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Hong Kong tram
in 4mm scale

Latest Reviews ... and much more

Francis Samish describes a recent project – a classic Beyer,Peacock 4-6-4T ordered for The Netherlands but diverted to military duties in France.
Photographs by the author, except as noted.

A Dutch conscript

A very British locomotive in war service abroad

Six 4-6-4T passenger locomotives were ordered by Dutch railways from Beyer,Peacock in 1913. A further order for thirty-four had only been partly delivered when, due to the downturn in traffic caused by the First World War, the Dutch authorities cancelled the balance of the order.

The forty locomotives were originally to be numbered 1201 to 1240, but the twenty-six that were delivered were later renumbered 6001 to 6026.

Fourteen were diverted for duty with the Railway Operating Division. They were assigned ROD numbers 1 to 12, 14, and 15; they were used on ambulance and troop trains as well as civilian passenger trains in the British sector.

After the war they were sold to the Chemin de Fer du Nord in France, and numbered 3.871 to 3.884. In 1938, all fourteen passed to the SNCF, renumbered 232.TB.1 to 232.TB.14. Two were withdrawn in 1946, but the rest remained in service until 1950-1951. In The Netherlands, twenty were still in service in 1952.

Backdating the DJH/Model Loco kit for the Dutch version to represent one of the wartime examples is relatively straightforward, providing you have some decent photos of the locos in British army service to follow. I was fortunate in being sent a set of scans that showed both sides; they could be enlarged on the computer to give enough information as to the locations of pipe runs and lamp brackets, etc.

First inspection of the components in the box revealed that the DJH chassis is actually an 0-6-4, with the front bogie being pivoted off the underside of the cast whitemetal footplate. Whilst there is nothing wrong with this approach, I felt that it would be easier to arrange things so that the running gear was made self-contained.

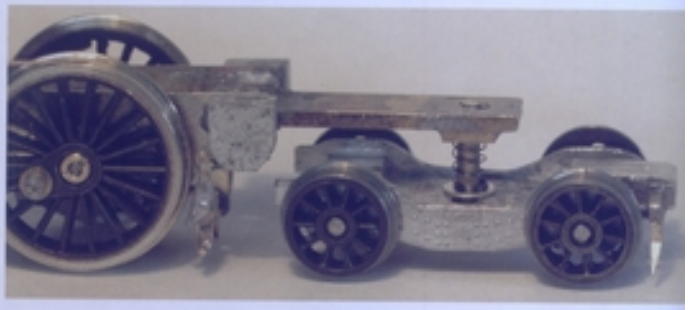
I could not quite make out whether the chassis was meant to be built as a keeper-plate construction, or to be bushed in the traditional manner. DJH do supply slotted square brass axleboxes, which seem to indicate the former. However, for better or worse, I elected to clamp both sideframes together, and take a chance on running a 4mm drill through both thicknesses of nickel-silver using a small precision pillar drill. A set of six home-turned round top-hat bushes were then soldered in to take the place of the kit components.

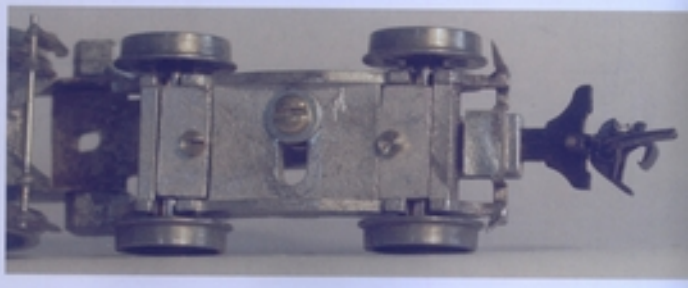
Though the drill did manage to bow the frames a bit, when assembled all the holes were still in line, and – more by luck than judgement, I suspect – came out pretty close to the same spacing as that of the etched coupling rods.

The chassis proper was first assembled dry using the DJH machined brass frame spacers and M2 screws, after which the various etched plates for bogie pivot and current collector ground were sprung into their respective slots. Once I was happy with the alignment, all the joints were soldered together, spacers and all.

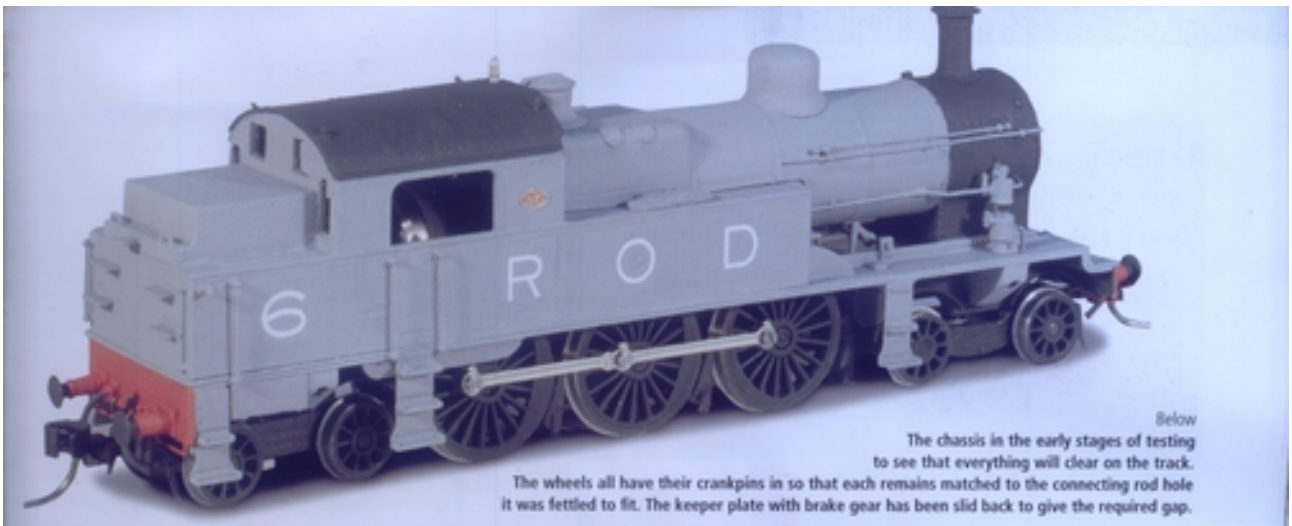
Because of the need to add a front bogie pivot mounting, an extension made from 2mm brass plate was grafted onto the front of the frames. This was made about 1.5mm narrower than the chassis sideframes proper, as it needed to sit between the cast dummy frames fitted to the underside of the footplate at the front of the locomotive.

Of course, I managed to get it in skew, and being picky, decided that there was nothing for it but to reposition the front pivot. The error was in the region of 1mm – no room to allow a simple re-drill and re-tap of the pivot hole, but enough to limit sideways movement of the front bogie. Luckily, there was vertical clearance to solder a small plate above the extension bar, after which it was a case of mark





Below
Front bogie. The spring bears on the bogie through a washer, to spread the lo over the soft whitemetal casting and forestall any chance of the fine end slipping into the gap between bearing sleeve and bogie guidance slot.



Below
The chassis in the early stages of testing to see that everything will clear on the track. The wheels all have their crankpins in so that each remains matched to the connecting rod hole it was fettled to fit. The keeper plate with brake gear has been slid back to give the required gap.

off (again!), centre pop, then drill through all the way for the new – and now hopefully correct – bogie pivot position.

On the footplate casting all that remained to be done at this stage was to cut off the original whitemetal bogie boss from the underside, and drill out the chassis mounting holes for M2 brass inserts. These were just bits of brass rod faced off and then drilled in the lathe 1.5mm for tapping size clearance. I do this as a matter of course now with all my whitemetal kit builds, as I have this nagging fear of stripping threads just when the loco is assembled for the last time after painting.

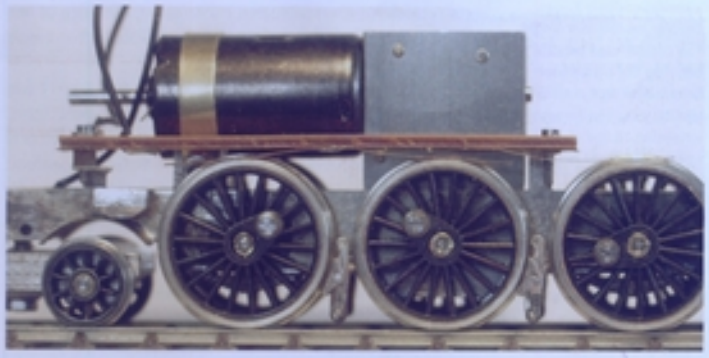
I was a bit doubtful of the way that DJH arranged for the bogies on this model to be nicely sprung vertically but left to their own devices as regards side control. However, on the track everything seems to work, even if the bogies also have to contend with buffing forces when propelling a train, as they also carry the couplings.

No soldering gearbox assembly

The heart of any model locomotive is the motor and the way its power is transmitted to the wheels. The kit provides for a comparatively large can motor plus flywheel, and a two stage gearbox unit that is assembled using screws and spacers rather than the more usual fold and solder method. The only problem with this – and many other similar gearboxes in 4mm scale – is that the motor mounting screws cannot easily be got at with a screwdriver once the worm and other gears are assembled.

As the motor mounting plate is separate in the DJH gearbox, it can be test assembled beforehand into the gearbox sideplates along with the two gear shafts, one carrying the wormwheel and idler gears, and the other the ⅛" diameter driving axle with the final drive gear. By rotating the motor shaft any tight spots can be identified and attended to. Then and only then can the motor mounting plate be taken off and the motor mounting screws proper tightened down for keeps with a drop of Loctite dabbed on the edge of the heads to stop them coming undone.

As supplied, the final drive gear is supposed to be Loctited to the middle driving axle and comes with a plain bore, to suit the standard Markits ⅛" OO/HO axle. All well and good, except that once the gearbox and motor is dropped into the frames – and the axle securely fixed – there would be no way to remove the motor or gearbox later without major dismantling. To their credit, DJH show, in the separate gearbox instruction sheet, an alternative gear complete with boss and grub screw mount. It should be possible to order up this part from DJH, though being my usual impatient self, I set to with the lathe and made a suitable bush, opening out the supplied gear's bore to match, and then soldering said bush and gear together after drilling and tapping 10BA for a grub screw. The screw is a bit bigger than it should but no-one is going to see it when the model is on the track, and the fact that it is a cheese head means that there is less likelihood of the getting irredeemably chewed up if it is inadvertently over-tightened!



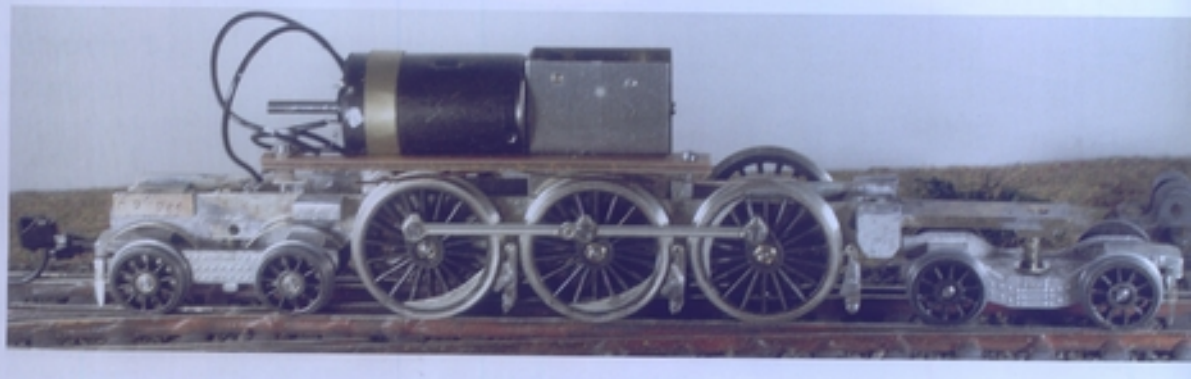
There is a whitemetal saddle casting provided to stop the motor rotating around the driving axle when the engine is travelling forward. I felt it prudent to add a restraining strap from brass strip to eliminate any chance of the motor trying to rise up inside the body when going in reverse even though it is a close fit within the superstructure and boiler.

Wheeling the chassis

Wheels are Markits RP25 profile, with DJH's own tapped bushes inserted to take M1.5 threaded crankpin screws. I have an ⅛" parallel reamer that I bought years ago which I run through all my OO/HO chassis just to take off any edges on the axle bushes which might still be there – whether turned at home or bought in – and also to ensure that the bores are truly in line.

For what it is worth, I always put together driving wheel sets for an engine off the chassis. This allows me to check the

Below
'Blacksmith engineering' at its crudest! To bore out the brass gear from ⅛" to 6mm to accept a bush for a grub screw, I mounted it flat in the stepped jaws of an engineer's drill vice. Aluminium packing strips protect the teeth, and the vice is left to float on the pillar drill table so that the drill can centre itself to follow the existing bore. Not pretty, but it works!



Above
The chassis assembled, complete with a Kadee coupler on the rear bogie. The copper-clad paxolin strip carrying the phosphor-bronze pick-ups is clearly visible, as is the forward extension to the chassis to take the front bogie.

seating of the squared axle ends into the zinc cast wheel centres better, so as to make sure each one is fully home and at a perfect 90° to its axle, thus minimising the chance of one wheel going 'rogue' and developing a wobble that would upset the back-to-back through pointwork.

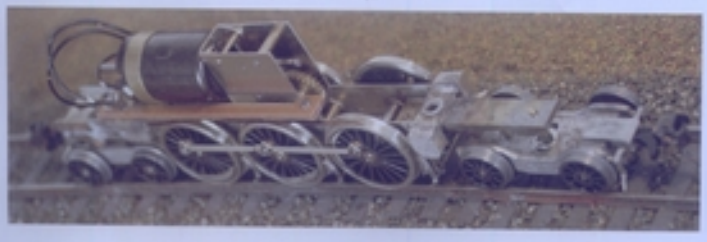
Dropping the coupling rods on for the first time, I was relieved to find that there were virtually no tight spots. Checking for binding is done either with the final drive gear grub screw slackened off, or without the motor and gearbox. The idea is that you want to ensure that any drag can be attributed just to the coupling rods. Rotate the driving wheels with your thumb, and instead of forcing through a tight spot, go back until you can sense it from the other direction. A jeweller's eyeglass is a great help in identifying which hole will need opening out, as you should be able to see the affected crankpin sticking.

One of the problems in opening out these small holes is that in this scale there is precious little 'meat' available around the coupling rod eyes. The best that can be done is to set the rod in a small precision vice at an angle so that the offending hole is gripped by its bottom edge, and carefully file the 'eye' oval. The very tip of a Swiss round file will do the job, but resist the temptation to saw the file back and forth, as it will only be really cutting on the forward stroke. Go gently, as otherwise the file can catch, and whip the coupling rod being worked on out of the vice, bending the rod in the process.

Current collection

DJH have gone to some lengths to make this as foolproof as possible, in that the top acting wipers are secured to bent over tabs on the chassis using moulded nylon pin blocks. There is not a lot of clearance between the top of the drivers and these tabs, so that if ever the driving wheels have to come off, their flanges will need to be sprung past the pick-up strips.

Below
The rolling chassis. You can see how the pick-up strip has been cut away to clear the side of the can motor, and the brass strap that now stops the motor from pivoting around the driving axle. The whitemetal sandboxes have been soldered to the side frames, but the bogie bolster castings will be attached to the body.



I was not happy about this initially, but fitting new wipers underneath the chassis as per my normal practice seemed like a lot of extra work to get it all in and re-use as much of the kit brake gear as possible. As a compromise solution, I opted for a strip of copper clad paxolin – O gauge point sleepering, cut down to size – to which the kit's etched phosphor-bronze pick-ups were soldered. The strip sits on top of the original tabs, using a turned tufnol spacer to bring both to the same height, and secured by a couple of 12BA screws tapped into the etched holes for the DJH pin blocks. The only drawback is that the extra height of the assembly at the rear meant that I could not mount a flywheel onto the rear of the motor. But I felt this was a small price to pay to ensure everything can be broken down for painting and maintenance.

Current is also collected through both bogies, the rear of which is mounted via an insulated bush. The wheelsets are supplied with only one wheel insulated, and are assembled with the live axle to the bogie frame on one side. Getting these on is a bit tricky because of the springs that keep the bogies on the track, and on the rear I resorted to using a long screw as a stud nutted onto the insulated chassis bush, so that the spring and its accompanying sleeve could be easily slipped on whilst the chassis was held upside down. A nut on the top of the screw, tightened down onto a washer and tubular spacer, secures everything.

Before leaving matters electrical, remember that there is only about 1mm clearance between the top of the rear bogie and the buffer beam. Track testing showed that this was just sufficient to accommodate up and down movement, but not enough to prevent passing contact between the rear bogie and one of the air hoses – which are lost-wax castings, soldered to the buffer beam. However, some tweaking with a pair of round nose pliers – so as not to mark the soft brass detail of the hoses – gave the required gap to avoid a short on most curves down to a medium radius.

While the bogies might at first sight look the same, they are in fact different wheelbases. The wheelsets are retained by keeper plates, but care needs to be taken before these are screwed home to ensure that the axles turn freely and the inner wheel bosses do not bind against the edges of the U-shaped axle slots. If there is too much sideplay, you can – at a pinch – in such cases take one wheel off its axle and drop in one, two, or even more 2mm fibre washers. Control of sideplay is critical, as too much can make the locomotive hunt side-to-side at speed, as well as giving couplers too wide a swing.

NEM pockets – but no NEM couplers

The model comes with NEM pockets designed for clip-in couplings; I fitted Kadees. Even so, the whitemetal castings had to be carefully adjusted for clearance and their heights reduced before the lids were soldered on with low melting point solder. Room also needs to be made for the hooked NEM coupler shank tang to spring outwards and so retain the coupling in position. I have a Kadee coupler height gauge which is used to set both the magnetic trip pin height and the knuckle height. The trick with these couplings – especially the older pattern with their separate draft gear boxes – is to set them a fraction high to start with, so as to allow for any droop at the knuckle end. A great help too is the fact that most Kadees come in varying lengths – I used a short version on the rear bogie and a medium length shank on the front, to allow for overhangs and buffer and pipework clearances on curves.

Brake gear

The brake gear is rather prominent on these engines, and DJH have arranged things so that it can all be assembled as a unit on what is intended as the axle keeper plate. This is actually a whitemetal casting which I would have replaced with brass strip were I to have gone down that route when assembling the mechanism. Once the hangers are bent up and located on their 'pips', the gear proper can all be assembled with the etched shoes touching the wheels, then slacken off the plate mounting screws and everything can be slid backwards about 0.5mm to give the required electrical gap between the wheel rims and shoes in one easy step.

Levelling the footplate on the rolling chassis was a case of loosely tightening up the front and back mounting screws and then checking that all four corners were at the same height off a flat surface. Packing pieces of brass shim are inserted between the tops of the chassis rails as required, or the 'high' chassis rail is filed down, until there is no perceptible 'rock' between the two. Only then can the shims be soldered or glued to the underside of the footplate. The mounting screws can then be tightened up securely without the risk of introducing a twist into the carefully set-up mechanism.

Superstructure construction

Body construction was fairly straightforward. Using the footplate as the starting point, the side tanks, cab, and bunker sides were first tack soldered on, and once everything was squared up the cab front and rear and the bunker back were set in to make the assembly nice and rigid.

Against my better judgement, I attempted to fill the gaps between the bunker sides and rear, and the front and back of the cab, by flowing in lots of low-melt solder. This was only partially successful, as the solder formed itself into a radius rather than just bridging the gaps between the whitemetal components. This would not in itself have been too much of a problem were it not for the fact that DJH have faithfully recreated all those rivets .... I did my best to level everything off using scrapers ground down from old needle files, but even so the result is not as good as I would have liked.

Right

Footsteps. The wider two have three steps and go under the cab. Soldering these up was a bit more fraught than usual, in that I had to clamp the middle tread set in place with a pair of forceps before moving on to the top one. This is where you need a hot iron, despite the small size of the component, to stop the heat leaking away into the clamp.

Below

The keeper plate casting serves no mechanical purpose and only holds the brake gear in place. Because the mounting holes are slotted, the brake shoes can be assembled hard up against the tyres then the whole thing slid back just enough to give the required gap. The final drive gear at the bottom of the gearbox can just been seen, together with its new boss and the cheesehead bolt that I used instead of a grub screw.

Before the boiler can be set in place, the etched pieces representing the inside motion link arms need to go on. The reversing rod leading back to the reverser in the cab is quite short and it is easy to get this at too acute an angle. It is also awkward to fit unless you first rivet the rod to the weigh-shaft crank. The latter can then be slipped over the weigh-shaft end and will assume the correct position once the gently sloping angle of the reversing rod has been 'sighted' back to the imagined position of the reversing gear in the cab.

Two self-tapping screws secure the smokebox to the footplate from below, with the Belpaire firebox secured to the cab front by soldering. As nothing mars a model more than a sloping boiler, I took great pains to set this component level, with the footplate and side tank assembly bolted up onto the rolling chassis.

Final soldering jobs underneath the footplate included fixing the front and rear buffer beams. Note the front is lower than the rear. Even though this would normally be a 'final touch', I elected to add the cast brass air brake hoses at this point as I wanted to get all the soldering done before moving on to adding the details with super glue. Even though they are quite delicate, I felt that soldering would be more secure than glue, especially as I could foresee them having to be adjusted later by bending with long-nose pliers to clear the couplings and bogie swing.

Adding details

Footsteps need to be soldered up as separate sub-assemblies, and there are six of them, four with two steps and two with three. These were awkward to put together without the first rung coming unsoldered whilst working on the second.

The 'leg' provided for fixing them to the underside of the footplate is a little narrow, and if I were doing them again I would probably drill a hole for a 1mm 'peg' to hold the component more positively upright whilst it was being soft soldered to the superstructure.

Then there were the splashers over the bogie wheels. Etched strips are provided with a recess along one edge to sit

Left
Making drop grab handles 1. The wire is bent to the usual long U shape, then set in a vice level with a scrap piece of bar the same scale height as the finished handle.

Left
Making drop grab handles 2. The upright handle is then carefully bent flat, using a metal plate that is wide enough for leverage.

Left
Making drop grab handles 3. The finished grab handle.

in cutouts under the smokebox and engage with the brass sideframes. Try as I might, I could not get these in, so in desperation I cut new pieces from brass strip, curved them to suit, and then temporarily clamped them flat onto the outside edges of the arches with a pair of forceps whilst applying the iron and plenty of flux. One ended up with one end slightly higher than the other, but the others came out more or less in the right position – not that you can see them at normal viewing distance!

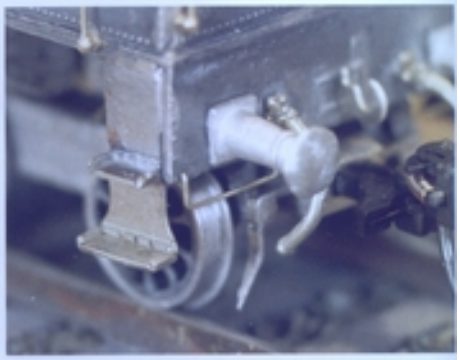
Dimples are provided to locate the various handrails, and there is no alternative here but to go around methodically with a pin vice and drill them all out 1mm to match the shanks of the knobs provided. I use a single-ended pin vice with a rotating finger pad on the end but a drawing pin or similar dropped into the hollow end of the normal pin vice will do just as well. Do not even think of doing these holes with any sort of power tool: the bit will either catch in the whitemetal or else will to wander when the hole is started, in the process either breaking the drill, marring the part, or both.

As to the handrail knobs, it is a good idea to check using a magnifying glass or jeweller's loupe that the bore of each knob is clear before trying to thread it onto the handrail. If not, catch the shank of the knob in a pin vice, and use a drill of the appropriate size in another pin vice and go gently through from the 'good' end.

Holes for boiler handrails and other pipework that need to be made in the cab front or back have often to be drilled place to ensure that they line up properly. Often, there is not enough room to get a drill in straight, especially on a tank engine like this, so the only alternative is to drill slightly oversize and carefully at an angle, then giving a slight 'kink' to the last millimetre or so of the handrail wire, enabling it to both locate in the hole yet assume the correct position parallel to the boiler cladding. No one will be any the wiser as to the subterfuge after a touch of superglue and a coat of paint have filled the resulting dimple.

In my experience, kit manufacturers tend only to give you just enough knobs for the job in hand. Whether it is my increasing years, or whether the knobs have got even finer

Above right
Making drop grab handles 4. In place on the buffer beam. Matching the grab to a block in the vice means that all come out the same height.



of late (probably both!), I always seem to lose a few in the course of a build, so recommend always having a couple of packs of the sizes that you use regularly to hand to make up for the inevitable losses.

Where pipework is mounted close to the boiler or platework, I make the clips from loops of fine copper wire, with the loose ends then wound together tightly in a spiral with a pair of tweezers. These 'mini handrail knobs' are then merely poked into holes drilled for them in the model, matching the locations seen in pictures of the prototype.

Lamp irons can be bent up out of strip, but I cut the vulnerable ones on smokeboxes out of a solid piece of brass of the correct scale thickness (or a bit thicker...) in one go, using a fine saw and a file to get the correct L shape, complete with the mounting pegs.

Lost wax brass castings are provided for the characteristic NS marker lamp brackets, which project outwards at an angle from the rear of the bunker. Whilst probably perfectly acceptable in terms of detail, their softness made me want to replace them with something stronger – in this case, some long O gauge handrail knobs that I had, with the ends filed into squares whilst held in a pin vice. Shorter ones similarly treated did duty for the brackets on the smokebox sides.

Backdating the kit to represent the ROD machines is mostly a matter of leaving off the more modern appliances, such the feedwater heater and the NORD train description boards.

Painting

Then it was time to take it apart for painting. I now have a routine which involves mounting the driving wheelsets in a piece of card with a series of numbered slots to correspond to each axle's position in the frames from the front. Each driving wheelset also has its appropriate crankpin screw and collar or nut screwed on – just in case one is longer than the others or whatever – and the coupling rods themselves are

Below
The classic lines of these turn-of-the-century Baltics really start to shine through.

also marked for left and right sides – especially important if the loco has a symmetrical coupled wheelbase, since if each rod has been 'eased' separately, swapping them over side to side can lead to a puzzling bind when all is re-assembled.

Screws, nuts, and other fixings were all put into separate plastic bags marked with their location, even if in some instances there were only one item per bag. I cut these from the kit packing and secure the folded-over end with a small staple. It saves all the frustration later in having to hunt through a small box for the 'right' length of bolt, and lessens the chances of small parts vanishing into the darkest corners of the workbench.

With the chassis and body now bare, the first thing is to give everything a light scrub with a brass suede brush on the main flat areas to both key the surfaces mechanically and also to ensure that all small parts are secure. More delicate parts are gone over with a fibreglass pencil, although I am not a fan of these as however hard you try to prevent it little slivers of the filaments always get into the fingers and are jolly painful!

For the chassis, I brush on Precision Paints clear self-etching primer as the base coat, followed by the same company's dirty black, which is actually a very, very matt dark grey, and ideal as a base layer for further weathering.

Preparation for the body was relatively straightforward, and consisted of a preliminary scrub and soak in water to which some baking soda had been added to neutralise any traces of solder flux. After this had been rinsed and thoroughly dried, the superstructure was rinsed in cellulose thinners, followed about an hour or two later with a coat of aerosol automotive grey primer.

This revealed the usual 'lumps and bumps' where the superglue had run and, because it is clear, not been noticed earlier. A folded strip of fine wet and dry paper was used to cut the various blemishes back, and then another coat of primer was applied, this from a little further away than normal, almost as a mist coat, to minimise the effects of too much paint build up and possible loss of surface detail.

Unlike the earlier ROD engines I have been asked to build, this one was to be finished in the grey livery rather than black. Researching the actual shade raised as many questions as it provided answers. The concensus seemed to be that the colour was a dark, slate gray, akin to the battleship grey used by the navy. I worked back through the various BS colour codes and this led me to choose Humbrol 165 Medium Sea Grey for the top coat, though now that the model is finished I tend to the view that it is too light, and perhaps something like Humbrol 125 would have been more appropriate.

Having said that, of the two or three extant photos of these locos in war service, one is definitely on the light side, and the other two seem to have been taken on overcast days, which would have affected the rendition of the actual colour onto the original negatives.

I was not looking forward to having to paint around the white lettering on the home-made ink-jet transfers that I had used up to now, I experimented by having a local printer reproduce the 'ROD 6' transfers using a very high resolution commercial printer to output the PDF file I had prepared onto laser transfer paper. At normal viewing distance, and close up under the naked eye, the result was good – but under the magnifier you could start to see the individual dots of colour making up the background shade. So, reluctantly, it was back to the OO size brush and back painting with body colour to the edges of the white letters.

Above
The bunker rear fits between the two main side tank and bunker sections, so the rivet line is unavoidably further in than it should be. Handrails and bunker steps are fixed with superglue; steps on the underside of the footplate are soldered.

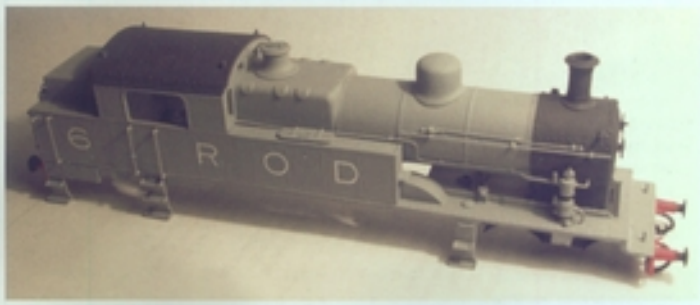
Left
Lining and lettering is one of the most time-consuming aspects of building locos and rolling stock. It can take two or three days before one side is finished, and then you have to wait for it to dry thoroughly before turning the model over to do the other side. Here the high-resolution printed transfers, complete with what should have been matching colour background, have been set onto the body, using Solvaset decal softener. Once any bubbles have vanished or been lanced, it is time to paint around each white character with a fine brush, effectively using the transfers as a painting guide.

Cab roof, smokebox, and footplate were finished in the same Precision Paints dirty black, applied carefully by brush so that if any brush marks manifest themselves when dry, they are at least orientated downwards so as to mimic the effects of rainwater weathering.

Buffer beams are red, again as per normal British practice of the period.

Finally, a coat of Humbrol matt enamel varnish from a spray can was misted over to blend everything together.

Below
Black parts are generally painted with a brush. For smokeboxes and other difficult areas, I use a OO brush to define the edge, and then paint up to that rather than attempt to do it with a broader brush in one go.



Finishing touches

I try to leave everything that has been painted for at least a week in a cardboard box in the warmth of the airing cupboard. When everything is dry, re-assembly and track testing can be undertaken. Wheel treads were scraped clear of any stray flecks of paint, bogies (with Kadee couplers) slipped onto their respective sprung pivots, and just a smidgin of oil applied to gears and axles. The rear bogie obscures the body mounting screw at that end, so has to go on last.

The icing on the cake, so to speak, was to add the brass whistle on the cab roof, and the Beyer,Peacock works plates. I am not sure whether they should have a red background, but they do look rather nice when set against the grey livery. To get the polished brass effect, I merely filled the background with red paint, waited for it to dry, and then lightly sanded the plates face down over a sheet of very fine wet and dry paper. The plates are secured using tiny scraps of double-sided adhesive tape, any extra squeezing out after mounting on the model being carefully pared away with the sharp blade of a craft knife.

The end result is a miniature reproduction of quite an elegant piece of turn-of-the-century motive power.

Given the relatively straightforward build, I was surprised that it took me between 110 to 125 hours to complete, with perhaps as much as 30 hours devoted to the finishing process.