



Wirral Steam

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Supacat's prototype Lifeboat Launcher on test at Hoylake

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The wind is howling in the eaves as I write this. I know summer is over for another year and that last fling in late September is already a dim memory. In spite of the SE centric media complaining about the summer, I feel we've done OK here in Wirral and its not really affected railway operations. Our events have gone well, we have made new friends and reinforced old friendships.

We have one last event to mark our 50th Anniversary, a lunch at the Manor Restaurant in Greasby on Friday 4th November at midday. If you haven't booked, please contact Alan Pennell as soon as possible. See page 12.

Nothing formal has been arranged (apart from the meal). However, if you have a tale or anecdote that you wish to regale the assembled members with, please let me know beforehand and I will invite you to share it with us on the day.

Then in December, we have the Santa Specials. Tickets are already selling fast, and it looks as though we will be as popular as ever. Your support of the event is always appreciated, so please help out when and where you can. Details of support needed will no doubt be posted in The Sidings.

In this edition I have included an article on a new Lifeboat Launch and Recovery System that will be used at Hoylake as well as other sites. When I took the cover photo, the fence was being tied down by two former crew members. The System was on test and they had been trying their best to get the rig stuck in the mud – to no avail. All four tracks are driven (tractor and trailer) and the pressure exerted by the tracks on the mud is less than 10lbs per sq inch (Human 8 psi, Toyota HiLux 4WD 25 psi). To say they were impressed is an understatement. More photos are on the website.

Finally, some will know that we have been trying to move house closer to our grandchildren. Well at last something seems to be happening and with a bit of luck and a fair wind we should be moved by the end of the year. Continued committee membership is impractical given the distance (Sandbach).

I will not be standing for re-election to committee at next years AGM.

New blood is required, please consider giving some of your time to helping with the running the Society on behalf of all of us.

I will remain a member, maintain the website and continue editing this journal.

I hope to see many of you on the 4th Nov.

AJB

Contact the Editor

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Editor: Alan Banks, alan@alanbanks.org.uk Tel: 0151 336 7797
7 Yewtree Close, Little Neston, Neston, Cheshire CH64 4ES

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Supacat's Pre-Production Lifeboat Launcher starts beach trials

Thursday 1st September 2011

The programme to bring the Royal National Lifeboat Institution (RNLI)'s new Shannon class all weather lifeboat into service reached a key milestone in July with beach trials starting on the upgraded pre-production Lifeboat Launch and Recovery System (L&RS), which has been developed by Devon based Supacat in association with the RNLI.

Following previous trials Supacat rebuilt the prototype L&RS into a pre-production system, incorporating a series of design upgrades to improve performance and longevity. These include a new lightweight composite cab with improved all-round vision, a Supacat designed marine proofed track system and new 13L Scania engine.

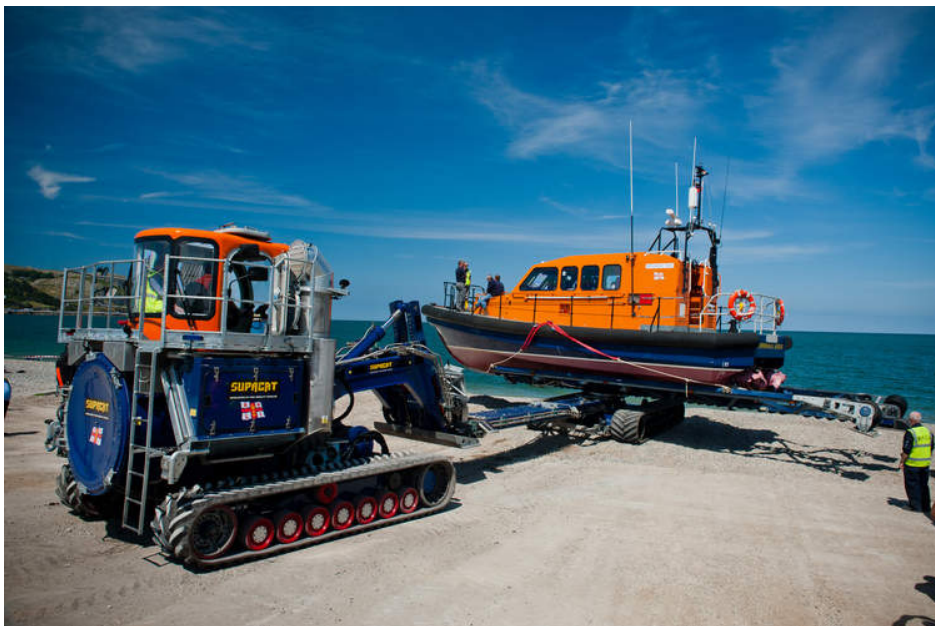


The L&RS is a track mounted, partially submersible tractor and powered-carriage system which has been custom designed by Supacat to launch and recover the new all weather lifeboat and carry it between the boathouse and water at stations where a harbour or slipway cannot be used.

To solve this challenge, the design uses a permanent, software controlled Four-Track-Drive system providing the mobility to negotiate the steepest gradients and gullies and travel long distances over flat sand or shingle, and a 360 degree rotating cradle facilitating the safer `Bow First` launch and recovery. The L&RS can be operated in heavy surf conditions, and in water at depths approaching 3m. In case of immobilisation, it is designed to withstand submersion in water up to 9m deep.

"The new pre-production L&RS is a significant engineering achievement for Supacat and the RNLI project teams who have found a unique solution to an extremely demanding requirement. It is a very important programme to Supacat since it demonstrates our innovation and skill in developing bespoke solutions as well as our specialisation in hostile environment engineering and high mobility transportation", said Nick Ames, Managing Director, Supacat.

"The RNLI's aim is to launch a lifeboat within 10 minutes of notification. For the new Shannon Class lifeboat the effectiveness of launch and recovery system is crucial to achieving this target. The Supacat L&RS provides a marked improvement to the existing equipment from an operational and health and safety perspective; as demonstrated during the recent trials where the Supacat's capability, versatility and robustness were clearly displayed. The combination of the Shannon Class all weather lifeboat (presently in the final stages of build) and Supacat L&RS will not only allow the RNLI to reach casualties faster, but also enable swifter recovery to shore if required", commented Chris Eves, RNLI FCB2 Project Manager.



This first trial phase involves testing the alterations to the L&RS against diverse conditions at different stations, starting at Llandudno where an undulating and deep shingle bank cannot be negotiated using existing in-service launch systems, then Dungeness for its steep pebble beach, followed by Hoylake where spring tides mean distances of up 3 miles have to be covered from boathouse to water.

The second phase will focus on the interface and compatibility between the L&RS and the new lifeboat. This is scheduled to start January 2012 at Hayle by which time the prototype Shannon lifeboat with enhanced hull design will be ready for trials. All pre-production trialling is expected to be completed by mid 2012 with the first production L&RS build commencing soon afterwards for delivery in 2013.

The key upgrades to the original prototype are:

- Lightweight composite cab offering all round vision with a water tight door and roof hatch to replace the prototype's steel cab with roof hatch only.
- Supacat designed, marinised, low maintenance track system for the tractor to replace an industrial specification track system.
- A new 13 Litre Scania engine replaces the original 12 Litre Mercedes, offering commonality with the boat engine.
- A Controller Area Network (CANbus) electrical system has been introduced to replace a conventional hard wired system and the operator's controls have been revised to utilise the CANbus capabilities.
- The boat cradle has been re-designed to accommodate an enhanced boat hull design.
- Stainless steel pipework replaces steel hydraulic pipework for ultimate corrosion protection.
- General design enhancements throughout to reduce maintenance and increase longevity.

*Text and Images with permission of Supacat.
<http://www.supacat.com/site-terms-and-conditions/>*



21st July 2011

Electrics, these are now almost complete and should be finished today. In future no further electrical work will be done without full committee approval and will be tendered for with full costs and estimates.

Brass labels, Quotes have been sent for but have not yet been received.

Eaton Drive 'Little Clifty', this is now working satisfactory.

NAME Rally Report, Thanks have been received for staging a successful event, the Chairman will compile a letter to be sent to F Cooper. Thanks were expressed to our photographers for providing the photos which are now on the web site.

Birthday Celebration Report, These went well again thanks were expressed to the people who had provided photos and videos which again are on the web site.

Bring and Buy Sale Report, This went well and was appreciated by the visitors. It was felt that the manning of the stall could be improved as the person in charge tended to wander off leaving the stall unsupervised.

York Visit, This needs to be progressed and names and numbers obtained.

Raised Track Trucks. The need to overhaul the braking system was discussed. New parts have been obtained and as an interim measure one truck will be fitted with the new parts for trial on the track. On examination of the original bogie design it was felt that improvements could be made to give better suspension and wheel wear. Work will be done to achieve this and when a satisfactory system has been found the trucks will be overhauled in turn.

COSHH and PPE. We need to ensure that proper handling of hazardous chemicals is observed and that all containers are properly labeled. Personal protective equipment should be worn at all times and we need to ensure that we provide the necessary equipment for the various jobs.

Suitable footwear should be used for all jobs; all equipment provided by the society should be properly cared for.

The Treasurer circulated details of the current financial statement and it was noted that expenditure was still in excess of income. The accounts as presented were approved but the Treasurer said that financial restraint was still required.

The Car Club Rally. This is going ahead as planned on August 7th. The Rangers have been informed, parking will be on the field as for the celebration weekend.

Junior Event. Details for this have been circulated by e-mail.

Notices will be published in Wirral Steam detailing the visit to York and the celebration lunch at the Manor.

The coach to York will unload and reload passengers at the entrance to the NRM, no stops on route are planned for refreshments. If there is free space on the coach it was agreed that non members should be invited at a cost of £10. The lunch at the Manor restaurant is on November 4th, a £5 deposit with names should be sent to Alan Pennell.

Details of events being held at other societies have been received and these have been posted on the notice board.

Santa 2011. It was decided that the cost would remain at £2 per person. We need to purchase books and other presents while we can get them at advantageous prices. It was suggested that the grotto should be kept simple. A sub committee to be set up to co-ordinate the arrangements.

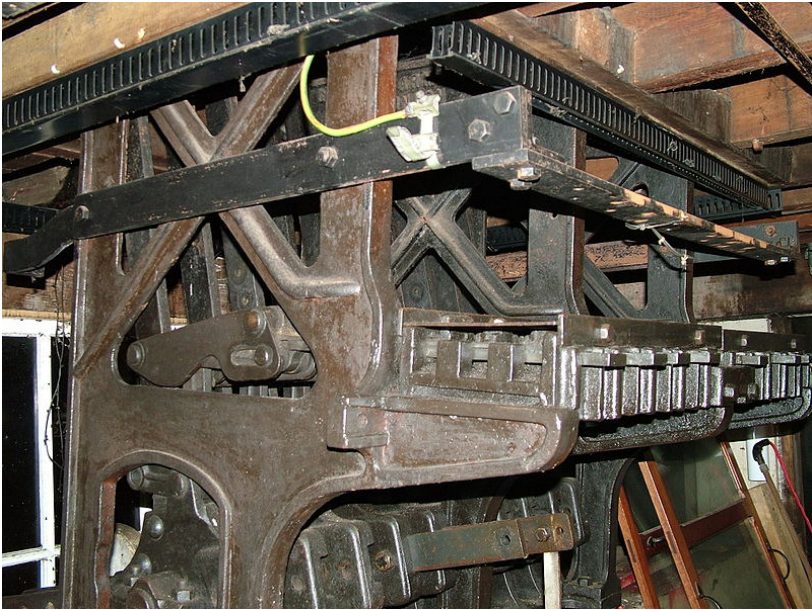
Ground Level Report. Maintenance is ongoing, thanks were expressed to all members who have helped on maintaining the track the track bed and the infrastructure.

Raised Track Report. The raising of the bunker has been put in abeyance due to the financial position. The record keeping needs to improve, few people record maintenance needs and completed jobs in the record books. It was suggested that the raised track running sheet should be modified to indicate that the trucks have been properly tested before they are used.

A request for a further trestle table to be obtained for use for serving the teas on open weekends. This was approved in principle. The ladies in the kitchen felt that the tickets issued for meals at the open weekend did not work well. The original concept seemed to get lost in the hustle and bustle of the kitchen. For future events this needs resolving.

The NAME minutes have arrived, these will be posted on the notice board. A response from the society is needed.

Several gaps in the programme of yearly events have occurred, it was suggested that that one of the vacant club nights could be filled by the society hosting one of these to put over points concerning society business.



Oulton Broad Swing Bridge interlocking frame.

Mechanical Interlocking

Ken Chynoweth

As it is proposed to move the control of the ground level points and signals to a central position near to the turntable perhaps a few thoughts on how mechanical interlocking is achieved in prototype practice may be of interest.

From the early days it soon became obvious that grouping of point and signal levers together was desirable for ease of operation. The first mechanical frame with interlocked point and signal levers was brought into service at by the Midland railway at Kentish Town in 1860.

Early interlocking was mechanical but nowadays this is largely achieved electrically by means of relays. Interlocking may be defined as a means of ensuring that certain levers can not be moved when other levers are in certain positions. The three main objects of interlocking may be defined as follows:-

1. To ensure that the signaller cannot clear a signal unless the relevant points are set for the correct route.
2. To make it impossible to clear two signals at the same time which may lead to a collision between trains.
3. To make it impossible to move any points connected with or leading to the line on which the train is moving until the signal governing the movement of that train has been returned to danger.

In manual signal boxes the interlocking is achieved by tappets and rods working in a locking box mounted beneath the lever frame. In simple installations tappets take the form of horizontal flat bars which are connected to the levers below the floor of the signalbox. These slide in notches cut transversely in the locking box which also runs parallel to the lever frame. The locking box consists of a series of channels along which slide rods, known as bridle irons. To these the locks, generally blocks of metal with chamfered corners, are riveted and these engage with the notches in the tappets. The notches cut in the tappets are so arranged that they will only accept the locks, which are moved by the bridle irons, when the relevant lever is in the correct position.

The simplest form of locking (Fig 1) is that when one lever is pulled it locks another in the normal position, the original lever becoming back-locked. This is achieved by arranging that the locks are riveted to the bridle iron in such a position that the length over the working faces of the locks is equal to the distance between the two tappets plus the depth of one of the notches. This form of locking would be used between signals which would set up opposing movements, for example signals governing movements over a crossover or, on single lines, movements in the opposite direction. If several signals in each direction are involved further locks would be riveted to the same bridle iron so that the operation of any lever would automatically lock any opposing lever.

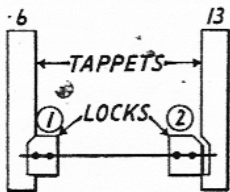


FIG. 1 — Lever 6 locking Lever 13 and conversely.

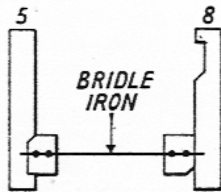


FIG. 2 — Lever 5 released by and back-locking Lever 8.

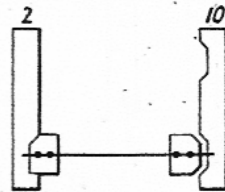


FIG. 3 — Lever 2 locking Lever 10 normal or reversed; Lever 10 locking Lever 2 during Stroke.

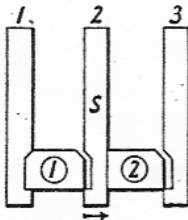
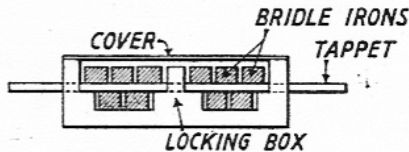


FIG. 4 — Lever 1 locking Lever 3 when Lever 2 is reversed.

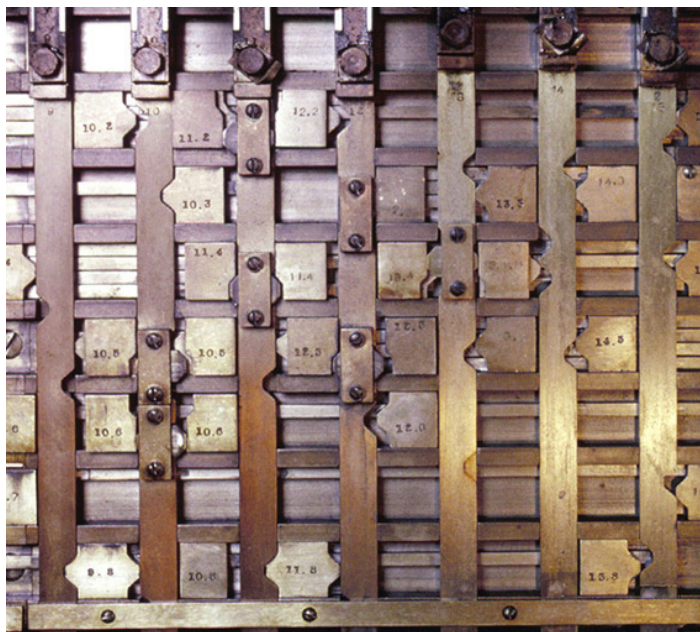


—Locking Box, Bars and Tappet.

It is more common (Fig 2) for one or more levers needing to be reversed before a certain lever can be operated. In this case the notches in the tappets of the levers which have to be moved first are cut in the reverse position thus presenting a solid face to the lock in the normal position. Such locking would be found on distant signals which requires that all the home signal levers for the relevant route are pulled before the distant lever can be operated. This indicates to the driver that all the home signals for his route, operated from the same signalbox, are in the clear position. Conversely all the home signal levers are back-locked until the distant lever has been returned to danger.

In the case of levers operating facing points (Fig 3) the facing point lock lever has to lock the points in both the normal and reverse positions. The point tappet has to be notched in both the normal and reversed positions, the notches and the relevant locks being double chamfered. This is necessary so that the facing point lever locks the points in both positions. The relevant signal levers are locked both with the point lock lever and the relevant points.

If it is necessary for a lever to lock another lever only if a certain lever is reversed (Fig 4) a swinging tappet, narrower than a normal tappet by the depth of a notch, is used. This swinging tappet can swing to the right or left of its normal position by the depth of a notch. The lock bearing on one side of the swinging tappet is cut without a chamfer and it only locks the third lever if the first lever is operated with the lever that works the tappet is in the reversed position. This is known as conditional locking. For example, if a shunting signal covered a reversing movement over a crossover as well as a reversing



movement along the main line it would not be necessary for this signal to be locked with the signal controlling movement over the crossover in the reverse direction with the crossover is in the normal position.

An interlocking 'machine' locking bed from the USA.

J. E. Donald Griffiths

It is saddening to report the death, on Sunday 11th September, of Don who was a member of the Society at about the turn of the century and was quite instrumental in some aspects of the Ground Level railway construction. Having substantial woodworking machinery at his disposal at home he was responsible for cutting the half-joints for fabricating the wooden gates we used, most of which we are still using, at our crossing places. Don eventually moved, in February 2001, to near Aberystwyth with the aim of installing a 5" gauge railway on his land which already had a 9-hole golf course!

In speaking with his widow Pat it transpires that they did not start building the track because of the potential problems of local children wishing to view/ride and the inevitable insurance risks! Sounds familiar! Pat tells me that Don celebrated his 81st birthday this July then had a stroke on 12th August which left him partially paralysed down one side, with no speech and unable to swallow. He was already diabetic which did not help his situation. Don had a 5" G Peter Sam (Tallylyn style) loco which had run on our raised track but has not run since he left Wirral, finding it increasingly heavy to handle. His interests stayed with railways however and he started building in 16mm gauge and achieved three part-built locos! Pat is now faced with the usual widow's dilemma - how to dispose of workshop equipment, but sensibly will approach the auctioneers who assisted in disposal of unwanted items when leaving Wirral. Don and Pat received great caring support from the hospital staff and she has now set up a 'Don Griffiths Trust' into which donations, in lieu of flowers etc., may go to provide small televisions for use in the special care rooms at the hospital. The funeral was on Friday 23rd September.

A Condolence card has been sent to Pat on behalf of the Society.

Alan Pennell

Royden Park - Green Flag

Some 3 months ago Royden Park was inspected by an outside pair of 'inspectors', for fairness, drawn from outside of the Wirral area. On the 'inspectors' visit they were accompanied by Adrian Oldfield, a couple of Council bods and our President Alan Pennell. They looked at the approaches to Hillbark, the Events Field and ultimately to the path between our two tracks and they asked for and were given explanations of the various aspects being observed. They were then left to agree and record their findings in the Forge. The Green Flag was duly gained and received and proudly displayed (when the wind blows strongly enough!) at the top of the main drive.

Alan subsequently received an Invitation from the Mayor of Wirral Councillor Moira McLaughlin to a Reception 'to thank staff and volunteers for all their hard work in achieving the Green Flag for Wirral Parks' in the Round Room in Wallasey Town Hall. This happened at noon on 15th September. Some 50 people assembled and in turn introduced themselves to the Mayor who told Alan that she was aware of our railway facilities. The Mayor gave a short

address thanking everybody for their inputs to making Wirral the beautiful place it is. Drinks, of all kinds, were handed out and then access was given to a selection of sandwiches which soon disappeared! Paul Greenslade was present and it was nice to see the well-deserved attendance of Mark Humphreys with Alan and Michael (a new member) from the Project Team. Whilst eating the opportunity was taken to talk to other attendees during which Jim Lester came over with the Mayor and told her about the Council's efforts to keep the park maintenance going.

When asked by the Mayor Alan (project) gave good account of what the Project Group did. Towards the end a lady, Mary Bagley, came and introduced herself as being the replacement for retired Dave Cowley. She has come from Sheffield and has the distinction of being the national representative for the Green Flag Scheme. The Government last year intended to axe the Green Flag scheme but Mary went down to London with other representatives resulting in government accepting the need to keep the scheme going. The scheme is proving to be effective in maintaining/improving standards in our parks and Wirral aims to have all its parks to Green Flag standards in the next 10 years. We shall see!

Alan Pennell

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For those who haven't heard (Ed)

As part of our 50th Anniversary Celebrations the Society is holding a Midday Lunch, on Friday 4th November at 12.30 for 1pm, in the Function Room of the Manor Restaurant in Greasby Village.

All Members and Family Members are invited.

Would you please let Alan Pennell know ASAP whether you wish to accept the invitation thus enabling me to confirm our booking with The Manor. If you wish to come would you please let me have £5.00 per head, either cash or cheque made out to Wirral M.E.S.

The meal will be 3-course, costing £17.00, including coffee/tea but the Society is proposing to donate the balance of £12.

All drinks will be to the account of the attendees.

Alan Pennell 4 Arundel Close, Pensby, Wirral, CH61 8TB. 0151 648 6588

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From Chris Postlethwaite

Hi Alan, I understand that my son Andrew organised the classic cars to be displayed in the field when our track was running. This was on August 7th this year. I understand that everyone enjoyed the event and, although Ken and I were away on the day, I thought that it would be nice to thank June and her band for providing lunch and teas on the day and everyone who attended and helped on the day.

This thanks is of course fully echoed by the Committee and members (Ed).

Dear Sir,

Yesterday we had the privilege of attending *the classic cars display at your Railways*, as I live close I arrived very early but you were kind enough to show me the way in. After settling in we walked back to see the engines being paraded and three of your members gave me the opportunity to drive the train. As I thought we were only going down the straight imagine my surprise to go all the way round the track, you made a man and his wife very happy. Then you spoilt us with a lovely spread for lunch, my wife and I greatly appreciated it.

I feel it is only right that I let you know how much it was enjoyed by us both. May I please return the favour as I am The Vice Chairman of the North Cheshire Classic Car Club we are holding a show of nearly 200 Classic cars and stalls at the Foxes Riding School. Badgers Rake Lane. Ledsham on Sunday 14th August if any of your Members would like to attend they would be more than welcome and if they announce themselves to me I will replace their entrance fee. *(I was able to circulate this by email to some members – but too late for most – Ed)*

Once again thank you so much for a cracking day and I look forward to seeing you all again soon.

Yours Very Sincerely *Peter & Diana Pope*

Dear Alan (Pennell)

Thank you very much for a very enjoyable afternoon at the 50th anniversary. It was lovely to be invited to take part and I was delighted that Timothy and his fiancé were able to come and Ian enjoyed it as well. Can you please pass on my thanks to Alan Banks who kindly sent me the latest copy of the Wirral Steam magazine which I have filed with the rest of Dad's memorabilia. What a professional magazine! It is somewhat different to the sheet of foolscap that used to be passed around. We found the whole thing informative and very interesting. In return I am sending you some pictures that we took. You probably have loads of these already but a few more are nice to look at. Hopefully we will see you at Royden one weekend.

Congratulations on 50 years - what an achievement.

Best regards

Glen Nixon

SANTA SPECIALS 2011

OPERATING DATES:

Saturday/Sunday 10/11th December

Saturday/Sunday 17/18th December

Between 12 midday and 4 pm

Please set aside some time to help us run this now 'Christmas Essential' for many families in Wirral.



30 Sep 2011

The National Railway Museum has today announced that the restoration of Flying Scotsman is expected to be complete by late spring 2012.

The iconic locomotive was expected to be completed during the summer of 2011 but unfortunately the project was delayed due to the discovery of a number of additional defects. Remedial work is currently being conducted at Riley & Son (E) Ltd in Bury and is focusing on ensuring that the locomotive is in a condition to be able to run for decades to come.

The work due to take place on Flying Scotsman in the next few weeks includes the fabrication and installation of a new mid stretcher, the machining of the axle boxes, the manufacture of a new middle motion bracket and the repair and installation of the horn guides.

Steve Davies, Director of the National Railway Museum, said:

"The Flying Scotsman restoration is one of the most complex steam locomotive engineering projects of its kind ever undertaken in Britain and there is no doubt that it has been challenging. There have been a number of points where unforeseen issues have arisen that have caused the project to be delayed whilst options were considered and decisions were made. These decisions were taken in accordance with our aims of ultimately maintaining maximum public exposure and enjoyment of the locomotive. In order to achieve this, the planned overhaul has always had safety, reliability and sustainability, both mechanical and economic, at the heart of our decision making processes.

"No one is more keen to see the completion of this project than myself, and I'd like to reassure the public that although the restoration has been ongoing for over 5 years, we are extremely close to seeing Flying Scotsman steaming once again."

The restoration of Flying Scotsman has been generously supported by Tata Steel, formerly Corus, a £275,000 grant from the Heritage Lottery Fund and support from many other generous organisations. Members of the public also generously donated £250,000 to the Steam Our Scotsman appeal.

The National Railway Museum will announce further details about Flying Scotsman's restoration, its display and its operation as soon as these are confirmed at www.nrm.org.uk/flyingscotsman

**Investigation into a boiler incident on the Kirklees Light Railway,
3 July 2011**

At 12:09 hrs the second passenger train of the day on the 15 inch gauge Kirklees Light Railway stopped a short distance from the terminus at Shelley with low boiler water level. The injectors were unable to maintain the level of water in the boiler which dropped below the bottom of the gauge glasses and the fusible plug melted. The train crew and the railway's responsible officer

were unable to diagnose the problem and, after some delay, the fire was dropped. By the time that the decision was made to drop the fire, parts of the firebox and boiler had been exposed to the fire without water behind them for several minutes. During this time there was an increasing risk of a dangerous failure of the boiler.

The RAIB's preliminary examination has found that the flow of water to the boiler from the larger of the two injectors was restricted owing to a valve between the injector and the boiler being nearly closed. The melting of the fusible plug in the firebox was not noticed by the train crew.

The investigation will examine the sequence of events leading up to the incident, the way in which the incident was managed, the railway's procedures for locomotive maintenance and preparation and its system of training and assessment of operational staff.

The RAIB has issued safety advice reminding operators of steam locomotives of the need to ensure that they have identified the risks associated with boiler malfunction and have suitable processes in place, and briefed, for managing them. This advice covers the need for preparation and routine inspection, and in particular, checking the correct operation of methods of feeding the boiler with water. It also urges operators to review the adequacy of their arrangements for ensuring that the crews of locomotives are competent to recognise signs of low water and are aware of the subsequent actions to be taken.

The RAIB's investigation is independent of any investigations by the safety authority (the Office of Rail Regulation).

The RAIB will publish a report, including any recommendations to improve safety, at the conclusion of its investigation. This report will be available on the RAIB website.

Eaton Hall Railway

Dates of operation	1896–1946
Track gauge	15 in (381 mm)
Length	4.5 miles (7.2 km)
Headquarters	Eaton Hall, Cheshire

The Eaton Hall Railway was an early 15 in gauge narrow gauge estate railway built in 1896 at Eaton Hall in Cheshire.

It was built for the Duke of Westminster by Sir Arthur Percival Heywood, who had pioneered the fifteen inch gauge with his Duffield Bank Railway, and

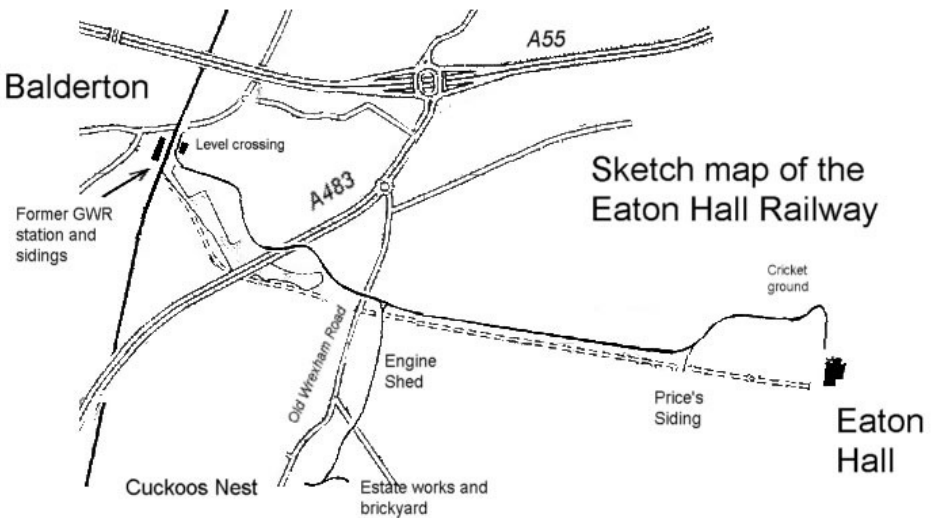
connected the hall to the GWR station sidings at Balderton on the Shrewsbury to Chester Line, some 3 miles away.

The total length of the line was four and a half miles, with the addition of several branches including one long one to the brick store and estate workshop at Cuckoo's Nest.

The track was steel flat-bottomed rail of 16.5 pounds per yard, attached by spring clips to cast iron sleepers, 3 feet long and 6.5 inches wide, spaced at 2-foot-3-inch centres. Pointwork was prepared at the workshop in Duffield (for which Heywood charged £7/15s/0d each), and carried to site.

The maximum gradient was 1 in 70 (1.43%), Eaton Hall being 51 feet above the sidings at Balderton.

For much of its length it followed the main driveway and crossed the park, including the major driveways. Therefore the line had to be as unobtrusive as possible and was laid level with the ground with a central drainage pipe beneath. The ballast was red furnace cinder, 5 to 6 inches deep and 4 feet wide. On leaving the park the line was embanked. The line was not fenced - where it crossed between fields it was carried on girders over a deep ditch to prevent cattle straying.



Map of railway in relation to modern road network.

There were bridges over one or two streams, the longest being 28 feet, but it crossed roadways on the level, at one point the main Wrexham to Chester road. Although Heywood had obtained wayleave, it could only be a temporary arrangement, since, for a private railway, the council was not able to enter in an agreement which bound its successors. Heywood therefore campaigned for a

clause in the proposed Light Railway Bill which would allow permission for public road crossings to be granted in perpetuity.

The first engine was "Katie", an 0-4-0T with Brown/Heywood valvegear (it had originally been intended to fit Stephenson/Howe valvegear). Following this were two identical 0-6-0T locomotives, "Shelagh" and "Ursula".

Katie proved capable of handling up to 40 long tons on the level, or 20 long tons on the gradient, at a speed of around 10 mph.

Under test, 20 mph was achieved in safety.

All rolling stock was built to negotiate curves of 25-foot minimum radius. Self-acting coupler-buffers were fitted and measures were taken to ensure interchangeability of parts.



Sir Arthur Heywood with his first engine at Duffield Bank Railway in 1875

Thirty open wagons and a 4 wheeled brake van were initially provided each wagon carrying about 16 long cwt of coal or 22 long cwt of bricks. The wagon 'tops' were removable to allow them to be used as flats, and bolster fittings were supplied to carry long items such as timber.

An open 16 seat bogie coach, a bogie parcel van (for 'game') and a small open 4 wheeled brake 'van' were also provided at the opening. Finally, a closed bogie passenger vehicle some 20 feet long seating 12 people inside and four outside and a bogie brake van seating four inside and four outside were supplied after opening. Other wagons were constructed by the Eaton Estate and rebuilt over the years.

The design estimate for the line was around 5,000 long tons per year, mainly coal, timber, road metal and bricks. To Heywood's mind it was the ideal application for this gauge of railway.

The Eaton Hall railway closed in 1946 and was lifted in 1947.

A new 15-inch railway, named the Eaton Park Railway was built in 1994 with a replica of Katie. It is not available for use by the public except on the various garden open days. The new line consists of a large loop with a spur leading to the engine shed. The latter follows a small part of the original route.

The original Katie was sold to the newly-built Ravenglass and Eskdale Railway and then in 1922 to the Llewellyn Miniature Railway in Southport. In 1923 she was sold to the Fairbourne Miniature Railway where she operated trains until scrapping in 1926. Parts of the original are currently back at Ravenglass being rebuilt using the original frames and various parts from other Heywood locomotives.

How to Eliminate Motion Sickness on Tilting Trains

Researchers have found that motion sickness on tilting trains can be essentially eliminated by adjusting the timing of when the cars tilt as they enter and leave the curves. They found that when the cars tilt just at the beginning of the curves instead of while they are making the turns, there was no motion sickness.

When a tilting train enters a curve, sensors on the front wheels of the train signal to the remaining cars when they should begin their tilt. In this reactive mode, since the sensors cannot be activated until the first car is in the curve, there is an inevitable delay in the onset of the tilt. In addition, the cars tilt more slowly. The researchers established that the late, slow rise in the velocity of the tilt during the curves coupled with the centrifugal force produced by the turn, causes motion sickness.

In contrast, when the curves were sensed from the geographic position of the train on the tracks, determined by a global positioning system (GPS), the tilts occurred earlier and were faster, and motion sickness was eliminated. In this predictive mode, lateral thrust was also reduced as the train rounded curves, making it much easier to walk in the aisles.

"This is a major breakthrough and a very practical solution to a problem affecting people's everyday lives," said Dr. Bernard Cohen, lead author of the study and Professor of Neurology at Mount Sinai School of Medicine.

The Schweizerische Bundesbahnen (SBB), the train system in Switzerland that requested this study, serviced 347 million passengers in 2010. The SBB wanted to order new trains that would maximize train speed and passenger comfort. Tilting trains are utilized world-wide to compensate for the centripetal acceleration during turns, allowing the trains to run faster. However, the tilting has also led to motion sickness.

"After seeing the results of the study, the SBB invested 3.2 billion Swiss francs for trains utilizing the results of the new technology that came from these experiments," said Dr. Cohen.

During the study, the researchers placed angular velocity and lateral acceleration sensors on the front car in a seven-car train as well as on the heads of passengers. Over the course of about two months they used three control modes to evaluate the levels of motion sickness in 200 passengers: an untilted mode, a reactive mode based on the information from the front wheel set, and a predictive mode based on the information from the GPS. Passengers had no motion sickness in the untilted mode, showing that the lateral acceleration itself was not responsible for producing the discomfort. In this mode the train ran more slowly, however. The train ran equally fast in the predictive and reactive modes when it tilted, but passenger comfort was significantly better when the train tilted just at the onset and end of the curves in the predictive mode.

Cohen et al. **Motion sickness on tilting trains**. *The FASEB Journal*, 2011

The above story is reprinted (with editorial adaptations by ScienceDaily) from materials provided by [The Mount Sinai Hospital / Mount Sinai School of Medicine](#), via [EurekAlert!](#), a service of AAAS.

Future Programme

Regular Meeting nights on **1st and 3rd Thursdays** of the month,
at the **W.I. Hall in Thornton Hough (unless stated)**.

Doors open 7.30pm; Meetings start **prompt** at 7.45pm.

2011

October 20th

"Meet the Committee"

**Chance to talk informally about
Society activities & business.**

November 3rd

Club Night

November 4th

Friday

Celebration Lunch. 12.30pm for 1pm

Manor Restaurant Greasby

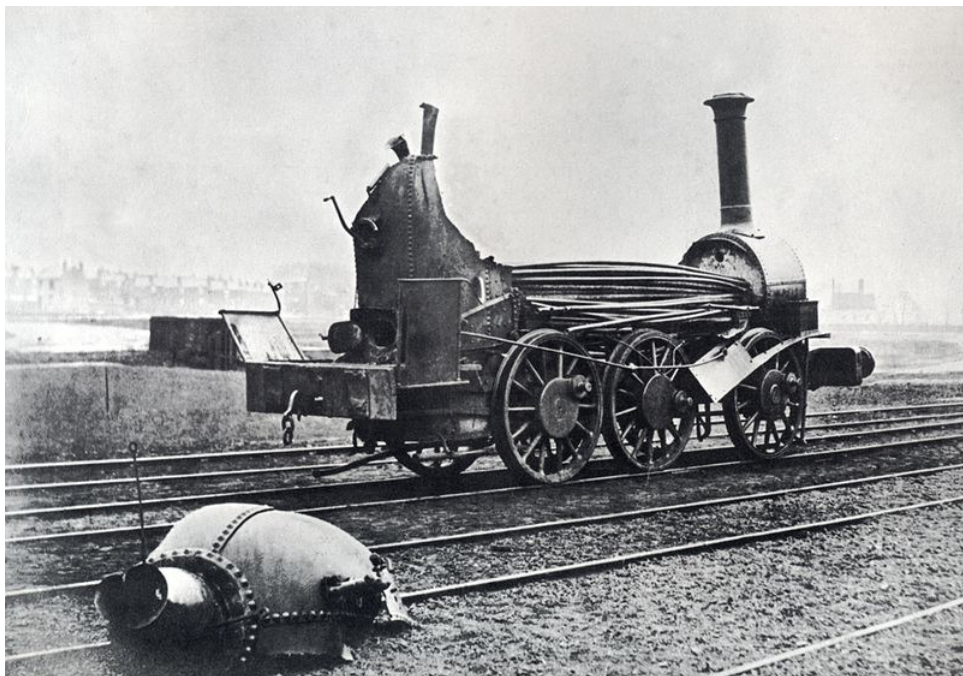
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November 17th

'Underground Wirral'. Gavin Hunter

December 1st

Mince Pie Club Night



*Steam locomotive boiler explosion, location unknown circa 1850
Appears to be a Kitson long-boiler of around 1845 (note the staggered spokes),
as supplied to the York and North Midland Railway.*

