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Miniature Lokomotive u. Wagen Bau, England

www.modellost.co.uk

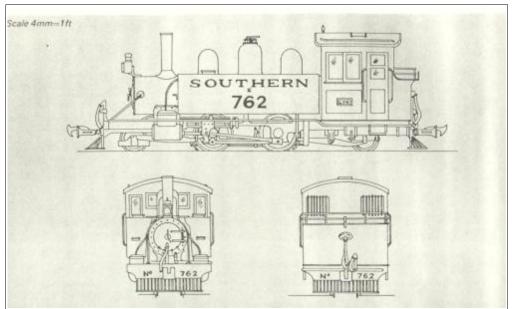
info@modellost.co.uk

+44 (0)1308 897 911

BUILD NOTE

Lynton and Barnstaple Rly. 'Lyn' 2-4-2 - from the Backwoods Miniatures kit in OO9 / 1/76 scale

One of the few UK 'long distance' common-carrier narrow gauge lines, the L & B's locomotive stud comprised three Manning-Wardle 2-6-2s, and Lyn, one of the very few American narrow gauge locomotives to run in the UK. Upon closure, all the locomotives bar the last built for the line - Lew - were scrapped, and all that was left of the (not so) little Baldwin was the cab, which being wood, found further use as a garden shed. However, as the wreath on the last train had it - 'Perchance it is not dead, but sleepeth' - attempts are now being made to rebuild the railway on its original route. A replica of one of the Manning-Wardle's is already running, and a new 'Lyn' is well on the way towards completion.



What it is supposed to look like when its finished...

The Backwoods Miniatures kit comes with most of what you need to complete the model, except for the couplings. There are lots of nice detail parts, most notably a set of cab fittings, and fortunately in this version of the kit, good old fashioned Romford pony truck wheels that you can solder close to with a (relatively) low risk of melting the axle insulating bushes.

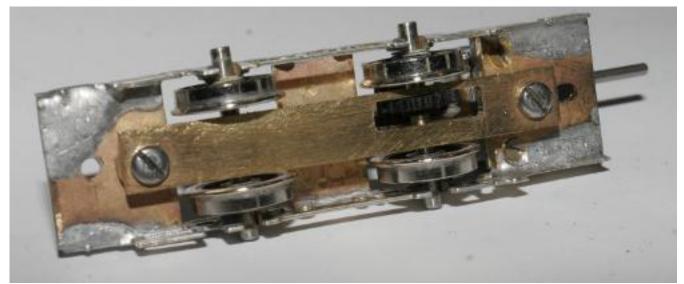
I deviated from the construction recommended by Backwoods, because I have not the confidence in my skills to build a model like this, and this small, as a 'one-shot' exercise. I prefer to be able to subdivide all the various bits into self-contained assemblies, and then bolt them all together later, testing each stage for correct operation and fit, as I go along.



Note that I have removed the front and rear chassis extensions from the Backwoods etch; I reasoned that they would impede bogie swing if left in anyway, and would be exceedingly vulnerable to damage during the build.

Having long ago built a couple of OOn9 locomotives before, I knew that with a model this long and with such a comparatively short wheelbase, the pony trucks - which need to carry the couplings as well - have to have unimpeded movement side to side and up and down. Lyn's wide cab and the valances around the front pilot, provide ample space to hide the leading and trailing wheels movements, as a 4 coupled chassis is always going to 'waggle' a certain amount, given the back to back wheel dimensions necessary to make N and OOn9 gauges work in the real world.

After some thought - and there's an awful lot of thinking in a build like this - I opted to convert the kit sideframes into a keeper plate chassis, and make my own soldered-in chassis spacers from brass bar. (There's no room for my usual turned and screwed OO or larger pattern...)After opening out the axle holes in the etched fret, new turned bushes were soldered in, and then 'slotted out' to receive new, longer, 2mm axles.



Chassis from beneath - the slot to one side is to accommodate the driven axle gear.

Keeper plate also serves the function of beefing up the mechanism.

To assemble the sideframes and get everything level, the keeper plate and its mounting spacers were first screwed up tight, the wheels and axles inserted in the frames, with toolmakers clamps holding everything together cross-wise at the ends. The whole assembly was then set on a surface plate, and prodded this way and that, until the wheels sat level on the flat.

With the clamps done up tight, the spacers were soldered in with a hefty 75 watt iron, rinsed under a tap to remove the flux, and set aside to cool. Once dried off, the keeper plate could be removed, and the axles and wheels dropped out, ready for the flycranks to be fitted. As a precaution, I placed a couple of PECO 2mm fibre axle washers on each axle, to guard against any possibility of shorting across the Romford wheel centres.



Chassis partly assembled with all the 'bits' laid out for inspection. I turned up the bushes and spacers for the crank pins out of brass bar, and the M1 screws were shortened by being screwed into a piece of threaded bar the thickness of the finished screw length, and then filed down.

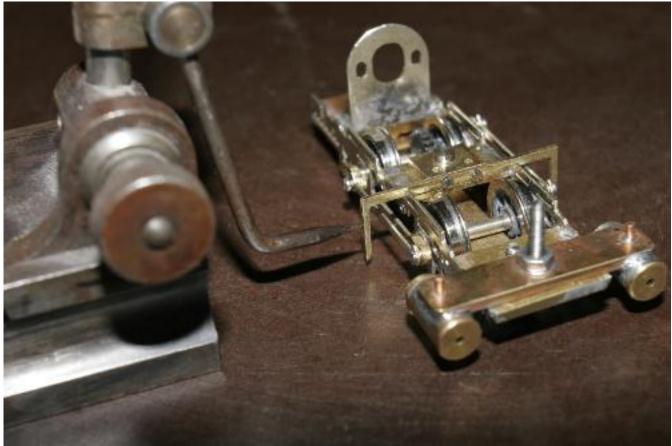
The Backwood cranks are cast brass, but I opted to make my own, from brass strip drilled in a jig to create the embryo cranks, which were then drilled and tapped for the crankin screws - M1 in this case - whilst still 'on the bar'. Each was then sawn off into rectangles, and then individually filed up in the vice.



Crank drilling jig in the machine vice. The 2mm dowel - just visible - ensures alignment of the drilled hole for the crank pin to the axle. The crankpin holes are tapped before the cranks are sawn out of the bar and shaped. Completed crank laid on top of vice jaw above acme screw.

If I had to do this again, I would probably ream the holes to suit the axles, rather than try to go straight through with a final size drill in one operation. The reason being that if you look in some of the photographs, a couple of the cranks have gone on skew-whiffy due to the drill cutting a slightly oversize bore. All of which led me a merry dance with chasing tight spots when it came to fettling the coupling rods later.

Loctite 641 is used to secure the cranks to the axles. Despite my best endeavours, I did manage to get some into the chassis bearings. But, because of the keeper plate construction, it was possible to lever the offending wheelset out, clean everything up once the Loctite had set, and carry on with the build.



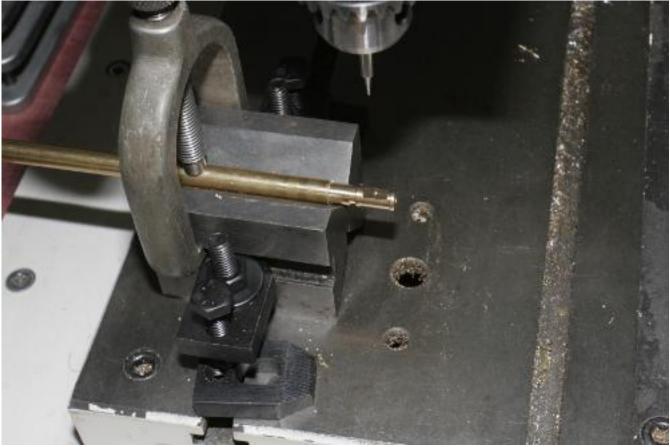
Setting the motion bracket height for the slidebars with surface plate and scribing block. Note the screws holding the motion bracket to the chassis plate. It is just too risky to attempt soldering a mechanism this small.

The cylinders and motion plate are made as a separate unit. The front of the chassis has been 'stepped' so as to allow a full-width brass stretcher bar to sit in place of the Backwoods design of whitemetal cylinders and etched components sitting in slots. I erred on the side of caution by positioning the cylinder centre-lines over-scale width, to allow for any sideplay in the front coupled axle, and also to accommodate the thicker cranks and their crankpin screws.

Slidebars are replacements made from 0.5mm steel plate - the Backwoods ones were too short for my cylinders - and soldered in to holes drilled in the turned brass cylinders. As per the prototype, once the cylinders were fixed to the stretcher, they were filed 'flat' on their outer sides for clearance within the loading gauge.

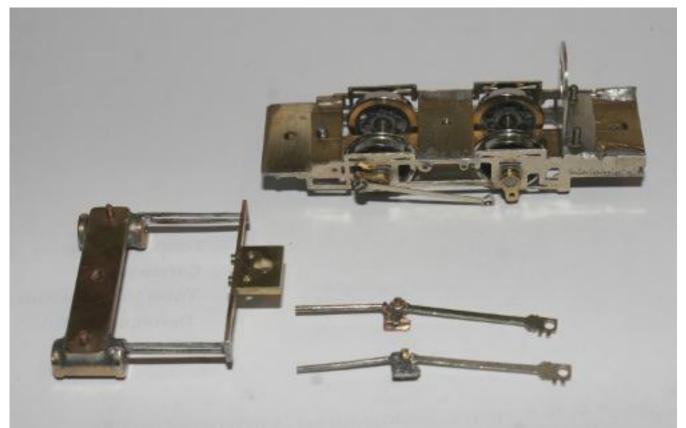


Cylinders 1 - once a cylinder has been turned up on each end of a section of bar stock, drilled ror the piston rod, the bar is clamped in a vice and each 'round' embryo cylinder is then filed to accomodate the stretcher. In reality, these would each have been been cast as one half by Baldwin - and as adopted by Churchward at Swindon. The block of wood is to support the filing operation.



Cylinders 2 - after filing each cylinder needs to be drilled for a locating 'peg' to hold it in place whilst everything is soldered together, and more importantly, to keep the one side in place, whilst the hot iron is applied to the other end...

Motion plate deserves a closer look in that this is actually fixed to its relevant mind-frame stretcher with 14 BA screws. To prevent tap breakages - 14 BA taps are I think if not no longer made, certainly increasingly more difficult to find - I drilled a pair of cross holes for the tap end to 'break' into, and also so that I could ensure visually that a full depth of thread was being formed for the screw.



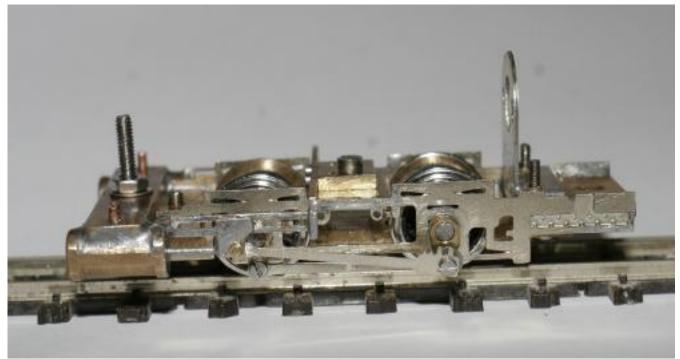
Slidebars in more detail. The cross heads are Backwoods items, but tinned with soft solder to better represent steel, and are secured with 12 BA nuts and bolts.

The motor mounting etches are designed very nice and tight, but in this instance, my chassis building skills were not up to getting everything in proper alighment first time around. The only solution was to make up a more substantial 'outrigger' shaft for the idler gear - this is in any case prevented from coming off the shaft by the axle driven gear - which can now be jiggled up and down to get the best mesh between the motor work and the rest of the two-stage drive train.



Motor mounting showing intermediate idler gear 'outrigger' shaft.

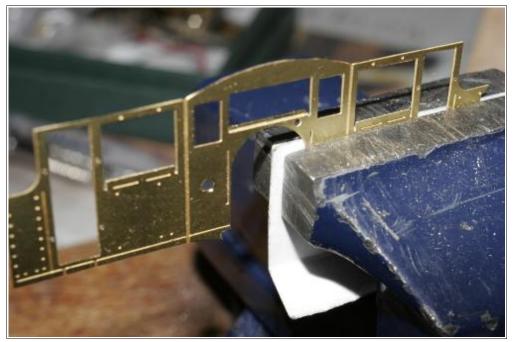
As a footnote, Backwoods Miniatures seem to have used the same idea of a 'drop-box' intermediate gear carrier as I fitted myself to a batch of three Vale of Rheidol engines from Backwoods kits that I built back in the early 1990s. Good on you Peter, I say....



Without pickups, the chassis as it stands will freewheel down a 1 in 10 slope, which I think is about the best one can hope for in 1/76 scale, given the tolerances that these constructional methods can only really result in a 'craft' as opposed to an 'engineered' mechanism.

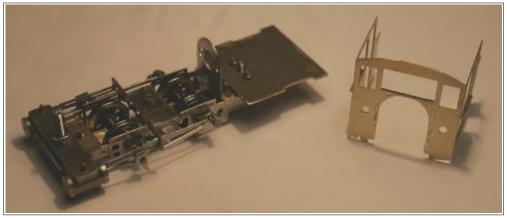
On this 'modified' 'Lyn', the motor is now offset further towards the right than as designed, which in turn meant that the cab etch needed clearancing accordingly. I decided too, to leave the motor open inside the cab, rather than fit the kit's boiler and backhead over it. Not so much as as to save extra work, but to let the motor run cooler - which should hopefully allow it to last longer - and also to allow the fitment of a flywheel.

Perhaps one of the major issues when modelling American-built locomotives, is the lack of a conventional running plate to act as a 'datum' during construction. 'Lyn' adds another layer of complexity, in that the kit has no boiler as such to serve as a backbone to hang the tanks and cab onto.



Folding up the cab - made more complicated because of the need to bend out the bottoms of the front and side windows. Note the piece of white card to protect the rivet detail from the vice jaws.

Backwoods provide a simple slot and tab to secure the rear of the tanks to the cab front, but I elected to use brass screws, nuts and square spacers so that I could jiggle everything around until everything lined up and fitted to my satisfaction, before finally soldering up for keeps. Two holes had to be drilled through the cab backsheet - don't worry, you can't see them now that the bunker is on - to allow a jeweller's screwdriver in to have access to the cheese head screws. To ensure that the nuts could be grabbed with a pair of forceps, and to allow the soldering iron access, the bottom and inner sides of the tank etches were cut away, leaving only a vestigial lip underneath to make the resulting open sided box a little stiffer than it might otherwise have been.



Cab, new full width cab floor with cutouts for steps and - just visible due to my use of a box Brownie camera - the 10 BA screw heads holding what will become the main body mounting plate underneath the cab floor. Holes in cab front are for tank assembly screws.

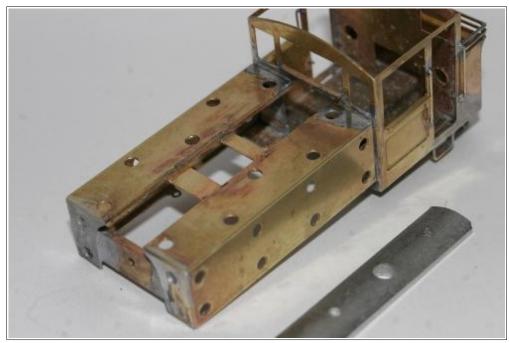
The cab floor has an M2 tapped plate screwed on underneath with a pair of 12 BA screws to serve as the rear body mount, and which held things securely whilst the tank bottoms were levelled up on a surface plate. Again, screws were used initially, to elminate the risk

of the plate shifting its position, were solder only to be employed.



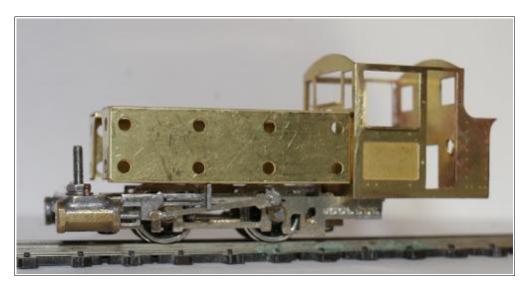
View from below prior to soldering everything up solid. The bolts allow one to jiggle the tanks up or down and side to side so that this key superstructure join will allow the body to sit level onto the chassis. The bottoms and inner sides of the kit's etch have been removed to allow access to the nuts - using a pair of forceps - and access to the slotted head screws is via holes in the rear cab weatherboard. 1 mm thick flat brass spacers are used to retain the gap between the tank backs and the cab front. Needless to say, these shifted during soldering...

With the cab and tanks together, a 2mm thick brass crosspiece was set in behind the tank fronts. The smokebox then received a turned brass insert, through which a long M2 screw passes to secure it to the tank crosspiece. Another threaded brass insert was set into the base of the smokebox saddle, forming the front body mounting.



Cab and side tank assembled. Note the supports between the two tank tops. These will stop the cast whitemetal boiler top section from falling through whilst it is being soldered in. The front - thick - crosspiece will take the smokebox, secured via a single M2 screw passed in from the front.

In fact, it is is not quite as simple as that, since the front body mounting needed firstly to be soldered to the front pilot using ordinary tinman's solder, and then the complete pilot and cowcatcher assembly fixed with low melt solder onto the whitemetal smokebox in turn. The threaded insert forming a 'stud' over which the smokebox saddle could then be dropped. This last operation being all done with the front apron complete with cowcatcher mounted on the chassis. All a bit nerve-wracking really, as if the low melt had decided to run where it ought not to, the whole front end would have been locked solid.



"Why go to all this bother?", you may well ask Well, it all makes for a mechanically rigid assembly which is better able to survive the odd derailment or two - though I would draw the line at a tumble off the edge of a scale height Chelfham viaduct - and which can stand up to the application of a motor tool to remove those inevitable fouls that tend only to emerge when a model is track tested prior to painting. Long ago, I realised that I could never hope to produce models the calibre of a Beeson, a Guy Williams or a Bernsten, but I could aspire at least to build stuff that was mechanically robust and that runs almost as good as today's RTR.

That mention of robustness brings up the small matter of couplings and pony trucks. Compared to the Manning-Wardles, Lyn's 'footplate' height - specifically the locomotive's front pilot deck and cab floor - are about six inches lower than its Leeds-built stablemates. That 2mm in 1/76 scale may not sound much, but it makes things very tight when arranging for springing and vertical movement of the leading and trailing axles.



Lyn on a standard Peco OO9 point. Notice how the rear coupler is now lying - more-or-less - along the centre line of the turnout curve.

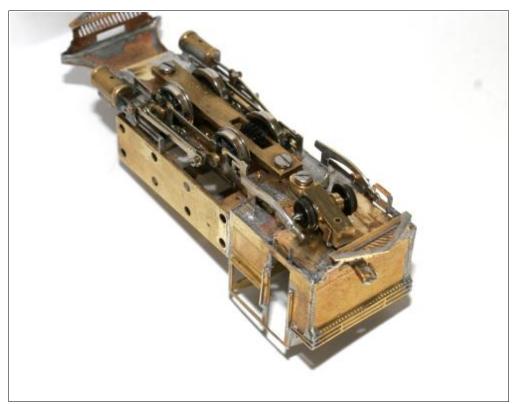


And side on. The overhang could have been reduced by about 2mm either end, but at the expense of not having coupling loops - and there would still be the issue of a potential foul of the uinderside of the couplings upon the cowcatchers.

To be quite candid, much as I would have liked to use some form of springing to help keep these wheels on the track, I had to admit defeat here and settled for making the pony trucks from brass block - harvested from old-style rectangular 3-pin mains plugs, if you

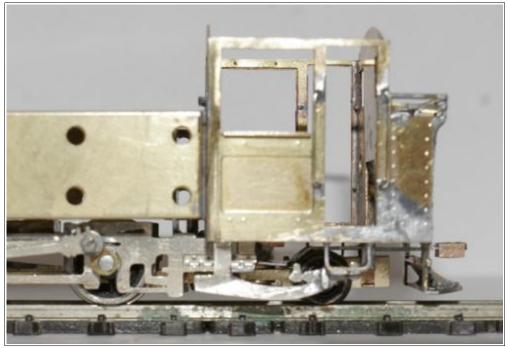
must know. The front truck is made in two pieces, the bottom being an 'H' form, with the Backwoods truck etched sideframes soldered to it, and the top carrying a 'U' cut out for the axle, the whole lot secured with a 10 BA countersunk screw and locating peg. As things stand, there is still only a 'fag paper's' worth of clearance between the bottom of the truck frame and the rails.

The resulting pony now has sufficient weight for reliable tracking through points, and also allows the wheel set to be readily removed when it comes to painting. Also, I was not happy about the kit arrangement of merely using an opened-out etched 'dimple' as the sole means of locating the pin-point ends of the axle.



'Lyn' from underneath, illustrating the rear pony issue on this loco and scale. Given more space, I would have liked ideally to have mounted the pivots for both trucks further back, as close as possible to the outermost axles, if not actually within the fixed wheelbase. But as you can see, in OOn9 one just runs out of room...

On the prototype, both trucks are actually inside framed. The 'outside frames' that are visible are part of the compensating beam arrangement. Furthermore, whilst the front axle on the real Lyn is set in a conventional inside frame truck, with a pivot underneath the smokebox, the rear truck uses a 'virtual pony centre', whose arc of travel is defined by radius bar links affixed to the back of the rear buffer beam. A bit like the arrangement of OVS Bullied's first diesels on the Southern, and also the Class 40s....but I digress.



Grossly enlarged view of rear pony compensating beams. These are fixed to the body, rather than made up as per the kit's instructions into a conventional outside-framed truck. The pinpoints have been left on the axles, to act as 'stops' in case the wheel sets move out too far on curves.

Once the mechanics of the machine had been sorted, it was time to attend to the cosmetics. Cab handrails seem to be something of a moveable feast on the prototype, the Baldwin works photo has them facing inwards, the two scale drawings that I have show them variously as facing in, or facing out, and there is even a picture that I came across with them both facing towards the front.... To make it easier to position both these and the cab doors, I originally cut slots in the cab floor opposite each door opening. The cab doors had their droplight frames soldered up as 'open' and were then held in place with the trusty forceps whilst the iron and flux were applied, all the while watching the surrounding soldered-on bits for any sign of the 'pastyness' which could mean the onset of imminent local meltdown.



Whitemetal smokebox being cut to fit on top of front side tank inner crossmember. It helped that I had previously inserted a tapped brass plug to locate this key component with a long bolt, but even so, it was two or three tries with a razor saw to get the 'shelf' recess cut 'just-so'. I no longer try to file the stuff, as the teeth just clog and skate over the surface after the first few passes.

Cylinder chests are the original whitemetal items, superglued in place over the locating studs left in for the purpose on the tops of the cross stretcher. The chests needed trimming on their rear facing ends so that there was clearance between them and the tank fronts – I think I may have managed to get my side tanks a tad further forward, though in my defence, I should say that when I measured them, one scale drawing was about 2mm shorter than the other.

The steam and vacuum pipes are something I am not really entirely happy about, as if they were made dead to scale, they would I fear have been too fragile. Also, as the model itself is overscale in width – a combination of having to build it to run on 2' 3" gauge track, and the need to accommodate clearance for the motionwork – the steam heat piping on the LH side especially had to be 'joggled' quite a ways around the cylinders. Incidentally, rather than try to make these long pipe runs in one piece, I make them in several sections, disguising the join with a add-on clip or fillet of solder, scraped and shaped up afterwards when all is set.

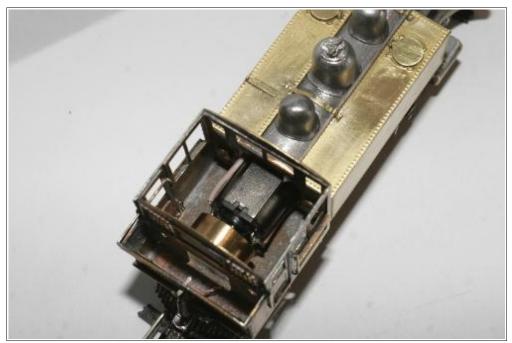
The rubber vacuum hoses are just fine electrical copper wire wrapped around the formed brass rod, and secured with a touch of solder to fill in the corrugations. Just like John Ahern tells you how to do it. There are shut-off cocks on the steam heat elbows, made from loops of twisted copper wire and then covered in solder, but they are more of a conciet than anything else.



Getting there...All soft and low-melting point soldering is completed, and everything else will be applied with adhesives form now on. Chimney and lamp irons are already on, and still to come are tank tops (with fillers), tank fronts, smokebox door, cab roof, rear window coal rails, and vacuum tank. The latter is slotted to fit around the steam heat pipework.

Under the cab on the LH side, there is supposed to be an air tank, but because of that rear pony truck swing (again), there was no room on this model for the kit's cast tank. In desperation, I resorted to a 'low-relief' tank made from sheet brass, which is given a slight 'roll' to at least give the suggestion of a cylinder. It and the vacuum cylinder are glued in place, as at this stage, I was starting to get consious of how easy it would be to spoil things by a slip of the iron.

Any work around the front end, in proximity to the whitemetal smokebox, had to be done in low melt solder. This is something of a devil to clean up, and I had to resort to an X-Acto knife blade used as both a scraper and carver at times to get in and around the pipework

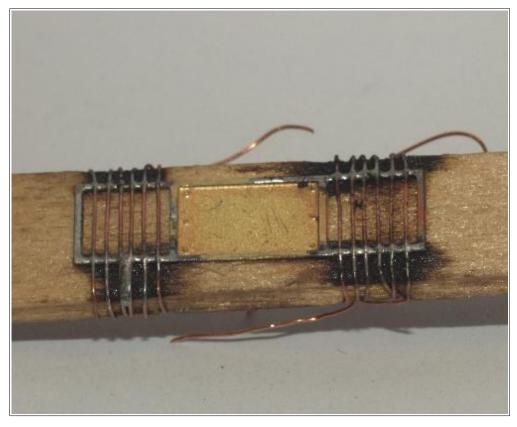


A peek inside the cab. The flywheel is hard up against the rear weatherboard, and as I had offset the drivetrain so as to get the gears to all mesh together as to how I felt they should, the inside of the RH cab front needed to be clearanced to suit. At several points I had to cut through the kit's original tank mounting ears, so something to watch there for any other 'Lyn' builders out there.

Backwoods provide a nice etched set of rivetted overlays for the water tanks. Having been caught out on another etched kit where the thinness of the material caused me problems in getting everything flat as I worked the iron, this time I resolved to use an adhesive. Though I got there in the end, if I was doing this again, I think I would use perhaps a slower-setting grade of Cyanoacrylate or even an epoxy, to allow more time in positioning. Nice as they are, the etching process can leave parts like this a little 'sharp', so I went over the rivets with a bit of used fine-grit wet-and-dry abrasive paper to 'de-nib' the edges to avoid them cutting through the eventual paint finish.

Of course in all the palaver I managed to lose the lovely brass cast smokebox door locking dart lever – and had to make another one from wire. The cast whitemetal boiler fittings were all cleaned up with a roll of wet-and-dry, worked round and round over the mould lines. I hold these fittings in a pin vice by their mounting stubs – always assuming that the kit's designer has been kind enough to leave enough protruding to grip upon!

When Lyn was built, she had a lovely American chime whistle, but in later years, this dissappeared and was replaced by a smaller 'peeper' on the cab roof. Which is a shame, because the one in the kit is quite a work of art... Safety valves changed too. I drilled out the cast 'pop' valves, and added the spring lever from nickle-silver, fretted out with a piercing saw to represent a sort of 'E' with the middle bar bent back outwards. It's not perfect, but hopefully should pass muster at normal viewing distance.



A closer look at the rear window bars. Here they are, bound up to a piece of wood with fine copper wire.

The coal rails on the back of the cab proved something of a poser, until I remembered the trick I used on an Austrian U class 0-6-2 many years ago (and no, it is still in the drawer, uncompleted...), where to keep everything in place, the bars were made of fine copper wire, and wrapped securely around a piece of wood for soldering. Once secured, the wire is cut back close to the window frame, and no-one will be any the wiser!

After that, soldering on a couple of slices of whitemetal to the underside of the cast cab roof to more securely locate it, was something of an anti-climax. On small stuff like this – and indeed, not so small stuff – I find that gluing the cab roof on with a white glue or PVA is the safest course of action That way, it can always come off, if something breaks away inside.



LH - firemans side - side of the completed loco.



Top view - RH blower pipe clipped to top of tank stays.



Could not resist this one - the pound coin gives you an idea of the size of the completed locomotive. Front lamp iron is filed and sawn from 1mm brass plate - far stronger than folding it from strip or etch.

As per my usual practice, painting begins with preparation, which involves a good scrub down with a brass suede shoe-cleaning brush, then a brass or fibreglass burnishing pen for the nooks and crannies. Any detail on the model needs to withstand this treatment - if it won't then there's no point putting it off, as I don't believe in building glass case models that are too delicate to run on a layout. This is where the 'bolt-together' approach for the the mechanism really pays off, as you can break get everything back down into its constituent parts and ensure a good surface finish, without the risk of paint clogging axles or crankpins.

My system now is basically to give everything a bath with cellulose thinners, and then give the body and major components a spray over with automotive etching primer from a rattlecan. The cellulose thinner will cause some local delaminatation of Cyano-acrylate glued joints, but I find that such imperfections are usually filled by the application of the paint basecoat. Sensitive components – mechanisms, cylinders and bogies – I brush paint with Precision Paints' two-pack etching primer.

Being a Southern engine, Lyn was to be finished in the rather fetching Maunsell olive scheme with white lining separating the black edging of the tanks and bunker panels. There is however, an awful lot of black there too, which you can't see from platform level in real life, so I took the path of least resistance and reached for – another – spray can of acrylic automotive matt black, and did that colour first. The olive green was Precsion Paints, brushed on when the black had dried, and then in turn left for about a week to ensure it was properly 'hard'.

Now, I have done lining out with a bowpen and even a brush in the past, but given the small size of this model, I opted to produce my own lining as waterslide transfers.

I had some spare sheets of white inkjet printing transfer paper to hand, upon which I ruled a series of 0.75mm wide black lines in Humbrol Hull Black using a bow pen. Some came out OK, others not so, but I just kept going until I had enough lines set out on the sheet that gave a reasonably clean edge against the white. Then, it was a simple matter to slice off individual lining 'tapes', by cutting close up to each black edge with the blade of a craft knife.

I use a disposable 'snap-off' blade types for this job – my 'proper' craft knives never seem to have a keen edge on them when I need them to – and do two or three light passes up against a steel rule pressed down on a self-healing cutting mat. This way, the cut off strip does not 'curl' as easily.

Then, it was merely a case of cutting a strip to length, letting it soak in water, and then applying it to the model with a wet brush. Once on the painted surface, it could be teased and prodded with the brush until each piece was truly straight and level. There was the obvious 'tenting' around etched rivets, and in a couple of places, I had left the transfers too wide so that they ended up overlapping the bottom edge of one side tank.

Not in itself a problem, as once the lining transfers were all dry, I was going to go around the model with transfer softening solution. I still have a bottle of Walther's 'Solvaset' that I bought back in the 1970s, but this is now nearly empty so have had to invest in some of the equivalent decal setting products that you can now get from the likes of Microscale and Model Master. You do however have to give these products time to work, and I usually go over the model at least two or three times to ensure that any underlying detail is fully defined.



Another cruel enlargement. Here, the basic lining has been done with transfers, and what remains to do now is block in the overlaps and gaps in the corners with an OO brush. White first, then 'backpainting' with black to give one a clearly defined edge and lining thickness.

With the lining in place, it was time to pick up the OO brush and block in the corners of the white, and set out the curves around the back of the bunker and the inside top edges of the side tanks. I do not worry about necessarily getting a properly defined fine line first time around – only along the inside edge to each panel. The outside edge of the line, is then formed by 'backpainting' up to it with black so as to give the required thickness of white. Areas where the black on the lining transfers does not cover green, are similarly dealt with.

It all sounds complicated, but in truth, you only get to see the join under a magnifying glass – and even that starts to dissappear once the model has received its final coat of semimatt varnish.

For the lettering, I used the Fox Transfers' standard 4mm scale SR set. I had my doubts initially as to whether there would be enough room for the 'E' prefix between the overscale white lining that separates the black tank borders from the Maunsell green centre panels. (The HMRS's LSWR - Southern livery register cites the actual width of the white line as being a mere 1/4 inch compared to the model's 1 1/2 to 2 inches...) If I was doing this again, I might try mixing 3mm scale numerals with the 4mm 'Southern' lettering, but as it was I - just – got away with it, even though things worked out extremely tight on the RH side.



Lettering and lining out all done, and just the final coat of matt varnish left to apply. The tank fronts where the lining follows the curves around the boiler had to be done freehand, and it took several goes with the black, the green and the white, before I was satisfied with the result.

I found the transfers bedded down very well to the slight imperfections in the paintwork and over the rivets, to the point where very little transfer setting solution was needed. They also appear to have minimal carrier film around the printing, which also helps matters in this respect.

For the final flourish, I decided to touch in the window frames to represent varnished wood, as on the Baldwin works photo, this is how Lyn was outshopped, and it seemed reasonable to expect that the same painting scheme would be copied when she went into Eastleigh for overhaul under the Southern's ownership. Unfortunately, it proved very difficult to get a brush in at the required angle to pick out the tops of the front cab windows, but hopefully the end result is acceptable at normal viewing distance.



Not that you can see it well in this shot, but the coal in the bunker by the way is real, glued onto a separate drop-in 'shelf', along the same lines as that used on the HO scale ROD 'Pershing' 2-8-0.

So there you have it, a Baldwin for OOn9 and one that will go around 9 inch curves - just - to boot! Would I build one again? Probably not, unless my arm was twisted very, very hard, and there was something in the order of 3,000 euros on the table just for starters....