Barclay P Class Atlantic

for 2' 3" narrow gauge

By Richard Maxted

Introduction

This is a "work in progress" as is most of my stuff. I wanted to make a large locomotive for hauling my Leek & Manifold coaches up the gradients on the LMVLR. It was also a project to develop my understanding of modelling more complex valve gear. As it turns out, its been a project that reflects quite a few new areas of learning for me.

The Campbeltown & Machrihanish Light Railway (C&MLR) was opened on the 18th August 1906, and although short (just over 5 miles) was a full service route with both goods and passenger services. The C&MLR was interesting because, unlikely many speculative ventures, it had a real use carrying coal from the pit to the ships at Campbeltown harbour. The route followed on from on earlier coal hauling route built in 1876 between Kilkivian Pit and the coal rhee at Campbeltown. It also had some rather impressive gradients including 1:35 out of Campbeltown.

The locomotives included a Kerr Stuart Skylark "Princess" and a Barclay saddle tank "Chevalier" that were largely used for coal working. However, the main motive power was provided by two 0-6-2 Barclay Class P locomotives; Atlantic & Argyll. Other stock included a rake of 6 coaches, built by Pickerings, and one hundred and fifty coal trucks. There was also a hardly used guards van.

By the 1920's the railway was suffering from road transport competition and starting to look a little tired. Boat train specials to Machrihanish and coal supply to Campbeltown being the principal traffic. By 1932 the locomotives were worn out and no longer fit to operate. Killed off by road competition the entire railway was sold for scrap in May 1934.

Barclay P class locomotives

The C&MLR placed an order with Andrew Barclay Sons & Co of Kilmarnock for a large side tank locomotive in 1906. Wether Barclay's built this to a new design or the C&MLR were ordering an existing design is not obvious. However, the Barclay's Spanish catalogues from 1907 have pictures of the C&MLR locomotives described as P class "for suburban railway lines of Estrecha" which suggests that the C&MLR may have ordered the first P class. This was locomotive 1049 of 1906 "Argyll". In 1907 a second locomotive "Atlantic" (1098) was purchased. This had a number of changes compared to Argyll in the shape of the rear buffer plate and location of the lamp brackets. It is this locomotive that features in the catalogues.

These were large for narrow gauge engines. The cylinders were 11 ½ inch x 18 inch and coupled to 2ft 9 inch driving wheels by a set of Walshaerts valve gear. The locomotive weighed 20 tons 10cwt when filled with 600 gallons in her tanks and 15 cwt of coal in the rear bunker. The P class were capable of hauling 70 ton + loads but were restricted to 42 tons on the C&MLR. The catalogue suggests a 176 ton capability on straight and level but this seems a little unbelievable.

Since there are no preserved locos and so little data I have had to use a fair amount of guess work, extrapolation, and my own hunches to model these locos. In particular in regards to the physics and the cab. The loco is modelled using scale drawings but these are I think drawings from photographs. There is a wealth of photographic evidence on the web and a very useful guide by Nigel MacMillan (Plateway Press) that is still in print.

Using a number of standard equations and a bit of extrapolation is required to get the loco physics in place. The known facts are the diameter of the driving wheels and the cylinder sizes. Assuming a top speed of 20mph on 80% cut-off it is possible to calculate a steam demand of sorts, a tractive effort, and an HP. This provides an engine of 10,388 lbs TE and 435 HP; which seems to be about right when

compared to other similar sized locomotives such as the Welshpool locomotives which have 8,175lbs TE. This sort of power enables a comfortable 4 L&M coach set to be pulled up the 1:50 gradient on my Leek and Manifold route. There are photographs of Atlantic pulling four coaches up the 1:35 on the C&MLR but needing double heading for 6 coaches.

I have had to guess from first principals the entire layout of the cab as I found no information. The injector overflows are in the right place based on photographs but the type of injectors (Gresham & Craven) are just some I have wanted to have a go at modelling based on things I have seen. Similarly the vacuum brake (Davis & Metcalf M type) is one I thought might fit well. The layout of other features follows on from the what little evidence I could glean from the photographs, such as something being bolted to the cab left-hand side; a Wakefield lubricator seemed a good fit for this.

There is little data about colour schemes of locomotives but there is a good picture in the Campbell and Machrihanish book by N. MacMillan of Argyll and Atlantic in makers black and white photos. There are also enough other photographs to give a sense of how the colour scheme wore out during the life of the railway.

Version Control

Version	Description	Date
1	Initial release Atlantic and Argyll in four liveries	Feb 2020
2	Updated loco sounds with new chuff sounds, vacuum brake sounds and distance decay sounds. Better vacuum brake performance with less abrupt braking.	September 2024
2.1	Update to fix a possible sound problem causing TSC to crash. Also update to physics to add more fuel and steam consumption and a bit more driving needed.	January 2025
3	Updated coupling physics	March 2025

Conditions & Licence – PLEASE READ THIS

For freeware that you develop for yourself or for release as freeware on any website or system, you have an absolute and total right of ownership. This package contains only assets made by me – it does not need any other downloads. It does use unmodified generic Railworks wagon sounds and a driver. You may use it, clone it, modify it, rebadge and rebrand it.

It may not be used where payment is sought or other commercial activities. I reserve absolutely the right to determine what is commercial. Charityware is commercial but is likely to be granted access.

If you release this stock modified then please do keep in mind that others will be using it in an original form. Please don't use the exactly the same names as mine in a public release just add your own. This is only to stop other folks having difficulties.

The Models

Installing should be simplicity itself as I hope I have added an RWP file that works. Don't forget that if you have a good .zip file manager like 7-Zip you can actually open an RWP like any other file anyway. You will than need to go into your route editor and enable them if you are making scenarios etc using the infamous blue cube. My assets will always be under **richardmaxted**. All my Narrow gauge assets will be in the **NarrowGauge** tick box under this. I have also provided some quick drives to get started – other than the light engines the other QD's will need my SWR wagons, C&MR Brake Van and L&MVLR Coaches.

The asset is structured in directories based on livery. Each contains both an ”Atlantic” and “Argyll” mode as each differs slightly in their rear ends. Argyll and Atlantic share common texture files with the exception of the nameplates. There is no separate cab model as everything runs from a single model that is used for both external and cab views. There are a number of “common” directories used by all my models and these have been added / updated with improvements and additions such as new sounds used by this model.

Campbeltown & Machrihanish olive green livery (default)

This is the DEFAULT loco that is absolutely essential as all other versions refer to elements of this loco (like the wheels, the animations, and the physics).

There seems to be little agreement on the colour scheme. Various paintings and postcards show everything from a reddish brown to a very light green. All of which probably stem from a verbal description of the locomotives being in North British livery; which changed from green to brown over the years. I have used North British olive (dark gamboge) livery and lining that was described as black, yellow and vermillion. This livery as very lightly weathered but basically “as new”.

Plain black un-named “as new” livery (black)

This livery is a plain but polished black. Essentially exactly the same as the default but in black. The cab interior is in a rather fetching grey that sort of matched the “workman-like” nature of the livery.

The key difference is that the textures for the nameboards do not contain names and the C&MLR crest; just the makers plate. This provides a means of un-naming any of the locomotives by copying this texture.

1920’s weathered C&MLR livery (used)

So this is probably my favourite livery. It is as close as I can get to a match for the many pictures of the locomotives in the mid to late 1920’s.

The locomotives are somewhat neglected, beginning to rust, and the names and badges have worn away in the Atlantic weather.

This version also has the rear window protection – see later…

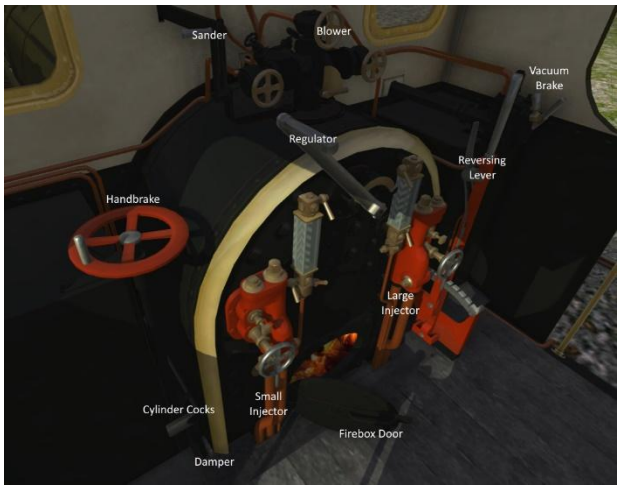
1930's rusty & old C&MLR livery (worn)

It wouldn't be one of my assets without the usual extremely neglected version.

However, there is good photographic evidence that by the time the railway was sold Atlantic was in at least as bad as condition as this – if not actually worse.

I have added some extra steam leaks to this version.

Driving the Atlantics



All locomotives have the usual views including an interactive cab that can be driven from one of four positions that include leaning out of the cab.

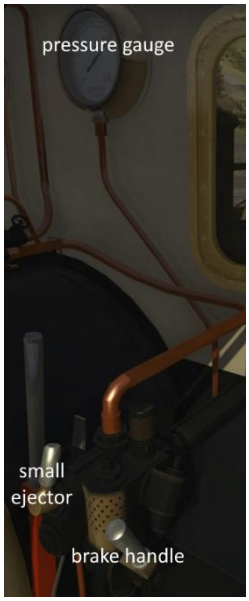
The controls are set up to be driven from the right – as that is where the brake is.

There are no particularly "leading edge" driving techniques required as I am not capable of that kind of advanced script writing. However, they do have a few features worth learning about beforehand.

Hand Brake

The handbrake on the locomotives is fully operational and gradual. Use the [and] keys to increase and decrease the braking. You can also move the animated brake in the cab. The brakes will cope reasonably well with about 24 tons + loco but on a steep 1:50 hill it will take time to slow down. It is quite possible to lock this locomotive's wheels by over enthusiasm.

Vacuum Brake



The vacuum brake on the locomotives is fully operational and is reflected in the vacuum gauge.

The main brake lever is the large ejector and so pushing forward rapidly (and noisily) ejects air using steam, creates a vacuum and releases the brakes. You can use it "trim" the application but it is a bit on/off. Pulling backwards gradually allows more air into the pipe which applies the brakes in a gradual manner.

There is also a running position that holds the application and the brakes partially on.

The main brake lever is supplemented by the small ejector which can be used to make small reductions in brake pressure once in the running position. It is good for trimming an over application. The keyboard "J" key is set up as a hold down and release toggle to make this trimming easier.

In some locos using the large ejector produces a steam leak where it enters the smokebox union.

Reverser

The reverser has a number of fixed stops. As you move the cab lever you will hear a “clunk” at each stop. These are set at roughly:

0 %	-	no cut-off
10%	-	crawl and idle coasting cut-off
30%	-	a good compromise of tractive effort and steam use for the cruise
50%	-	useful for a bit of power with heavy loads or on short gradients
75%	-	heavy hauling up gradients but expensive in water consumption
100%	-	slow long climbs but your boiler pressure will plummet.

Throttle

Drive from the right facing forwards and pull towards you. Quite a sensitive throttle and it is all too easy to cause a slip (you will see from the black smoke).

Sander

Use the cab lever or toggle using X. This loco occasionally needs sand. Its mechanical and so there is just a “clunk” when operated.

Injectors

In the absence of information I have added two Gresham & Craven injectors. The drivers side small injector is useful for small running feeding the boiler. Turn the water on using the lever located on the injector or key L. You should hear the water feed lever squeal and looking out of the cab you will see the water running out of the overflow. Then turn on the feed steam using the wheel or Key O. The noise is obvious and the overflow will change to steam. Once you turn the steam off then don't forget to turn off the water (check the overflow) otherwise you will soon empty the tanks.

On the “fireman's side” there is a large injector fitted for rapid filling or a quick dose of cooling water. Same sort of controls using levers and wheels or keys I and K.

Blower, Dampers and Cylinder Cocks

The blower is the top centre wheel. The blower works quite well but also generates clouds of filthy black smoke. The dampers are on a kick lever by the handbrake. In the same area the cylinder cock lever pulls out.

Fire and Coal

The ideal fire for getting a good boiler going is about 500lbs of coal. The coal bunker has a small door that can be opened at its base to control the shovelling rate, or press R. The firebox door opens as usual but there is no fire animation. Adding coal darkens the smoke.

Whistle

There is an animated control for the whistle or use the space-bar. This is for the whistle that is looped so you can hold down the spacebar for a long blast. There is also a set of random short whistles assigned to the B key – useful for a short warning.

Lights

There are lights available front and back. Press H to scroll between no lights / front / back. This puts the light in the right place as a model but you need to add paraffin to the light (Press P) to make it light up.

The lights are markers and not designed to light up the route.

The models for the lights are child objects called into being by a script and can be used on other stock. However, as yet, they only show up on the loco not coaches etc.

Child & Common Elements

There are a number of "Child" elements used in this asset set. The headlights and the actual lighting of them are two that are used by all models. Atlantic and Argyll differ in the placing of the rear light.

A further child element is the window plates that were added to the locomotives sometime after 1910 as the rear windows kept being broken by coal. I have added these to the Used and Worn versions but they can easily be disabled or added to other versions.

A final child element are the new couplings which are a better version of a Norwegian type.

Mods & Reskins

The loco uses a common texture set which are the same for the cab, the interactive controls, and the engine. The nameboard textures are a transfer decal which is mapped onto the loco water tanks. It is the same basic decal for all the loco types and maps into the same place.

All textures are alpha shine and bump mapped using the TrainBumpSpecEnvMask.fx shader. The textures also contain glass objects such as windows and gauges which are mapped using the TrainGlass.fx shader.

The other textures are used in a complex but not unpredictable manner. It should be possible to recolour the locos using the green parts of the texture as a guide.