Burra 0-4-0ST Kit Development

I have been developing a kit for this fine locomotive for some time now. The release is drawing slowly closer. This page covers the development progress.

Burra is a 1923 product of the famous builders R&W Hawthorn Leslie of Newcastle-on-Tyne, England. Builders number 3574, Burra is a 71/2ton 0-4-0ST with a gauge of 2'.

Originally operated by the Corrimal Coal Co. of Corrimal, NSW Australia, Burra has been preserved and can now be seen running at the Illawarra Light Railway Museum at Albion Park, about 120km South of Sydney.

The model is in 1:43.5 scale, originally gauged to the correct 14mm, however interest has been shown in a 16.5mm gauge version so I will redraw the etches for that gauge too.

A word on etching-this process is used by the majority of locomotive kit manufacturers in the UK, as tremendous accuracy is available. Etched brass is suitable for anything that was built from sheet metal on the prototype. Luckily, most steam loco's have all body work from sheet metal. Small detail items such as backhead details and sandboxes are usually lost wax brass castings.

I am drawing the etch patterns using CorelDRAW 11, for 0.3mm thick half-hard brass. Whilst I would prefer Nickel Silver for the chassis, I work with the brass as my etch vendor can't supply NS and brass is plenty adequate for this loco anyway.

The model will feature a can motor driving a reduction gearbox, custom made wheels of the correct pattern, simple compensation and (hopefully) a full suite of backhead details. I am aiming to produce an un-compromising model of the prototype, I have over 150 photographs of Burra to work from, and have easy access if I need more or need measurements. The 16.5mm gauge version wil not be quite as accurate,

however, only the chassis will be different, and I will endeavour to make this as un-noticeable as possible.

I am only producing 10 models for sale, you choose whether you want a kit or RTR. The kit will probably be about half the price of RTR

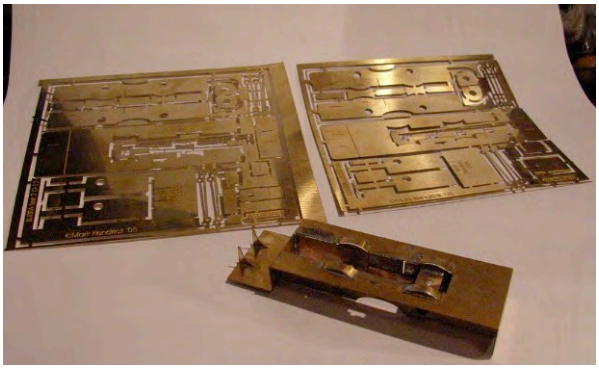
After this run is made, there will be no more model Burras made by me for sale. There will be one available from the ILRMS, with all proceeds going to the preservation, restoration and operation of the exhibits, including Burra.

The aim is to have an assembled test model for show at the Australian Narrow Gauge Convention at Easter in Albury, NSW. Looks like I have to get a wriggle on!

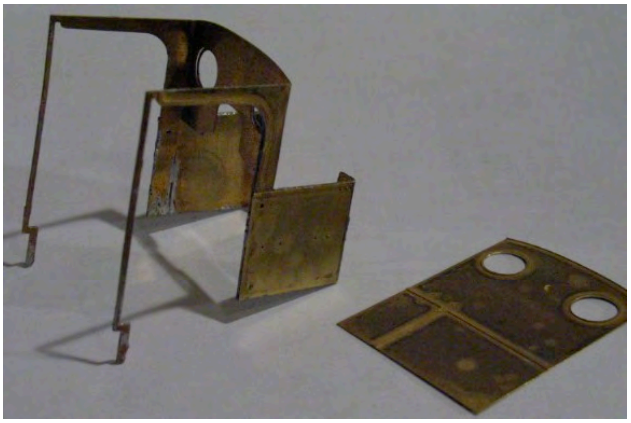
Latest news:

13-2-06 It has been a long time since updates! That reflects how busy I have been with university and work commitments.

News is, I have recently had a test etch made, photos here show progress.

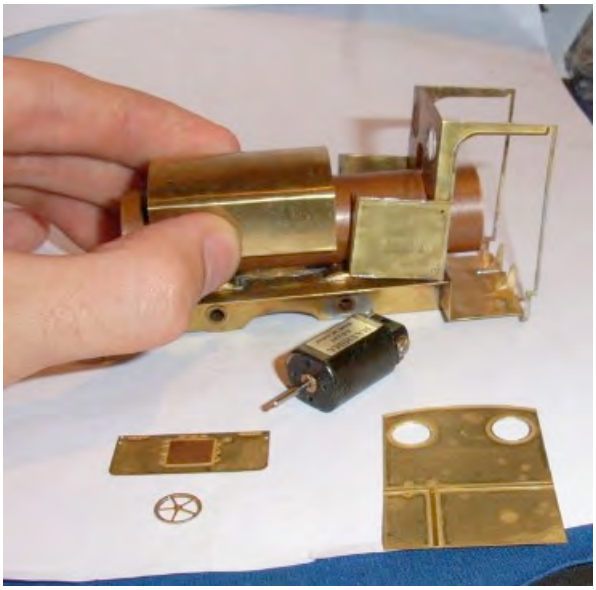


The 3 different gauged chassis, 14mm built, 12 and 16.5mm in flat fret form. Once I have corrected any errors present in all chassis, then I shall build the other two chassis to make sure anything else that crops up is corrected.



The Cab has worked very well, the biggest worries are having too many tabs on the fret where the cab is very flimsy, meaning the parts twisted slightly when removing from the fret. Many people think laminating layers of brass is difficult, but i will explain how I get easy and consistent results in the instructions.

Sandboxes are neat little fold-ups, but I might get them cast depending on the price of brass casting.



And putting everything so far together (boiler is 2mm too small in dia.). Major parts are not attached, just resting together, hence the cab's angle and hand holding tank.

I have selected the Mashima 1224 motor for this model, they are well suited to the task, larger than those in Branchlines' Manning Wardle 'Busy Bee' kit and Berg's Burrinjuck Krauss 0-4-0T kit.

The tank wrapper is twice as long as it needs to be, but it proves my design is easy to build-the inside of the wrapper has grooves and formers to keep everything square. Next etch will be the right length, with holes for filler and handrails in correct locations. There will be 'plenty' of space in the boiler and tank for DCC chips, a speaker might fit but I don't know what size speakers are available to check.

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I will scratchbuild the required parts to complete one model in the coming weeks, to test theories before committing them to etch, to provide masters for castings, and to test drivetrain options. I am currently hoping to use a 'High Level' brand 'Load Hauler' gearbox with 80:1 ratio, though if that idea doesn't work I shall use an Ultrascale 50:1 gearset with etched gearbox.

Wheels are taking far longer than anticipated to arrive, as are the 1/8" brass axle bushes as the company making them won't deliver 6 packs of 10 to my local hobby shop for me. They reckon it's not worth their while!

2-4-05 Contrary to what most people probably think, I have been busy. I have just about completely redrawn the chassis to include wheel splashers, reversing gear cutout, cylinder locations and cab footplate. Also have the nameplate and saddle tank drawn up. Wheels are ordered - and here's a diagram of what it'll look like - nice and spindly.

There should be bolts in three places to hold the rims on, but it will be easy to epoxy or MEK NBWs on, moulded on ones wouldn't have quite as nice detail. Rims will be steel - nickel silver is too expensive for such a short run. Any preferences (and reasons) over stainless vs mild steel? Oh, and the wheel inserts will be injected styrene.

I have had a look at getting a specially sculpted driver figure produced, but it would add about 20 Aussie dollars cost to each loco, so I have started to teach myself to sculpt (1st figure nearly complete). Hopefully I'll have good enough results to be able to include a suitable driver.

I have sourced a lost-wax/investment brass caster so all I need is to make masters-oh fun!

The backhead details will be castings. My lathe is being set up so I can make everybody's funnel, dome, whistle and safety valves.

Power! I had a chat with my hero Paul Bernston of The Model Company/Classic Commercial's fame, and he confirmed that an O-ring drive is a great way to go. Before you shudder at memories of early rubber band drives - O rings don't stretch so there isn't any slingshot effect, they are deadly silent, and drive reduction is easy. I want to use gearhead motors, but haven't looked all that close at prices yet-Faulhaber's may have a great reputation, but there are other brands out there with better pricing.

Enough rambling for this update!

19-2-05 Updated this page, added a photo of the builders plate and a reasonable low view of the prototype. Current photograph collection totals 179. I will include a CD with all the photos with the model.

Also added a note about the era that the model will represent. Scroll down to the bottom for that.

5-2-05 Test etch assembled, discrepancies noted, adjustments made, mistakes corrected....

Here are some photos, albeit poor, of the initial test etch of the 14mm gauge chassis:

The pics show some other O scale models to demonstrate relative size. Its a small loco! The prototype operated on 25 and 28 pound per yard rail, which is about 3" tall or code 70 in O scale.

There are a number of changes to make, for example the footplate at the front of the loco extends back to the rear of the smokebox, and the frame at the rear curves up to strengthen the buffer beam.

The chassis as it is at the moment is a little bit

flimsy around the rear axle, I have designed a fix for this, though if I can arrange it i'll have the chassis etched in slightly thicker Nickel Silver-which is nicer to work with anyway.

26-1-05 Happy Australia Day!

25-1-05 The first test etch for the chassis was sent last night, I hope to have the test etch ready for assembly next week.

24-1-05 Announced on ausnarrowgauge and O-14 yahoo groups that I will be making Burra as kits and RTR-orders being taken (use my email at bottom of page, I will reply with

details)

20-1-05 New parts to test etch added-cab footplate and connecting rods

15-1-05 footplate and front buffer beam added to etch

1-1-05 Initial test etch pattern drawn-contains frame sides and spacers and compensation set up.

Last Year and earlier: I decided to build Burra around September 2002. I started collecting photos and plans, but only started drawing etches for Burra in November 2004. I only learnt CorelDRAW a few months prior to that!

Variations to Burra through the ages

Like most locomotives, changes were made to Burra throughout its working life. The model

Burra will represent the loco as preserved and in operation in 2005.

In 1946 Burra was reboilered, the boiler coming from Clyde Engineering. External changes included the size of the steam dome, which is now larger, and juts into the cab slightly. This necessitated a cutout in the front of the cab. The type of safety valve was changed too, it was orignally a spring balanced type. Clyde builders plates were affixed to the sides of the smokebox. The smokebox door is of a different design too. The spark arrestor supplied when new was removed and a straight 'water pipe' funnel fitted, with a strengthening rib at the very top. A small step at the cab entrance on the driver's side was removed too.

Preservation and restoration has resulted in other changes too. Burra had a wooden floor in the cab, as preserved it has a chequerplate steel floor. I haven't decided which I will include with the kit. The lubricator has changed too, it is mounted behind and beside the funnel now, but in operation it was mounted on the front of the smokebox. The injector pipework has changed a little too, I will provide a sketch of both types of plumbing. The injector control rod has moved too since preservation.

Paintwork- in service, Burra had a faded 'machinary green' colour, and prior to reboilering had some ornate pin striping. In preservation, Burra has recieved a brown colour with red/black/brown pinstriping. I am going to try and get some decals made to aid in lining, but I don't know if I can organise it. And they'll only be ALPS printed waterslide decals anyway.

Sources of info

The books I am using for reference are:

ILRMS Guide to exhibits (ILRMS)

Away With Steam (NSWRTM)

Light Railways number 60 April '78 (LRRSA)

Light Railways number 171 June '03 (LRRSA)

Bulletin number 523 May '81 (ARHS)

all excepting 'Away With Steam' are still available from the ILRMS.

If anyone would like to see video footage of Burra in action at Corrimal, there is a video called 'Coal Gravel and Steel' by Rowlingstock Productions, I haven't seen it but apparently its good...Its on my list of 'to gets'.

Protoype - Model dilemmas

I am trying to make this model as accurate as possible, but when miniaturising something like a loco, there are a lot of questions to ask oneself.

First up-the model will not hold steam.

for 16.5mm gauge models, the frames will be too wide the wheels will be over scale width there won't be bolt detail on the wheel rims

The thickness of material isn't to scale...

I'm sure there will be other prototypical discrepencies, I'll list them as I come to them!

Here's another two pics of the prototype:

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Life after Burra?

A few people want to know whats on the books after Burra has been built and sold. Well, if

all goes to plan, there will be another loco, and some accessories.

Rest assured, the loco will have ran in Australia (in three states actually!), and it will have been used on 2' gauge. It will definately be produced for 14mm gauge, but 16.5mm gauge

I'm not sure about!

I have some ideas for etched parts to make scratchbuilding easier. I've drawn a few items up, and will have photos fairly soon.

I also hope to have a small range of 14mm gauge wheelsets available in the next month or two. 21 inch curly spoke wheels and 8 inch (I think that's what I specified!) straight spoke skip wheels. More info when I have them in hand ready to sell.

If you are interested in modelling in O-14, I suggest you visit and join the O-14 yahoo group

Mark Kendrick 13/02/06