

Club Details

The newsletter of Plymouth Miniature Steam. Published quarterly (normally March, June, September & December) and issued free to members. Cut-off date for submissions is 24th of the preceding month (i.e. Feb, May, Aug & Nov).

We operate a ground level track of approximately half a mile in length at our site at Pendeen Crescent, Southway, Plymouth, with facilities for 3½, 5 and 7¼ inch gauges. Public running occurs on the first and third Sundays of each month, from April until the end of October.

For further details and membership information, please contact Ian Jefferson (01752-788862) or Rob Hitchcock (01822-852479).

Current Membership Rates - Adult £28, Junior £10.

Workshop facilities available to members at 'Tor Bridge High', Plymouth, £30 per term (10 weeks) or £3.50 per session(eve).

Editor: Phil Chant

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We also operate an email message service within the membership; if you wish to join, please contact 'the membership secretary'

Please note that contributions reflect the views of the writer and are not necessarily endorsed by the Company.

Members' advertisements for models and other related items are published free. Non-members and Trade, by arrangement. All items for inclusion to be sent to the Editor. Plymouth Miniature Steam, a Company limited by guarantee, registered in England No. 3360128

Your committee for 2022

Ian JeffersonChairmanNick HillVice ChairmanUrsula BrownSecretaryJames AtkinsonTreasurerSelwyn BrownTrack Marshal

Alan Smith Bob Sims Ti Daley Rob Hitchcock Phil Chant

Please make sure that any change of address, email or mailing preference are notified to the membership secretary promptly in order that we can keep you informed. If you do not wish to receive communication by phone or email, please ask the membership secretary to delete that information.

Club Details

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Front Cover: PMS Class 20, 20118 "Jack" awaits passengers on the public running day Sunday 1st May 2022.

Photo: Phil Chant

Editor's note:

I am a relatively new member having joined Plymouth Miniature Steam after attending public running days with my young son over a number of years. I started to assist at the limited public running days in 2021 firstly by helping to maintain train seat cleanliness (a Covid precaution), then being quickly being promoted to assisting with set up activities including helping to assemble the rakes of rolling stock and guard duties.

I come from the world of full-size railway preservation, having until recently, been the Chairman and Secretary of Great Western 3802 Limited, the company that rescued GWR 2-8-0 no 3802 from Barry Scrapyard and returned it to steam. It is a pleasure to downsize to miniature steam and I look forward to editing this magazine in the years ahead.

Phíl Chant

From the Chair

Springtime 2022 is now well established and this is reinforced by the fact that the grass is growing well, as are the trees and wild flowers; whilst we have resumed our normal pattern of public running on the first and third Sundays, along with the members' day on the second Sunday. As I write this, we have so far had 2 public runs that were dry and I that was wet; and we have already given half the total number of rides that we achieved last year. This means that we are well back into the levels we last saw in 2019 and we are very busy, as those of us who have been involved in those days can vouch. The fact that we were so busy on a wet Sunday, reinforces that the public do want us to run and it does provide us with appreciable income. Following on from the success of Halloween last year, I managed to find some 'Easter' colouring sheets and got them handed out to the younger children on our opening Sunday. Those that were returned on Easter Sunday earned the artist a dip in the 'goodie box' for a small treat and as there were a few 'Easter Bonnets' around as well, the wearers were also allowed a dip in the box. A montage of the returned pictures has been placed on the noticeboard and is pictured below:



Thankfully, through these early days, the locomotives and stock have performed well, alas the same cannot be said of the track. It is clear that the winter weather has not been too kind to one particular section, that behind 'little rock' as there have been a few issues here and this has added to the difficulties on this awkward climb. Measurements of gradient and can't have been taken at every half metre and unfortunately, they do not make pleasant reading. This will require major works to address, but we have to see if there is anything that can be done in the short term, beyond the imposition of a speed restriction and reduced loadings. One beneficial change is the new batteries fitted to Bob and Jack. These have proved that they can stand up to the demands we are placing on them, we just need to see how well they stand up to a full year and beyond. I would remind you that we now have a cash account with BBL (just off Cot Hill), so if you need a battery, charger or any related equipment, give them a try and show your membership card. As for the members' Sundays, these have been well supported and they are an ideal opportunity to have a bit of fun whilst indulging in your favourite hobby and of course the chance to test out your creations or hopefully get a solution to a problem. It is also the ideal opportunity to learn more about driving a steam or battery locomotive. The good weather on the May members' day certainly brought out a number of members, as can be seen in these photographs.









Away from the track, we welcome Phil Chant as the 'new' editor of our magazine and thank Dave Biss for his years of service in the role. I hope you will be able to support Phil with interesting items to be able to take our message onwards for the interest of all our readers. Staying with membership matters, some of you may remember one of our newer members; John Arkle; who died a few weeks ago, he was often to be seen early in the day at Goodwin Park, with his Schnauzer 'Jimmy'; his memorial service was held at St Andrew's and there is a brief resume of this elsewhere in this magazine. Some of you will also remember Bob Masters, who we lost back in 2020; he left a moderate bequest to the club and in honour of which, the committee felt that a suitable memorial would be to install a seat at Goodwin Park and after some thought a site was found just to the east of the steaming bays. Unfortunately, we were not able to progress this at the time, but now that all the necessary planning has been completed, we hope to have this in place later this year. We hope that it will be enjoyed by members and public alike.

One thing that we are trying this year, is a 'rolling display' of models on the shelving in the clubhouse. Although we have not had a vast number of items, it has provoked comments and questions from some members of the public. In that respect at least, it is achieving the aim of gaining a bit of reaction and hopefully it may also lead to one or two new members. Unfortunately, so far, the range of items have been significantly limited and to avoid this becoming a stagnant display it would be good to see a few new items on show, so if you have something you would be prepared to display, even for one week it would be appreciated and there will be a small token of appreciation for you.

As we look towards the future, I would remind you that in addition to Sundays at Goodwin Park, we also gather there on Tuesday mornings to do any work that is required around the site (there is a lot of grass to cut at this time of year) and it is also an opportunity to meet up with other members, be it for a social get together or to get or give help. Then on a Thursday evening we have access to the workshops at Torbridge, another chance of a get together and an opportunity to do any work that you cannot achieve at home. This is also the time when we give time to bringing on some of the younger members, as 'apprentices' in the hope that they may join us for the longer term. Returning to Goodwin Park, we will once again be holding our annual barbeque on the second Sunday of July, let's just hope that the weather is better than it was last year! And finally, whenever you are at Goodwin Park please remember to 'sign in', so that we know you have been there, just in case there is any need to contact you.

So back to that issue with the track behind 'little rock'. Following on from taking measurements of the track, further investigation has been done regarding the general condition in the area. The result of this is that there is no viable option for a short-term repair and the extent of the work is such that it is more than can reasonably be achieved over the winter closed period. We therefore can see no option, other than to close that stretch of the track early, to give the best possible chance of completing the repairs in time for next year's opening. The area in question exceeds 100 metres and will be the biggest single repair section we have tackled since the track was built. The expenditure will also be significant and as a consequence we will have to call an EGM in the very near future in order to gain the authorisation. Then, when the work

starts, it will be a call to arms to help carry out the work in order that it can be completed as quickly and successfully as possible. So, please come to the EGM and when the call goes out, if you are able, please come and 'lend a hand'!

And finally, what have I been up to for the last 3 months? I honestly cannot account. I did manage to finish the 2 tank wagons I mentioned last time and have almost finished their storage boxes, but that is about all and the immediate future does not look much different so I just hope I can find some time to progress something. I hope you have more success with your projects.

I hope to see you all soon.

lan.



By Nick Hill

During the first couple of public running days, this year we suffered many derailments on the stretch of track behind Little Rock station (labelled A) on the diagram on Page 12. We also found numerous defects on the upper track just before the new track up to the bridge (labelled B).

Area A was identified as requiring replacement several years ago, but due to more important failures, this has been put off, until an investigation into why the derailments were taking place. It was found that the track was a real roller coaster, with the track changing super elevation by as much as four degrees in half a meter and it was probably this rapid change in super elevation (camber or slope), that was causing the problems. In addition, there are areas of the track that have broken loose from the existing track bed, and this is allowing the track to move.

Over the years, several repairs (usually a meter in length), has been carried out, so we expect that the track bed is in a very poor condition. Parts of the original track bed was laid by work experience people (YTS – for those that remember that far back), and can vary in quality, both in mixing and depth of bed (anywhere from 50mm to 100mm – we currently aim for 200 – 300mm), then there is the question of tree roots, trying to lift the track, and the added problem, that the site is an unconsolidated land fill site and is prone to sinking.

This is a long length of track (approx. 90m), and runs around a corner, so presents some challenges in laying out the shuttering for the new concrete bed. But there is nothing more complicated than hitting stakes into the ground and using a spirit level (with a suitable block of wood, approximately 19mm) to get the correct alignment and then screwing the shuttering to the stakes (basic handy-person skills).

Area B is a shorter length (approx. 30m) and has suffered numerous failures during the first month of running – broken welds (so loss of gauge – distance between rails), excessive wear on the rails (causing the wheels to run on expansion blocks) and the track sinking in places. Looking at the track bed, we may get away with not having to remove and replace it all, but again we have done several patch repairs, so we may have to lift some of the bed for replacement.

If the track bed must be replaced, again especially as this is a flat track in a straight line setting out for concrete is basic skills of hitting stakes into the ground and then screwing shuttering to it, using a spirit level and a screwdriver.

We would normally start the track repairs on the fourth weekend of October, but due to the scale of the work, we have taken the unprecedented decision to close the top track on the fourth weekend in July, so that we have six to seven weeks (my summer holiday from school) to get a good head start on the work. Before, we move back to working weekends, from September until the end of October when I have half-term so can spend all week on site, the back to weekend working until Christmas.

So, what do we aim to do?

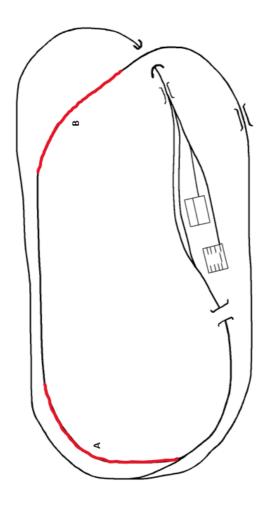
Over the summer, take up the old track at both repair sites and fully investigate the concrete bed, I am expecting that almost all of this will have to removed, widen the existing track bed on the curve and to replace all the failing track bed. Then get the shuttering into place (the biggest job will be cutting the stakes for this) and finally laying in the MOT sub-base and compacting it.

The section of track at B is a big unknown, we may decide that we can mix and pour the concrete required here, but I am expecting this to not be the case, so we will have it pumped at the same time as the rest of the repairs at section A.

Any help with this work would be gratefully received, to reduce the manual work, we will be hiring in a digger and a dumper (both are easy to drive, you just have to watch a short video first), there are a number of other jobs such as cutting back roots, cleaning the sides of the trench, removing the odd large stone that is in the way, the biggest and most important job is being qualified to make the tea.

We aim to start at 10:00Hrs every day and work until 15:00, but the end time is a bit flexible, I would ask that if you are coming down to help, please do not come down too early as I usually need some time to get my head into the right place.

My aim is to send out a weekly update and a rough plan for the following week over the weekend, so if you are interested in finding out what we have done or are aiming to do please feel free to let me know at NAM.Hill@Btinternet.com.





Area A – work will commence on right hand track immediately beyond the crossover point and continue behind Little Rock and extend approximately 90m to the area shown in the picture below.



Area A – Looking back toward Little Rock and the crossover point, work on this section will run to the wider concrete pad at the bottom of the picture.



Area B – work will commence at the wider concrete base shown and extend approximately 30m to the concrete pad shown below (the point where the last major track replacement was undertaken up to the bridge)



Area B – the other end, looking back toward the area shown in the above picture.

By Rob Hitchcock

Few among us now doubt that humans have changed the climate of the world and that we could be locked into an upward spiral of ever- increasing greenhouse gases and rising temperatures. If mankind stopped producing all CO2 and we could stop deforestation burning, wildfires, and human activity producing greenhouse gases, would we see a reduction in temperatures in our lifetime? the true answer is probably unknown. The target reduction advised by the Governments Climate Change Committee (CCC) is to limit temperature rises to 1.5deg C. by 2050. In order to achieve emissions net zero. The most likely scenario is estimated by climate scientists to be a rise of 2.4 deg C. This will be difficult to achieve when the major emitting countries and corporations are not taking things seriously. The recent post covid and Ukraine crisis may mean delays of years to any progress we were making as countries revert to fossil fuel use due to recession, shortages, and price increases. Future generations and new unknown technologies may provide the solutions and hopefully see the benefits.

Having seen some of the output from COP 26 ("conference of the parties", a UN sponsored series of conferences resulting from the 2015 Paris agreement). It is clear that all governments now give credence to rising global warming but some are only prepared to make rapid CO2 reductions if their future economic expansion and stability allow it.

I am sure that at present the worlds governments are not totally convinced that disaster is on the horizon, otherwise they would already be in continuous co-operative dialogue with each other, and already have detailed plans for change which will not take us up "blind alleys". The danger is that any green idea becomes a good idea, and this could waste resources and ultimately slow the change to a green economy. We have already seen this by government sponsored schemes such as the Drax coal power station conversions to wood chip fuel which is using millions of tons of virgin forest in the United States to provided dried wood pellets by sea and train to Yorkshire. (See Daily mail Dec 17th 2021).

The public in Britain have been told we will lose internal combustion engines (petrol and diesel) by 2035 and that battery vehicles will have to replace them, sounds simple, but battery vehicles, hybrids, and fuel cells, will not yet provide anywhere near the capability to replace the wide range of power sources that will be required. Although improvements in battery and hydrogen fuel cell technology is moving extremely fast.

When everyone has battery cars that need charging overnight where is that generating capacity coming from? Similarly, we have been told by the government that all domestic heating appliances need to be replaced by Heat Pumps and gas boilers will be discontinued by 2025. This may be fine for new homes, but for existing will only happen when all properties have upgraded insulation such that they have negligible heat loss and hence affordable running costs, the systems need to be made cheaper by mass production or better government grants, again this commits the creaking generating system to further strain when all homes become heated by an additional 3.5-5kw heating load, plus vehicle charging and electric cooking. Heat pumps are best suited to steady loads and are unlikely to cope with periods of low sub- zero temperatures necessitating supplementary electrical heating.

Most domestic consumer units are rated at 100amps, this could easily be exceeded by normal future domestic utilisation of systems and appliances. A change to 3 phase supplies to domestic dwellings may be difficult to avoid. (Is already happening in some areas of the country). The CCC. indicated rise in required generating capacity in 2050 is from 300 Twh (Terra watt hours) to approx. 600 Twh (see CCC table) The comparable cost of energy is currently in favour of gas; however recent price rises may shift this position. In 2050 there will be no gas system as we know it. The government will probably effect change to electric by politically driven pricing.

On the domestic front it very much looks as though our future electrical power needs are to increase drastically. In the absence of any firm plan to improve supplies to homes do we assume that householders will have to provide some form of generating and storage capacity themselves? PV cells and battery storage could do the job using for example the Tesla "power wall" or similar, and some form of solar hot water heating to reduce electric consumption. Hopefully the government have a plan as the problem is too big for householders to resolve by themselves.

Green solutions also need to be found for heavy road transport, rail, buses, ships, and aircraft. The expansion of our green generating infrastructure must be commensurate with increasing battery use for charging, and further electrification of our homes, transport, and industry, this is one of the major challenges we face.

It is a fact that the direct use of green generated electricity such as PV's or wind power is the most efficient and environmentally clean methods of using energy, therefore there should be few conceptual arguments that consumer use of green generated electricity is the only way forward, some of that green electricity will be needed for hydrogen production (electrolysis) until new environmentally acceptable mass

production alternatives become available. Hydrogen production by electrolysis may be a contender for storage of excess energy not able to be used on grid at off peak times, although storage of hydrogen under high pressure has some engineering and safety problems to overcome.

The total abandonment of ICE engines including gas turbines may be one of the blind alleys we should be wary of, as at present natural gas is used via gas turbines as a producer and moderator for our generating system. Our national grid is now fed by variable input green sources, fixed output nuclear generation, and a coal generating industry just about defunct (2-5%). Gas generation (40%) runs on Methane or Natural gas but could also use Hydrogen (H2). The country has a national gas grid system which has a replacement value of approx. £40Bn (Munro associates). It is known that some EU studies including UK. have been looking at injecting green hydrogen into the national gas grid and that this appears a feasible option up to approx. 20% H2. There are many practical engineering problems to overcome with a 100% H2 system as the energy density of Hydrogen is x3 lower than methane and will need to be compressed to deliver the equivalent amount of energy. This will cause pipeline sizing and replacement issues, not to mention hydrogen embrittlement of metal pipelines (including copper.) all are problems which could cause concerns over the future of the network. In the rush to change to Hydrogen we should not be tempted to rely on non- green methods of production that still rely on fossil fuels. (Steam Methane Reforming, SMR)

On a more positive note, the government is encouraging the public via grants for central heating boiler replacements by electrically driven heat pumps. These individual plants if driven by green electricity are environmentally sound, but are expensive to install, £12k -£20k compared to £1.5k for a conventional gas boiler. Households also will have the disruption of greatly increasing the size of radiators due to the lower operating temperatures of heat pumps, as well as improving insulation. Worcester/Bosch and other leading boiler manufacturers have already designed and developed a hydrogen boiler which will be able to use both natural gas and hydrogen as fuels, these boilers are being trialled in homes now and will be sold as hydrogen ready from 2023 -2024. How millions of homes are to be fed with hydrogen is not yet clear whether this will be pressurised domestic gas tanks, local networks incorporating electrolyser plants, or by the existing network. The reality may be a mixture of methods depending on density of housing. The combustion of hydrogen with air to produce energy for central heating and hot water may not eventually prove to be the most efficient process.

Across the world batteries are undergoing rapid development and change, eg. the Tesla 4680 NCA (Nickel Cobalt Aluminium) although slightly larger than currently used cells could give a good improvement in charge rate, whilst the Israeli "Stordot" manufacturer of 4680 batteries claim a recharge time of 10 minutes, with an increase in energy density of 54% and lighter weight. Imagine this in a car and the range problem will soon be solved. There are many companies that claim to be solving the dry cell battery problem, although these have been worked on for over 40 years are not near market as yet. Portability for cars and aircraft dictates small size and weight with high energy density, the investigation of dry cell batteries and disuse of lithium-ion batteries is an environmental need and the many alternatives being investigated is a developing technology to be watched closely.

Heavy transport and Rail will most likely go down the fuel cell route with possibly battery assistance for peak demand where storage space allows. (Full grid supplied electrification for rail where possible). As a safer future alternative to pressurised gas storage on vehicles and where space allows, a LAH plant (light activated Hydride) could be used where a laser is used to activate a chemical hydride to provide H2.

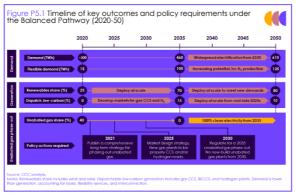
Municipal bus transport has already been established with bio methane as a transition technology in the process of cleaning emissions, however as a source of CO and Co2 they will have to change in the future to fuel cell hybrids with battery support. These have already been commissioned in London Transport.

Siemens/Deutche Bahn are already testing a hydrogen fuelled train (Mireo +H) which is intended for commuter use and this is supplemented by on board lithium ion battery storage. Sensibly Siemens are already testing the fuelling, storage, and distribution system which will be needed to support the train.

JCB in The UK have developed a remarkable ICE piston driven engine with a diesel origin, this has been tested and run in the field on a backhoe digger using 100% Hydrogen gas. Refuelling in the field is by palletised pressurised gas cylinders. It may be that this presently suits the application and its rugged nature on building sites but is not the most economic method of using hydrogen, as an ICE engine would be approx. 20-25% efficient compared to a fuel cell at 60%. Perhaps hydrogen fuel cells and pressurised H2 storage may come later. Interestingly we should note that Hydrogen burnt in air also produces nitrous oxide (N2O) which forms 8% of all greenhouse gases. Significantly, because it is 300x more potent than CO2 in trapping heat within the atmosphere it is possible that a large reduction in greenhouse gas could be made by targeting this gas initially. Most N2O is found in agricultural activities such as

fertilisers and animal waste. Perhaps N2O will eventually become another nail in the coffin of domestic gas boilers and the re-use of the existing gas network with hydrogen. It is becoming clear that many of the green initiatives are interdependent on each other for their implementation and future widespread use. Electric cars need longer lasting and lighter batteries with a faster recharge. Hydrogen needs new green methods of production and distribution, Whilst the very clean green energy produced by unreliable sun and wind power needs means of storing it to cover periods of inactivity, we already have grid battery storage which will be assisted by improvements in cell design. Other methods such as capacitor banks and pumped storage whilst proven need more widespread development. Flywheel energy storage has been with us since the 1940's where it was used for Trolley Bus prime movers boosted by electric motors at passenger stops. Development for grid level storage may be possible. Internationally the development of green initiatives has never been greater and will soon produce an explosion of ideas and workable initiatives.

Whilst I have mentioned a few of the many engineering related issues that may help to solve our environmental problems. We should not forget that whilst Rainforests account for 28% of the oxygen produced on earth, and tree planting initiatives are very laudable little attention is given to the health of our oceans which accounts for 70% of all oxygen produced. This is via the photosynthesis of phytoplankton and algae. These plants are very susceptible to temperature changes and chemical contamination. As we all know in photosynthesis of plants CO2 is taken in and O2 passed out by plant life, the oceans are therefore a major contributor to reducing CO2 and do not deserve to be treated as a public sewer for the convenience of humans.



PS. CCS = Carbon Capture and Storage

Horrabridge Jubilee Fair 2022

Photos by John Briggs

The Horrabridge Jubilee Fair was held on 4th June 2022, supported by the portable track built by Rob Hitchcock, and operated by members of PMS. A total of £180 was raised for PMS club funds.



Horrabridge Jubilee Fair 2022





Horrabridge Jubilee Fair 2022



Item for Sale

Cylinders for Sale - John Briggs



The cylinders come with front and rear covers and pistons but not the valve chests; two templates are provided to locate the drillings in new valve chest castings. The cylinder bore is 1.358" with a cylinder length of 3.125"

Offers can be sent to ibmon@btinternet.com or left in a sealed envelope at the track addressed to "John Briggs" with your contact details.

Club Diary Dates 2022

Club Diary - 2022

03/7/2022 Public Running Sunday 07/7/2022 End of Summer Term – TorBridge High 10/7/2022 Committee meeting and members' Sunday 10/7/2022 Summer Barbeque 17/7/2022 Public Running Sunday 07/8/2022 Public Running Sunday 14/8/2022 Members' Sunday	,
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14/8/2022 Members' Sunday	
21/8/2022 Public Running Sunday	
24/8/2022 Autumn Magazine press date	
04/9/2022 Public Running Sunday	
* Torbridge High –Start of Autumn Term	
11/9/2022 Committee meeting and members' Sunday	,
18/9/2022 Public Running Sunday	
02/10/2022 Public Running Sunday	
* Torbridge High – last of first half term	
09/10/2022 Members' Sunday	
16/10/2022 Public Running Sunday	
* Torbridge High – start of second half of ter	m
13/11/2022 Committee meeting	
24/11/2022 Winter Magazine press date	
* End of Autumn Term – TorBridge High	
11/12/2022 Committee meeting	
01/01/2023 Members' day	

Dates marked * are TBA / subject to confirmation

The "Tuesday Gang"

Meet weekly at the track from 9:30 to Midday. The jobs tackled include mowing, DIY on the building, maintenance of locos and rolling stock, painting bridges etc.

Workshop Evenings

Workshop facilities available to members at 'Tor Bridge High', Plymouth. £30 per term (10 weeks) or £3.50 per session. Thursday eves (6:30-8:30pm) during term time.