WORKSHOP WANGLES

by Martin Brent

Martin Brent played an important role in the development of the Missenden Railway Modellers weekend in the current format and was the Chief Tutor from 1996 to 2000.

*It was Martin who introduced the **Missenden Abbey Railway Modellers Manual**, in which he passed on useful tips and techniques gained during his long and successful modelling career.*

This is one of his documents and was included in a tribute booklet published in 2001 following his death from the complications of leukaemia in 2000.

It has been brought up to date as part of our preparations for the Virtual Autumn Weekend in October 2020.

We have also updated as much product information as possible and but hope we have been able to preserve Martin's inimitable style.

A is for adhesives (which I used to get into a terrible mess with)

Lately, I have been trying some cyano type adhesives by a concern called De Luxe Materials. Their cyanos go under the name of Roket and they come with clever little tips and microbore tubing which makes life a lot easier in terms of getting the glue where it is meant to be and, most importantly, in keeping the nozzles clog free.

https://deluxematerials.co.uk/

A is also for abrasives

Martin makes reference to a lot of abrasives in this section as well as a number of products throughout the document. Current suppliers such as Eileen's Emporium carry a wide range of these including some of those referred to.
https://www.eileensemporium.com/

So……. you have just opened your first etched or part etched kit and the soldering iron is warming up nicely. When soldering, cleanliness is next to Matins or Evensong and then having identified as many of the bits as possible, the next step is to clean the bits that you are intending to unite. Many worthy eminences have written on soldering techniques and I will not try emulate them or try to reinvent the wheel but suffice it to say, it is essential to clean those bits, be they white metal or brass before putting a soldering iron anywhere near them. The former seems to grow a skin (probably the release powder) that dislikes solder and the latter will almost certainly have a residue from the etching process, to say nothing of the Sellotape that some manufacturers will insist on using to hold the frets onto the protecting card. I, by the way, use cellulose thinners (nasty stuff) to remove the fossilised sticky goo from the etch. You still however have to clean it before it will take solder satisfactorily.

Cleaning large flat sheets with no raised or rivet detail is easy and usually they can be cleaned using the coarsest tool in our abrasives' armoury, the Rubbing Board. At its most simple, this is a sheet of wet and dry paper - about 400 grade - glued with contact adhesive to a flat and I emphasise flat, sheet of chipboard or similar. This is a most useful tool and one that can be used to clean the reverse of etches, to remove cusp and ragged edges, to remove solder from flat surfaces or straight edges and very useful this one, to ensure that the edge that is being rubbed against it is absolutely straight. I cheat and use a double-sided board with 400 grit on one side and 600 for finishing off on the other. It is another of those tools that once you have tried it, you will wonder how you ever survived without it.

Now available on the model railway market are the 'conforming foam pads'. These are reusable foam backed pads which come in a variety of shapes and grit sizes. They have a peculiar quality in that the makers claim that the grits are mounted on the backing so that they can always present a sharpened cutting face to the work and they have the further advantage that they are washable when clogged so that they last longer than conventional abrasive pads. They can be shaken as work proceeds, to remove dust or, when really dirty or clogged, a wash with the stuff that does dishes will invariably restore the bite to their cutting faces.

The foam backing makes it easy to use with surfaces that are not quite flat but it is necessary to exercise a little care as sharp-edged parts, e.g. etched corners will dig in. These pads come in sheet (Approx. *5"* **x** 4") or block (about 1" square) form (No, the writer does not like this new-fangled metric nonsense!) and I have found the former most useful. There are a number of grit 'sizes' ranging from 60 grit to 280 grit, pausing at 100 and 180 on the way. I found the finer grits of most use on metal, particularly that with the fine 280 grit which cleaned old, tarnished, etched parts quickly and easily. The block form has not been used quite so much as I find it a lot easier to rub the part on the pad rather than t'other way round. Very useful for cleaning areas of models where rubbing boards won't reach.

The next step down in terms of size is an abrasive stick or pad and whereas we used to make these, they can now be bought ready made and in a far more sophisticated form than we ever dreamt of. My favourite is the Flexipad by Creations Unlimited -would you believe an American concern - which comes in a number of grit sizes ranging from extra-fine - fine - medium - coarse. I tend to use mainly the coarser sticks because at this stage I'm in a hurry and I finish off with a glass fibre brush anyway of which more anon.

Creations Unlimited also produce Flex-i-files which are thin bands of the abrasive material on a flexible backing suspended in what is, in effect, a small 'hacksaw' frame. I have not yet tried one but initial reports have been good.

Then, of course, there is the old faithful - small pieces of wet and dry sheet which can be screwed up into improbable shapes to get into impossible corners and crannies and then discarded. Cheap, cheerful and very useful.

Something finer still is the large fibreglass stick as sold by Eileen's Emporium, Shesto, Squires and many others. Usually tape or cord bound, they are capable of producing a beautifully burnished finish almost ready for paint but if your skin is at all sensitive, use surgical or other protective gloves. Also make sure that the residue goes nowhere near a motor, gears or bearings.

Always wash the model after using any abrasive but particularly so after a session with a fibreglass stick**.**

These tools are used more towards the end of the construction of a model and are most used in my workshop for final mechanical cleaning of the body, particularly where there is rivet or other detail. These brushes come in a variety of sizes and the usual ones are those mentioned above and the pencils which come in two sizes. Both are useful. The thinner the stick, the harsher the action and the more quickly the stick will disappear. A useful dodge is to soak the pencil refills in PVA adhesive which makes them last longer and gives them more abrasive powers. A usually overlooked abrasive is wire wool, not the domestic pads, but the stuff cabinet makers use and available in a variety of "Strengths" from DIY shops.

A very useful polishing tool but again never ever let the swarf go near gears, motors or paint!

Last in the Brent book of abrasives is Vim or a similar powder cleaner which is used wet on the model to prepare it for painting. An old soft toothbrush and a good dollop of Vim, well washed off, will produce a really clean model providing a good key for painting. But that's another story.

B is for Bench and tidiness which, my wife says, is next to Godliness...

The phrase "of shoes - and ships - and sealing wax - of cabbages - and kings" is one that has always stuck in my memory and most of the articles mentioned above have been found on my workbench at one time or another - usually embedded in the enormous pile of tools that builds up into a miniature Matterhorn as the model progresses. Each time that I started a new model, I have every good intention of being tidier with my tools and replacing each one in the tool box or the holder after I have used it. Then, I say to myself, you wouldn't spend five minutes trying to excavate whatever it was you wanted from the tangled heap that clutters up the bench, surrounding and almost hiding the model under construction. The problem was that I knew that I would need that three-square file or that triangular scraper again in a minute and it seemed daft to bend down and put them back in the right compartment in the tool box. Talking of tool box compartments - are you lazy like I am, or rather was, and keep all your needle files together in one slot so that when you want a particular shape it is always the last one that you pick out of the assortment? Think of all the time that we must waste looking for the right tool. They can go missing permanently too.

I think that it was P. D. Hancock of Craig & Mertonford fame who, back in the 1950's, wrote about the case of the missing 1/16" drill bit. This was a case worthy of Watson if not Holmes himself. Briefly, he (PDH) was using two drill bits, one clearance and one tapping and whilst drilling a series of holes he removed one bit from the pin vice, used the other to drill the next hole, removed that bit and went to pick up the other bit that he had just put down less than a minute ago. It was not there! An hour later, after a fruitless search of the entire house (and the garden no doubt), he went out on a Saturday afternoon to try and buy a new 1/16" bit so that he could finish his model. You can guess the rest. Suffice it to say that until recently my bench was some sort of Tardis where things wandered off from time to time, seemingly into the outermost reaches of the universe, never to be seen again. Well, for a few weeks at least.

It was whilst browsing around my local Woolworths that I saw some plastic desk tidies at 99 pence each. They look like four lengths of tube stuck to a base and in a blinding flash I knew that I had the answer to my problem. Three or four of these would suffice to hold all my dental probes, needle files (each shape with its own compartment), screw drivers, scalpels and the other bits and pieces that made up the modeller's armoury. And they did. Clearing out the tool box and sorting the files took a little while but that done, all that remained was to drill a few holes in a piece of chip board to hold the drill accessories; you know, all the burrs scrounged from the dentist and the various rotary wire brushes and cutting discs

which did not fit easily into the tidies.

The proof of the pudding is in the eating and the four tidies are at the back of the bench where they are within easy reach thus giving me no excuse to leave everything out on the bench. What's more, I can find things now too. One of the best £3.96 worth that I have spent for some time and thoroughly recommended.

This is great advice – desk tidies are readily available in current retail outlets such as the Range – as well as on line.

C is for Colour.

As a group, we railway modellers are so conservative that all too often we just will not look at what our near neighbours such as wargamers, ship and aeromodellers or modellers overseas are doing. This is a shame because some of their techniques and materials are miles ahead of anything that we use or do. That is not to say that they cannot learn something from us. As an example, Wargamers' scenery is generally not up to the best railway modelling standards and much of what we do in the model railway field is superior to the efforts of a lot of the Continental modellers. It is a question of outlook. Which is why to me, the Model, as distinct to Model Railway Exhibition are so enjoyable. I am afraid that I keep sneaking away from the layout and go poaching ideas from other branches of the modelling hobby!

When we paint our models, we tend to use the established paints from one of the general or specialist railway ranges, or if we can find a colour match, from car aerosols. All very good, but have you looked at what the aero and military modellers have been doing? Some of their paints are very suitable for railway models and the following relates to two hues of that most popular railway colour - black.

"You can have in any colour you like so long as it's black". One of the most quoted sayings in history and it all sounds extremely simple. In reality it is not as simple as it sounds as I found to my cost when spraying one of my previous M.G. s - there are any number of blacks! This is even more so where railways are concerned when one takes into account the ravages of the weather on the paint work of machines that were out in all weathers and subject to all the nasty airborne grot that emanated from the chimneys of the Industrial Revolution.

So far as model railway paints are concerned, the choice, if one is using the readily available ranges, is relatively limited - usually black or coal black but there is no reason why we should not pinch a few ideas or products from other modellers' ranges. "Ah", you might say, "but why not mix your own colour?" True this is quite easy but it is not always easy to exactly reproduce a mixture which is a bit of a problem when repairing the ravages of an exhibition. Suffice it to say that I am always on the lookout for new colours and recently I have come across two blacks that have produced outstanding results for weathered locomotives and stock. These are sold under the "Xtracolor" label and are available from Hannants – https://www.hannants.co.uk/

The two colours in question are Tyre Black and Exhaust Black. Both paints are synthetics; they can be let down with white spirit and they come in the usual tinlet cans. Exhaust Black gives a lovely brown tinged black while Tyre Black gives a very flat black with just a hint of grey. I sprayed them and they were excellent so applied but I have used a brush and again, I have obtained good results with little brush stroke effect to show when dry.

I have used them to paint locomotives that have obviously been in service for some time but have been regularly cleaned on a cursory basis. I used Tyre Black on the body and Exhaust

Black on the smoke box, cab roof and below the footplate. A light blow of the latter along the top of the boiler gave an impression of cleaners who hadn't been able or couldn't be bothered to clean right over the boiler.

These paints saved a lot of time and swearing insofar as I did not have to produce an ex-shops locomotive and then dirty it with the ever-present risk of overdoing it. It also gave a nice uniform colour base for the final weathering coat and patches of rust. (Well, nobody yet does weathered decals do they!). I am impressed with these paints and can recommend them to all those souls who like their locomotives to look as if they really work for their living. Oh, and they are good for road vehicles too!

Since Martin wrote this, we have seen a revolution in terms of the type and range of paints available. Acrylics are now favoured by many railway modellers and anyone who has attended a weathering course at Missenden will have come across the wide range of colours and weathering materials available from manufacturers such as Lifecolor (who produce a set of six "blacks"), Ammo by MIG and AK interactive

Useful links are:
Scale Model Shop https://www.scalemodelshop.co.uk/
HobbyHolidays www.hobbyholidays.co.uk
The Airbush Company https://www.airbrushes.com/

Not really colours but two other American products that are worthy of attention are the Micro Satin and Micro Flat clear finishes for models. Varnishes to you and me! These are water based and applied with an air brush or, carefully, with a brush, give excellent results. Use over a period of time has shown them to be superior to most other finishes.

As I said they are water based and they are probably a lot safer than the solvent-based products that we so often use. They can also be applied to plastic and synthetic paints with impunity. They produce a very nice satin or matt finish with little evidence of orange peel. If over-diluted they will run quite freely and I recommend letting the mixture down very gradually, spraying onto a piece of scrap before turning your attention to your new model.

There is a snag. They dry very quickly both on the model and in the brush and immediate cleaning of the airbrush or paintbrush is essential.

After spraying, I immediately spray water through the brush and then strip it for a good clean using a proprietary aerosol cleaner.

Where finishes are concerned it is worth looking at the range of products available to military modellers as well as other US products such as TestorsDullcote

D is for distribution

One of the problems that we face is getting small amounts of liquid or paste to an exact spot in an exact amount. There are several solutions. For liquids like white spirit I recommend disposable pipettes. They come in a variety of sizes and will last for quite some time. They are also useful for watering the ballast when using PVA or powder adhesives.

The other useful gadget is a syringe with a large bore tube. Sorry to hark back to a commercial concern but the syringes sold under the De Luxe label are ideal for flux, be it paste or phosphoric. They are hard plastic and last indefinitely. The needle will, however, need reaming out occasionally with a bit of stiff wire.

Eileen's Emporium provide a range of syringes and a blunt needle.
https://www.eileensemporium.com/materials-for-modellers/category/oils-and-oliers

E is for elastic (Lycra in fact)

What is Lycra doing in this tome one might ask. In my professional life I worked with a gentleman called Al who was part of the team who developed Lycra. One morning the postman delivered a spool of Lycra thread used by our aircraft modelling cousins to rig their SE5a's and Tiger Moths. The accompanying letter said that it looked "useful". What did I think and what for?

To one just starting to think about detailing a layout, this product was manna from Heaven. Just what the doctor ordered in fact. One of the moans that I have been accused of over the years is the lack of a vertical dimension to our layouts. Our trees are far too short - veritable midgets of the arboriculture world in fact - we rarely bother with telegraph poles and as for electricity supply poles; well they are virtually a no-no so far as the modelling fraternity is concerned. In the real world though just drive through the average village or hamlet away from the Home Counties and look skywards. The plethora of public utility poles dominates the skyscape. It quite ruins the landscape in fact so why don't we model it properly? Is it because we have a subconscious yearning to only model national parks or what your scribe terms "Summer County" scenery? Come to think of it, that's a misnomer: it's not scenery, it's landscape. Another moan that I have been known to give vent to is about the sags and loops in our post and wire fences. For years, I cribbed Peter Bossom's idea of a rather large weight hanging on the end of fishing line fed down through a hole in the baseboard. It worked… (sort of)

Looking at this humble spool of Lycra it dawned on me that this humble product had a value far beyond its very reasonable price. Although the following relates to seven-millimetre modelling, this material can be used in 4mm or 7 mm settings and I would risk it in a 3 mm environment. Because of its composition I can't give a strand diameter but it is fine, believe me. It is also very stable and very strong.

The first application was the fencing. Slaters "concrete" posts were already to hand and planted according to instruction. The Lycra was threaded through a fairly fine needle, knotted and a knot tied to make everything secure. Don't be tempted to use glue; anything with a solvent base attacks the Lycra sooner or later. It was then child's play to thread the Lycra through the holes in the posts. The most difficult part of the exercise was to gauge the degree of stretch that was necessary. If anything, I had too much tension and the next stretch (a goodly pun if ever I heard one!) was so arranged as to have a bit more slack. It has to be said that the temperature in the Brent workshop is, despite its proximity to the Welsh borders, somewhat warm so the effect of say, a loft or an exhibition hall does not seem to have a major effect on the tension.

The electricity poles were next. I used 1/4" dowel for the poles in 7 mm scale and the insulators were dress making pins bent into a right angle and super glued into holes pre-drilled in the post. I won't waste your time with a description of the various types of post and cable arrangements. Just accept that the modern-day cabling does not necessarily reflect the practices of the thirties, forties, fifties or sixties. Most houses in those days had a three-phase cable supply network with two cables providing a single-phase supply taken off the main cables or, alternatively two cables giving a single phase were strung between posts and the supply was taken from those. Look at old photographs of the area of your model before bending pins to represent insulators and fixing them in place. If you want to see skyscapes with poles, I can recommend any number of small Welsh Border villages which

still have an overhead supply. Steps or, rather footholds for the linesmen were another movable feast. The general rule was that the top footholds were a pair at the same height for the linesman to stand on while the climbing footholds started a good bit above human reach and were mounted alternately on each side of the post with a riser distance of about 12". So far, I haven't got beyond bits of scrap fret and the photographs of the electricity supply to the mill (Hope Mill; what else?) at Arcadia show a surprising lack of such aids to maintenance. Fear not, there is a prototype for everything and in this bit of Herefordshire I can show any disbeliever a number of poles bereft of any footholds. I shall however get around to them in time. A triangle of thin brass wire flattened with a hammer or, better still, scrap fret suffices. While I think of it, do think about the colour of the poles; don't just slap black paint on your poles - look for the subtle nuances; the greys, the greens and the silvers. A bit of care in the painting will make all the difference. Also, what about the odd hop or cluster of convolvulus vigorously climbing the straining cable.
The system of staying the poles particularly on road bends is a subject worthy of an article in its own right. Diagonal stays with adjusters; stretchers across the road to another pole with a diagonal stay. Two stays to a pole, broken stays, stays covered in ivy, the variety is amazing. Again, go out and look at the prototype.

The obvious extension of this idea is to string the Lycra between the insulators of lineside telegraph poles. No problem with this idea but it is a bit fiddly and careful attention to the tension is necessary. If in doubt make it a wee bit slack. There was degree of sag on the prototype and too much tension on the model will pull the post out of vertical as sure as eggs is eggs. It certainly did on Arcadia.

The next step was to complement the point rodding with signal wires. Again, a simple exercise. Short lengths of square plastic or metal stock sunk into the baseboards with the Lycra strung along from post to post and embedded in PVA which had been allowed to start to go off. Signal stays? Look at any signal worthy of note such as a bracket splitting home and the odds are that it will have stays. Lycra is the answer. Earlier I mentioned adjusters and these were a feature of signal stays. These usually take the form of an elongated "U" with a screw adjuster mounted in the jaws. All of mine were made from bent bits of wire.

I have to say that rarely have I have come across such a versatile material. New ideas came thick and fast. The next application was wagon sheet tie ropes. No more sagging loops; all was tight and tidy and knots were easily made. In short, any application needing a taut rope needs Lycra. Other ideas canvassed by John Cox and the writer (usually over a pint of amber nectar in one of our monthly, lunch time, brainstorming sessions) were horse drawn vehicle harness, mooring lines for boats and ships and, most intriguing of all, bouncing signals. To be fair, no work has yet been done on the last-mentioned idea but the sheer (another rather good pun) indestructibility of the thread makes it an ideal imparter of a bouncing motion.

It is not often that a material that is so versatile and so useful comes at such a reasonable price. As well as the above suggestions, I am sure that there are any number of other applications.

An internet search for "lycra thread model" will bring up numerous results referring to model ship and aeroplane modelling.

F is for Fluxes

I think that most of us now use a liquid phosphoric acid flux for most of our soldering and until recently I was under the impression that everyone used a hypodermic syringe to apply the Phosphoric acid or whatever. It was whilst demonstrating at the hugely successful National Model Railway Exhibition at the N.E.C. that I found that this assumption was

wrong. Indeed, a number of modellers commented on what a good idea it was. I therefore mention it in case you too have not thought of this idea.

Eileen's Emporium provide a range of syringes and a blunt needle
https://www.eileensemporium.com/materials-for-modellers/category/oils-and-oliers

A point of safety (get the pun?), if necessary do grind off the sharp end of the needle and keep a piece of thin wire handy to clean it out occasionally. For some reason the Phosflux 6 for white metal solder forms more of a Verdigris type deposit on the needle point than the stronger 12% solution. Don't ask me why. To store them upright (needle down for safety) can be a problem but most syringes come with the needle in a protective plastic sheath which can be forced into a suitably sized hole in a piece of wood. Otherwise a piece of rigid plastic tube will do just as well.

Recently, although I still keep faith with the Phosphoric acid fluxes, I have been using the power fluxes by Fry's and others sold by most of the DIY warehouses under their own brands. To be the right stuff they should be white pastes which are water soluble and marked "British Water Council Approved". This flux really is the bees' knees and is worth a good 10 degrees of tip heat. I now use it for almost everything except white metal but I have learnt to be so, so, so, careful when using it near steel. It is an excellent flux but attacks the steel with extreme rapidity. You can almost see the rust forming! Good washing and scrubbing at the end of each session is essential and don't leave the top off near the model or near your tools; the fumes will attack any steel items nearby.
If, perchance, you do leave the top off, the paste will thicken and go brown. Fear not; just let it down with a little water and you are back where you started. Getting the rust off the models or tools is another problem though. Something from my little bits on abrasives perhaps....

G is for Grabbing or picking it up as you go along

I have come out! I am no longer a closet finger nail nibbler. I shall face the world bravely, confident that my real friends will now accept me for what I am rather than what they believe me to be. I have suffered this unhappy blight on my life for the best part of half a Century, hiding it as best I could but I am sure that in reality some had guessed my secret and pitied or even shunned me because of this aberrant behaviour. Nobody realises the problems that I have had to face as a closet nibbler, not the least being the fact that without fingernails it is d****d difficult to pick really small objects up from a hard surface!

The answer is rather simple and is one that I picked up when I was studying work and trying to find ways of producing more MGB's and M.G. Midgets. In their wisdom, the new vibrant, sales-driven, management for British Leyland in the 1970's sent me on a course to learn work study and of course, there was the obligatory practical project, the detail of which I will not bore you with. Suffice it to say that we had to re-create a section of the production line to show how our individual improvements(?) worked. My project involved the worker in picking up a lot of small nuts and bolts and for years, we at Abingdon had (like most other concerns) used trays lined with foam to hold small components. It is easy to see that this made picking up small parts a lot easier than from a hard surface 'cos you could actually get your delicate pinkies around the bit, fingernails or not. Anyway, I made a mock-up of this tray and on the great day, the top brass from Leyland came down to see what we thought we had achieved and the one thing that sticks in my mind was the amazement with which my little tray of foam with compartments for the nuts, bolts and lock washers was received.

Which is a long-winded way of showing how easy it is to pick up delicate little bits like cast whistles, handrail knobs or 14 BA nuts using a foam lined tray. Any shallow

compartmentalised tray will do and I find that it helps to empty the box of castings onto the bench and then sort the various pieces into separate compartments using the instructions as an aid.

H is for Handrail knobs or a "Handy Tip"

One of my most hated tasks is fitting handrails to locomotives. It is so fiddly and if you get it wrong and fit it with the wrong knobs, they slope or kink and it is one of those errors that glares at you for ever more. There is no way of avoiding the darn things 'cos the prototype invariably had them in abundance. I am convinced that if there was a spare space on the drawing for, say, Mr Maunsell's latest creation, the draughtsman would fill it up with another handrail just to make the drawing look more impressive and to make life more difficult for modellers in years to come. I have, however, found one or two fiddles that make the job just a little easier.

First of all, the wire. You can buy straight brass wire from establishments such as Eileen's Emporium and such wire is eminently suitable for handrails. I sometimes use it for my models but usually, I use either piano or guitar wire. These are both spring steel wires. The former can be obtained from most general or aero model shops while the latter - for guitars - can be purchased from most music shops in one thou. increments starting at about 0.006" up to about 0.025" before the strings start to come wire wound. I believe that E's E does some too. The joy of this wire is that it is inherently straight and you can, within reason, bend it, crush it and do other devilish things to it and it just smiles sweetly and straightens itself out again. Ideal for handrails (and signal operating wire and Alex Jackson couplings!) and the range of sizes means that you can obtain just the right size. Soldering can sometimes be a pain but a dab of one of Mr. Carr's stronger fluids or that good old fall back, active paste flux will cure any reluctance to take the solder. Do wash well afterwards though!

The next tip to make life easier is to grind the end of the wire into a needle point so that you can thread the handrail knobs onto the wire. Maybe my sight is failing but I can waste a morning finding the blankety, blankety little holes in handrail knobs as well as the dozen or so knobs that ping off into the darkest recesses of the workbench. And people say to me "How do you make such intricate models - you must have so much patience..." if only they knew!

Certainly, I have found that the sharpened point makes life a lot easier. The sharpening can be done on a stone or a grinding wheel and does not need to be anything special since when the handrail has been affixed the point will be cut off and discarded. Oh, I almost forgot. Do put a squiggle or a sharp bend on the other end of the wire so that your carefully threaded handrail knobs don't just slide straight off the other end of the wire into oblivion! Again, it can be cut off when everything is ready for installation.

If the handrail is continuous, i.e. it goes up over the smoke box door, the first stage is to bend the wire. Measure the full length from spectacle plate to spectacle plate and allow a bit extra. Then in the middle create the beautiful curve and any reverse curves and bends. When it looks right the knobs can be threaded. A careful look at the prototype or drawings is essential here as many locomotives had knobs of different lengths in various places. Where the smoke box is not flush with the boiler cladding is a typical example.

When fixing in place, start at the cab end of the locomotive and solder the first knob into position before offering up the rest of the handrail knobs to the locomotive. If the rail disappears into the cab, leave enough length of wire to thread it through the spectacle plate so that it can then be soldered and trimmed later on. If the rail finishes short of the cab then trim it a smidgen - a millimetre or two - over length and fit it. Solder or super glue will

bond it to the knob. At this stage it is important to try and ensure that the rail is parallel to the foot plate (if it is meant to be) and I have found that the fixed handrail knob at the end helps you align the rest of the handrail when fixing it into position. How? Easy, have a squint along it from several angles! All that remains is to trim the rail to length. Certainly, I have found it a useful dodge.

J is for Joints - cleaning them after soldering.

If you are like me, you probably live in awe of those supermen who can solder a joint perfectly, so much so that no surplus solder sullies the immaculate surface of their creation. My attempts at welding on my ancient motor car were once described (kindly, I am sure) as "agricultural", i.e. robust but not pretty to look at! Some days, I feel that my soldering is rather like that too. So, how do we remove the surplus solder which has oozed out all over the surface adjacent to the joint that we have just flooded with solder?

If you have the equipment it is possible to use a grit blasting gun (Badger do a small abrasive gun).

https://www.graphicair.co.uk/product/badger-mini-sandblaster-abrasive-gun-set/

Alternatively, you can immerse the model in Mr. Carr's Solder Stripper. I have tried both and they are reasonably effective but expensive since the grit and the stripper have a limited life and have to be renewed.) If the solder has formed a fillet where there should be a nice crisp right angle then I would suggest that you use a "dental" scraper. A very limited range of not particularly useful shapes can be found on tool stalls at Exhibitions. Usually they are sold as wax carvers and are inferior to anything a dentist uses. At a pinch they can be ground to shape with a flat on one side to give a cutting edge. The pointed probes that dentists usually use to find that particularly painful spot in a tooth are not too useful when clearing an excess of solder. What is needed is an edge rather than a point. The best shape that I have found is the small heart shaped scraper which has two cutting faces and a point angle of less than 90 degrees. It really gets into corners and cleans quickly and cleanly. Square or chisel shapes are not so useful as too much force is needed to persuade such a large cutting area to work.

Eileen's do sell a scraper.
https://www.eileensemporium.com/materials-for-modellers/product/triangular-scraper/category_pathway-1066

Of course, it is not always necessary to clean all the solder off. When building a chassis or where the part is structural and does not show, I prefer to leave a fillet of solder around the joint for strength but it is sometimes necessary to clean a bit of solder away for clearance. If it can't be seen then I tend to use a dental rotary burr or a flap wheel - a mandrel with a radial series of flaps of abrasive material - in the mini-drill. Do not use the former on the surface however, it will mark the metal. I am not too sure about the latter either and suggest that it is best to accept that where it can be seen, what is needed is a bit of careful work with the aforesaid dental scrapers, or that most useful of tools a triangular scraper. A standby in the tool room, particularly for scraping white metal bearings to size, these cutting tools are a Godsend to the modeller. They look like a completely smooth three square (triangular) file but in fact the most useful ones have slightly concave surfaces which give the cutting action. They can be purchased from engineering tool suppliers or you can make them yourself (assuming that you have access to a bench grinder with a fine wheel) from an old three-square file such as one of those plastic handled ones sold at Street Markets. With the file held at 90 degrees to the wheel, slide it across the wheel over its full length, grinding off all the teeth and making sure that all traces of the teeth where the faces meet are

removed. Remember to keep it cool by dipping it in water every pass and don't linger on the wheel. In use, solder can be removed with the tip or the face and once you have tried one you will wonder how you ever coped before. They are, by the way ever so good at removing solder from, and giving a really good top and bottom surface to built up coupling rods.

Another form of scraper is the flat scraper, usually ground from a piece of power hacksaw blade or tool steel. This is not as difficult as it sounds if one accepts that rules are there to be broken.

I was taught to never ever use the side of a grinding wheel but over the years I think that I have used the side more than the periphery when sharpening drills or lathe tools. I use the side when making flat scrapers too - just put a face on the top side of the blade, or if you like one tool to do the job of many, face up all four faces. I always radius the corners to stop the tool digging in and a tip that I was given many years ago is to make the scraper as a Rhombus so that it can get inside a right angle. When is such a tool used? On any large flat area but one sticks in my memory. A kit for a flared tender was produced with the tank body as a box with the flared top as a separate etching. The only snag was that the joint was below the flare at a point on the tender body where there was no joint on the prototype! How to hide it? Short of a new body the only answer *was* to hide it, and this was done by flooding the surface with 188 solder until the joint could not be seen and then carefully scraping it until there was a nice smooth surface.

Some of you may recognise this as a practice akin to the leading of car bodies before the advent of epoxy fillers. Building up the solder requires a bit of care and the scraping is something that should not be hurried. The tool is used by dragging it across the surface at an angle of about *75* degrees and the cutting is all done on the edge created by the grinding process. If you looked at the edge of the tool through a microscope, you would see that there is not a nice clean right angle between the two adjoining faces of the tool. The grinding process has thrown up an "edge" of metal and it is this that is cutting away the surplus solder. Not a tool that I use all that often but it has got me out of trouble on a couple of occasions and I have even used it to clean paint from the surface of rails to good effect. I pass it on for what it's worth.

L is for Lap

When we left our last house, I reckon that we left a couple of hundred small B.A. nuts, bolts, washers and other sundry small bits in the depths of the best long pile Axminster that graced the dining room in a corner of which I did my modelling. Somehow, they had a habit of pinging out of the tweezers or, if it was a really bad day, all falling out of the pack as I opened it and disappearing into the carpet. You must have suffered the same.

The answer was simple and came to me one day whilst buying tools. A carpenter's apron. I obtained one for a fiver and found that now, when I dropped things, I had a reasonable chance of finding them in the folds of the apron. It also saved my trousers from the worst ravages of solder paint, flux, paint, glue and general grime and grot that is all part of our glorious hobby.

Later, I found a bigger and better apron which is the one I now use. This has the advantage that by using two bits of Velcro (supplied) the bottom hem of the apron can be attached to the bench which gives an even better chance of finding the dropped bits. Don't be a cheapskate like some I know. One person who saw and modified used drawing pins which was fine until the phone rang and he got up to answer it. Pins are more permanent than Velcro. It took him a day to find and sort the contents of his bench! People may snigger and

think me old fashioned - but at the end of the day I've got the last laugh - I've got more nuts (16 B.A.) than they have.

Regular attenders will know that Missenden Railway Modellers aprons are also available!

M is for "Mock" glass

It must have been about 1978 or 79 when a friend who was one of the most innovative modellers that I have ever known passed me a bottle of Microscale Kristal Kleer with the suggestion that I try it out as a glazing material for locomotive spectacle plates. I did and was immediately hooked. No more sitting at the bench with a glazed look, (sorry about that!) cutting and filing silly little bits of clear plastic to a size that was invariably, when finished, just that bit too small to fit the window aperture. No more struggling with adhesives that insisted on squidging out onto the glazing material and fogging it. From now on it was simply unscrew the bottle, twiddle a cocktail stick in it, stir it around the window and it was done!

Over the years I found more and more uses for this clear, liquid PVA and in the hope that I can save you, gentle reader, from all the frustration of cutting and filing, etc., etc., I set out below some of the uses that I have found for this magic juice.
Before so doing, however, do let me say that despite all the nice things that I am about to say about it, it is not a universal panacea; it has a meniscus and it is not 100% clear. However, for locomotive cab windows in 4mm and locomotive spectacle plates, signal spectacles, docket windows, clerestory lights and Georgian window panes in most scales it is eminently suitable. It can also be used as an adhesive to stick carriage windows made of plastic sheet or glass into place. It dries clear and being PVA based will not attack any materials. True, the bond is not up to super glue standards - far from it, but on the basis that we usually try and handle our stock with a modicum of care it is adequate for our needs. There are other uses and I am sure that if you try it you, too, will find a host of new uses. If they haven't been mentioned before, why not write and tell us about them?

As I say, its application is simplicity itself. Give the bottle a shake and using a cocktail stick or similar pull up a blob of Kristal Kleer. Insert the blob (sounds like the script for a 1950's Sci-fi, horror film doesn't it) into the window or spectacle aperture, (if possible from the rear but don't worry, it won't affect your paint work if you have to do it from the front) wiping it around the edges and then, tilting the stick, stretch a thin film over the aperture so that the stick ends up at one side or in a corner. Carefully withdraw the stick and leave the model to dry when your new window will have miraculously cleared. It helps to try and leave it flat to dry to save the fluid draining down to the bottom of the aperture. If you are filling a large hole the film may collapse. Don't worry, just try again having removed as much of the old as is possible. About twice in fifteen years I have had windows that just did not clear. The only answer is to remove the white film and start again. Why it should do this I know not.

How much do I put on the end of the stick? It is largely a matter of experience but if in doubt always load the stick with more than you think you will need. It also helps to have a variety of sticks of different diameters on the basis that a larger stick will be easier to use in a larger aperture. Don't overdo this however - I have never used a stick of more than 5/32".

It is effective, too, when using clear plastic sheet to glaze, say, a coach. Simply apply a thin bead around the window frame or the glazing, keeping back from the edge if possible so that it doesn't squidge out onto the visible area when the window is pressed into place. Whilst wet, excess can be removed from, say, your paint work with a moist cotton bud and when dry it can be removed with a chisel shaped piece of cocktail stick after cutting around the perimeter with a sharp scalpel. I have also had some success in using it to re-stick a

loose coach window by puffing a blob that ran over the edge of the offending corner of the glazing onto the coach side. The loose window was pressed into place with a small piece of foam until dry.

I said earlier that I use it for signal spectacles and a word on colouring the medium might not be amiss. Initially I made up a small amount of red and blue/green mix using food colouring but this produced an opaque gaudy colour and I later found that most water colour paints used with discretion were just as effective. My good friend John Shelley felt that this was a bit of 19th Century technology and used felt tip pens with some success but his hand is obviously steadier than mine - I poked out a spectacle with the pen tip!

Microscale Kristal Kleer is available from the usual sources as are Formula 560 Canopy Glue and Deluxe Materials Glue 'n' Glaze.

O is for obtaining engineering tools cheaply

A short tip here. If you are a tool junkie like me don't just pass that bric-a-brac shop or antique centre. It was while hunting for some chairs to match a table that I found micrometers, engineers squares and scrapers going for only a pound for the latter and a couple for a good Moore & Wright micrometer. The price was silly but the quality for bric-a-brac better than the stuff seen on some of the stalls at exhibitions. Who knows? some of the skill of the last user might rub off on you too!

Missenden's David Brandreth has a fascinating and very useful toolbox of such tools which he is happy to demonstrate at our weekends

P is for Pipes

Not the faithful old briar that I loved when it was politically correct to be seen smoking but the vacuum pipes, tender pipes, slack pipes and other pipes that some of our revered C.M. Es hung all over our favourite creations. In the bit on handrails, I mentioned Guitar wire which can be can be purchased from most music shops in one thou. increments starting at about 0.006" up to about 0.025" before the strings start to come wire wound. Above those sizes, and indeed, in some cases below, it is possible to get them wire wound. The largest size that I have found to date is 60 thou. but for the 4 mm modeller the various sizes are ideal for vacuum, Westinghouse, steam heating, pull push, slack or tender water pipes and a multitude of other pipe work.

This wire has the advantage of being flexible and self straightening unless a bend or kink is introduced deliberately in which case it will hold that shape.

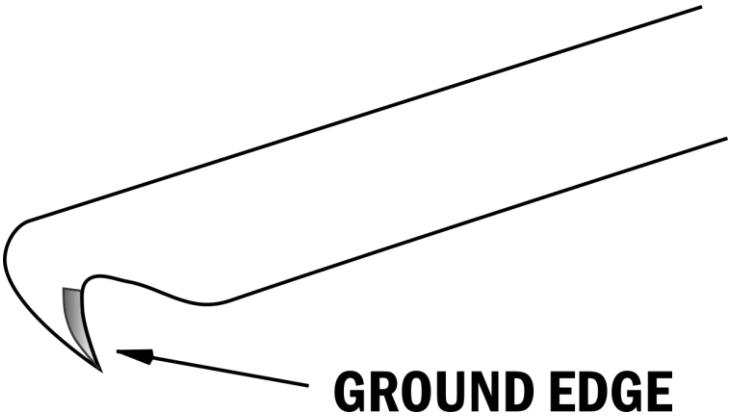
I don't need to expand on how it should be used; that is self evident. Suffice it to say that for tender water pipes, just attach the pipe at one end, say to the locomotive, and bend the wire so that it disappears behind the frames of the tender. Leave it disconnected for easy maintenance and to avoid stresses which might lead to derailments.

Sooner or later you will come across a water or steam pipe, sometimes along the foot plate valence, that has a wound protection. How to reproduce it? Easy take a length of wound guitar wire, clamp one end in the vice and with the pliers pull the winding so that the closely wound coils spread out. Bend to shape and cut off. It works for slack pipes too. I told you it was easy.

S is for Skrawker or the unkindest cut

Which is the one where the scalpel veers off the line of the last cut on whatever you are making. When cutting plastic sheet, even using a steel rule as a guide, scalpels are prone to do this and the answer that I have found is the old fashioned or newly discovered depending on your viewpoint Skrawker. Back in the 1970's these useful cutting tools were described in the magazines of the day and we all got out our old hacksaw blades and started grinding them into the shape shown below.

As can be seen, a hooked notch is ground into the tip and the hook so formed is sharpened



into a cutting point. For safety sake the rest of the old blade is bound with tape. In practice they are used with a straight edge and are dragged across the surface to be cut, the downwards pressure depending on the thickness and type of material. As it cuts, a piece of swarf will be seen to be travelling ahead of the cutting edge and the tool has little or no tendency to veer away from the guiding edge. Skrawkers revolutionised cutting plastic sheet, laminate, copper clad, hardboard and, indeed, thin metal sheet and at the time, as I said, we all went out and made them. Once we had all got one each it went quiet until they reappeared a few years later as commercially produced laminate cutters.

Mike Sharman used to demonstrate how to make these tools during the early gatherings. Nowadays you have the choice of spending a few minutes crouched over a grinding wheel or driving to your nearest DIY store and purchasing a laminate cutter. As a further alternative, you can go to your friendly art shop or your model aeroplane shop and buy a pukka cutter.

For most work the Olfa cutter is quite suitable.
https://www.olfacutters.co.uk/Olfa-PC-L-laminate-plastic-acrylic-window-tint-cutter