



## Part 4 - Completion

What, you might reasonably ask, is going on here? We have taken all this time and only got as far as a basic box with a pair of sides for it, and suddenly everything else is being dismissed in this final part. Well, it is certainly true that there is a lot still to be done before our pride and joy takes its place in a train, but the reality is that the hard work is now over. From here on it is rather routine. I do not mean that in a dismissive sense, because there are still plenty of details that will make or mar the final result, and of course it is the quality of the underframe that determines whether it will run smoothly. But I find it difficult to identify any ideas or methods I use that have not been extensively aired elsewhere- I flatter myself that this has not entirely been the case in the previous parts of this article.

Perhaps I should remind you that my original and continuing inspiration is David Jenkinson's *Carriage Modelling Made Easy* (Wild Swan), and while I trust that this series has been something more than 'footnotes to Jenkinson', I have tried to focus on those areas where I do it differently and to touch only lightly on the things that he covers so well in his book. I would like to emphasise that word 'differently'. I am not making a judgement (and I hope you won't) that my methods are inherently better or worse. My intention is to put ideas in front of readers. If you want to take them up and try them, all well and good; if you prefer doing things in other ways, that is fine by me. We are all different, and what works for me may not work for you. More than anything, if you are inspired to try something you have not tried before, whether or not it follows what I have done, I shall be delighted.

Enough philosophy, let us get back to our coaches. In fact the sides are not quite done. The edges of the doors must be scribed, and hinges, brackets and other small details can be added using pieces of microstrip and rod. At this point I drill holes for the door handles, but I do not fit them until after the side has been painted. I find it easier to paint the side without the handles, particularly if it is to be lined as well. Some people, I know, fit the handles before painting and then remove the paint from them with a glass fibre brush. For the handles themselves, I rely on fittings from the trade wherever possible.

The next thing to tackle is the ends. If the sides are of panelled construction, the ends almost invariably are too. The end panelling of the coaches I built prior to starting these six-wheelers had square corners, even though the sides had rounded corners, and I had made this up quite simply piece-by-piece from microstrip. So it was with some surprise when, glancing at some photographs, I noticed that the coach ends of this era had rounded corner panelling. Which only goes to show that you should never rely on your assumptions, but always check them out. It was back to the computer, and I drew out and printed some sets of end panel layers with round corners, which were then punched out just as for the sides and set in position. Then the ends could be finished with steps, gas pipes and other bits and pieces made from styrene strip and rod.

And so we move on to the underframe. Once upon a time I made underframes quite separately from the bodies. The solebars, buffer beams and various spacers were cut from brass (using the extensive range of sections that is commercially available) and soldered up into a very strong structure. The body

was attached using screws through holes in the spacers into tapped holes in the floor. After a while it dawned on me that the only real advantage of this was that the body and underframe could be painted separately, and since it is generally quite easy to mask off one from the other for painting, this was not much of an advantage. I therefore changed to making the underframe largely in styrene, assembled directly on to the underside of the floor.

I mention this because I thought long and hard about reverting to metal underframes for these coaches. The problem was the large sets of double footboards that run the length of each side that you can see in the photographs. These are somewhat vulnerable and I thought that if they were made in metal and soldered to the underframe, they would be less liable to accidental damage than if they were made in styrene. But I was frankly not enthused about the additional time it would take to make the underframes in metal and in the end I compromised. The underframes are styrene, but the footboards and their brackets are in metal, firmly soldered up. Each footboard assembly was attached to its solebar using epoxy, and so far all has been well. In theory, if a footboard were to receive a severe knock, the most likely result is that it would break off entirely at the glued joint without being damaged itself, and could be glued back again - a theory, you understand, that I am in absolutely no hurry to test.

The solebars were cut from commercially available styrene strip of the correct depth, 0.060in thick, and the buffer beams from 0.080in material. Each was decorated with the appropriate straps and plates cut from 0.010in. sheet and embossed with bolt heads as necessary. The riveting tool reverted to its original purpose for this task. But the solebars and buffer beams also needed their own bolt heads that, on the prototype, held the various underframe components together. Ignoring the cries those who say you cannot emboss bolt heads in styrene of that thickness, I decided to try it.

The secret is to use the right type of point to impress the bolt heads. When embossing metal or thin styrene sheet, I usually use a point with a fairly large included angle at the tip, somewhere between 60 and 90 degrees is common. I found that if I replaced this with a much more sharply tapered point, more like the end of a needle, I had a usable tool. In fact, you could probably use a darning needle, although the point would have to be sharpened first on an oilstone. A very fine sharp point can be plunged to quite a considerable depth into styrene sheet without causing too much lateral distortion. I found that I could impress bolt heads quite close to the edge of the styrene strip, and if the edge did bulge out a bit locally, a quick wipe with abrasive paper cured it. You should experiment on scrap material of the correct thickness to determine how deep you have to go to raise a decent bolt head on the opposite surface; a depth-stop on the riveting tool is a great help in keeping the bolt heads consistent in appearance. If your riveting tool does not have such a thing, try forcing a collar of material such as a piece of insulation from an electric wire on to the point to mark the depth you have to go.

Six-wheel coaches pose something of a problem. To make them go around the sort of curves we are forced to adopt, the centre axle needs considerable sideplay. You can simply make the whole chassis rigid except for the centre axle which is allowed to move sideways, but the long wheelbase of such a vehicle does tend to accentuate any lurching when the track is less than perfect. I felt that some form of springing or compensation was essential. In the end it all worked out quite easily because I was able to adapt the underframe units from Slater's MR six-wheel coach kits, which are also sold separately. I won't go into detail because you can find my review of these units in the November 2001 *Gazette*. Suffice to say that they solved the problem and I will use them again for any other six-wheelers I am called upon to build.

And that almost concludes the story, except for glazing the windows. I have left this till last because that is the last thing that I do, and in fact it does not get done until after painting (both inside and out). When constructing the sides, if you space the outer and inner walls apart on stringers, as you have to do to model a deep tumblehome (refer to Fig 2 to see this), there is a space into which you can slide glazing material. To do this, at least one of the ends has to be detachable, if not permanently then at least until the very last moment, but Jenkinson's book will tell you all you need to know about that.

In my case, I glaze each window or group of windows individually. Remember that the window openings in the inner sides are about 1mm larger all round than the windows themselves, and this means that when the sides are assembled there is a recess for the glazing material. I try to cut the glazing to be a fairly good fit in these recesses, but in any case I use a tiny smear of cyano adhesive to hold the glazing in place. I emphasise tiny - if you use too much the adhesive will ooze out on to the visible part of the glazing when it is pressed home. If this happens, take it out quickly before the adhesive grabs, wipe any excess off the side, and try again with a new piece of glazing. Do not try to reuse the original glazing,

because you will never remove all traces of the adhesive from the visible part, and that particular window will be forever spoiled.

That really is, or was, the end of the story. The coaches were handed over to Peter who, I was delighted to hear, opted to have them professionally painted. At the time of writing I have not seen the results, but I'm sure they will be splendid.

