulk road trackwork, and more importantly, a supply of specially drawn aluminium 7mm scale bridge rail; the time had come to shamelessly exploit my membership of all the societies I belong to, as sources of information and advice – the Broad Gauge Society, of course, but also the Historical Model Railway Society, the Great Western Study Group, and in particular, many members of my own 'home' club, the Manchester Model Railway Society.

What started out as an experiment and testbed in baulk road construction gradually became more extensive and capable of much more wide-ranging operation than originally envisaged; the baseboards gained an extra 4in width and a full height backscene, and the storage area grew from a very limited 4ft long sector plate into a 9ft long eight-road fiddle yard with all-point operation. However, the guiding principle remained that control of the layout should be as foolproof and authentic as possible – all points and signals to have full mechanical interlocking, all running routes to be signalled (including ground signals), and track current to be interlocked with points and signals so that locos can't be moved until the correct route has been set up. One little extra for the sake of authenticy is working catchpoints, and most of my operators, including myself, have indeed been 'caught' by them at times, especially when a question from the public has distracted attention. However, the baulks underneath the rails mean that it is often possible to discreetly pull the derailed wagons back on to the track without everybody noticing!

Baseboards show the change of plan in mid-construction, but are basically 3in deep boxes with cross bracing, 2ft wide and up to 5ft 6in long, all built out of 9mm ply, with 6mm ply for the backscenes. Each board rests at one end on a locating ledge on the end of the previous board, with precise location provided by pattern-makers' dowels and interboard connection from large case-catches – these have proved extremely strong,

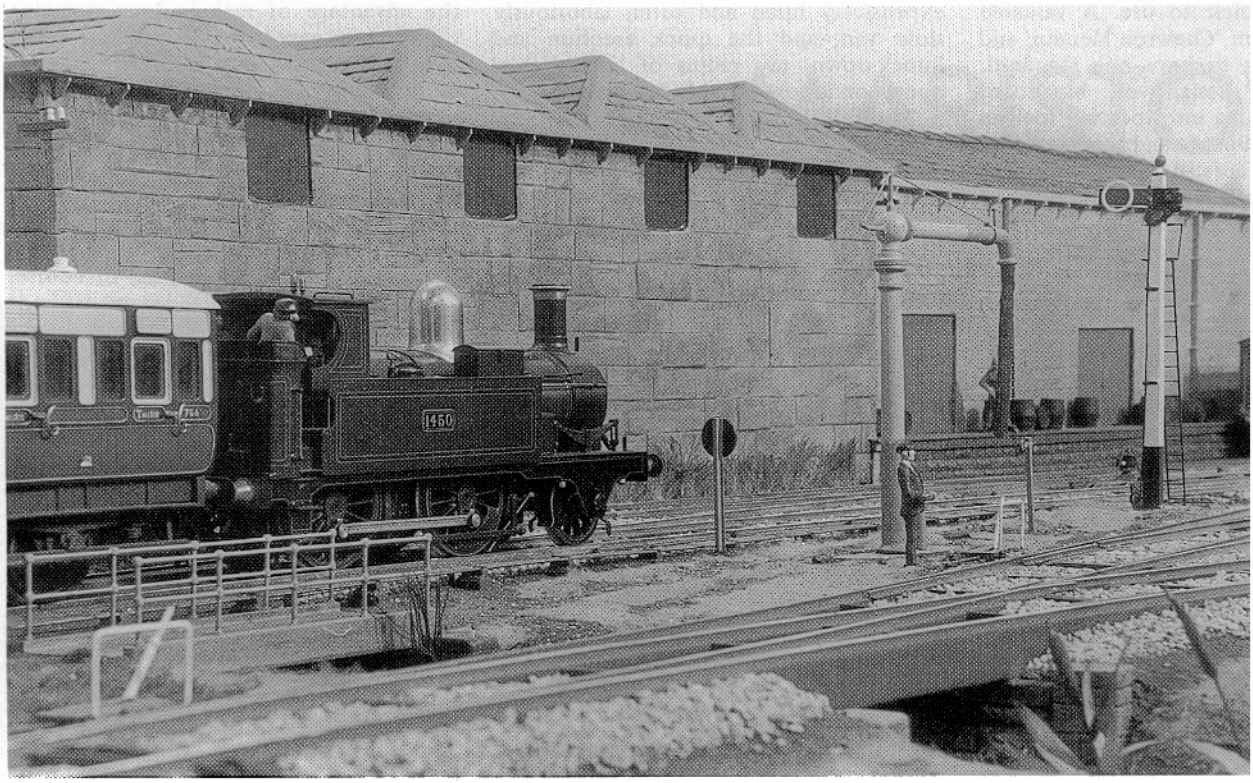
effective and quick to use. A valuable lesson learnt from 'Chewton Mendip' and repeated here is to have one standard, interchangeable design of baseboard support. These plug into locating sockets under the baseboard and are steadied with diagonal braces. As with everything on an exhibition layout, the emphasis is on speed of erection and robust construction, the fruit of much thought and planning. This is extended to such items as stock boxes, overhead lighting, electrical connections and front curtains. The lights are fixed to standard 6ft fascia boards which clip on to each other and are supported by simple 1in square battens which plug into sockets along the front of the layout. Pinning on the front curtains was always a chore that I tried to delegate to an unsuspecting junior operator, but the Maristow curtains are ready glued to lengths of 1¼in x ½in batten, which rest on a ledge along the front of the layout. As a result of all this attention to detail, it is possible to have the whole 25ft long layout up and running, with all curtains and lights in place, in 12 minutes, though positioning all the rest of the rolling stock obviously takes longer. Equally we are usually driving away from an exhibition not more than half an hour after it closes, given no major hold-ups.

As everything breaks down into rectangular boxes, it is also possible to pack it all into a much smaller space for transportation, compared to 'Chewton Mendip'. Everything fits easily into the medium-sized box trailer that I bought for the purpose, so what with travelling at car speed rather than in an expensively hired and often laboriously slow van, and the quick erection and knock-down, my radius of 'exhibitable' operation is considerably increased.

With all the basic timberwork done, all that remained was to build a railway in the space left for it. The main departure from conventional methods is, of course, the track. My local wood-shop cut the baulks for me to the right dimensions (8mm wide for running rail and 11mm wide at crossings and switches), and this was glued down with wood glue in 6ft lengths, one baulk at a time (the baulks are actually considerably deeper than scale, so that I could recreate the typical drainage cess between the rails without having to gouge a trench in the baseboard; since the sides of the baulks are all covered in ballast, this overscale depth doesn't show). The cross transoms were fitted later, but could have been done at this stage. These long 6ft lengths do have the advantage of making long sweeping curves very easy to achieve – far easier than with cross-sleepered track. There is hardly any dead straight track on the scenic part of the layout – a feature of the prototype that is not often followed in models. Once the baulks are down, the rail is simply glued down on top, one rail at a time, using as many track gauges as I could lay my hands on to glue on the second rail. The difficulty is, of course, the aluminium rail, which is very difficult to glue and can't be soldered together at crossings (at least, I can't solder it). After roughening the base of the rail with glass paper, I found that 24-hour Araldite worked well enough, even if it needed two or three attempts on certain sections of rail. However, it has survived eight exhibitions so far unscathed, and looks as if it is not as vulnerable as I anticipated. Electrical connections are a problem. I was intending to use the conductive glue

'517' class 0–4–2T No. 551 alongside the platform.

'2021' class 0–6–0ST No. 2048 arriving with an empty milk train.

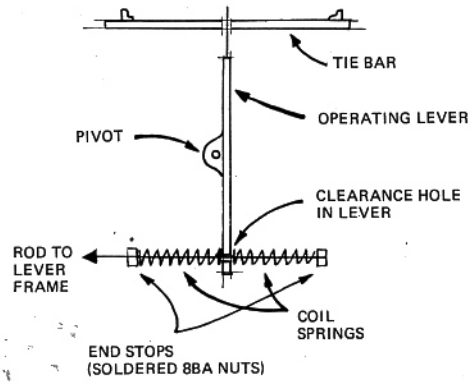


'Metro' class 2–4–0T No. 1450 pulling away from the station.

available from RS Components, but found that it had gone up to £42 a pot when I wanted some! That prompted a rapid rethink; I ended up drilling interference holes in the outside web of the rail and forcing pins through the rail and down through a hole in the baulk, grinding the pin head down to a less obtrusive shape, and then coating the head of the pin and rail around it with conductive paint. This is a mere snip at only £3 a tiny pot! Wire droppers are then soldered to the ends of the pins and fed from the jumper wires underneath the baseboard. I always run a copper wire under the baseboard paralleling each separate electrical section of rail, so that it is easy to run connections from the control panel, feed each individual length of rail (a lot of these in a glued-together crossover), and trace faults if necessary.

I use mechanical operation of points and signals as much as possible, and to this end, I designed and made the masters for the components of a mechanical lever frame, which are now cast in brass for me as required by a firm in Sheffield. This is robust enough to take the mechanical interlocking that controls 'Maristow', and makes electrical connections through two roller microswitches per lever as well as giving the mechanical movement required from the outer end of the locking frame. Movement to points is through 3/16in rodding and reversing cranks – extravagant, but very robust and strong enough to be self-supporting. I give the rodding more movement than is required, and take up the overrun with coil springs, one either side of the operating lever below the point tie-bar.

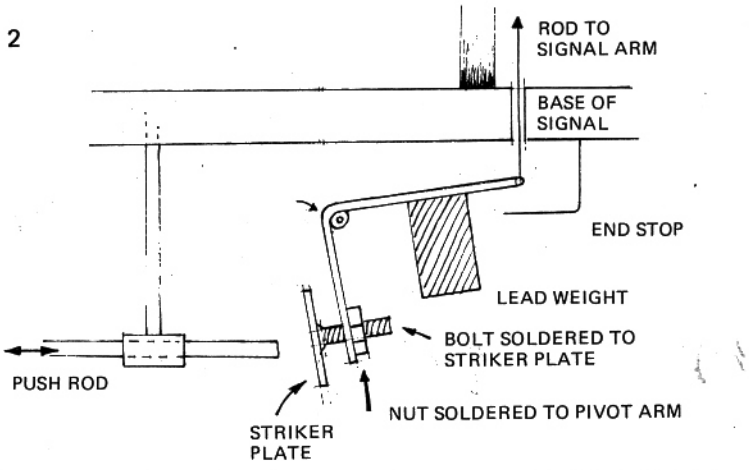
Sketch 1



Signal operation uses lighter gauge rodding and again is not connected directly to the signal. As the rod moves forward, it hits an adjustable striker plate pivoted below the signal and pushes the plate upwards (and the signal arm down). On withdrawing the push rod, a large cast lead weight fixed behind the striker plate falls under gravity (a very useful force – it always works) and restores the signal danger.

Ground signals are scratchbuilt to represent the rotating, non-independent

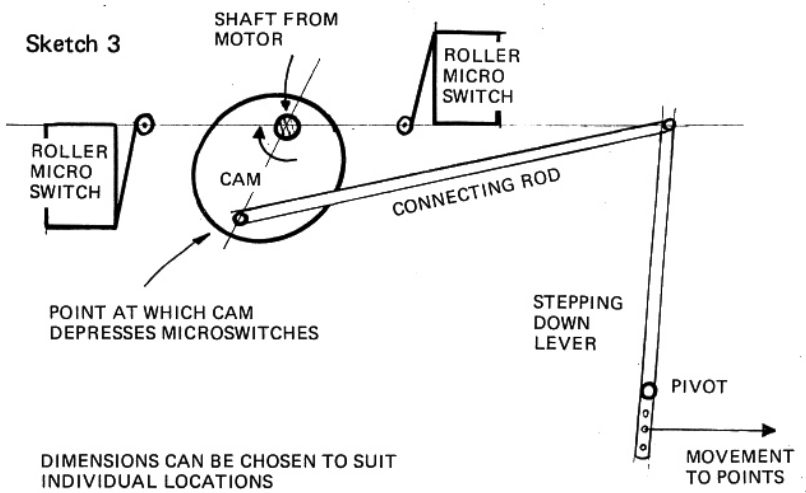
Sketch 2

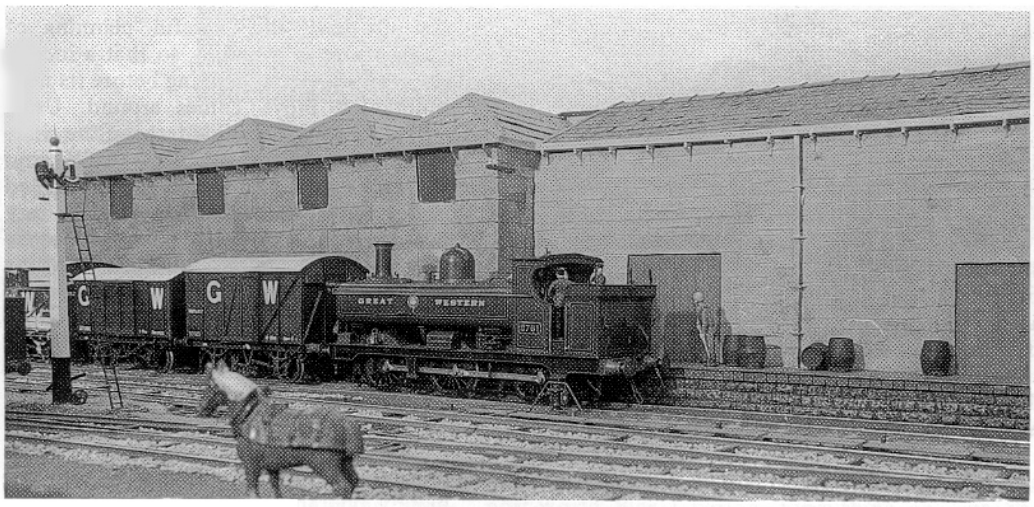


type still in use in rural backwaters at the turn of the century. Here the push-pull movement of the point rodding is converted into rotation by a hashed-up reverse version of a car steering rack.

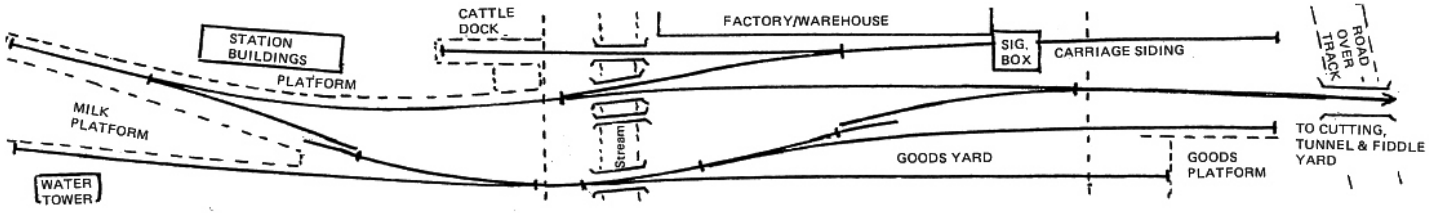
Outlying points and signals are motor operated, using my own home-built point motors. These use an industrial surplus mains voltage AC motor (which *never* fails to operate) with integral reduction gear box giving a desired final drive speed of 12-15 rpm. The circular motion is converted into a reciprocating motion which is then stepped down by an off-centre pivoted lever to give a choice of final movement of 5, 7½ or 10mm. The cam that drives the connecting rod to the pivoted lever also serves to depress a microswitch every half revolution, so

Sketch 3





0–6–0PT No. 2761 shunting vans in the warehouse siding. The shunting horse is called 'Caesar'.



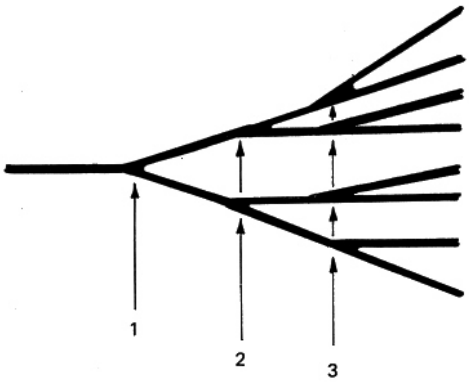
cutting off the current and stopping the motion. Switching in a 12v DC relay reverses all the connections and gives the next half revolution turn and so on. These motors give very smooth, slow, and totally reliable operation of points and signals, but are a bit time-consuming to make.

The signals themselves are handbuilt using various commercial components, including an old Colin Waite etch of signal arms that I found very useful. The bracket home signals are based on the down main starters at Oxford at the turn of the century, and use centre-balanced arms. I have wanted to build some signals like these for a while and have now found a genuine need for them. When sighting through the tunnel and bridge as an incoming driver would, the low centre-balanced signals can be clearly seen, but any normal arms would have to be higher to clear parked vehicles on the adjacent siding and as a result would not be seen under the bridge.

Trackwork in the fiddle yard is conventional nickel silver rail soldered to copper-clad sleepers, and the single incoming line fans out through three successive banks of two-way points into eight equal length sidings. Three of my point motors control all the points, with the first motor operating one set of points, the second one does two sets and the third one, four sets.

A rotary switch is used to 'dial-a-road', and acts like a binary number converter, sending out an on-off signal to each of the three point motors so as to produce the right combination of movement, as well as switching on the traction current to the desired siding. The end of each siding is also separately isolated through a spring switch so that incoming locos are isolated automatically at the end of the siding whilst another loco backs on to its train for its next departure. As the sidings

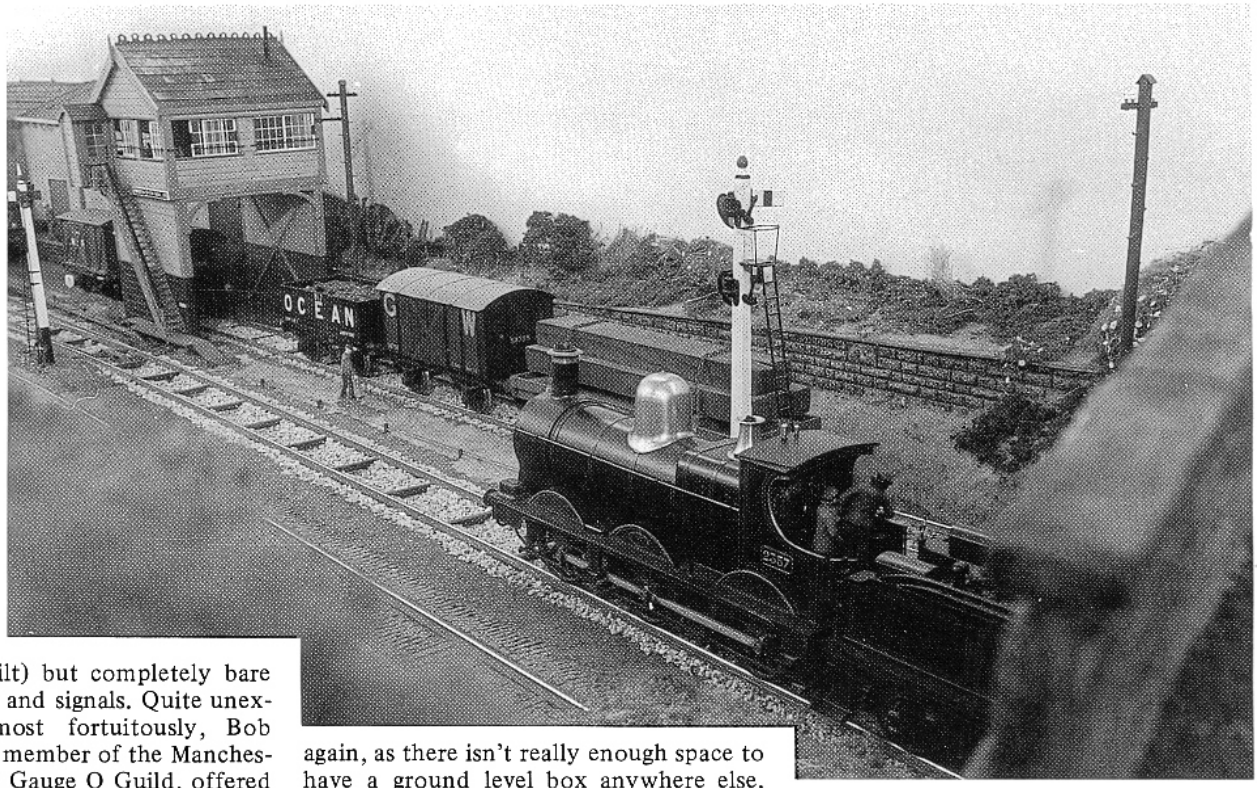
Sketch 4



are all dead end, careful planning of siding usage is essential, so that a loco is always freed from a siding before its next timetabled move comes around. Using eight locos, it is possible to keep the timetable sequence going for its full 2½ hour extent before so many locos are trapped that there is nothing left to pull any outgoing trains. At this point a hand reshuffle is needed to set up everything ready for the next timetable. The actual control box for the yard is mounted on a long extension lead so that it can be moved over to the station operator's position in cases of absolute necessity (i.e. when someone hasn't come back from lunch in time).

Anyway, all this made the layout completely operable (the rolling stock having

Dean 0–6–0 No. 2449 arriving with the branch goods.



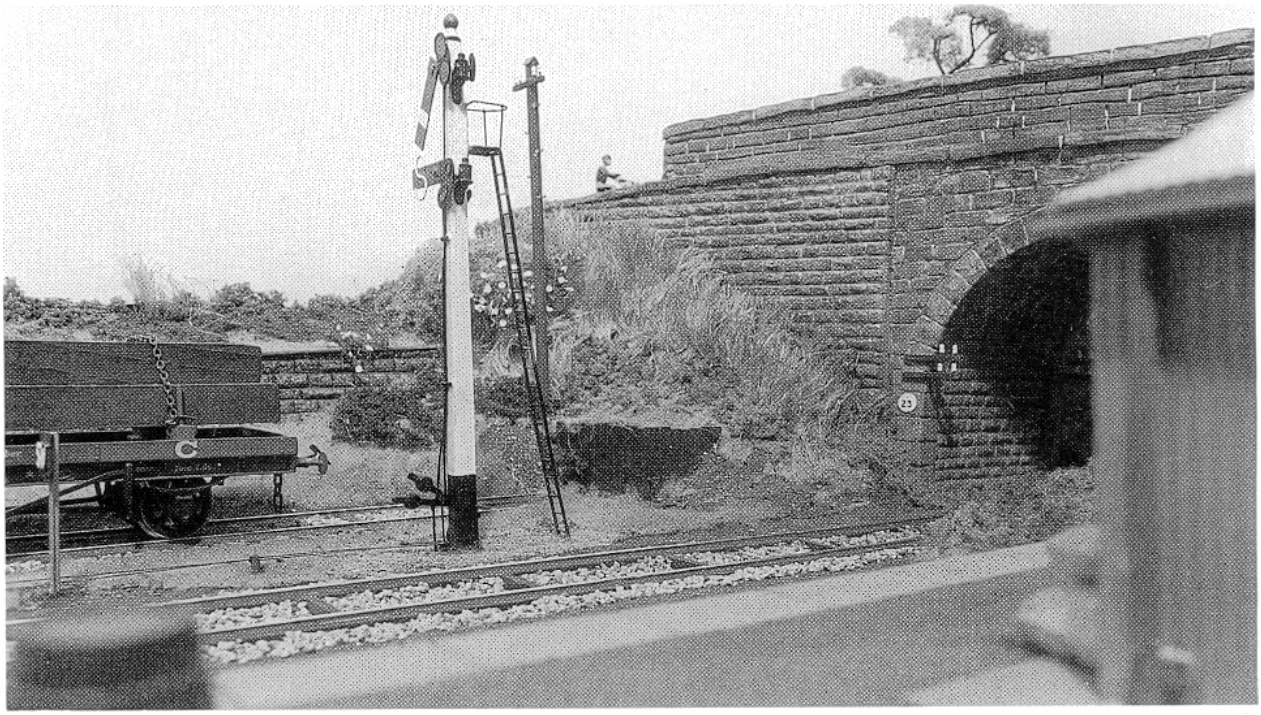
already been built) but completely bare apart from track and signals. Quite unexpectedly but most fortuitously, Bob Deakin, a fellow member of the Manchester MRS and the Gauge O Guild, offered to help with the scenic side of the construction. His offer was very gratefully taken up and a large part of the building construction and landscaping, and all the vegetation, detailed painting and backscenes are his excellent work. His skills developed as we went along, and lifted a good mechanical model to the level of a scenic masterpiece, in my opinion – I was quite amazed to see the transformation in my own railway. We got on so quickly as a result of his efforts that with two weeks to go before our formal public debut at the Manchester Christmas Show in December 1990, we had time left to fuss over tiny details like getting the rain reflectors on the telegraph poles to face the right way, fitting mile and gradient posts, weight restriction and whistle boards, and, almost totally invisible, GWR boundary markers.

I'm sure that most of the scenic techniques are fairly standard, but would need a whole article to themselves if they were to be described fully. The two basic materials are old rope, or hemp, for nature and Plastikard for buildings. Bob finds Plastikard far easier to work with than plaster for building surfaces, and uses my Dremel drill burr to carve individual 'stones' for walls and roofs. The station building is from Abbotsbury (a very popular choice), the warehouses from Totnes Quay, the bridge and tunnel mouth from the Kingsbridge branch, and the signal box from Perranwell on the Falmouth branch. The elevated site of this box turned out to be a necessity yet again, as there isn't really enough space to have a ground level box anywhere else. The buildings all have full interior detail, but the lights inside them finally overloaded my 12v power supply, so for the moment they are too dark inside for the detail to be seen.

I have built virtually all the rolling stock from various kits over the last ten years and now no longer need to run any of the earlier models that come from the post-World War I period. Everything on show is suitable for the Edwardian period – roughly 1900-14 – but all future construction is pushing the 1900 starting date further and further backwards, so that I've just started on Broad Gauge vehicle construction c.1880-1890, but that's another story. Many of the kits have been heavily adapted or rebuilt to produce an accurate model of a loco/vehicle of my period, with scratchbuilt chassis on all locos and heavily adapted running gear on all the coaches. More and more detail is now added to the coaches in particular, as both my prototypical knowledge and skill has increased. The trouble with this, of course, is that the speed of producing finished vehicles slows down in proportion to the extra detail added. The guiding principle is smooth, quiet, realistic and totally reliable mechanical operation of all stock, and to this end all the locos are fitted with fully sprung, split frame chassis with Portescap RG7 motors and 31:1 gear boxes, together with Alan Harris wheels on all new construction. The extra cost of these is far outweighed by the assured quality and ease of fitting (I use the telescopic axle type). All the coaches have full springing of each individual wheel so as to ensure good track holding and to eliminate the drumlike noise inherent in unsprung four-wheel coaches, and all wagons are compensated in various ways. The superb painting of locos and coaches is by Alan Brackenborough – a master of his craft.

As the layout operates primarily at exhibitions, any stock requiring uncoupling is fitted with my own design of unobtrusive auto-coupler, which is cheap, easy to make, and very reliable since it only needs permanent magnets and gravity (again!) to activate the various movements. Power supply is from two purpose-built Phobox controllers that another of my operators, Pete Boyce, builds and markets, and are specifically made for handling RG7 motors, with internal circuit breaker set for the appropriate current to protect the RG7 (thus eliminating the need for individual fuses on each loco, though I do in fact fit an alternative resistance protector in the locos for use on other layouts). My controllers always have a vertically mounted slider rheostat for control of speed with OFF at the bottom and MAX at the top, together with a changeover switch for reverse direction. I find that this gives much easier fine control than a rotary and/or centre-off rheostat.

Rolling stock is transported in purpose-built foam-lined trays, which are all of a standard modular size, so as to fit into carrying boxes in any combination. The



trays are subdivided into slots of various widths and lengths, suitable for different types of rolling stock.

The operating sequence as originally devised and in use at the moment, attempts to capture the types of train movement that a rural branch near to a big city would have had. Tavistock is an obvious parallel, where a rural branch did in fact see fairly heavy commuting into Plymouth from quite an early date. The basic service of local passenger trains is overlaid with strengthening coaches for the morning and afternoon school train, late evening trains for returning revellers from Plymouth, morning and evening milk trains, a morning general freight which shunts the yard thoroughly, and special trip workings from Plymouth with cattle wagons, horseboxes, and vans for the warehouse. The omission of a loco shed from Maristow was deliberate – it would have taken up a lot of space and would have seen very little use for most of the timetable. Light engine movements from the large shed only ten miles away in Plymouth add to the operating interest and have the extra advantage of assisting in the operation of the fiddle yard, by feeding locos on to the front of outgoing trains.

So far I have been very satisfied with the layout in both scenic and operational terms, and in the response it has elicited from exhibition managers who have seen it and from the general public. It sets out to provide high quality modelling with realistic operation together with the extra, unusual, feature of the baulk road, and has succeeded very well so far. The one design drawback that became obvious straight away was the unequal workload between the two operating positions – the station operator had to concentrate strongly all the time, whilst the yard operator has long periods of inactivity (this does, however, mean that the yard operator can talk at length to the public without causing operational disaster). This, together with a growing interest in the final years of the Broad Gauge era of the GWR has led to the design of a mixed-gauge scenic extension to Maristow, which will feature the actual junction to the branch, with the main line running

'Small Prairie' No. 4540 leaving the tunnel on its way into Maristow.

round the edge of a tidal inlet. This will allow the fiddle yard operator to fill his/her time running trains on the main line the gaps between the branch line service. Construction of the baseboards is far advanced at the time of writing, with the deadline of 18th May 1992 looming for a semi-finished state to be reached. It is hoped that this extension will actually be ready in a fully operational form, albeit with rudimentary scenery, for display along with Maristow at the Scale Modelling '92 exhibition at Alfreton in Feb/March 1992. This extension will be to ScaleSeven (seven *feet*, of course, not forgetting the extra ¼ inch!).

This layout can be seen at Scale Modelling '92, Alfreton, Derbyshire on February 29 and March 1. It will also be appearing at the Widnes, Heathcote and Derby shows during March and April.