The Barnums – excursion carriages for the Great Central Railway

– by John Quick, Trustee

During the early years of the 20th century the traffic department of the GCR recognised the need for new excursion stock. In October 1909 approval was received for the manufacture of 32 bogie saloons and 6 bogie brake saloons. They were to be built at the company's newly constructed works at Dukinfield, Manchester. It is believed that these were all delivered the following year though the bogie brake versions may have been released to traffic in 1911.

An American performing circus, the Barnum & Bailey's, toured this country shortly before the these new-design carriages were built. The vehicles that conveyed the circus by rail, animals, the equipment including the "big top" and all the staff and performers, were built at the Stoke works of W Renshaw to a distinctly American rail-road style. The new GCR carriages shared some of these of these features – which led in time to their nickname of the Barnums.

This new production, which were of the saloon type, were 63ft 7inches long over the buffers and 60ft long over the body. The extreme width was 9ft and from rail head to the top of the water tank fillers was 12ft 9 ins. Roof ventilators were dispensed with by introducing flush sided vents. Hence these vehicles exploited the GCR loading gauge to maximum advantage. A new design pressed steel bogie with a wheel base of 10ft 6inches was employed. These provided body mount points at 41ft 6ins centres. The result was a an excellent ride at speed and over indifferent track, smoothed by the 3ft 7 1/2 in diameter wheels.

> We asked John why the bogies had become so much bigger. John's reply: The new, larger bogie was used because the Barnums were, at the time, some of the heaviest stock on the GCR. The earlier 8ft wheelbase bogies which were fitted to the Parkers, and other vehicles, were designed for a shorter and, therefore, lighter carriage.

Another feature was that the underframe was fabricated of steel and had the characteristic stress bars which ensured that the body was freed of any centre sag. To enable the vehicles to travel off the GCR to adjoining company networks – in particular the GER which employed air braking extensively, both vacuum and Westinghouse air brake systems were fitted . Steam heating and electric lighting was fitted throughout, with the unusual provision that both were regulated by passengers. Ventilation was by controllable vents and hand cranked drop lights.

> We asked John whether there had been any connection between the GCR discussions with the Pullman Car Co, initially agreed, but discontinued in 1910. And did the Barnum design, not dissimilar to the Pullman carriages, emanate from a potential GCR competing service? John's reply - I have never read anything which connects Barnums with Pullman cars. There is no mention in the Board Minutes I have on this and I think it important that we realise how quite austere the Barnums were internally when delivered. I suppose that there were some common features; there always are, all rolling stock designers copied others' work but, I have never heard of any linking.

Internally the saloons were laid out as follows, mimicking the design adopted for the Parker first and third class dining cars of 1898 for the London Extension. Passengers entered the carriage by inset doors at the ends and then into an end vestibule. On one side was a water closet compartment, the opposite side a lavatory. Passing through into the saloon, which was 22 ft 6 ins long, there were 32 seats. They were arranged in fours around 8 tables with a central walkway between, and at each table was a large picture window (making the most of the latest large-size glass making), an attendant's push button, an ashtray and match striker, and hat-racks. A novel feature was that in the summer the seating was covered with rattan cane and this was changed in the winter season to upholstered seating. A sliding lockable door (so that separated party groups could be accommodated) gave entry to the second saloon which was a mirror image of the first. The lavatories were supplied with hot and cold water from a ceiling mounted 40gallon tank each end.

> We asked John about the uses of the Barnums as dining cars. John's reply: We have photographs of Barnums set up as dining cars and, I feel sure, they were used as such at times, but there was one feature that would have been inconvenient – each table had a pair of folding leaves to enable easy access to and from the seats. I feel that such views were excellent P.R. for the company, but these vehicles were primarily meant for excursionists. The earlier Parker dining cars were much nearer being Pullman vehicles.

The brake saloons, the only variant of the type of Barnum, were literally a full saloon occupying one half of the vehicle, the other half being a large baggage compartment, with sliding exterior doors and a guard's brake section.

Externally the Barnums broke all the previous GCR design criteria. The universal use of previous panelled sides and ends of past builds had been shelved, although a drawing exists of a proposed but not built panelled Barnum, similar to the Parker dining cars referred to earlier. (*Line diagram from JQ)* When former Swindon apprentice John G Robinson, the new Chief Mechanical Engineer got to work in 1900 he brought a range of new ideas – he was tasked with an ambitious target, to build quicker, at less cost. He determined that carriage ends and sides would be of teak match boarding with bevelled edges. Even the transfers, universally applied in earlier times and indeed rather ornate, were outdated, replaced by cast brass characters about 5 ½ inches in height, which indicated ownership and identity.

These carriages anticipated many of the features that British Rail incorporated in their mass produced saloons built half a century later. The TSOs – or Tourist Second Opens - had large windows, a central walkway and four seats in pairs bench style around tables. The Barnums were the first of many more similar vehicles that ran throughout LNER days and into the BR period. With the introduction of the Barnums and the larger, modern locomotives hauling them, Robinson transformed the GCR into an increasingly efficient, competitive 20th century railway system.

> We asked John about the influences in the delivery and timing of the Barnums. John replies: The timing of the introduction of the Barnums was due entirely to the traffic requirements at the time and new production capacity at Dukinfield. The days of the painted two-tone carriage livery on the GCR were coming to an end because of the difficulties of keeping carriages in good external condition. Teak wood does not hold paint well due to the wood's oily nature so paint gave way to varnished wood. Think back to BR days when Gresley teaks were looking shabby because of this. Also we must remember that at that time there were very serious plans to amalgamate the GN, the GE and the GC into one company. Natural varnished teak would have been the livery of the combine. The GCR board decided, in 1908, that this would be the livery of all new carriages from thereon.

On the GCR these saloon carriages were allocated to areas of concentrated population to cope with the likely demand. Today at Ruddington there are three saloons, nos. 228, 665 and 666, and the now unique brake saloon, no.695. When new no.228 was allocated to Manchester London Road, but the other three vehicles were Sheffield-based. Even Mexborough had two on hand. It is believed that all but one, which was destroyed in World War 2, survived into BR days. Thus is testament to their use to the traffic department. The last Barnum was not to be taken out of BR service until October 1958.

> We asked John about the confidence in ordering 38 of such a radically different design off the drawing board and where the production was allocated.
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> John replies: I believe that 24 saloons were built at first, but I not sure how many brakes were. The GCR ordered another 8 later. I suspect a study was made of how many would have been required to cover the excursion needs of the traffic department. The allocations of them gives us a clue; 12 at Manchester + 2 brakes, 6 at Sheffield + 2 brakes, 2 at Mexborough, 3 at Nottingham, 3 at Leicester and 6 at Marylebone + 2 brakes. This means that the main population areas served by the GCR were covered when excursions were planned.

When the end came to their passenger service all four carriages were found new employment. No.228 was sold and served in Alexandra Docks in Hull as an engineers-support vehicle, latterly being used to grow tomatoes requiring three stoves (which ultimately rotted the floor). No.664, by now BR no.5664E, became departmental no. DDE320540, the Darlington tools van, hen acquired to run on the Severn Valley and then the GCR. No.5666E was renumbered DE320709, a mobile workshop and store for the Peterborough area. This latter coach is owned by the National Rail Museum. The brake saloon became BR no.5695E and was allocated to Newcastle area as a mess van and was ultimately saved by the North Yorks Barnum Group.

The restoration of the first Barnum example is being scrupulously planned with the aid of CAD and electronic scheduling and will be commenced shortly. The GCR RST was extremely fortunate when having responded to an advertisement in the local press, it secured a large quantity of redundant teak doors, these having been replaced by steel versions to increase the fire protection in a tobacco warehouse. Machining of the cut down doors has enabled provision for much of the external and internal vertical boards for at least one vehicle, no.228.

Challenges to authenticity have been largely settled by the provision of drawings from the original GCR drawing office and by way of the previous owner of no.695, the North Yorks Barnum Group. However, this failed to provide the evidence needed to deliver the finishings. For instance, to provide drawings for the identifying numerals and owner, transparencies were made from original photographs, to be projected to size, traced and adjusted to enable drawings to be made for casting of the brass items.

Much more recently a considerable research energy as been devoted to the type and colour of material of the upholstery and seating. The NRM and the Public Records Office at Kew appear not to have any helpful records – a major factor of concern as so much was destroyed due to War action. However, that very researching has uncovered a contemporary coloured illustration which will form the basis of evidence

when ordering the replacement upholstery covering. The Rattan alternative will not be part of the initial consideration.

The Barnum carriage which will be restored first will require very many hours of work, but most of the bogies are in relatively reasonable condition though needing substantial overhaul. All the interiors were stripped out many years ago and require complete replacement, including the re-running of steam pipes and heating, all the electrics, plumbing of water tank and supply for the water closets and lavatories.

Here is a tremendous opportunity for all to join in to recreate a fascinating slice of GCR railway history.

RTS – 23 March 2017

Barnums ~ carriages of renown

Team research – by Roger Penson, Trustee

Having completed the original Manchester, Sheffield and Lincolnshire Railway 6-wheel, 5-compartment carriage no. 946 of 1888, we in the GCR Rolling Stock Trust are now turning our attention to what the public affectionately dubbed the Barnums, which technically are described as Open Saloons – Third Class. Some 38 of these were built at the newly-opened Dukinfield Works for the now re-named Great Central Railway.

To the travelling public, as well as to the railway world in general, these carriages – 32 Open Saloons and 6 Composite/brakes (which included a luggage and guard's facility) - must have been a revelation. Built to near-Continental loading gauge, their size, the seating arranged to make the most of their picture windows, electric lighting, and even bell pushes on each of the tables, speaks of a very significant 'move forward' in both comfort and design.

Technical aspects, not neccesarily seen by the traveller, included longer bogies with larger diametr wheels, compensation springing, giving an enhanced ride in terms of both speed and smoothness. Built in 1910/11, for the excursion trade, these carriages show how far railway design, based on the increasing understanding of how far apt choices of metals, wood and safety aspects, had come in the 30 years or so between no. 946 and the Barnum design.

Heavily influenced by American production and design practice, partly recognised by the appearance of carriages used by the Barnum and Bailey Circus tour of the kingdom in 1904, and techniques witnessed at the Chicago Railway Fair visited by GCR executives, they were intended to

attract members of the public who had rising wages, and hence spare money to go on holiday or day-trips. The increasing speeds of railway travel meant that day excursion trips did not take all day to reach seaside destinations such as Scarborough.

These ideas included mass-production techniques. Whereas no.946 was hand-built, shown by slight differences, for example, in compartment dimensions, Barnums were built along similar lines to Henry Ford's car plants. They were the first GCR type that were production engineered for mass manufacture. This – to restorers, can be a great benefit when planning the restoration of the only four Barnums left. It can also be very much the opposite!

Chasing original detailing

As is often the case, vintage carriages only survive by being adapted, after withdrawal from passenger service, without benefit of new planned drwaings to various types of engineering support wagons. Hence the lack of complete interiors, and amendments not at all original. Mass-production requires an enormous amount of detail, especially in technical drawings, and – in theory, their availability should direct the restorers' efforts (allowing for modern safety requirements) – a boon to those who have never 'had their hands' on one before.

Unfortunately, the 1941 London Blitz put paid to that idea. GCR records which had long been archived in the Marylebone Goods Yard warehouses, which took a serious pasting, with a pile of hot ashes the result. This has left us with two options – either we rely on 'forensics', that is seeking what marks we can find inside, or we look elsewhere. But where?

Fortunately, within GCR, there seems to have been enormous pride in their innovations, and, having patented many of these, much detail – including some fabulous treasure (for restorers) of quite detailed and dimensioned drawings and explanatory text, appeared on the *Railway Engineer*, a monthly magazine directed at designers, draughtsmen and directors of railways across the world. Even during the Great War, issues continued to describe both new and existing innovations, as well as proposing further developments. Copies of this magazine are held at the NRM in York, and their curatorial staff have proved magnificent in the help they have given us.

Recording our finds

Having an inquisitive volunteer with extensive CAD experience, we are beginning to use this information to extrapolate the components for such

complex items as the hot water system, wiring diagrams and the like, enabling us to plan an echo of the original build process.

One of the major components the traveller sees on entering a Barnum, of course, is the seating. We were fortunate enough to hold plans and elevations of the 64-person seating per carriage (32 in the composite). These were not strictly to 'engineering' standards, but enough to build a quarter inch-scale model of both seats and tables, in order to prove information needed for the real thing. As this progressed, we decided we could use these as part of an eventual museum model. Thus,we chose a period in the late-1920s to include scale manequins of adult travellers dressed for the times. These were provided by a wonderful local artist in many mediums, and we were delighted at her results.

Let down on colour guides

Many carriage restorers will have seen photographs – both exterior and interior shots – of their types of carriage, and very helpful they are too, as they give the 'atmosphere' of the period and type. Anyone with photos of past family members will realise the problem here! Lack of colour! This is especially problematic when it comes to fabric for seating. In any case, the picture may show your carriage, but who's to say it is not a later recover?

Chasing every lead

This is where it pays to 'read the small print'. Magazines such as the *Railway Engineer*, can contain that last nugget of information you need. For example – always read the 'ERRATUM' section, as we found an apology for an omission from an earlier article that opened up a whole new avenue of research: We had thought that the seating would have been made 'In-House' at GCR's new 1910 production plant at Dukinfield, and this may well have been so for First Class seating (for their other carriages). However, the omission included reference to a company called G. D. PETERS, based in Moorfield, London, from circa 1894. These people were devoted to Transport seating and automatic door opening systems, until - it seems - they closed circa 1956 in Slough. They it was who had 'made the third class seating'. So – a trip to Slough Transport Museum is in the offing. We also know from the erratum that 'First Class carriages had Walnut seating and interiors, and Third Class carriages had Mahogany..'

We were still left with the puzzle about suitable fabric – until one of our volunteers came across another magazine of the period, called *Railway and Travel Monthly*. In an edition dated 1912 (ideal timing!) we found an artist's watercolour of the interior of a Barnum, reproduced in full colour, alongside some text that basically told us no more than we already knew,

but at least confirmed our information. Now colour reproduced through the print process can be highly variable, and the passing o time does not help, but we were able to compare colours directly against other known livery details.

Into our possession came a letter from an employee at Dukinfield plant (Carriage Foreman during the 1930s) who claimed the original fabric was CHERRY RED – a colour we would never have thought of – as being 'rather bright'! for the period. The carriages had obviously come in for refurbishment, as he went on to describe a fabric very similar to the shreds we had recovered from another type of carriage – built circa 1905, but carrying a clearly 1930s pattern/colour from LNER days.

So - we have learned not to ignore the slightest hint, the smallest print, and the un-likeliest source on the hunt for guidance when trying to re-create 'the look' for Barnums, and indeed any other carriage or wagon that comes our way.

Managed Build Plan

Not everything is resolved yet, but we have enough to create and start on a managed building plan, thanks to many sources of information, and the wide range of volunteers, artists and technical knowledge. It seems quite rare to be able to use one 'set' of evidence across a number of carriages. We hope this will enable a full rake of these magnificent 'beasts' to show the public what Edwardian through to 1920s travel experience was like.

Rescue considerations

Under the progressive CME John G Robinson, we know that GCR designer staff had attended the Chicago Railway Fair in 1900, and came away inspired by the then 'modern' style of carriages there displayed. Of course, adaptions to the United Kingdom's taste and weather had to be incorporated ~ e.g. no open balcony ends for enjoying the Southern heat and Priarie scapes!

'Picture windows' – enabling the passengers to appreciate the scenery on Excursion traffic - must have been a revelation for the increasing range of passengers, now finding that rising wages (due to increased mechanisation and productivity) gave the mass working classes opportunity for day trips – or longer - to the seaside, from the many Northern industrial towns and cities. Their restrained opulence and comfort both impressed and encouraged the traveller. Their design, including the 'hidden' engineering details the traveller did not see, aimed to fulfill the company aim to be the most comfortable and impressive railway in the U.K. It is almost true to say that – after the Barnum design,

railway travel was never the same again – except for the Great War and the extremes that caused.

Naturally, these carriages worked hard over their lifetime, the last ones being withdrawn (after at least two internal seating refits), in the mid-1950s. It is sad but true, that we have only four Barnums left from the original 38, and only because these were 'converted' to a second life to various types of engineering support wagons.

Gazing at these once magnificent beasts, we have to ask some hard questions: “What level of restoration do we persue?; How are these carriages to tell their story? Where and how do they 'earn their keep?'”. It pays to take time to consider these points very carefully, including as many potential 'user representatives' as possible, alongside the working team. There are, generally, 3 approaches which could be taken:

* CONSERVATION ~ meaning 'save what you've got'. This maintains the item as it is. In consequence, it may not be a usable item, and in anycase it may have later additions that do not truly reflect its original state. However, you could identify these to visitors, and these become part of its history. A static exhibit is the result, possibly lacking interest and excitement, except to a knowledgeable viewer;

* REPAIR – often called 'an honest repair', meaning that what has been done is clearly visible, producing a useable item that could earn revenue and give the user some understanding of 'how it was' for the Edwardian travellers;

* RESTORATION – meaning that the item is fully returned to its original state, using the correct original materials, based on the original engineering drawings and other explicit evidence from the period of manufacture. This is often the ultimate aim of any restorer, but it can produce a 'magnificence' you hardly dare use. Again, this can become merely a static exhibit, not least because modern legislation to permit 'live usage', the carrying of passengers, requires today's enhanced compliant safety features – such as kite-marked Safety Glass, and fire-retardent seating amongst others not so obvious.

In consequence, the decision to work towards a revenue-earning carriage often includes elements of both REPAIR and RESTORATION. It is the only way that the great number of people, interested in the Heritage Railway experience, can immerse themselves in the impressions of period travel. So -what should we do?

All four Barnums arrived showing little physical evidence: stripped interiors, largely missing brassware, 'modern' (i.e. 1950s lighting), to guide us. There were, however, many useful – and often original,

engineering drawings; much descriptive text and sized drawings of details such as water-heating for the washroom, b/w photographs etc., found in archives, books, and letters from railway staff who had first-hand experience of the Barnum brand.

Thankfully, we found much interior wood and metals, to act as patterns at least. We had to devise a work-programme, before we could even develop the restoration programme. This meant the following exercises (currently on-going):

Indentify the various 'sections' of future work:

* Under the solebar, such items as Bogies, Braking Systems, Electricity generation, etc. etc;

* Exterior Fittings, such as roof, timber cladding, window glass, brassware, etc;

* Interior Fittings, such as lighting, seating, interior claddings, washroom and toilet design; Water and waste disposal provision, etc;

In short, re-create the work-programme similar to the original build plan. We now have a spreadsheet, from which a planned work-sheet for each of the sub-elements can be created. The above, of course, is useless until you know: what you've still got available, how many and what condition. This leads on to the need for:

Condition and engineering Survey:

Whilst surveys were available, these were around 10 years old. Deterioration, due to outside storage, rendered these unreliable. We had thus to:

* Organise new surveys by experienced members, recognising that, until work actually commences, we may find un-expected horrors requiring more funds;

* Expect that any we find will likely delay the programme, but at least we will have other elements we can address, whilst these are 'fixed'. Leading on to:

Stock-take:

A physical stock-take of materials and items held by the Trust. As we hold a range of carriages and a stack of bits, we need to identify, from drawings and photos, whether the items in question actually belong on a Barnum;

* How far the item matches evidence such as drawings or photographs, or as described in texts we hold;

* Their condition, especially of any mechanical/technical item, must be assessed for:

* restoration/use, or merely acting as a pattern for new;

* Quantity held/required for manufacture;

* Whether we can restore/make on-site, or must sub-contract;

* Identify members' skills/neccessary equipment required:

* A members' skill/training set is required; or

* Suppliers must be identified and (in both cases) availability of acceptable materials and their costs must be identified;

Funding considerations:

The spreadsheet must identify both costings of materials and sub-contractor costs (including – where necessary transport off-site); as well as:

* Timings of expenditure: (This is essential to accelerate fund-rasing and monitor costs against progress). It is also an extremely valuable exercise to demonstrate we have the controls in place to manage any funding we derive from funding bodies and donors.

All the time, we must ask ourselves: “Does what we are doing now continue to meet the criteria we started with, and produce a useable and revenue-earning result?” As railway enthusiasts continue to identify and bring onto Heritage lines, engines and rollingstock they deem worthy of rescue, to avoid the build up of a sad and neglected siding space, such considerations must be addressed and adhered to. It is the only way to keep sane!

So – having said and done all that – When can we start?!

Roger Penson Feb 2017