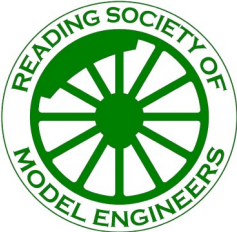


**Reading Society
of Model
Engineers
Charity Number
1163244**

The Prospectus

May 2021



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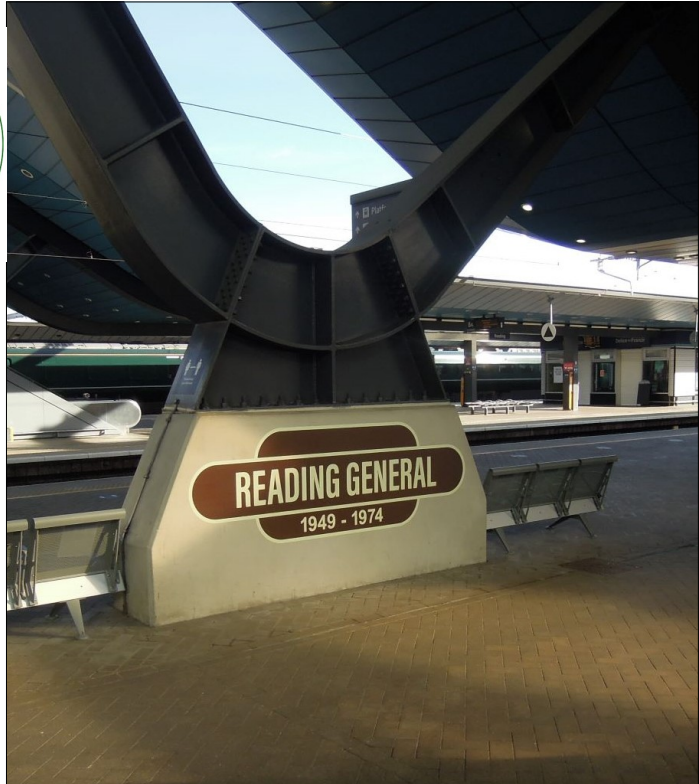
Editor

John Billard

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Free to members



No Kings or Castles here today. Reading Station 2021
Photo John Billard

**PRECISION SHOOTING
COMPUTING VALVE GEAR
INSULATION
BOILER MAKING
EAST SIDE STORY**

A VIEW FROM THE CHAIR

John Billard

At the time of writing, on 24 April, we have just had our first club running day at the club. This was ably organised by Peter Harrison, and was assisted by our boiler testing team who conducted steam and hydraulic tests. I am pleased that it went as well as it did and is a good sign for the future. We are subject to social distancing rules as well as anyone else and this has to be watched though.

The trustees met on 12 April. We are seeing if we can have a rebate on our insurance as few events were held last year. However the accounts remain healthy despite a debit of the last twelve months. We were pleased to hear about re-boarding the footbridge as has the loft in the club house, the kitchen area has been retiled—all by the efforts of trustee members.

As expected the track extension has had to take a back seat but there is considerable interest now in resuming this project. Accordingly it was decided to hold a meeting including all those involved so far, and some new volunteers, to kick start things again. This will probably happen when the Covid rules have relaxed further.

We expect to hold our delayed AGM, hopefully in October and November. As stated, club running has resumed and public running will take place when it is safe to do so.

We are pleased that the Southern Fed Rally will take place at RSME on Saturday 18th September. We will need much help with this so it must not be left to just the trustees to manage this. A date for your diary!

We have had a comment from a member particularly asking about information on trustee activities and sight of the minutes. The approved minutes are available to anyone who asks for them. Contact the secretary. Trustee meetings are held on the Monday after the second Saturday of the month so if members wish to raise any issue we will be pleased to hear from them. The next meeting is on 10 May.

Precision Shooting requires Precision Engineering **by John Spokes**

Members may remember a time when it was always possible, without breaking some Government-inspired Restriction, to sit outside on a summer's evening and enjoy a drink and snacks with friends. It was at one such event, about 3 years ago, when a neighbour remarked to his wife that "SHE had eaten Muntjac!". I had missed the start of this conversation, but now I became more attentive. To my recollection Muntjac (like the grey squirrel, a non-native introduced species) had never appeared on any plate put in front of me, but my Streatley garden, which was bounded by unfenced woodland, provided a fully equipped vegetarian restaurant to these flowerbed-ravaging pests.

The summer evening's narrative progressed, and it became apparent that my

neighbour (I will call him ‘M’; however, no connection to James Bond) is an expert marksman, is secretary and training officer at a local rifle and pistol club, a qualified instructor and winner of many competitions and trophies, notably at the home of rifle shooting, Bisley. He is also on-call to the police to humanely put-down injured wild animals and assists local landowners in controlling local deer numbers - hence the muntjac dinner!



M is very much a practical man and more recently he showed me a device for annealing the tips of cartridge cases, a process which extends their life when refilled and fired again. Without annealing the cases can be refilled only five or six times, but when annealed the increase in useful life is five-fold. This device (*left*) was built by apprentices at an engineering contractor as a training project. It is superbly finished and an elegantly arranged concept. The external and internal workings are supported and contained within a stainless-steel console and much of the moving parts are made of stainless or nylon. The speed of feed to the annealer and the time of annealing are

adjustable, and the annealing is done using a fine propane flame, the gas cylinder, motors, bearings, etc are contained within the console.

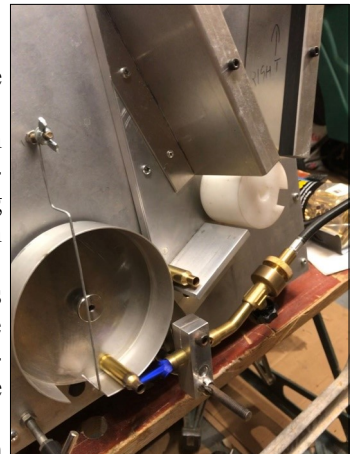
The machine works as follows:

Cartridge cases are placed in the V-hopper at the right.

At the bottom of this hopper is a rotating nylon bobbin with an axial groove on the circumference, which feeds individual cases to a sloping ramp where the case lies waiting for the slot in the periphery of an open-ended rotating drum.

Once in the rotating drum the case itself is forced to rotate with its tip in the propane flame (*right*) and when the rotating drum has completed one revolution the gap “reappears” and the cartridge case falls out, to cool.

Thus, by varying the speed of the rotating drum the duration and temperature of annealing can be controlled (*Photo left overleaf*) shows the effect of different annealing durations. The cartridge at the top is correctly annealed). Some components of the device are interchangeable to accommodate cartridge cases of different sizes.





The annealing process is just one part of the art of reusing cartridge cases. Another is the type and amount of powder used for refilling. Competition shooting at a high level requires precision, not just in the execution, but also in the preparation, and filling is measured to one-tenth of a grain of powder, equivalent to one seventy-thousandth of a pound. M uses an extremely sensitive, US-made, lever balance to do this (*below*). The device to the right of the balance assists in dispensing the powder,

one granule at a time to get the exact amount.

When a rifle is fired, the cartridge case distorts because of minor dimensional differences between it and the chamber. Various adjustable hand presses can be used to recover the dimensionality and the extent to which this recovery is done depends on whether the case will be used in the same or a different rifle (of the same calibre). In addition, the tip of the case where the projectile is held stretches with use and a small hand lathe is used to remove excess metal and bring the case back to length.



Apologies for mixing metaphors, but I realise after speaking with M that I can only just scratch the tip of the iceberg here. The science involved is complex. There are different powders, fast and slow burning; different barrel rifling giving different spin rates; different distances before the projectile reaches the rifling; different bullet materials; different bullet profiles (both front and rear) which determine drag and trajectory stability, two competing entities. All of these have an impact on the outcome of result irrespective of the skill of the shooter and the process of refilling if not correctly done can lead to disappointment in the competition, more seriously, damage to the rifle and most seriously, damage to the shooter.

Once we are back to “normal” at the Club then perhaps M would consider joining us one Thursday evening to talk in more detail about the Science and Engineering behind this sport.

IN SHOPS THIS MONTH

BUILDING A CLAUD by John Billard

Continued. In the last PROSPECTUS I covered the wheel pattern making. This was all part of making my 5" Claud a little more representative of the real thing compared with the design published in MODEL ENGINEER. This month I will cover the valve gear and the boiler.

The original Great Eastern Claud design incorporated Stephenson's motion to the inside cylinders with direct drive to slide valves underneath via locomotive type expansion links. See lower picture. By contrast the ME arrangement used indirect drive with launch links driving overhead slide valves. As far as I know this arrangement was not applied to the Clauds although some

received new piston valve cylinders (not being among the final survivors as the additional power eventually did for their frames).

Consequently a redesign was required and this was a new education for me. Having had a false start via the Model Engineer web site forum I moved on to adopt a computer aided solution via a recommended Bill Hall program. Having fed in the appropriate scale dimensions it is

ENGINE: 62613

Equal leads at each end of the cylinder have been set at the lifting arm position initially chosen for this run. (see below *) If you wish to change the lifting arm position for equal leads, go back to 'GET RESULTS' on the DATA ENTRY form.

GO | ANIMATE

In mid-gear the lifting arm points up 1.3 deg.
 Set Lifting arm angle relative to mid-gear (Positive downwards) 27
 Die deflection (engine on dead centres) 0.6574

VALVE EVENTS		
Admission	0.003674	0.005197
Cut-off	82.11	80.55
Exhaust	94.5	95.18
Compression	4.824	5.402
Lead	-0.001409	-0.001409
Max port opening	0.156	0.144

* Lifting arm angle for equal leads set at 27
 Minimum angle of link (anticlockwise) -15.85
 Maximum angle of link (clockwise) 32.13

NOTE Lap line Port line

NEW ENGINE

Valve Type:
 Outside adm
 Inside adm

Rocker types:
 No Rocker
 Type A
 Type B

Save Current Engine

GET RESULTS

Back PISTON Front

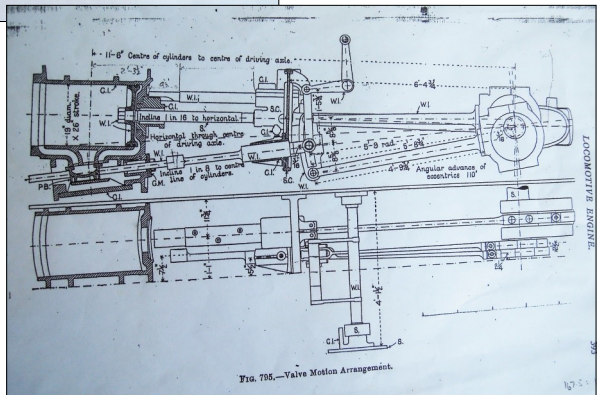
CLEAR FORM | PRINT FORM | CLOSE

Connecting rod	7.438	Dist. between pins on link	1.75
Main crank radius	1.125	Circ. disp. of lifting pin	0
Eccentric radius	0.39	Radial disp. of lifting pin	0.1
Angle of advance	16.5	Steam lap	0.145
Length of eccentric rod	4.625	Exhaust lap	0
Ecc-rod pin to link slot	0	Port width	0.156
Crank axle to Weighshaft (v)	3.5	Rocker arm ratio	
Lifting arm radius	1.375		
Length of lifting link	2		

Delete Current Engine

PRINT FORM | EXIT

possible to examine a moving graphic display showing the movement of the valve over the ports that varies according to the data fed in. Thus, by making a series of adjustments, the best possible valve events can be arrived at. Having come this far I thought I



would have the result reviewed by our old friend John Marrington. Via a few more tweaks we came up with something acceptable. Not able to be verified until after construction!

Turning to the boiler, the engine, being No 63613 (as it was in 1960), this had a round top firebox; the ME design has a Belpaire flat top. Possibly a round top was going to be easier to make in any case. Accordingly I drew up a redesign making close attention to the principles laid down by the appropriate Boiler Test Code 2018. With this the drawings were submitted to the RSME boiler inspectors to seek approval for construction. With their comments incorporated I was pleased that this was successful. *To be continued.*

WE GO ALL EXPERIMENTAL ON INSULATION

by David and Lily Scott

Which is in fact very useful in existing workshops owned by the Cold Footed Machinists.

The floor boarding was removed in a few huffs and I stood looking. Yes, although timber is a great insulator, some cold will come up through it. Two unrolled eight foot sections of Multi-foil were soon down and stapled into the floor beams. It is essentially fancy bubble wrap and thin foam, foil and more foam. 19 layers. It is also superb for camping. The boards returned and settled upon. Then I had to get two battens at each end and screw down through into the boards. For our day out to somewhere exciting B and Q was chosen as they do many things useful for workshops including floor covering. Lily fancied a very ROUND heater on offer for £8.00. It has been wonderful and we are still using it during the late running cold snap. Eight inches in diameter. The previous flooring had been a big problem as it kept lifting. Masses of PVA left to go sticky and bung down and many weights left on top. The planks strangely being the stickiest things encountered.

The roll unrolled and the extension got stuck on the bit under the bench. Then the battens were unscrewed. The roll slipped under, and re screwed down. We went for timber effect again. Then we had a very cold night, so first thing in the morning I set off to have a test. Wow, quite a difference. Yes, we had a similar experience in the house seven years ago when I insulated under the floorboards. Suspended floor with cold air circulating. I now have advanced plans to multi-foil the older part of the workshop especially where the oldest bit of roof is, which did not get its covering in time and became rotten. Also the quality of the grey slated roof-roll has improved along with its price. And the super sticky black stuff for fixing it in place has a better spreading in the cold.

Then it was time to do my favourite which is the benches. Many combinations were tried in card. But we ended up with the two Raglans on the Newbury wall. An L shaped bench under the long window and round to the door. One of the photos this time will show you all a little bit of progress.



Then another weather dependant event was planned. The outer roof boards had been painted in various parts of the garage and utility room. And the quality of the paint tested. Yes, we have devised a test depending on the number of days it takes to wear off hands. Gripfill is a three day event! This managed four days... Yes, moments if you catch it early enough with

water. Yes, four boards one is a part board painted both sides and ends. Outside was miserable of course.

Then we had a window of opportunity with the weather, so my best pair of planks were set up against the roof and with Lily pushing and me pulling the roof was soon on. Cherry tree being a complete pain of course. Even more so when screwing down between branches. Then having to black sticky stuff my way round them and slide the roof roll under. Yes, we have one of the main



branches propped up on a noggin. Lining it up is important, then the sticky stuff likes to be quickish so it is no good doing lots. Paint nine inches of board, paint 12 inches of roll having brushed off the sand. And roll it towards you. Do another section. Then tread it down. Check for alignment. And do two rows of staples. As it grows dark you still have a metre of it to go.

Back inside with Lily's help we do the permanent electrics which I like to fit just below the ceiling so if the bench gets moved at a later date they stay in place. Of course a plug for the best MK. Also fresh in the knowledge that my electrics passed their test last summer down in Plymouth. I still have visions of the lift up of a board above the kitchen in the clubhouse. Peter did a photograph in horror. All out and lets start again. On a nice warm day last year we ran a new outdoor cable 50 meters just did it nicely... Well almost?

Yes, as long as we extended three meters more towards the house!

My sister in law once asked me. "What was I going to do with the growing collection of old doors you have?". "Build a garden shed, of course, as you always build a garden shed out of doors!"

Always check the latest rules when working on home electrics. Ed.



We are very sorry to hear that Peter Farley has died following a stroke. David and Lily Scott have provided the following appreciation.



Peter Farley

An appreciation by David and Lily Scott

Where do I start? And what sad news about his departure.

He loved making models and occasionally he would bring his latest creation to run at the club.

I always remember the white one. Built so his daughter Ruby could also enjoy a drive.

Which also meant that someone like me could also enjoy without having to worry about water levels and letting the fire go out. Peter did venture into steam in the shape of an Alice Class Hunslet. Mine is a Port Class so I can tell the difference. Many hours getting splattered with oil and enjoying every minute describes Peter's time at the track.

Peter was very excited over the last year when he managed to turn his hobby of rapid plastic prototyping into a business P.D.F. Models, where on his last count six machines which once set up and a file transferred will sit there for hours making locomotive bits. Yes they are called PDF. Portable Document Format. Bunged onto a USB stick and your design gets built. His love of a prototype led him to Wales and in fact a footplate journey on her.

Tallylyn in model form was coming on nicely and was in five inch gauge quite impressive. Yes, you have guessed it she was going to be electric. This does help with many plastic parts!

We were friends in real life and on Facebook where many hours of commenting and liking his latest creations took place.

He will be sorely missed by the regular mob who also got to know his family who so many times came and enjoyed the Reading track with him

Love and Rest in Peace Peter.

AN RSME BOILER BUILDING GROUP? asks John Billard

Readers of my Claud piece this month will see that I am close to making a start on the boiler. I have Alec Farmer's book, a full boiler kit from Western Steam, good heat sources, a hearth to be built and then all it wants is glue! It is a long time since I made my Rob Roy boiler and this is a different kettle all together. Basically I need help and I have already had some offers in that direction.

It might be that most engine builders these days resort to professionally made boilers. The downside here is a possible waiting list (two years in the case of Western Steam), and of course cost. And also a possible complication if a non-published design is being constructed. Therefore I wonder if these needs might be expanded to include the idea of a club boiler building group? This might take advantage of the existing knowledge and experience among RSME members and give the confidence to others to have a go themselves particularly as I would hope that the group would be kept in being. It does not have to be just my boiler. We might do two at once! Like many things in our field today, it is a question of keeping the skills alive for the future.

There would be a few more things to be worked out but please let me know if this appeals to you or have any questions. 07834 998971, john@jegbillard.plus.com

ANALYTICS

Where WP looks at some photographs taken by the editor Changes on the East Coast since 2015

John took these two photographs in February 2015, and as with his pictures at Paddington in 2017 there have been substantial changes since then. Up-



heavals to the status quo on the railway are usually the result of complete modernisation schemes, such as electrification and or substantial upgrading of rolling stock. Very unusually we are currently witnessing wholesale replacement of entire fleets of locomotives and rolling stock. This has mainly come about by the ageing profile of the fleet coupled with cheap access to finance. The majority of these new fleets are leased from banks and finance

houses, thus saving the users the capital outlay.

The first picture is at York and shows a northbound East Coast HST. It is led by class 43 power car 43311 and sports the modified National Express de-branded livery.

East Coast services have had a rather chequered journey since privatisation. This started in April 1996 when Sea Containers under James Sherwood signed up the East Coast franchise as Great North Eastern Railway. This lasted until December 2006 when it was stripped of the franchise due to constantly missing the agreed financial targets with the DfT. Despite still rising passenger numbers the figures were too ambitious. From that date the service was run by the Operator of Last Resort i.e. the government.

This was replaced in December 2007 by a new franchise won by National Express after competitive tendering. As with GNER before it the promised revenue returns were missed, being again too ambitious. National Express handed back the keys in November 2009. The Operator of Last Resort took over once again until Stagecoach/Virgin won the franchise from 1st March 2015. They too failed to reach the anticipated revenue figures and blamed lack of new rolling stock and non-completion of the East Coast upgrade, affecting passenger perception and operating performance.

Once again the government stepped in. This time creating London North Eastern Railway a government body which took over on 23rd June 2018 and is still running the show, pending publication of the modified Williams Review on how it wishes the railway services to be structured.

Returning to 43311 at York. All East Coast services run by LNER are currently Hitachi class 800/801/802 Azuma 5 and 9 car electric or bi-mode units. This has been possible due to a reduced frequency timetable following less business during the Covid pandemic. All their HST sets have been withdrawn and the Mark 3 coaches either scrapped, re-used elsewhere or stored. So far over 300 have gone for scrap.

Likewise Great Western have replaced all their InterCity services with Hitachi units. The only services currently operated by HST vehicles are-GWR 16x4 car sets working local services between Cardiff and Penzance etc.,- ScotRail using 26x4 car sets working internal Scottish intercity services between Edinburgh/



Glasgow and Aberdeen/Inverness. Cross Country have 5x7 car sets working between Plymouth and Newcastle/Edinburgh. East Midland Trains were due to receive 8 HSTs displaced from East Coast because their interiors were more compliant with the Disability Access rules than the ones they were using. This until their own 33 x 7 car Hitachi class 807 Bi-Mode units come on stream from 2022. Also as a result of a reduced timetable they are managing without any HSTs currently I believe.

No HST power cars have been scrapped yet, except those involved in accidents. 43311 is currently stored at Papworth's sidings at Ely.

John's other picture is at Kings Cross, where we see from left to right, DVT no. 82205 at platform 4 in Flying Scotsman livery. This and 91101 received a special livery for the launch of the new Flying Scotsman service 05.40 from Edinburgh to Kings Cross calling only at Newcastle and due in London in 4 hours in May 2011. This service went over to Hitachi 800s on 1st August 2019. It currently is not running due to the reduced service. LNER are retaining 7 sets plus DVT/Class 91 for Leeds/York services until 2023 based at Leeds Neville Hill. However they are currently stored due to the reduced service. Those in store include 82205 plus 82211, which on John's picture is in platform 2.

Sitting at platform 1 is a Grand Central Alstom Coradia (Adalante) ex GW. It is one of the 5 x 5 car diesel units on a GC service from/to Sunderland or Bradford. Back then GC also ran 3 x 6 car HST sets. They now have 10 of the Coradia class 180s and have ceased using HSTs.

These 5 platforms (0-4) are currently closed and full of engineers' wagons, class 66s and plant as the work of re-modelling the layout and re-opening the closed bore of Gasworks Tunnel progresses apace.

**2021 subscriptions are now due
Rates are unchanged.
Membership forms are being issued.
Please respond promptly!**

ATTENTION ALL CONTRIBUTORS!

Just a note about formats. I try to keep up to date but I have had several pieces submitted recently by e mail or phone text. Please don't! Unfortunately these will not convert properly to the Microsoft Publisher program. To keep things going I have been known to retype articles and I would rather not. So... **please keep text and photographs apart** and submit in separate files. I prefer Times New Roman 11 point with 14pt Arial Narrow for headings, single spaced with no space between paragraphs.

John Billard, Editor.

p.s. I still take handwriting; it's often less trouble!

CLUB FOOTBRIDGE REDECKING



Thanks to Nigel Penford for organising this and who took the photos.

DIARY

Please watch for announcements regarding future track activities.

The clubhouse is at present closed for refurbishment.

**Don't forget our regular Thursday evening Zoom discussions
1930-2100**

***Please write for Prospectus. Photos welcomed.
Comments by RSME members on any subject appearing in
Prospectus are welcomed by the editor.***

Opinions expressed in PROSPECTUS are the personal views of the contributor and cannot be taken as reflecting the views of the trustees or editor.

The deadline for the June issue is 18th May

Contributions may be submitted in hard or soft copy to the editor.

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