The Oily Rag!

Bob Herriot assists Peter LeCoyte rolling his smokebox in the workshop at West Buckland.
Photo: David Hartland 2026

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Chairman's Report

by David Hartland

We have had some excellent indoor meetings the last few months,in our clubhouse at West Buckland. The heating works and the kitchen is in action. Come along and experience the feeling! Outside, however, the weather is less cooperative, with continuous rain at most of the recent working parties, which has restricted work to inside. We look forward to the warm dry days to come, and much planning work is now going on to establish the design of the tunnel and drainage system for the Phase 2 (Yonder Field) track extensions. A sub committee has been formed and we are looking at drawings, scouring suppliers for drainage sumps and pumps and considering the loadings of the tunnel. The tunnel roof will form the only road access to the far end of the site and we are keen to design this access for heavy vehicles, including, for instance full size traction engines, so the construction must be strong enough to take these loadings. We will require a great load of concrete and steel beams to establish this design in reality and all the plans are needed in the next few months. We have met with two possible contractors, of which one is very keen to help and has provided us with quotations which seem reasonable for the work. All being well, the work on site will commence in April this year and the intention will be to complete all the heavy excavation in one go, along with the base of the tunnel, leaving us to construct the walls and roof as an ongoing project. If you think the West Buckland scheme has been dramatic so far – well come along and see what we are doing this year. Although most of the heavy work will be done by the contractor, there will still be a good deal of work we need to do, particularly the surveying and levelling plus the installation of the pumps and drainage for the tunnel. Don't miss this chance to be part of something really special in the model engineering world!

I am pleased to see that most members have renewed their memberships on time by the end of the year but there were still some who were late and did not pay until January. It really does make quite a difference to the club so those who are a bit slow please do try to renew by the due date of 31st December as it helps our cash flow significantly and prevents the need to make subtle (and not so subtle) chase ups.

The new programme for 2026 will shortly be on the website and on the notice board in the clubhouse. Once again we have a very full programme for the year and do come along and take part.

Why Bitzer One?

By Paul Williams

I have always been interested in railways and engineering right from an early age. My eldest brother had an old Hornby Dublo three-rail model railway which he was not interested in; luckily my other brother and I were and so we could be found playing with it on any occasion that we were forced to be in the house.

At school I had a brilliant metalwork teacher and in the afterschool club he ran, I made a small simple single cylinder air driven engine; (alas after many years and many house moves it is gone). For me though, the pursuit of railways and engineering has never gone. Not being very academic, my army career which began straight after leaving school was steered towards electric power supply in the Royal Corps of Signals and not the more creative engineering trades that I so craved. So, for 12 years my career did not allow me to pursue the hobby like I wanted to.

On leaving the army, I returned to North Devon where I had grown up. I went to college and trained as a mechanic. Now I had a home of my own, I began to repair a few secondhand Stuart engines and even managed to build a steam road locomotive from a kit that my dad had bought. This however was mainly only an assembly job with minor fettling. It was always run on compressed air, unfortunately it was never steamed before he died and was sold off along with all the model engines he had accrued over the years. I had by now accrued a large quantity of OO/Ho and N gauge model railway items and this kept me occupied in my spare time.

Years moved on and Janet and I set up home in Wellington, here I met Philip Mortimer and eventually ended up joining TME. (Whether this was a good thing or not, I have yet to decide!) Chuckle to one's self! The problem with being active in such a club and seeing lots of lovely locomotives on club and open days, for me brought on a big problem - the burning desire to have my own locomotive began to occupy my mind. I should say at this point that I am not the most patient of people, so I began to look at EBay!

I suppose like most model engineers I would love to have a steam locomotive, but to be honest, I do not at this moment in my life have the finances, equipment, or spare time to build something fast enough to satisfy my patience. So electric was going to be the next best thing and I found on EBay, a laser cut body and underframe for a 7¼ in 08 shunter at a good price. Plans were free to download from the internet so off to Yorkshire I went and bought it. I very soon realised that this was not going to be the quick fix I wanted, as a good deal of time and many engineered parts were still needed to get it on the track.

Then one day I was in the workshop at the club and there was a small 5-inch underframe with driving wheels and the beginnings of a drive train, I asked if it was for sale and purchased it from the club. After a little research, I found that the frame had in fact been built as a tram chassis from plans in the *Model Engineer*, the problem was that it was not long enough for what I had in mind.

The first job was to extend the underframe and make it wider. I had a small amount of steel plate that was the right thickness and I had sufficient tools at home to hand craft the new underframe parts which I completed in a day. Once the underframe was the required size, I fitted all the runnig gear from the original donor locomotive. I obtained a new/old stock motor from eBay for £20 and was off. The original design was for a vertical motor which would fit in the tram body design without any trouble. I decided however to put it in as close to horizontal as possible, mainly for weight distribution but also so I could build a lower body over the top, so a new motor mount was constructed in my trusty vice with the aid of my little disc cutter.

The original drive train was from the motor to a geared wheel on a lay shaft and from here a chain drive to both front and rear axles.

I decided to stick with this although with the frame extension the chains were not long enough. I was struggling to source some new chains when I was given some which fitted perfectly but the only part of the drive system that was missing was the gear from the motor to the layshaft gear. This was originally sourced from a Stanley hand drill which I luckily had two or three in my box of old tools under the bench. The only part I had to make was a bush which was to centralize the motor drive gear. This I turned on my little EMCO unimat lathe.

Now to the body, the idea in my head was to have a one off, industrial narrow gauge diesel shunter, which would have been made and used on the many independent railways throughout the country. The design was purely in my head and not based

on anything particular. I have over the years restored a good few vehicles and undertaken a lot of fabrication work, so having acquired the outer panels from an old domestic oil boiler, I set about building the body and after a couple of days she was ready and *Bitzer One* was born. The photos show the cardboard mockup and the actual bodywork being painted.

It is *Bitzer One*, not Bitzer number one; this is because the locomotive is simply bits of one thing and bits of another, for instance the exhaust which is copper plumbing pipe, or the enlarged front buffers which were engine-block core plugs.

The thing about this whole project is that although the locomotive is not perfect and not to everyone's taste, it was cheap to build, less than £100 not including the battery, it only took a few weeks to get it onto the tracks and I now have a gutsy, (noisy) little locomotive that is all mine.

Bob Arlett trying out *Bitzer One* at West Buckland.

For Sale

The Club has a small fridge surplus to requirements, clean and in good working order. £20

Milling Machine CNC Conversion

by Michael Callaghan

Over the past few months my mind has turned back to my time working as a test engineer for a company manufacturing MRI (Magnetic Resonance Imaging) scanners. A very interesting machine with an interesting background and somewhat gory history. But a job as boring as watching paint dry.

However it was a time to witness some cutting edge technology first hand and of course this involved CNC (Computer Numerical Control). Within the design department Solidworks was the software used and the staff using it could produce complex designs faster than I could draw a square. However they did find time to show me the basics of the program which years later I would put to good use.

So moving on to the here and now. I needed a project to keep me from being out of the builder's way, an army of which had invaded the house fitting a new roof and windows and emptying my bank account at an alarming rate. So it was of interest to me when I saw an advertisement for a milling machine not a million miles away from me going cheap because apart from having been taken apart and not stored too well for a number of years was covered in surface rust (see picture showing rust on the bed). My intention was to convert this mill to CNC and with the help of a mate and his van the mill was soon back with me. It was a sorry state, the motor control board had seen better days so was binned from the get go, a new three phase motor was ordered.

So what is needed to convert a milling machine or lathe to CNC. The machines lead screws need to be replaced with ball screws with anti-backlash fittings. Ball screws are available from a number of outlets in the UK. Fitting the ball screws is not that hard depending on the machine. I went with a simple design for the stepper motors to save time and material. So with the mechanical parts fitted consisting of the screws, stepper motors and couplings, it was time to move on to the electrical part which to be honest I find the hardest part to do. My apprenticeship a million years ago consisted mainly in hitting large bits of metal into spaces they did not want to go into with very

large hammers, the electrical part of my training took around an hour and I forgot most of that. However the parts needed are in my case. Three stepper drivers, one per motor. One breakout board, power supply and the assortment of wirings to connect it all together.

Stepper drivers convert the signals from the breakout board into a format that the motors can read. The power supply rated at 24volts or 48volts and 5 to 8 amps feeds the breakout board and the stepper drivers,motors etc.

The breakout board or BOB needed depends on a whole number of factors and how deep your pockets are. Its job is to act has the translator, reading G-code and feeding the information to the drivers as they need it.

A computer, two is better, is needed to run the CAD (Computer Aided Design) program which will allow you to draw what you wish to machine. You then need a further program or if using Fusion 360 a free to use very good program to down your 3D design into G-Code which then needs a further program connected to the milling machines computer which reads the G-Code and sends it to the BOB. Mach 3 or 4 is a common program for this and is used my millions. I keep the computer running Mach 4 off the internet due to interference which you do not want when machining.

I use a mix of Solidworks for my 3D designs and Fusion 360 for producing the G-Code. Other programs are around but I don't know how good or bad they are.

So what do I make using CNC? Well a few years back I made a 1:5 scale Tiger tank out of aluminium using my CNC router which carries a spindle of much greater speed needed for aluminium. The picture shows the router machining a side panel for a 1:6 scale Matilda tank I made for a mate who is ex-tank regiment.

I have seen locomotive frames machined by CNC machines, axle blocks and chimneys, domes etc all produced. However I just like playing with machines and trying new ways to get jobs done embracing new technology which I feel the model engineering hobby so needs to do. Our American brothers are so far ahead in this field.

Auction Roundup 2025

by Michael Callaghan

If my partner knew how much money I spend on my hobbies she would make me very poor and her lawyers very rich. However I think it would be of interest to fellow members how much our toys have made at various auctions over the year.

We start off with a partly made 5 inch gauge 9F. No paperwork or boiler history at all. This made £1800 plus a 34% auction buyer's fee.

A 5 inch gauge battery powered class 35 Hymek. No batteries included or handset. This made £640 plus 24% fees.

A 2½ inch gauge Atlantic. Looks nicely made, but again no history and in need of some TLC. This made just £400 plus 24% fees

A very nice 7 ¼ gauge G class 2-2-2. Past boiler history, made by an award winning builder. This made £8000 plus 30% auction fees

A number of very nice 7 ¼ gauge locos came up for sale this year but every fee hit their reserve guide price and many falling way under the half way mark. 5 inch gauge locos on the whole remained stable with prices at the level of last year. However the smaller gauges did hit some high points with good models getting into the tens of thousands. Maybe it's a sign that model engineers are looking for smaller more easy to handle models then the larger more difficult ones.

A Doubled Up Beam Engine

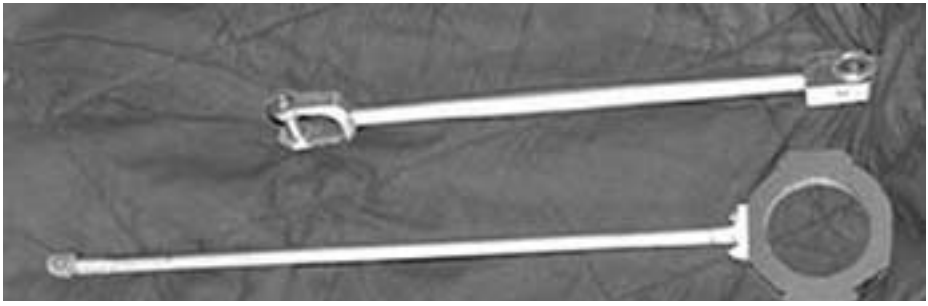
by Andy Cooke

Part 2 – Following on from *The Oily Rag*, Autumn 2024, Issue 153

After overcoming a hip replacement with its aditional waiting and recovery times the beam engine is now virtually complete. It has recently been in pieces having just been painted, the worst part of the hobby, I believe, and an operation I heartily dislike. I always seem to complete projects in the autumn which means I am painting during the worst of the winter weather – this was certainly the case this year. However, this has now been done which leaves only four oil cups to make. I have to admit the paint which I purchased on line is the worst I have ever used - buyer beware!

But I am jumping the gun, in my first article on this project I had only the base, column, beam and an almost complete cylinder unit. Much has been done since then – such as the connecting rod, the reach rod, the eccentric assembly, the valve gear and crank assembly, being the flywheel, eccentric and rope race pulley.

Starting with the connecting rod, this was fabricated from three pieces, the top which is connected to the beam, the shaft and the bottom which connects to the crank web. The shaft is ‘fish bellied’, ie has opposing tapers with the greatest diameter being in the centre. Being beyond the traverse of the top slide this part was turned between centres having set over the tailstock. The top and bottom fittings were screwed and Loctited. The reach rod is straightforward and requires no explanation, save to say that the eccentric is cast iron and the sheave is steel.



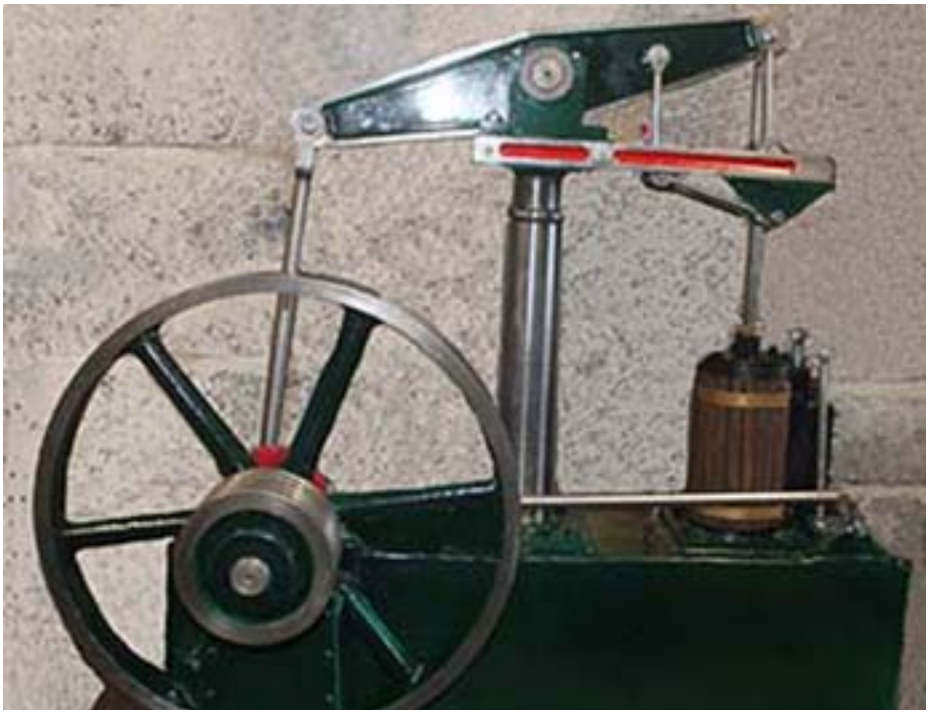
The valve itself is out of cast iron as I did not have any suitably sized bronze. The flywheel, which was to be mounted on the faceplate, is around 14 inches in diameter and rather heavy – I usually mount faceplate items with the plate on the bench so I do not have to fight gravity – I struggled to lift it onto the lathe when it was mounted but once this was accomplished and the final

position achieved, the machining was straightforward. The rope race was simple turning – 4 inches in diameter with a number of grooves machined with a round-nosed tool into the circumference – left over cast iron again!

I intend to make a false floor to surround the base in order that the flywheel goes into a recess, this is on the 'to do list' and is purely for aesthetic reasons.

Prior to painting I ran the engine on compressed air just to see if everything worked, it ran well after a few tweaks to the valve timing. Probably to the horror of some members almost every nut and bolt is metric. I do not believe in paying the same price for around ten fastenings in BA when one hundred in metric size costs much the same locally!

My next project is to refurbish an old Super Adept very small lathe which I acquired as a box of bits. Just as an aside, this machine is so small I could mount it on the faceplate! I am short of a small motor for this so if any member has a spare one we may be able to do a deal.



The engine as it stands at the time of writing.

Signalling at West Buckland

by David Hartland

The project is making progress in several directions. Most notable is the progress on the colour light signals.

Like so many things on railways, signals have developed over many decades. The basic requirement is simple – the train driver needs to see from the lineside a clear red light (for stop) or a yellow light (for caution) or a green light (for clear). There are two practical designs – the first is a single aspect (that is one lamp) which is capable of showing one of the three colours. These have been used on the full size railway since the 1920s and passed out of favour; but they have re-emerged recently as a result of advances in LED technolgy. Drivers on the real railway have very good colour vision and undergo strict colour blindness tests so that the one lamp indication is not a problem. At West Buckland we cannot be so sure – we know of a few members who have less than perfect colour vision and therefore we are going to use the second and more common type of signal – a two aspect signal where there are two lamps mounted in the one signal head, each capable of showing just one designated colour. In this way, any driver can read the signals by noting the position of the lit lamp in the signal head and without perfect colour vision. (It is just the same on our road system – many drivers cannot distinguish between the colours and rely on seeing the lamp alight in the relevant position to receive their highway instruction).

Convention says the red or yellow aspect is set at the driver's eye level to give good visibility. Each lamp is protected by a semicircular hood to reduce the effect of sunlight shining into the lamp and giving confused aspects; it also keeps snow from blocking the lamp. In winter, snow can collect on the upper side of the hood, and risks obscuring any lamp mounted above; so the upper lamp is arranged to be the green(clear) aspect leaving the more serious red or yellow lamps below the lowest hood and less likely to be obscured.

A real railway two aspect colour light signal showing red (lower aspect). Note the prominent hoods to shield the individual lamps.

For our own project, Dave Wood has been working on a design of the signal head, while Jon Freeman has produced a prototype LED lamp box. These two pieces of work were mated together for the first time on site recently to form the first prototype of the new signals. The photographs show the unit being tested and approved by the unofficial design committee assembled for the purpose. All was agreed and we will now proceed to make production quantities of this

design. We need 5 for the first stage, to protect the level crossing and a further 12 or so for the eventual Phase 2 final track layout.

The prototype signal showing ‘red’.

The ‘signal sighting committee’ giving their approval to the new design.

Bob Arlett and Dave Wood with the prototype signal.

Meanwhile, Paul Orrells has been making a scale GWR nameboard for the signal box. This has been done by scaling the exact typeface used on the full size nameboards, and laser cutting the letters out of steel sheet. These have been glued to a steel backboard using the intaglio steel as a guide, and painted. The result is very pleasing and a very good representation of the full size item.

Inside, the timberwork has been finished by Bernard Hart and the decorating is underway by Gerry Goble.

Out on the track, ducting is being installed for the cables which will provide the current to the signals, controlled by the electronic interlocking. Jon Freeman has this control box assembled and shortly will be installed into the signal box with a power supply.

As always, we could do with more volunteers to help with this and all the other projects on site. There is always plenty to do!

The completed nameboard in place on the signal box.

Dates for your Diary

Mar 3 (Tues)	Meeting : "Somerset Light infantry 1914-1918 by Darren Berry at West Buckland.
Mar 17 (Tues)	Meeting CLUB ANNUAL GENERAL MEETING at West Buckland.
Apr 5 (Easter Sun)	Public Running at Vivary Track from 2.00pm.
Apr 7 (Tues)	Meeting:A Recovered Barracuda, sinking the *Tirpitz*, an artist and Low Ham- How do they connect? By Dave Morris at West Buckland.
Apr 21 (Tues)	Meeting at West Buckland
May 3 (Sun)	Public Running at Vivary Track from 2.00pm
May 5 (Tues)	Meeting "Bishop's Lydeard Mill" by Alan Reeve at West Buckland .
May 10 (Sun)	Public Running at Vivary Track from 2.00pm
May 12 (Tues)	Members Running at West Buckland from 2.00pm
May 14 (Thurs)	Setup exhibition at Newton Abbot from 2.00pm
May 15 (Fri)	Club Exhibition at Newton Abbot ME Exhibition.
May 16 (Sat)	Club Exhibition at Newton Abbot ME Exhibition.
May 19 (Tues)	Meeting – TROPHY NIGHT at West Buckland.
May 21 (Thurs)	Volunteers' Day at West Buckland working party
May 23 (Sat)	Portable track running at Warac Rally, Weston Zoyland Airfield
May 24 (BH Sunday)	Portable track running at Warac Rally, Weston Zoyland Airfield
May 25 (BH Mon)	Portable track at Stockland Fete
May 31 (Sun)	Public Open Day at West Buckland.
June 2 (Tues)	Meeting at West Buckland
June 7 (Tues)	Public Running at Vivary Track from 2.00pm.
June 9 (Tues)	Members running at West Buckland from 2 pm.
June 16 (Tues)	Meeting at West Buckland.

NOTE - All meetings at West Buckland start at 7.30pm unless stated otherwise.

Graham Swales on a test run of the club locomotive *Tenacity*. Several members have contributed to the rebuilding of this locomotive in the last three years but Graham is now bringing these various efforts together to give us a functioning, reliable locomotive.

Flashback to last summer – remember the hot days? Harry Howe driving his Jinty across the traverser at West Buckland. Photos by David Hartland.