RESEARCHING YOUR PROTOTYPE

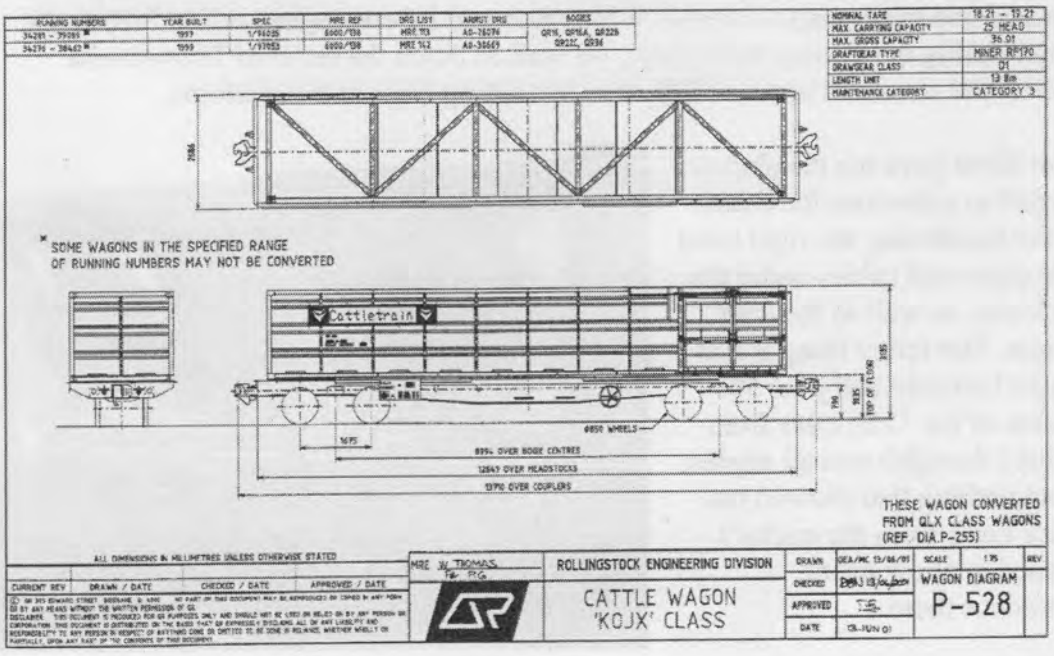
By Adam Wuiske

As many of you know, I am the ugly half of Wuiske Models and as such I have been asked to make a 45 minute presentation about researching your prototype. When I was first asked by Les to do this, I was wondering what I would spend the other 44 minutes and 15 seconds discussing, as the short answer is PHOTOGRAPH EVERYTHING!

The more I thought about it though; I started to realise that there is a lot more to it than just taking photos here there and everywhere in the manner of a certain Japanese tourist that featured in some Telstra ads a few years back. The basic thing that each and all of us require as modellers is information and lots of it.

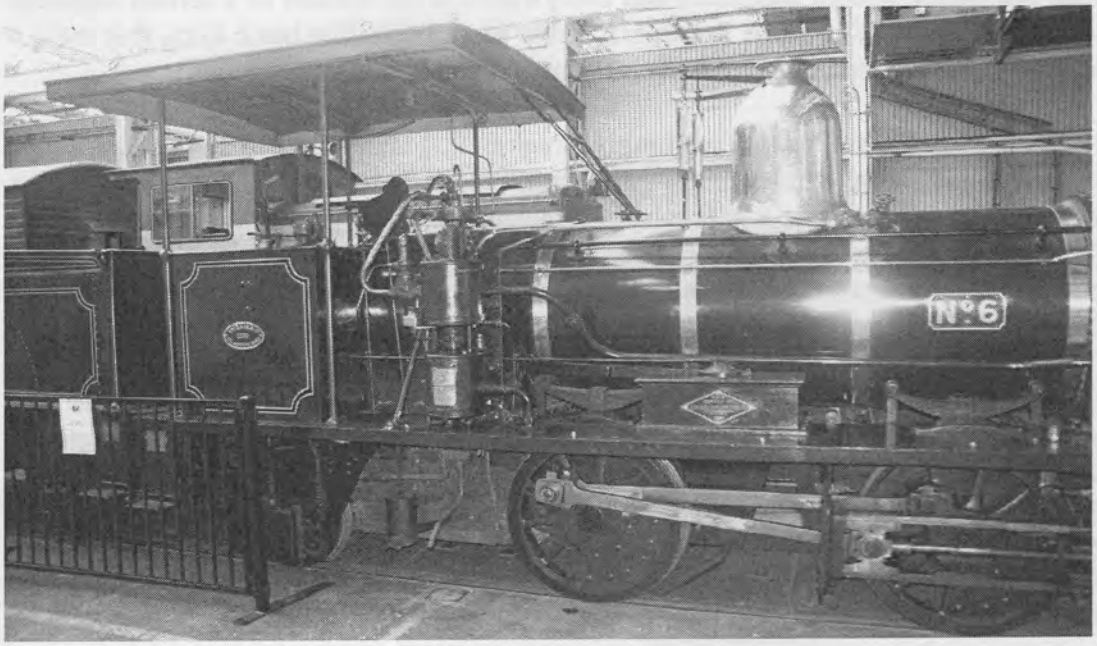
If you're like me, you have a seemingly never ending supply of old newspaper clippings, magazine articles, photos and plans lying all around the house. Similarly if you are like me you have a wife who is constantly on the war path wondering why there are the products of an entire Brazilian rainforest cluttering up "her" house. I can confidently say that *most* bruises heal eventually and if you're lucky, your information collection will remain fairly intact.

Due to the nature of our business, I have learned a lot of valuable things over the years that have helped me greatly in my own personal modelling. One of the most important things I have learned is to NEVER trust plans or general arrangement diagrams. These seemingly innocent and (for the most part) inoffensive little sheets of paper are, in fact, prolific liars. The amount of times I have seen items left off diagrams is beyond belief. By the same token, there are a few diagrams out there that have pretty little additions on them which never existed on the prototype. This is the major reason I try to take photos of everything I can.



When I started drawing the plans for our A10 kit to be sent over to DJH in England, I was very mindful of the fact that the lovely blokes at DJH are not lucky enough to live on Planet Queensland, and therefore would most likely have no idea what they were building. As such, we were lucky enough to have Mick Thornes hop over to the Workshops Rail Museum for us and take 549 photos of the loco.

This, I found, also helped me make accurate plans, as the ones I was working from weren't. A good portion of the detail photos we took turned out not to be required by DJH but of the ones that were, a few were things I had never thought of. So again, it's better to be safe than sorry and have a photo of everything.



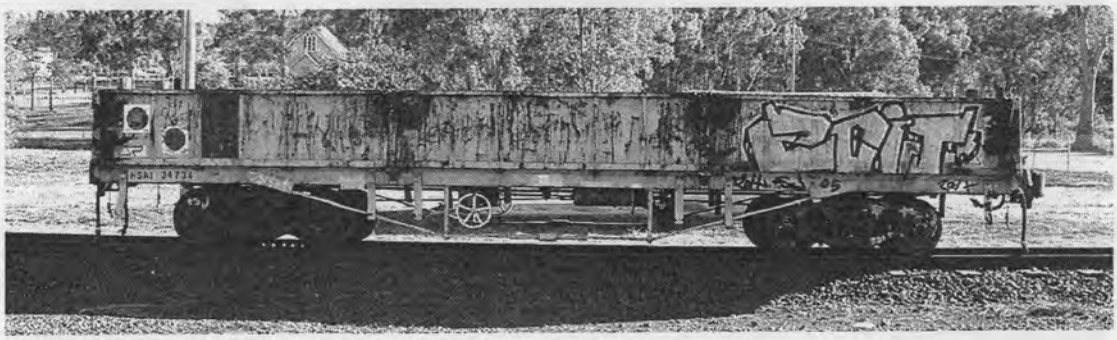
When it came to producing our 1720 kit, I used a collection of just over 560 photos to ensure I had every angle covered. Whilst Rob and I were staying at Ted Freeman's house during the Toowoomba show, we walked down the street to Toowoomba station and stumbled upon a 1720 class just sitting there at the platform.

That alone gave me the photos I needed to reproduce the detail of the handbrake, the right hand side pipes and cables under the walkway, as well as the door hinges. The funny thing is that whilst I already had over 500 photos of the 1720 class from (what I thought) was all angles; I had nothing that showed me these items from the angles I needed to allow me to reproduce them.

One of the things I have learnt is that whilst the photos we see in many of the magazines out there may look pretty and inspire us to greatness (or mediocrity) in modelling, they are just that: pretty photos. They are usually useless to us from a modelling perspective.

Whenever I am photographing an item I tend to try to obtain an overall photo of each side. This helps me locate the detail photos later on as it is very easy to "get lost" on a loco or wagon. After this, I start at one end and take photos in batches of three (one up, one down and one pointing straight ahead). I then walk a couple feet further down the vehicle and repeat the process. This gives you a massive amount of photos but,

more importantly it gives you every surface from a slightly different angle with overlapping photos. With any luck, this will eliminate any phantom things appearing on your models that were actually just a trick of light.



More often than not, it is not safe, practical or legal to gain access to all sides of a rail vehicle so you may have to be content with the photos you *can* get. It should go without saying that safety is the first concern... not for us, I mean after all, he who dies with the most accurate HSA wagon wins, right? I am talking more about the number of photographers out there who seem to think they will win in a head butting contest between themselves and a 4000 tonne train, purely because they have an orange vest on. Not to mention the look of fear we have all most likely seen when an unsuspecting driver hits the brown trousers point when he is wondering if this knit wit is going to get out of the way in time.

As a result, I find that I tend to avoid events such as Steam Train Sunday and the like when I want to take photos for my modelling. That, and the fact that the bit you are trying to photograph is nearly always obscured by the outstanding comb over of a middle aged, um, "gent" who is convinced he is standing in front of a "Choochy" that was built by the Calathumpian Locomotive Works in July of 2087.

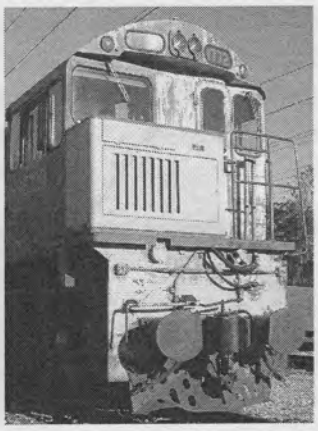
In order to avoid me ranting on about just how much these events diminish my already small collection of marbles, I'll just say this: if you go to these types of events, be prepared to just enjoy the day and don't get too upset by the usual rent-a-crowd that will get in the way of that last photo you need to complete your model after five years of working on it.

What I have always found to be a far more productive method is to simply turn up at a station/yard and talk to people. Despite the ramblings of a few people on day release from the local happy home, QR or any other railway is not of the opinion that we are all a bunch of amateur terrorists with nuclear guided cameras. What they tend to get annoyed with is a small group of people from the "I know my rights" brigade.

At the end of the day, these people are just trying to do their job, and so long as they know you are there and that you are not going to interfere with it, usually (for the most part) they are happy for you to take photos and in some cases will even help answer a few questions you might have for them. The vast majority of rail workers I have met over the years are often glad to see someone taking an interest in their profession, and are often even more interested in the fact that you make models than they may first let on.

Essentially the rules are simple, use common sense and do as you're told and you should walk away with all the photos you need. Or to put it in a nutshell, trains are big and they will punish stupid people.

Safety and legal nonsense aside, I'd like to return to our 1720 model. Whilst I can't speak for all railways, QR has a bad habit of making multiple versions of everything. When preparing the driver only version of our 1720, I discovered that there are, in fact, three different versions of the front panel on the air conditioners. This, combined with a few other variations to the same class of locomotive, gives us 6 different versions and combinations of details on the 1720 DOO class loco. Whilst making the pattern for this model, I went through photos of every member of the class and picked the most common variation for the air conditioner.



If you are making a model of a specific wagon or locomotive, try to avoid assuming that things will be the same, as more often than not they won't be. For instance, in making our demo models for 1770 "James Cook," I discovered that this one unit has an extra set of grills on the observer's side and a few other variations that you would never notice. If you ever decided to incorporate these little variations into a model then you would notice them from a mile away though. Some of these differences, if

modelled, can really make a model. They can also point you out as being a master of your chosen topic as opposed to just a bloke who took a photo and was blessed with working eyesight.

Oddly enough, this same problem does not seem to continue into the electrical cables under the footplate of these locomotives. Whilst preparing the model, I found the one main issue I had was getting the right perspective to give the impression of depth. If you look at the cables under the footplate of our model you will note that all bar two cables have been represented. The two we omitted were not included as they would not be able to be cast onto the frame as one piece. That aside, the biggest issue I had was working out the depth of these items. Again, a series of photos showing different angles would go a long way toward helping here, but you would still need a dead side on photo to see where items line up with other items. So far as working out the depth of these items, I essentially took an educated guess. Usually this involved placing the item and looking at it from every conceivable angle and if it did not look right, then it was removed and replaced in a different location. One of the major considerations was allowing for the bogies of the mechanism to have enough swing. Again, this is not an issue that the twelve inch to the foot modellers have. As a result, I would happily bet that the underframe details on most model locomotives are actually compressed into a narrower space. This is where the problem of creating that illusion comes in.

One of the major things I have learnt as a modeller is that we are not trying to create an exact reproduction in miniature but more of an accurate representation. Or to put it another way, what is correct on the prototype may not look correct on the model. On

certain vehicles, items such as air hoses can stand out more than on others. The perfect example is any of the aluminium coal hoppers. Whilst they have a fairly plain and boring side, any item protruding from it will be far more noticeable than it perhaps should be. If we were to model these hoses correctly in HO scale, then they would only be 0.3mm diameter. However, for modelling purposes, 0.5mm wire actually looks more accurate. We have nearly doubled the size of the item here and everyone will compliment that perfect replication of detail. Perspective seems to play a far greater role in modelling than (I believe) most of us would have thought.

To sum this all up, in modelling, we have to make a lot of compromises in order to portray what appears to be a miniature version of the prototype. Personally, I tend to glaze over when people start talking about this standard and that with regard to what is considered right or wrong within the modelling community. To highlight this to the point of stupidity, most of you know, my layout is loosely based on the Toowoomba range. Now after the 2010 floods, I was sent some photos of the massive holes created under the track by the washouts. At no point did I see portions of 9mm ply wood poking out. I mean it could have simply been well weathered, but I am still going to go with my gut and assume that there was in fact a little bit of rock, dirt and general Earthy things underneath the track. This is a compromise we make with modelling. As well as this, it demonstrates (somewhat absurdly) that perception and reality are two very different things. As modellers we are representing our prototype in a somewhat cosmetic sort of fashion.

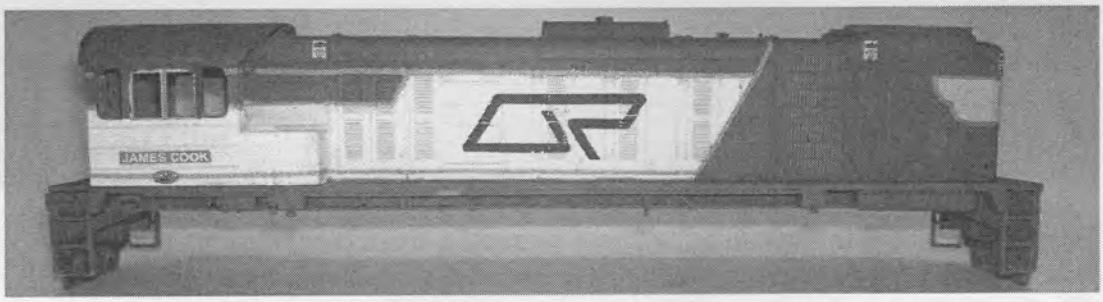
Breaking from tradition and getting back onto topic, I would like to point out the primary reference sources I use. Firstly, the QR general arrangement diagrams are a must for modelling locomotives and rollingstock. Secondly, the series of drawings by

Keith Macdonald are invaluable, if for no other reason than that they contain all the running numbers for that class of loco or wagon. Thirdly, it is helpful to have an understanding of the prototype. By this I don't mean "I'm making a ballast hopper... it carries ballast", I am talking about an understanding of why the railways did certain things and incorporated them into their "large scale models".

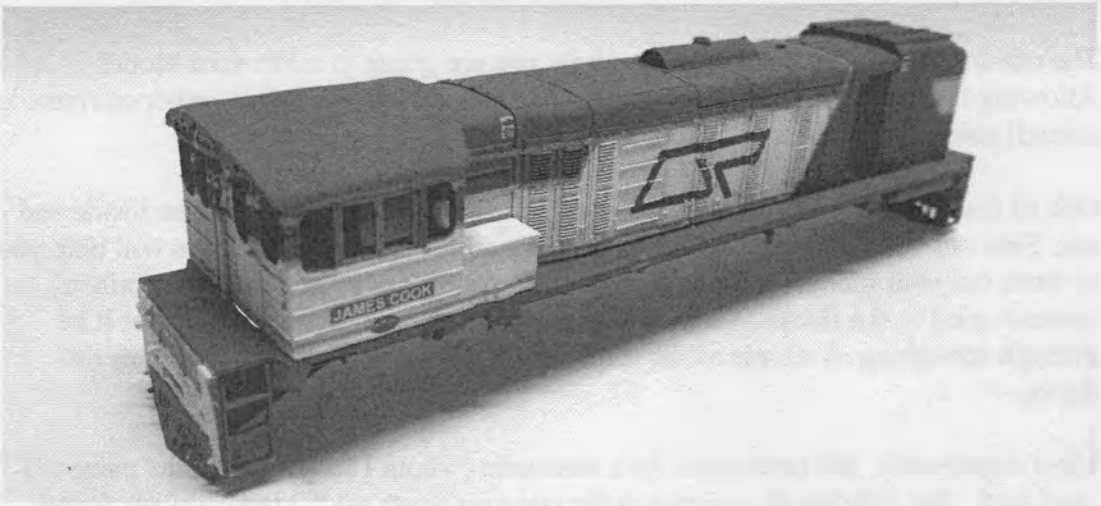
One of the best examples of this I had heard was the early disc wheels that had a series of three or four holes in them. I recently learned that the reason for these holes was to reduce flange squeal on tight curves. It also limited possible damage that could be caused by sympathetic vibration transferring from the wheel into the rest of the wagon. If anyone else here has a better reason for why QR did this, then please feel free to let me know. Lastly, photos, photos, and more photos. I use the Prototype Info section of our site constantly for making patterns for kits as well as for making my own models.

Getting back to the actual modelling side of things, as I have mentioned, the important thing is that items look right, more so than actually being right. If you are simply scratch building a model, this is a lot simpler than producing the model to form part of a pattern.

For instance, with the underframe of our 1720 kits, I made all of that complex pipe work on the underframe by making it half round. This gave the right impression but allowed the item to be cast whilst creating the smallest possible amount of undercuts. If this model was being built without the intention of reproducing it, I would have used actual styrene rod to produce these sections. Having said that, this step alone would have made the underframe impossible to reproduce with any of these details.



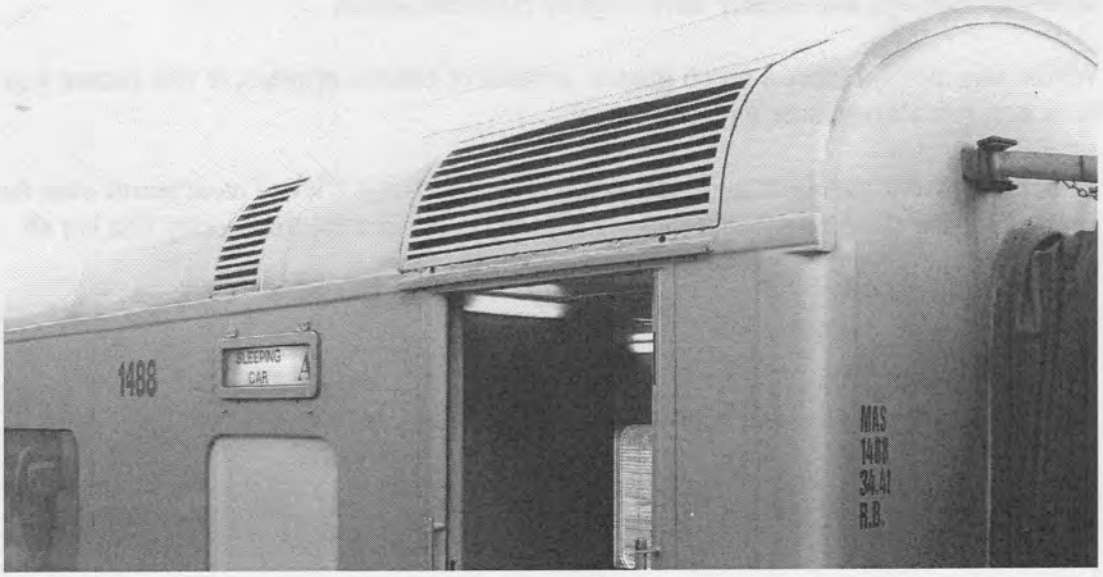
Another aspect of this particular model that required a lot of compromise was the roof peaks. If modelled correctly, then these items would have been 0.1mm thick. This would not only make them impossible to reproduce but would also make them extremely delicate unless the modeller was asked to make them from brass. What we chose to do was to recreate them at 0.4mm thick and then add a fillet of 1mm radius behind them. This gave us a much more solid piece that could give a far greater surface to "mate" up with the cab as well as ensuring that it was not a delicate piece either. Once the peaks are attached to the body as well, they are very strong and gain a lot more strength from the actual cab itself due to the way it is mounted.



In order to start building the master for our 1720 kit, I first spent a few weeks just formulating ideas on how it could actually be built. Most of these ideas centered around eliminating the multi piece cab. This has always been the worst part of constructing any of our locomotive kits. This process should (in theory) work with just about any model, but would be nearly impossible to produce from a hand made pattern due to the tiny tolerances required.

With the 1720 kit, I allowed a 0.2mm tolerance all around for it. This would hopefully allow for any "growth" from the flat backed casting technique used to produce the peaks. Again, this becomes a nightmare to try and reproduce by hand with a straight surface, let alone where you have a complex series of curves and other obstacles. That left us with only one possible way of producing the master and that was by having the master machined.

The end result of what I am trying to say here is that, as a modeller, I am always on the lookout for photos that I may need. So it is important to have a camera with you no matter where you go. As well as this, a small notebook and a pen are essential as well. I always keep one in the glove box of the car as well as one in the tool bag of my bike as you never know when you will need it.



The other important fact is to plan out how you are going to make your model. Allowing for the thickness of side walls and things, whilst sounding rather obvious, is a small point that is often overlooked.

One of the other important factors to consider, is knowing your prototype inside and out. Find out what that little box or grill is actually for. These little steps will help you to work out your model a lot more simply. You should also find that most railway systems tried to standardise their equipment in one way or another. Whether it be through something as simple as the mounting brackets for air horns to hinges on doors.

Most importantly, ask questions! As a wise man (whom I forgot to ask the name of) once said, "the only dumb question is the one you never ask". I have always found that whenever asking people questions about items I am intending to model, I have always walked away with answers to questions that I had never even thought of asking which later became essential.

The reality of this little game we call modelling is that you can glean information from just about anywhere and anyone. So ask questions, take photos and notes and you should be able to find what you're looking for.

One last thing that I get asked a lot is about preparing drawings for my models. Firstly, I have to say that I HATE the idea of reducing or increasing the size of drawings on photo copiers. Every time I have ever attempted this, I have ended up making major mistakes.

The method, I use is to take a general arrangement diagram and measure the known dimensions. Say the distance over headstocks. Measure the distance on the drawing then divide the known dimension by the distance you have just measured and there is your scale for the drawing. If you repeat this process over as many of the known dimensions as possible then you should be able to come up with a very accurate scale. Don't ever rely on the printed scale on the drawings as these are never correct. The other tip I have learnt is that the end elevation and side elevations should be treated as separate drawings and usually have slightly different scales.

Whilst this method takes a much greater amount of time to prepare, it will ensure you have accurate dimensions for your model.

Hopefully I have managed to impart just a few of the little tricks I have learnt over the years and have done so without making myself sound like the total loony that we all know I am.