

How does he do it?

Adrian Batt reveals the secrets of building prizewinning models

► The late Brian Martin, in his editorial for *Tramfare* 202 (July – August 2001) wrote: “Adrian Batt has walked off with yet another AGM models title – just how does he do it? Obviously he puts into his models that certain touch! Well done Adrian...” TLRS Chairman John Prentice presents Adrian with the Ralph Price trophy for another winning model at the 2003 AGM in Manchester.

Photo Graham Sidwell



An Approach to Tramway Modelling

Since Brian wrote those words I have walked off with more AGM titles, so perhaps an explanation is overdue. This is a combination of three articles published in 2004 in *Tramfare* magazine, where I gave an indication of what goes into achieving ‘that certain touch’. I would like to say a big ‘thank you’ to all those TLRS members who have voted for my models at each AGM, over those years. I have had great pleasure in making the models and I am delighted to know that so many people have enjoyed seeing them.

Getting Started

I was once someone who, although in the past enjoyed making models, had stopped modelling due to other commitments (e.g. going to college, finding a job, getting married, starting a family etc.) taking all the available time and energy. It seemed to be much too difficult to break into a busy cycle of life and get started again. I had collected a number of books on the subject and attended the occasional models exhibition, but there things rested for many years. However, back in the late 1980’s I worked for someone who possessed a keen interest in tramways and railways and we often went on lunchtime forays to bookshops looking for remaindered transport books and then visited nearby model shops. So, one day I found myself standing in Kings Cross Models looking at a BEC LCC B class kit,

with my boss saying into my ear “buy it, buy it!” How could I refuse?

This was the initial ‘push’ that I needed. I reasoned that making a tram model should be more rewarding than making a railway model (I am a lapsed railway modeller!), as the tram is a complete model in itself and there is no need to make anything else to go with it (a railway locomotive needs a train of wagons or coaches).

So the kit was started. I had very limited experience of making up a kit in whitemetal, and that was nearly 20 years earlier, so I had to learn how to do it. Fortunately, I had a copy of David Voice’s book *How to go Tram and Tramway Modelling* to hand and this was read over and



What Happens When You Listen to Your Boss. My first tram model, a BEC Class B. Lacking in imagination, I numbered it ‘106’.

Unless otherwise stated, all photos and models are by Adrian Batt



If You Can't Stand the Heat...

Yes, this is the kitchen table, set up for another evening's work. The 'modelling board' is a shelving off-cut. All the tools, paints, etc, pack away into small boxes for storage.

over to ensure that I got it right. If any readers are in a similar situation and need expert advice, clearly explained, then I cannot give a better recommendation than to get hold of a copy of his book, which David had first published in 1982 and which ran for three editions.

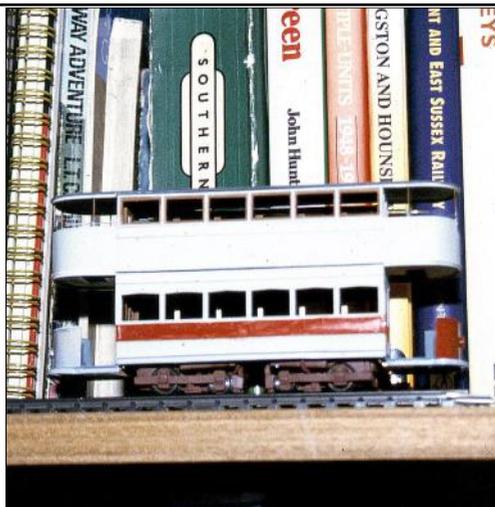
Painting the model also proved to be a problem. I had to learn the patience and dexterity required to reproduce the LCC livery. My previous experience was of limited use, as I had taken up 7mm scale modelling in my teens precisely because I found it too difficult to

replicate the GWR livery of chocolate and cream on 4mm scale clerestory coaches! Perhaps the patience and perseverance necessary comes with age and I managed to complete the model. This was the first model I had completed in 4mm scale that I was satisfied with (previous models had suffered due to my inability to finish them properly). However, one problem remained in that it had taken too long! I decided that taking four to five years to complete a kit 'out of the box' was far too slow and perhaps it was fortunate that it was finished at all.

Safe on the shelf...

The shelf is high up at my eye level (I am 6ft 2ins tall) and so far all models have escaped the attentions of inquisitive children and an adventurous cat. The models do get dusty. However, I always give the paintwork a light rub down with 1200 grade wet and dry paper (used wet) to level all dust and other particles trapped in the paint (more about this later) before applying the final coat. Finished models can always be 'dusted' with a small sable haired paint brush.

The 'open' shelf is deliberate, as I need to see the model to ensure progress. Also, when thinking about the next task, I often take the model down for a brief look before going off to do other things (usually going to work). I have thought about putting a clear plastic cover over the model, but as the shelf space is so narrow I have not found one that fits (even Ferrero Rocher chocolate boxes are too wide!).



Waiting for Work. Here is a partially completed LUT type WT car up on the shelf waiting for the next modelling session. Sharp-eyed readers will see that she is co-located with the railway books!

► **LT 2055 in Less Than a Year.** I found a good photograph of this car at the Hop Exchange (Borough) on route 72 and I based my second model (a Tower E1) on this picture. As I was determined to *make* time for modelling, I completed it in under 12 months.



◄ **The Last One in the Shop.** W&H Models sold me their last K's MET type E kit in 1989 and this became the subject of my third model. I adapted the kit to accept a BEC mechanism.

Making Time

The main problem was that I was relying on finding time to do modelling. Sometimes this would come in short bursts, but more often than not there would be long periods of time when nothing got done, due to other 'priorities'. Also, when a modelling session finished everything was packed away, and so some of the time I simply forgot about modelling, even though there may have been time available.

As I enjoyed model making and I wanted to do more of it, I had to tackle the time problem. Finding time was not working and so I resolved to *make* time. If you are someone like me who is married with a family and in a full time job that requires a significant amount of commuting time, then making time is not easy. It usually means giving something up. I also have a number of other hobbies that I enjoy and I certainly did not want to give these up, and so the only real choice for me was to give up watching television. Thus at a single stroke, I was able to reclaim several hours each evening that could be given over to model making. This may sound drastic to many, and is perhaps a step too far for some, but it has worked for me over the last twelve years. I certainly have not missed the TV!

To maintain my current standard of modelling, each model takes in excess of 250 hours to complete. As I aim to finish each model within a

year, I need to devote about five hours per week to progress the model. This normally breaks down to three to four sessions per week of around 90 minutes each. Usually this time is found on weekday evenings, with perhaps some time taken at weekends. I find that it is necessary to keep the modelling time down to short bursts, as it is difficult to keep the concentration up after a busy day at work and sleep quickly becomes a priority!

Finding a Space

Finding a space in which to work is perhaps easier for some than others, as it depends on how much space is available to you in the house. For myself, I then lived in a small semi-detached house, so space was tight. I did not have a workroom, study or shed that could be used and I discounted the loft early on, as this can either be too hot or cold for most of the year. The space that has been consistently available to me over the years is the kitchen table and then only when the kitchen is not being used for its prime purpose! Working here requires the discipline that everything must be packed away after a modelling session and so all materials, paints and tools go into a small number of boxes and old biscuit tins. These were stored in between times on a shelf elsewhere in the house.

The model itself (in whatever state) is put in a place where I can see it at the beginning and end of each day and this is normally on a shelf in the



Another Winner: Adrian Batt's model of LUT Z-type car No. 34, which won the small-scale modelling trophy at the 2003 TLRS AGM.

Graham Sidwell

bedroom. This is so I cannot forget about the model and allows me to review progress at odd moments during the day. In this way, I am able to start straight away when I sit down to start modelling again. Thinking about things beforehand helps to reduce the challenge of making a model, allowing large tasks to be broken down into small units that can be achieved at each modelling session. Progress is measured in small but frequent steps.

Don't Get Stuck

Part of the secret of making a good model is experience. You need to make models and plenty of them, so that experience is gained in using the different materials required (I use combinations of brass, plastic, wood and whitmetal), together with the tools to work them. Also needed is knowledge of how a model goes together. This is an understanding of which parts to start with, where to go next, etc, and where to start painting so that nothing gets left out. A few handy techniques need to be picked up on the way on how to achieve a good finish, together with the application of lining and transfers. To complete a model, a number of skills need to be acquired and honed and the important thing when progressing a model is to persevere and *do not allow difficulties or set backs to stop you*.

Some readers may be thinking 'easier said than done', but my view is that no problem should be insurmountable. Try to keep a picture of the model in its finished state in your mind's eye and work toward that. If things go wrong (and they do!), undo the mistake and try a different approach, perhaps using different materials, tools etc, to overcome the problem. I have

encountered significant problems on models, usually caused by using the wrong materials, by leaving certain tasks too late in the construction process or by simply getting it wrong at the first attempt. By attempting to correct the problem I have learnt from all of these experiences and aim not to repeat the same mistake on future models.

If I really get stuck, or I am attempting something new, I often ask myself 'how did David Voice do it?' and look in one of his books on model making. In most cases David has not only been there, but also solved the problem and written it up in clear English! Another approach is to ask fellow modellers, particularly when it is essential to get an important detail correct. Readers who know me will remember my question 'what colour was LUT Venetian Red?' I received a number of different answers, but finally managed to achieve an acceptable colour on my type Z car.

Enjoying It

Frequent attendees to TLRS AGMs will know that my last five models have been LUT cars (all five have each won an AGM award, is this a record?). What may not be so widely known is that all of these cars have been built to run on the TLRS Thames Valley Area Group's *Kew Bridge* layout. I have already mentioned that I enjoy making the models and to see them running as part of a larger model only adds to that initial sense of satisfaction.

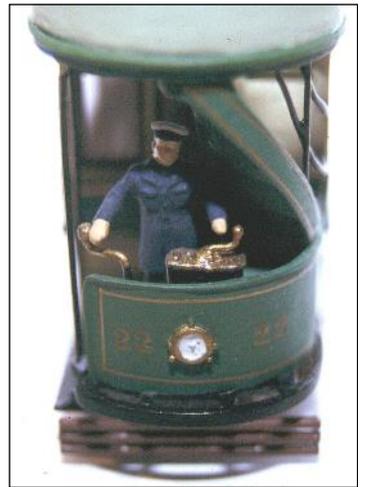
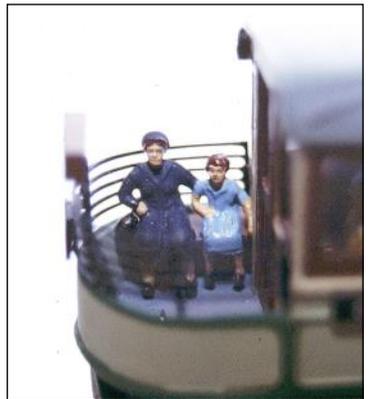
Kew Bridge has been exhibited many times since it was completed in the summer of 2001 and the models clearly give people a great deal of pleasure in seeing them, particularly if the number of questions and reminiscences heard are anything to go by. It is always a pleasure to talk



▲ **Frank E. Wilson Trophy Winner 1996.** Wallasey 22. The inspiration to build this car sprang from my mother's memories of that system.

▶▶ **Going Home on the Tram.** My mother was aged eight when the Wallasey system closed. Here she is on the upper deck open balcony of Wallasey 22, with her mum.

▶ **How it was in Grandfather's Day.** Here is my grandfather driving Wallasey 22. He drove the Wallasey cars for about six years until the system closed in 1933 and so it is probable that he actually drove car 22.



to people viewing the layout and hopefully convert some of them into tramway modellers!

Apart from the AGM and exhibitions where *Kew Bridge* has been present, my models have been individually exhibited at the Festival of Model Tramways and at the Model Engineer Exhibition, when the latter was located at the large London venues. Consequently hundreds, and perhaps thousands, of people have seen

these models. Hopefully, this has stirred a few more people to take up an interest in tramway modelling and if it stimulates the commercial production of more books, plans, kits, parts and finished models, this can only be to the benefit of our hobby.

Prototype Class: LUT Type WT 243 was in the guise of London Transport 2409 by the time it was photographed on service 64 at Acton, shortly before withdrawal. In 1928, LUT converted five 1902 Milnes-built type W cars to WT by adding a type T top cover and higher-powered motors. Adrian is building car 261 in 4mm scale, from another photograph.



Building a London United Type WT

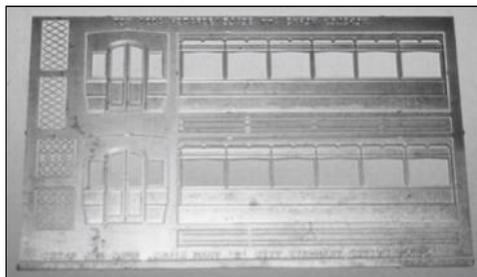
For me, the beginnings of a model lie in researching the prototype. I usually like to model a particular car and so gathering together photographs is an important first step. These will be used to work out body details, livery and lining and the correct destinations and advertisements to give a period 'feel' to the model.

Maurice O'Connor photographed Type WT number 261 at Kew Bridge in 1933/34 and this photograph has become the main reference for my model (*see end of article*). Maurice's original negatives are now in the hands of the National Tramway Museum, but as copies of these were unavailable, I have had to make do with the reproduction that appears in Cyril Smeeton's *London United Tramways* Volume 2. Cyril's book also contains livery and lining details..

Terry Russell has produced a drawing of a Type WT and a copy of this was obtained to get the correct dimensions for the scratchbuilt sections of the model. As Terry's drawing is of car 157, comparisons will need to be made with the photograph of car 261 to ensure that the details are correct.

This model is a true 'hybrid', being part brass etch, part plastic scratch build and also uses whitemetal castings for the stairs, controllers, etc. In describing 'how it's done' readers should get a taste of the techniques used to work these materials.

Readers who are familiar with the modelling methods and techniques described in David Voice's books will see that much of what I do is based on David's work. However, I will not be repeating the

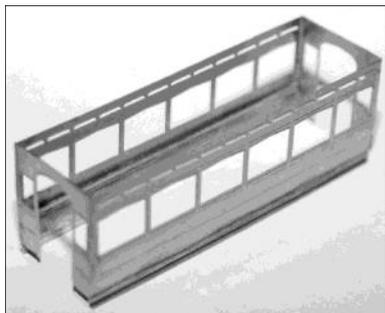
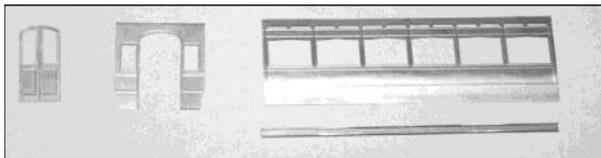


Start Here: The brass etch of an LUT Type W lower saloon which was obtained from Ron Howes.

content of these books. Instead, I will attempt to go one step further and show how to turn a good model into a potential award winner.

A few years ago, Ron Howes had a batch of Type W saloons produced as a brass etch by Worsley Works. These featured the lower deck sides, bulkheads, solebars and wrought iron scrollwork panels for the platforms. The modeller had to produce the rest of the car, but at least the tudor-arch windows and panel beading are already done! As a Type WT is essentially a W rebuilt with a T type top cover, one of these 'scratch-aid' kits was obtained from Ron. As supplies are now difficult to obtain, parts from a Chris Cornell W or X class kit could be used if available, or the lower-deck scratch built.

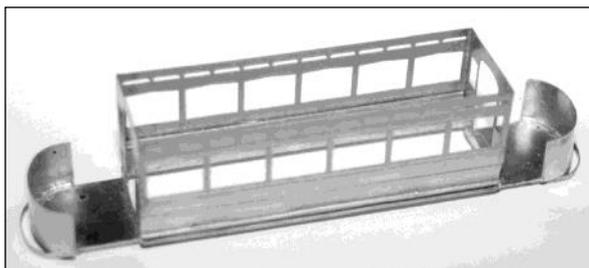
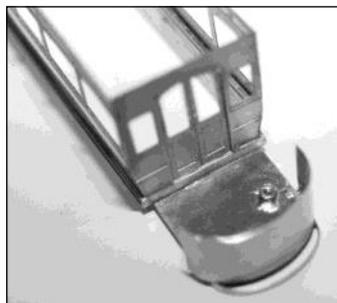
Building the lower deck



1 ▲ Bend It Like This. Rocker panels and solebars have been formed, whilst the doors have been detached from the bulkheads.

2 ◀ Soldering On. The main parts from the etch have been soldered together, although the doors have yet to be added. The sides have been stiffened with Code 75 rail soldered to the inside and below the windows.

3 ▼ Strip Development. Platforms, dash panels and fenders have been added after being formed from brass strip. Underneath are platform bearers from square brass strip.



4 ◀ The Nut Behind the Stairs. This shows the nut soldered on to the platform after plotting the 'footprint' of the stairs. A bolt will be screwed into the nut from below to hold the chassis to the body. Note also that the doors have been added so that they are recessed behind the bulkhead panel.

Remove the lower deck sides by cutting through the tabs holding them to the sheet with a modelling knife. Use a flat needle file to file off the tabs flush to the body edge. Next, form the rocker panel using a wooden spoon handle (working in the kitchen has its benefits!). As this is an 'S' shaped curve, the lower part (between the solebar and the waist rail) is formed by laying the spoon handle along the outer face of the panel and then gently bending the brass between thumb and forefinger. Use the same method to form the upper part of the 'S' but with the spoon handle placed on the inner side of the panel, between the waist rail and the windowsills. Several gentle bends may be required to get the correct shape, which should match the edge of the bulkhead panel.

Remove the bulkhead panel; the saloon doors have been etched on the same plane as the bulkhead. On the prototype, the doors slide behind the outer panel and so they should be set back a little. I decided to cut out the doors, doing as little damage as possible, as the etch is very good and I wanted to try to re-use them. I found that I could cut through the brass around the door edge with a sharp modelling knife. Several cuts are required to free the doors, with the curved tops being the trickiest part. The bulkheads are now quite flimsy without the door and so the beam that runs

under the bulkhead should be cut from brass strip and soldered on, to put back some stiffness. Later, the platforms will be attached to this strip, so it will need to be strong, especially if it is to run on an exhibition layout. Trim off the curved top to the bulkheads, so the top edge is level with that of the lower deck sides. As very little of the upper deck floor will be seen on a car with a top cover, it is easier to make this floor flat.

Next form is the solebars. The first right angle bend is quite easily achieved with a pair of folding bars. The other right angle (thereby forming a 'U' shape) is a little more difficult to do. Fortunately, I have a set of folding bars made from brass angle. Any similar edge would do, perhaps even a wooden ruler. It is possible to achieve a good bend by just using the fingers.

The solebars should then be soldered along the bottom of the lower deck sides. Keeping the solebars in place for soldering can be a problem, but I used some 'clamps', which are ladies 'butterfly' hairgrips, which also can act as a heat sink. The best ones to have are made from aluminium and I got mine from a local (ladies) hairdressers.

Now to solder the lower deck sides and bulkheads together. This is best achieved by soldering one bulkhead to each side first, checking to ensure that all is square. Then, solder the two halves together, again

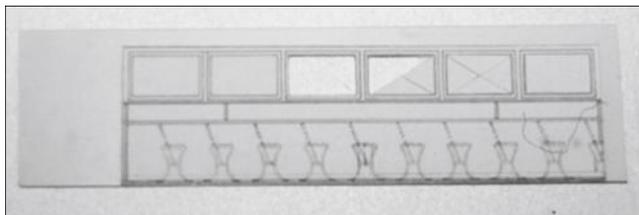
checking after each join that all remains square. Use the clamps next to previously soldered joints to ensure that they do not come unsoldered, whilst making the next join. Squareness in the horizontal plane is best achieved by soldering the sides, etc, together upside-down on a flat surface, so that the solebars are uppermost. As the body sides are still quite flexible, solder a strip of Code 75 rail along the inside of the body sides, half way between the window bottoms and the waist rail.

The saloon doors can now be added back to the bulkhead panels. First solder a thin strip of brass along the vertical edges of each door. This strip needs to be narrow enough to fit behind the window pillar next to the door. Then, solder the strip against the back of the bulkhead, so that the doors are set back by the thickness of the panel. There will be a small gap along the lower and upper edges of the door, but this should easily be filled with paint when finishing the car.

Next, cut a pair of platforms from brass strip. Transferring the required shape to the brass is best achieved by making a copy of Terry's drawing. (Or even buy two with this in mind!) If possible, use a PC

and scanner to make the copy, as each axis can be adjusted before printing out to ensure an accurate copy. Then cut out the platform shape and glue it to the brass with some Pritt Stick. The brass can then be cut and filed to shape following the paper pattern. Add dash panels, fenders and platform bearers from brass strip to complete the soldering on the lower deck. Use a suitable former to gain the correct curve on the dash panel and fenders (I use a whisk handle!), again bending with the fingers.

Detailing on the lower deck can now be achieved with plastic strip or sheet. This includes blanking off the right hand window on the bulkhead panel, covering over the ventilator slots on the sides and adding a thicker waist rail with 20 thou square strip. There is also beading that runs along the top of and down one side of the dash panel. This can be attempted using 10 x 30 thou strip, but it is very fiddly and tends to try the patience! I do all this in plastic as I find it easier and quicker to work and it stays in place when glued on with superglue.



Red upper deck

◀ **Cut it Out.** The upper deck sides are formed from plastic sheet and this shows the method of creating windows. A copy of Terry's drawing has been glued to the sheet and the windows are in the process of being cut out as described in the text.

Cut the floor from 40 thou plastic sheet. Then, cut complete sides for the saloon from 20 thou plastic sheet and cut out all the windows. To cut out a window, it is only necessary to cut halfway through the plastic with the modelling knife. First make cuts around the four sides of the window, being careful to go up to the corners but no further. Then cut two diagonals from corner to corner. The window shape should now be half cut through, with an 'X' shape across its middle. If the centre of the 'X' is pushed from the front, it should now be possible to break out the four triangular shaped pieces to reveal the window aperture. The pieces usually break out fairly cleanly, but the corners may need to be sharpened up using a needle file. There will also be a small burr around the window aperture and this is best removed with a small piece of wet and dry paper.

To give the impression of drop lights, the framing around the windows can be made from 20 x 30 thou strip, whilst the panel below the window sills can be added in 20 thou sheet. The completed body side will be 40 thou thick, with inset drop lights.

Next, cut bulkhead panels from 30 thou sheet, cutting out both doors and windows. Again, make the

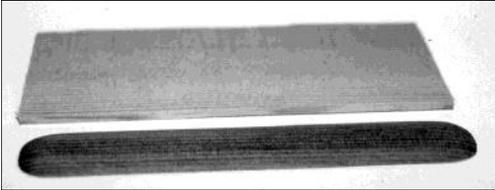
bulkhead panel tops flat to align with the upper deck side tops, as the underside of the roof will be flat. These panels will need to be slimmed down by 40 thou along each vertical edge, as they will fit inside the body sides. This usually means omitting the outer edge of the window frame. Cut out doors from 20 thou sheet, so that they are slightly wider than the doorway, to allow for gluing behind the bulkhead panel. Cut out both the window and the panels in the lower half of the door. Add a small piece of 20 thou sheet behind the lower door to make recessed panels.

Assemble and glue the saloon sides and bulkhead panels on to the upper deck floor. Next, cut balcony end panels from brass, remembering to cut out a section to receive the destination box. I have attempted to make these panels from plastic on previous models, but they have never retained the correct shape over time, even though his was 'steamed' in with boiling water. Brass holds the required shape, but the panels have to be carefully aligned with the body sides to avoid getting a 'step'. Another approach would be to make the entire upper deck from brass, but I prefer to use plastic wherever possible for speed. Prior to bending the panel to the correct shape, make a plan as



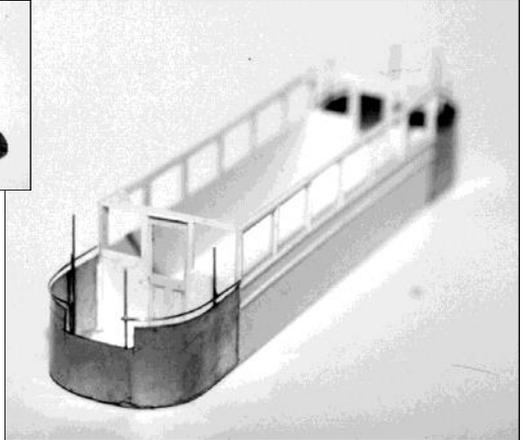
◀ A Marriage of Plastic and Brass.

The upper deck has been formed from plastic sheet, but with brass balcony ends to ensure that they keep their shape.



▲ **Wooden Top.** The roof has been formed from a strip of hardwood, which has been sanded down to the correct profile. The roof has been sealed ready for paint. Behind the roof is the strip of wood from which it was cut.

► **End in View.** A closer look at the balcony panels formed from brass strip. It also shows roof stanchions soldered to the balcony panels and a door set behind the bulkhead panel complete with recessed panels.



to where the roof stanchions are to be located. Use a strip of paper to derive the balcony panel length from the model and draw the required shape onto graph paper. The stanchions can then be marked on according to Terry's drawing. Using this plan as a guide, solder 0.45mm brass wire on to the back of the balcony panels to form the stanchions, together with the handrail, which runs around the top of the panel. Leave the stanchions overlong and cut to final length when the roof has been made. Form the panel to the correct shape and glue this to the upper deck floor and saloon with superglue. You may wish to add small lengths of 40 thou square plastic strip to the inner edges of the balcony panel ends to help them bond to the saloon bulkhead panel.

Add external beading to the body with 20 thou square plastic strip. Also, glue a strip of Code 75 rail along the inside of the body and just below the window bottoms, to stiffen the body.

The roof is formed from a strip of 2.5mm thick hardwood, sold in model shops for model boat building (I think). This is very straight grained and comes as a small plank, which will make many tramcar roofs! Using a copy of Terry's drawing cut out the basic shape of the roof using a junior hacksaw and modelling knife. The rounded profile of the roof is created by using glasspaper to sand down to size.

Make two gauges from plastic sheet. Using a copy of Terry's drawing cut one gauge for the roof profile from front to back, and another for the roof width at its highest point. These two gauges can be used periodically to determine how close you are getting to the final shape.

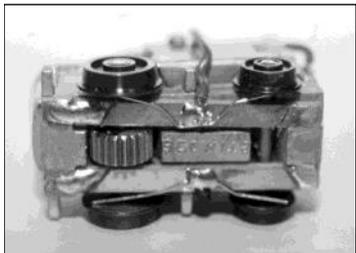
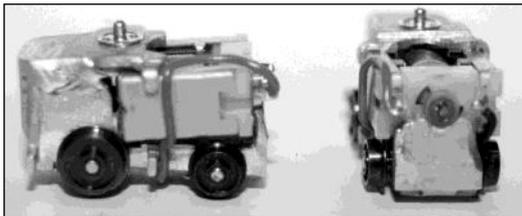
Use 'medium' grade glasspaper to rough out the basic shape and then change to 'fine' once the final shape is approaching. Finish the roof with grade '00' (very fine) and then give it a few coats of sanding sealer, remembering to coat the underside as well. When this has fully dried it will need to be rubbed down with 1200 grade wet and dry paper, used wet, before applying paint.

Glue a 'false ceiling' from plastic sheet to the underside of the roof to correctly locate it on the saloon sides. The plastic is best glued to the wood using UHU, which is why the underside of the roof must be sealed. The roof over the open balcony end has square beading running around its underside. This can be added with 40 thou square plastic strip and glued on with superglue. There is a similar strip on the underside of the upper deck, where it goes over the platforms, so once the upper deck has been mastered this can be attempted too!

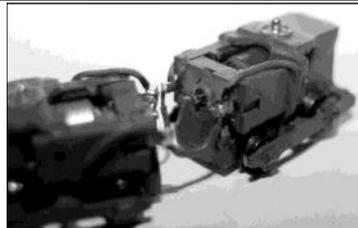
Do not glue the roof to the upper deck yet!

► **No Shorts (1).** An extra wire has been added to the BEC mechanism, running from the motor tag to the pick up wire below. This is described in the text and effectively eliminates the wheels shorting against whitmetal truck sides (to be added later).

▼ **No Shorts (2).** This is the underside of the BEC mechanism showing how the extra wire has been soldered to the same point as the pick up wire. The keeper plate has also been isolated by cutting through the copper cladding at each end.



► **Wired Together.** This shows short lengths of (telephone) wire linking opposing motor tags to ensure that each motor picks up from all wheels. If this is not done the leading bogie is likely to stall on a 'dead' section of track, running the risk of the rear bogie motor burning out.



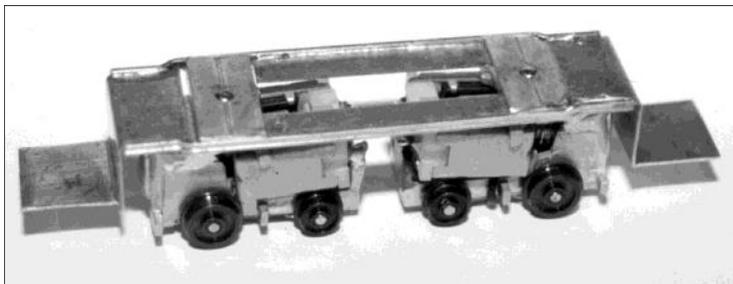
The chassis

I use a separate chassis for eight wheel cars, as it is much easier to set the ride height (the distance between the body and the rail top) correctly. These are made up from strip brass and short rail sections as per David Orchard's design and as described by David Voice. The chassis is attached to the body underneath the platforms and in between the bearer rails. Plot the 'footprint' of the stairs on the platform and drill a small hole 'behind' the stairs. Make sure that access to this hole is possible from beneath when the life trays are in position on the finished model. Put the chassis in position and mark the hole through onto the chassis and then drill out. For a bit more 'play' to allow for adjustment, this hole can be slotted. Open out the holes to clear a small brass bolt and solder a brass nut on to the upper side of the hole made in the platform. The chassis can now be held together with the body by screwing a bolt into the nut from below.

As the car will be used for exhibition running, I have used two BEC (now KW) maximum traction motor bogies. BEC bogies used on earlier models have lasted the course with no deterioration in running, as some cars have now run on Kew Bridge at every exhibition day to date. For trouble free running, the bogie pickups should be wired together to ensure that either motor will not stop running on a dead patch of track. This is

achieved by soldering small loops of wire between the tags of the two motors. The best wire is that used in telephones to connect the handset to the base. This wire is flexible enough to allow free movement of the bogies on their pivots. Less flexible wire tends to introduce bias, and either bogie will derail at points and crossings.

The bogie frame sides have been formed from BEC E/1 pattern sides filed down to shape. These frame sides are designed to fit the bogies and are quite robust, which is essential on an exhibition layout! As the metal casing of the bogie is 'live' from the track, it is possible for the wheels to short out on the frame sides, when running with 2-rail pickup (ie the overhead is dead). So the thin copper sheet on the 'live side' keeper plate should be cut through just after where it is soldered to the bogie body. Be careful not to cut through the insulating strip beneath. Solder a short length of wire to the keeper plate at the same point as the pickup wire. This wire is then taken up the side and over the top of the motor ready to be soldered to the motor tag. This tag comes soldered to the bogie body and this should be unsoldered and part of the bogie body cut away to match the other side. The wire that was previously added to the keeper plate can now be soldered to the tag.



David's Design. The chassis as built to a design originally developed by David Orchard.

Adding small details

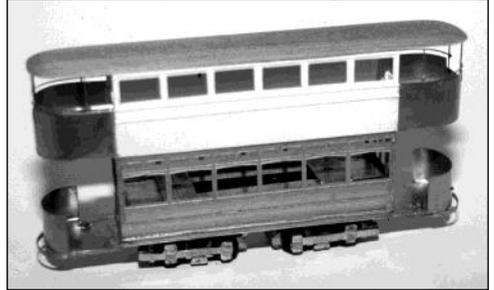
Many of these can be 'bought in' as ready-made parts, as when suitable parts are available the model gets finished earlier. Such items are stairs, controllers, brake standards, headlamps, life gates and trays, passengers and crew. However, there are a few items that are not available from suppliers.

Dog gates are made from nickel silver wire and brass strip. First bend a length of nickel silver wire to the shape of the frame as shown on the drawing. Leave the ends over long, as these will be used to attach the gate to the car body. Next obtain some 'Loco Boiler Bands' from Alan Gibson. This is a brass etch with thin strips of brass equally spaced apart. It so happens that the strips are about the correct thickness and spacing to represent the bars on a dog gate and they are kept perfectly parallel within the etch. So, it is a simple matter of soldering the wire frame to the bars. When this is done, release the bars from the etch and cut to length. When I have not been able to get hold of boiler banding, I have used a brass etch of 'iron railings'. My earlier model of 'Poppy' has dog gates made from SE&CR station fencing! The same method can be used to form the side gates under each platform.

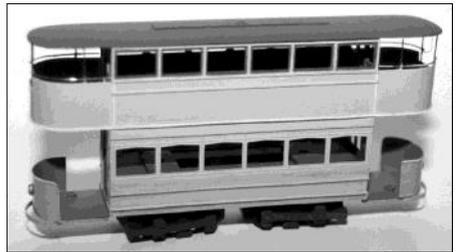
Destination boxes on a Type WT car are quite distinctive in that they have a separate route number box positioned over the main destination box. These are made from 3.2 mm plastic channel. Cut the channel to length, then glue another length of channel behind to achieve the correct thickness. When the glue is dry, trim to length and glue small pieces of 20 thou sheet to the ends. I usually make these oversize and, when the glue has dried, file to the correct shape using needle files. The route number box also has a small angled sloping 'roof' which can be represented by first gluing a short length of 10 x 20 thou strip along the top leading edge of the box. Then cut a small piece of 10 thou sheet to form the roof, gluing it along the front and rear edges. Again, if this is cut oversize it can be trimmed up using a needle file once the glue has dried.

The window pillars of the lower deck are very thin in depth and tend to look wrong when seen from an angle. This is because the window pillar should also be present on the inner side of the glass, thereby giving the model 'substance'. I prefer to cut an inner window strip from 30 thou sheet. This may seem to be unnecessary, as it means cutting out 'tudor arch' windows when these have been perfectly formed on the etch, but the finished model looks right.

Platform steps are made from strip brass soldered to 0.45mm brass wire hangers. Holes (0.5mm dia) are drilled in the underside of the platform bearers and the hangers cut to length and glued in.



Ready for Paint. All the main components of the model are finished and painting can commence. Each module (chassis, lower deck, upper deck and roof) are all still separate at this stage. These will not be assembled until most of the painting has been completed.



Some Fiddly Bits. Upper deck beading, applying a thicker waist rail and adding beading around the dashes was completed after the brass parts had been painted with etch primer. I was concerned about the etch primer attacking the thin plastic strip used for beading, so this was glued on after priming had been completed.



WT 261 at Shepherds Bush. A view of the car at the eastern end of LUT route 57. I am reasonably sure that this photograph (from the Burrows collection) was taken in the same period as the O'Connor view (see below), as I am told that photographic evidence exists of WT 261 in the earlier LUT 'all red' experimental livery.

*G N Southerden/V E Burrows,
courtesy Newham Archives and
Local Studies Library*

I have used BEC Robinson pattern stairs for the model, but these needed modifying to suit. First, the whitemetal casting needs to be cleaned up using a file and modelling knife. The file should be used to square up the base and to remove any flash from the casting. Unfortunately the steps are no longer 'square' in the area where step and riser meet the stringer, with some of the corners becoming very rounded.

This unwanted material is best removed with a sharp modelling knife. Use the knife to cut along the line of the step, then the riser and finally the stringer to remove the excess metal. The resultant cut can be trued up by scraping with the knife blade. The stairs will also need to be raised slightly to bring the halfway landing into correct alignment with the saloon windows. This is best

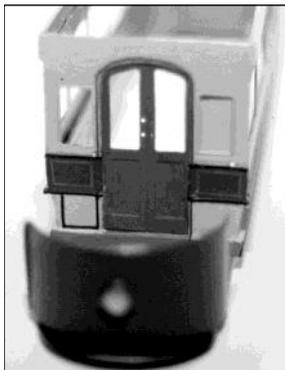
achieved by glueing a piece of 40 thou plastic sheet on the base. Although this makes the first riser taller, the stairs will now look right in relation to the rest of the car.

In conversion to a WT the stairs also acquired a decency board around the halfway landing. This is easily made from a strip of brass bent to shape around a suitable former (I used a screwdriver shaft). The stair handrail can be soldered along the top of the decency board, which is then curved downwards to meet the stair riser. The halfway landing will need its outer corner rounded to suit the curved decency board. Glue the board and handrail (where it meets the riser) on to the stairs with super glue.

Do not add any of these small details to the model yet!

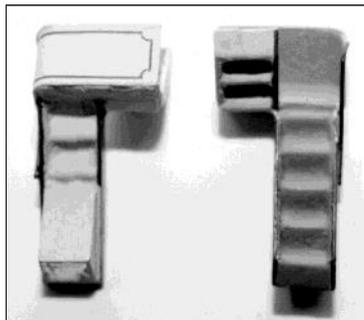
► **WT 261 - The Model.** How the model looked when this article was written. It was then 99% complete and only required a small amount of 'tidying' before its public debut.





◀ **Doing Lines.** Here the lower saloon bulkhead ends have been painted and lined out before fitting the stairs. The lining is from HMRS sheets as described in the text.

▶ **Robinson Stairs.** Paint and fully line out the stairs before fitting to the model. The stairs are BEC whitmetal castings to which a piece of strip brass has been added to create the decency panel.



◀ **Stairs in Place.** When fitting the stairs, the upper deck should be temporarily fitted (held in place with elastic bands), to ensure the correct alignment. The rail around the top of the dash, together with the 'wrought iron' side panels, were fitted and painted prior to adding the stairs.

Preparing for Paint

Applying paint is a task which modellers often approach with trepidation, in fear of 'making a mess' of their carefully constructed model. However, good results can be achieved with care and some practice and this task is best considered in terms of time, tools and technique.

Time is an important factor, as best results cannot be achieved if the job is rushed. Unfortunately, I know of no short cuts to getting a good finish and I tend to use the same process for each model I have painted. I have discovered that the amount of time taken to paint and complete the model is roughly the same as that required for construction of the main components. For me this is six months, which needs to be borne in mind if I am aiming to exhibit the model on a certain date!

Tools are also a significant contributor to achieving good finish. Good quality brushes are necessary to ensure that just the right amount of paint is placed in just the right places and the best ones to use are the artist's sable haired variety. Whilst these are not cheap, they are good at keeping their shape, will not lose hairs and will last for a long time.

English or German made are the better ones to use, whilst I find that Chinese-made brushes have an unhappy knack of falling to pieces! Aim to acquire a

number of brushes in a variety of sizes, suited to different tasks. The sizes that I use are '000', '00', '1' and '2'. Size '000' is used for very fine detailing, whilst size '2' is typically used for covering larger areas, such as a tramcar roof.

Another important 'tool' is the paint itself. I usually use Humbrol enamel paints as they give good results, are available in a wide variety of colours and can be easily obtained in small tins. I also buy new paint for each model, as 'old' paint thickens in the tin and I have known it separate into pigment and fluid.

Readers should be aware that the etch primer referred to later on is a very different paint, as it appears to be cellulose based. This means that it is very smelly to use (open the windows!) and cellulose thinners must be used to clean the brushes, rather than white spirit. I use Phoenix Precision Paints single pack self etch primer, which is coloured light grey.

A good technique for painting is to rest both forearms on the table edge to steady your hands. Then, if the model is held in one hand whilst the other employs the brush, I find that it is possible to achieve very good accuracy and I rarely need to use masking tape to obtain straight edges. The direction of painting should generally be along the length of the model, covering each panel in turn with a thin coat.

Paint away from panel edges and corners to avoid the build up of paint in these areas. Also, follow the 'wet edge' around the model to ensure that partially dry areas are not overpainted, which may result in visible brush marks. After each coat of paint has been applied, leave to dry overnight.

Painting the Model

Before starting to paint the model it must be clean. As brass has been used in construction, this must be cleaned of all remaining flux, grease etc. This can be achieved by dissolving a small amount of soap flakes into hot water and using an old toothbrush to scrub the model until it becomes clean. Do not be tempted to use washing up liquid or detergents, as the 'sparkle' agent used may have an adverse affect on the etch primer.

The plastic areas will just need degreasing with Carr's Neutralising Rinse. Dip a cotton bud in the rinse and wipe over the model. The rinse can be used on brass parts too, after cleaning with hot water and soap flakes. After using the rinse, wash all parts with water. Once cleaning has taken place, avoid touching the model with your fingers.

It is necessary to use an etch primer on all external brass surfaces to give the paint a good 'key', otherwise it will easily chip off, especially from panel edges. It is only necessary to apply one thin coat of the etch primer, remembering to keep it away from any plastic areas.

When applying the colour coats, I usually start with the interior areas first. This is normally brown to represent 'wood' for the saloon interior and grey/ blue for the platforms and dash plate backs. The pigment used for these colours is quite dense and two coats should suffice. When applying the exterior colour coats, I apply the white (LUT 'broken white') areas first. These are applied to one side and one end, which are then allowed to dry before painting the other side and end. The white pigment used is quite thin; so at least four coats may be required to get a good depth of

colour. Unfortunately, applying the paint in thicker coats to 'speed up' the process usually results in runs, sags and blobs!

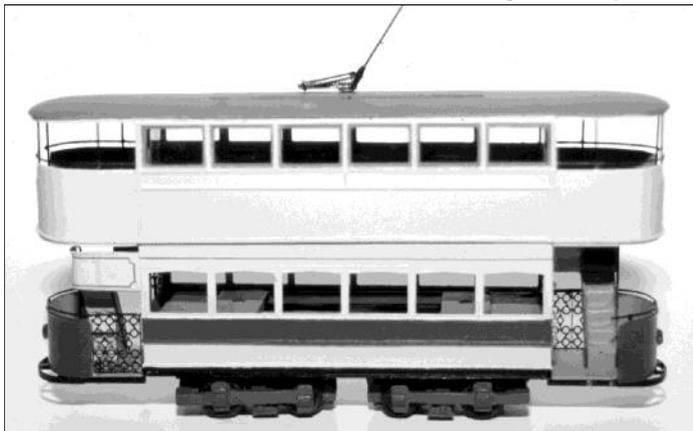
Next paint the second colour (vermilion red for a Type WT), being careful not to stray into the white areas! This is where a steady hand is essential and fortunately the older types of tramcar usually have panel beading that can be followed. Very small 'wobbles' can be corrected by scraping with a cocktail stick whilst the paint is still wet. This should remove almost all of the errant paint. Larger blobs in the wrong place can be removed with a cotton bud dipped in white spirit. The cotton bud should be only just wet with white spirit (ie, not drenched) and this will need to be used swiftly to avoid removing some of the white area as well. Red also has a thin pigment and so four coats will usually be required.

Then paint all the black areas, which are typically the solebars, fenders and underframe. The handrails will need to be picked out in this colour too. A steady hand is again required, but fortunately black only requires two coats.

The roof (shaped from hardwood) should have already been prepared with sanding sealer and rubbed down with 1200 grade wet and dry paper, used wet. When this has dried, apply the first coat of the roof colour (mid grey for a Type WT). It may be noticed that the wood grain is still visible, in which case add a few more coats of colour and when dry rub these down with the wet and dry paper.

Keep on repeating this process until all traces of the wood grain have disappeared. I prefer to get the roof as smooth as possible, as it is often the first area that gets looked at on a small model!

Back on the main body of the model, all of the painting activity should have resulted in a presentable model. However, the standard of painting can be improved further by a *very gentle* rub down with 1200 grade wet and dry paper (used wet). This should only be used on the larger panels, such as the car sides, dash plates and balcony panels. The object is to remove only the 'bits' and other irregularities in the paint, thereby achieving a flat surface.



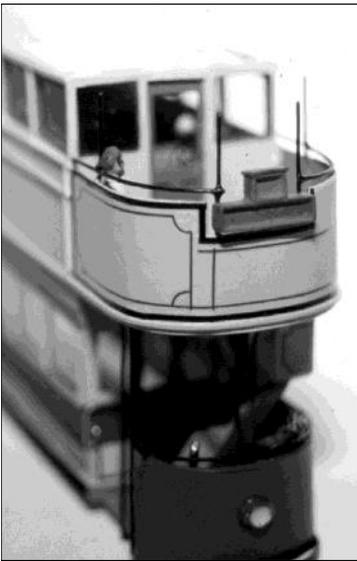
Fully Painted. Painting on the main parts of the model is complete and lining out of the remaining panels can commence. At this stage, the upper and lower decks have been glazed and glued together, whilst the roof and chassis remain unattached.

Where panel beading is present, the wet and dry paper will need to be cut into thin strips so that it fits in between the beading, to ensure that very little paint is removed from the surface of the beading itself. Also, it must be kept away from any other high spots and from panel edges, as the paint will disappear from these very quickly.

Once all the rubbing down is complete, the model should be cleaned with water in preparation for the final 'top coat' of each colour. Prior to painting the top coat, the model may be wiped over with a tack cloth to remove any remaining dust and dirt. The top coat should be kept as thin as possible and whilst the paint is drying, the model should be covered to protect it from dust.

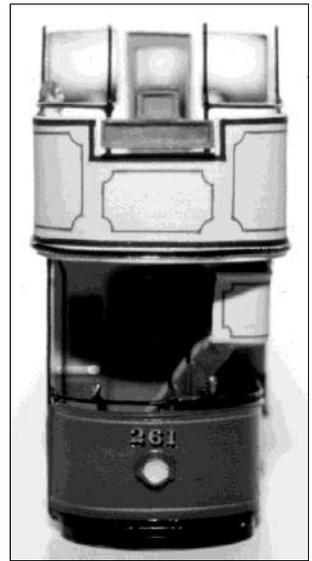
Glazing can now be applied to the model (I use thick overhead projector film) and the upper deck may be

glued to the lower deck. Once the glue is dry, fill in any hairline cracks between to two decks with grey Plasticine. Smooth off the Plasticine with a cocktail stick and paint to the correct colour.



◀ **Lining In Progress.** Lining out the balcony panels is probably the most difficult area on the model. Here the lining is being built up in strips and I was using a photograph of the prototype to gauge the correct spacing. The rounded corners are provided on the HMRS sheet. Unwanted sections of lining are scraped away with a cocktail stick, prior to varnishing.

▶ **Fully Lined End.** The lining is shown complete, together with fleet numbers in place. Also, the vertical handrails have been added and painted. Only the other end to do now...



Applying Lining

To apply lining to the model I use HMRS Transfers' Pressfix general purpose lining. The colours used on a Type WT are red, black and gold. This lining has the advantage over water slide transfers in that it can be repositioned a number of times to get the correct alignment and it has no carrier film. The instructions that come with the lining are comprehensive, to which I only need to add a couple of points.

The first is that when the backing paper is removed, the lining sheet should be 'tacky' to the touch. This is to ensure that the lining adheres to the model. However, this does dry out in storage and any sheets that are purchased which are not tacky are probably old stock.

The second point is that once applied the lining is very fragile until it is coated with varnish. For this reason, the model should be lined out working from top to bottom, to ensure that previously lined areas are not disturbed. Also, do not work on the other side of the model until the first side has been protected, otherwise the lining will transfer to the modelling board! The most vulnerable area is the waist rail (lined black) and great care needs to be taken with this area until at least three coats of varnish have been applied.

I use HMRS Transfers' Pressfix sheet No 24 (Loco and coach insignia, MR, S&DJR, LT&SR, M&GN) as the source for the fleet numbers. As these numbers are small, they are best positioned on the model using a cocktail stick. Add seats to the top deck (cut from seating strip), together with passengers, and glue the roof to the body



◀ **Transfer Sheet.** The required adverts have been printed to a transfer sheet and given two coats of spray varnish to protect the inks used. Many copies have been produced as 'insurance' against things going wrong when being cut out and applied to the model!

Making Transfers

To get the period 'look' to a model it is important to reproduce the correct side adverts. Very few pre-war side adverts are commercially available, so I took the step of making my own transfers. To do this I use a PC running Microsoft PowerPoint to produce the art work. The first step is to scan in Terry Russell's drawing and ensure that it is loaded to PowerPoint at the correct scale. Then draw an outline box to delineate the area of the advert, as it would appear on the tramcar side. When this has been done, the underlying drawing can be removed leaving just the box representing the advert.

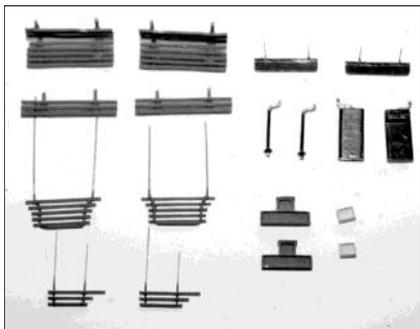
The advert may then be built up using the available fonts and colours, although the latter may require some guesswork if the adverts only appear in black and white photographs! The image can be zoomed up to 400 per cent in PowerPoint, which makes adding small details easier. The next step is to make many copies of the required artwork, possibly filling a whole A4 page (the reason for this will become apparent later).

Once the artwork is complete, it will need to be printed out. I use an HP inkjet printer together with water slide transfer paper, either with a clear or white carrier film, as inkjet printers cannot print white. This

can be ordered via the internet from Mr Decal Paper. (www.mrdecalpaper.com). Once the transfer sheet is printed it must be coated with varnish as inkjet inks are water soluble! This is best achieved with Humbrol spray varnish. Two thin coats are usually sufficient to protect the inks, but do not get any varnish on the backing paper otherwise it will not release from the transfer.

Cut out the transfers with scissors to ensure clean edges and place into a dish of water. The transfer will release from the backing paper fairly quickly and it should then be applied to the model without delay. Humbrol Decalfix may be used to give the transfer a bit more 'slip' and to shrink it down so that the edges are less visible when dried.

Points to watch are that the transfers are very thin and are thus prone to stretching and tearing. Also, if the ink is present at the transfer edge this will tend to 'bleed' away unless the transfer is swiftly applied to the model. Hence the need to print many more adverts than are actually needed! When all has dried, the transfers should be protected with a couple of coats of varnish.



▲ **Small Parts.** Here are a number of items that are best finished away from the model. As the model undergoes a lot of handling during the painting and lining stages, they are best added at an advanced stage of completion to avoid damage.

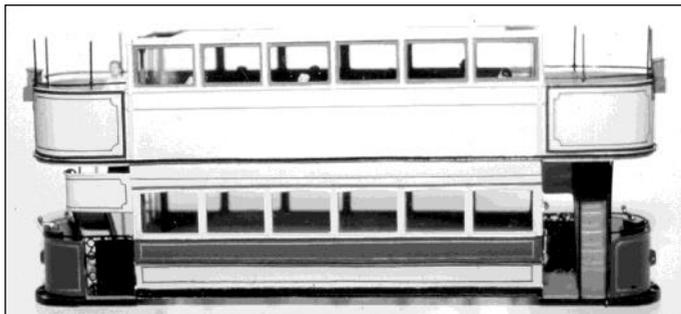
▼ **Passengers.** I like to add people to my models and here are the passengers for the WT. The top row is fully painted and will be seated on the top deck. The lower row only have their top halves painted, as they will be cut across the chest and glued to the chassis!



► **Lined Out.** Lining and varnishing is complete and many of the small details have been added. Lining out side panels is far more straightforward than the curved ends!

Where to buy the parts

Note, Most of the parts mentioned in this article as “BEC”, and many other parts can be now obtained from KW Trams. (www.kwtrams.co.uk)



◀ **Fleet Name.** ‘London United’ has been spelt out using water slide alphabet transfers. The font is ‘Cheltenham Medium’ and the letters are 2mm high in gold (Fox Transfers Pack FG1305). For the increased height ‘L’ and ‘D’, first cut out the required letter from the alphabet sheet. Then cut the letter in half (horizontally) and apply each half to the model in the correct place. The gap between the upper and lower halves may then be filled by cutting out another letter from the sheet, which should have its top and bottom trimmed off. This ‘middle’ section may then be applied to the model in the correct place. Some overlap between the top, middle and bottom sections can be allowed, as this shrinks down if DecalFix is used. A cocktail stick is essential for manoeuvring these tiny scraps of transfer in place!



Completing the Model

Only after all of the painting and lining has been completed can the small details be added (eg controllers, life gates and guards, etc.), as these are very vulnerable to being broken away during all the handling necessary to complete the lining. Destination and route number blinds can be made up in Microsoft Word. I usually make up the trolley pole from a David Voice kit (PC models—now available from KW). Last of all, the chassis can be fitted to the body and the model track tested. By the time you read this, the model will have joined the *Kew Bridge* fleet, and may be seen on each occasion that the layout is exhibited.

► **WT 261 at Kew Bridge.** This view (which appears in Cyril Smeeton’s *The London United Tramways Vol. 2*) was the inspiration and main source of reference for the model. M J O’Connor took this photograph in about 1933.

M J O’Connor/NTM

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