TIVVY BUMPER

The newsletter of the Tiverton & District
Model Engineering Society

Autumn 2019






Editorial

Welcome to the Autumn edition of 'Tivvy Bumper' for 2019.

As usual, we are featuring the last six 'Pictures of the Month' that have appeared on our web site. The first is a picture taken at a steam-up in February. Our track is on the edge of Exmoor, so snow is not uncommon. The second picture shows a guest, nonchalantly driving Steve's 08 shunter around the track; then there is a visitor to our spring Open Day with his "Heillan Lassie"; then a shot of Geoff surveying our track; Lew with his McLaren traction engine - pictured at the West Somerset steam rally, and finally, our chairman Adrian, taking his newly completed "Simplex" (and his wife) for a spin round the track.

Remember, all the previous 'Pictures of the Month' are available on the web site. Just follow the link at the bottom of the 'Home' page.

The club web site has all the latest information about the society, dates of meetings and presentations, steam-up days, as well as a link to the bulletin board where members can share experiences, post sales and wants, share information about events, etc. So if you have access to the Internet (or someone in your family does), have a look.

In this edition, you will find the penultimate article in the series by Billy, where he describes converting a standard Triang loco into a model of a re-built West Country class loco.

I am always on the look out for articles and pictures to go into the magazine. So if you have an interesting project on the go, or have some experiences that you would like to share with the rest of the members, please think about writing a short article to go in a future edition.

Steve

Chairman's Chatter

Since joining the club I seem to have been tweaking the signals one way or another. I thought that for the benefit of newer members I would give some of the history and possible future developments.

First, I will outline the latest developments. I am currently altering the method of setting signal 8 (just before the swinging point) to red when the point is opened and then resetting it to green when the point is aligned with the main track. Previously signal 8 was triggered to red by a micro switch linked to the chain that was pulled to move the point. To reset the signal to green, a cover was moved to reveal the reset push button. Unfortunately the reset button got forgotten sometimes which threw the control logic.

It seemed the best way forward was to have an automatic method i.e. signal 8 goes red when the point is operated, but automatically returns to green when the point is correctly aligned with the main track.

To achieve this, I am now using the main locating pin to operate a micro switch which is placed on the fixed track on the other side of the point. I have drilled a hole in the rectangular upright opposite where the pin locates. A stainless steel and brass plunger operates the micro switch I mentioned earlier. The plunger has now been fitted and a few adjustments are required to ensure reliable operation. I also had to modify the logic circuits in the control box which have now been tested and are working correctly.

Each signal has a connection box which is fixed to one of the concrete "A" frames. Each of the connection boxes has an LED that shows the system is powered up and also "blinks" when loco or trolley wheels operate the detection micro switch. The LEDs on the signal connection boxes have been duplicated on the control box to ascertain that the track switches are operating correctly.

The final upgrade is to replace the small 4 pin connectors on the signals and signal posts. Although weather proof these have found be be "fiddly" and not robust. These are being replaced with 4 pin XLR connectors.

The control box is at least 30 years old and was made by Steve Papworth for the Basingstoke track. It was a 7 signal system with a logic board for each signal. Fortunately there was a spare logic board which was used to increase the capacity to 8 signals to match our track.

The future? The control box is a mass of wires and boards . This could be replaced with a modern "computer" such as a Raspberry Pi or Arduino. These would offer additional features and improved diagnostics.

Now going back to the system that existed when I joined. The only remaining items are the Signals and connection boxes. Originally the connection boxes were mounted on the signal posts and contained 3 relays. These relays controlled the logic and were connected to the track switches and to the previous signal to set the correct colour. All the cabling was underground which proved to be the downfall of the system due to moisture ingress causing corrosion and failure. The system also used large diameter cables to overcome the volt drop as the signal lamps were similar to car head light bulbs.

The bulbs in the signals were replaced by 24 volt red, orange and green LEDs used in lorries. These only require a few milliamps, meaning smaller diameter cables could be used. These can be seen just under the track running through the "A" frames.

The existing track switches were very well built, although these needed adjustments to ensure the flanges of 3 1/2" gauge locos triggered the switches reliably. Unfortunately the boxes housing the switches were losing their waterproof integrity. The current micro switches are IP68

rated meaning they can be fully submerged in water. I tested one in a bucket of water for 3 months and found no problems.

I have tried other methods of track detection. Many systems use electric currents in the track, but these require insulation between rails. As we have metal fishplates, this system would be difficult to implement.

Another detection systems I tried were optical electronics. These needed two detectors - one to measure the ambient light and one to detect when a train passed. The ambient light had to be monitored to account for differing light levels. It needed quite a lot of electronics but the main down side it would not work in very low light conditions such as dusk, meaning no signals for our early November steam up.

A third system tried used ultrasonics, the same as used in car parking sensors. To work correctly these needed to be angled upwards, the problem being water would sit on the detector causing false triggering.

The fourth detection system I tried used proximity detectors. These are fine on tracks with plastic or wood sleepers and small section rail. Our metal sleepers together with large steel rail required a physically large detector which looked very cumbersome.

I also tried a mechanical system where I cut a 1/4 slot in the top of the rail. In the slot was a stainless steel roller on the end of a lever that operated a micro switch. This was simple and very reliable. However, the problem was the slot (tightly occupied by the stainless roller) caused loco and rolling stock wheels to jump.

In the end I stuck with a simple system that we have today. This uses a square nylon plunger that is kept close to the track (to ensure the flanges of 3 1/2 locos do not go between the plunger and track) by a brass guide. The plunger rests on a spring (a hacksaw) blade under which is a micro switch. The movement the plunger required to operate the micro switch is 0.045".

I find the signals add a dimension and interest to driving round the track especially with a steam loco. When stopped you can add some coal or have a bit of blower to increase pressure etc . They are also a safety feature to those of us who wear spectacles when driving, as on cold days the steam exhaust mists fogs up our glasses.

Adrian

Treasurer's Trivia

I am pleased to report that our finances are holding up this year. Due in no small part to the tool sales from secretary Chris. We have also attracted 3 new members in the last 6 months.

Due to our Internet host stopping, we have had to move the club website at short notice and it is now with 1&1 IONOS. The cost of moving and changing the name of the owner of the domain name to the society (from a former member) came to £24.00. The website now costs £1 per month.

Chris S.

Secretary's Scribbling

This summer has been a bit of a washout concerning working days at Worthy Moor, mainly due to the weather, but perhaps BREXIT influences everything, so I was pleased to receive this item which at least gave me a laugh.

The Medical Profession were asked should Brexit take place?

The Allergists were in favour of scratching it, but the Dermatologists advised not to make any rash moves. The Gastroenterologists had a gut feeling about it, but the Neurologists thought the Brexiteers had a lot of

nerve. Meanwhile, Obstetricians felt certain everyone was labouring under a misconception, while the Ophthalmologists considered the idea short-sighted. Pathologists yelled, "Over my dead body!" while the Paediatricians said, "Oh, grow up!". The Psychiatrists thought the whole idea was madness, while the Radiologists could see right through it. Surgeons decided to wash their hands of the whole thing and the Junior Doctors claimed it would indeed be a bitter pill to swallow. The Plastic Surgeons opined that Boris's deal would "put a whole new face on the matter." The Podiatrists thought it was a step forward, but the Urologists were pi**ed off at the whole idea. Anaesthetists thought it was all a gas and those lofty Cardiologists didn't have the heart to say no. In the end, the Proctologists won out, leaving the entire decision up to the a**holes in Parliament.

Chris C.

Mid-life crisis

My neighbour recently spent a weekend in Wales with a couple of friends who drive Porsche sports cars. Soon after he returned, he decided that he wanted one, and soon appeared with a beautiful 968 CS.

Having bought the car, he thought that such a lovely car shouldn't be left out in the rain, and although the previous owner of the house had obtained planning permission for a garage, and had cast the concrete base, a garage hadn't been built. Instead, a substantial wooden shed occupied the space.

So my neighbour decided to take the shed down, and erect a modular garage to house his pride and joy.

Seeing the shed, I suggested that I knew of a certain model engineering society that would really like it. With amazing generosity, my neighbour offered it for free - but we had to collect it.

After a couple of failed attempts to organise a day for the collection, John H arranged to collect a car transporter trailer and drove over to my home village to collect the shed. Adrian and Chris S both came over too, and after two hours, we had the sides of the shed on the trailer (see picture).

We had to man-handle the trailer out of the driveway, but then John was able to hitch up his car and drive it over to Worthy Moor. Adrian and Chris S also drove over there, where they were met by Chris C, and between them all, the shed was unloaded.

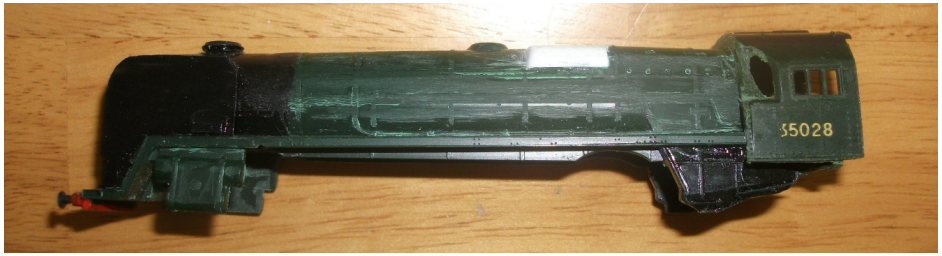
All we need to do now is put it back up!

Creating a Rebuilt West country in TT Gauge (Part II)

The Body

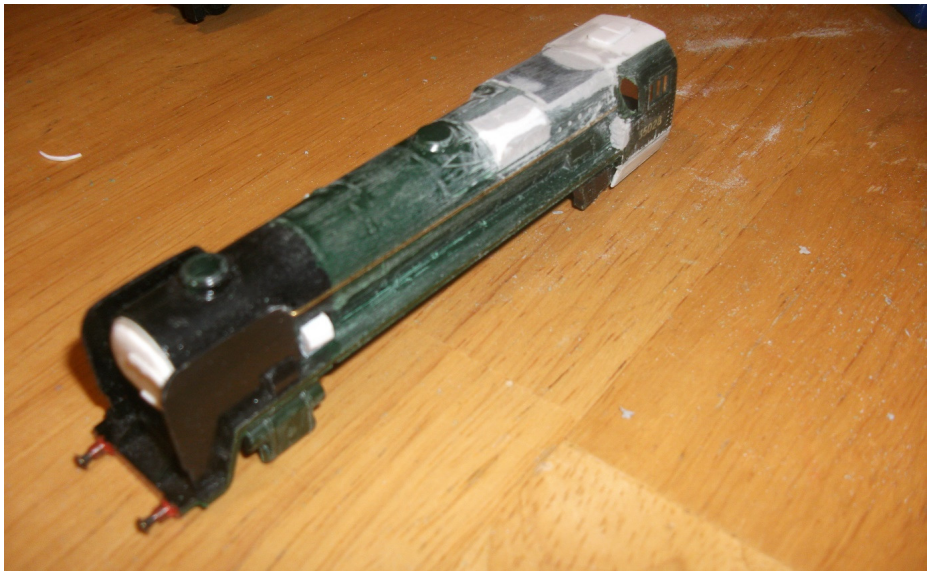
As discussed in the last part, the cab for the locomotive had to be changed from a BR standard cab, to that of a West Country.

The first step was to cut the cabs from the two donor loco bodies, the cut line was then trued on the main body and the new cab. These 2 parts were then married together as shown below.



As can be seen, when the main cab portion is positioned the roofline is well out of height. This issue was rectified by removing the roofline as shown in the image above, and inserting a new roof, made from plasticard into the gap created by the roof's removal.

Once this was complete, finer details such as the Vacuum Ejector pipe, Sand Boxes, lower cab valences and reversing rod could be fitted into their position and any joints filled with model filler to enable the elimination of joins.



The image above represents the progressed state of the locomotive, the model filler allows all joints to be removed and smoothed out. One important point to note is the new profile of the cab roof, far more prototypical than the first picture.

Once these items were complete the model was given a full paint, so as to prime all of the bits that have been added and also highlight any imperfections. Once this was complete it is almost time to start transferring the locomotive. Prior to this however details on the smoke box require adding e.g., electric lamp mountings and smoke box darts.

The biggest addition to make is that of drilling the positions for the handrail stanchions. These Stanchions require a 0.4mm hole to be drilled for each one prior to fitting.
The first stage was marking out. Firstly the body was mounted to the chassis and placed on a surface plate, then using a scribing block, the height was marked to ensure that all of the stanchions were on the same level.

The scribed line gives the required height. Once this was marked, I used a pair of dividers to scribe the position of the stanchions. Using the dividers as opposed to a rule had one major advantage in the fact that the measurements would be identical on either side of the body.

Once scribed the positions were first manually spotted using a 1mm drill. This created a depression that was used to centre the 0.4mm drill.

I was lucky that I only broke one 0.35 drill and only bent the 0.4mm after all of the holes were drilled.

The body then had its final coat of BR loco green paint, as shown below. You can just about see where the holes have been drilled, which will require cleaning up prior to the fitment of the handrails.

Once happy with the results, the locomotive was varnished with gloss where the lining was required. When dry the loco was lined out with the orange-black-orange lining and then varnished to seal the transfers.

When fully dried the hand rails were fitted to the loco. Careful re-drilling was required prior to fitment to remove any paint that had built up in the holes.

For the main handrails, one handrail stanchion was fitted with the handrail. By gluing the handrail here it prevents movement and allows the remaining handrails to be fitted. This was repeated for the handrails on both sides and the smoke deflectors.

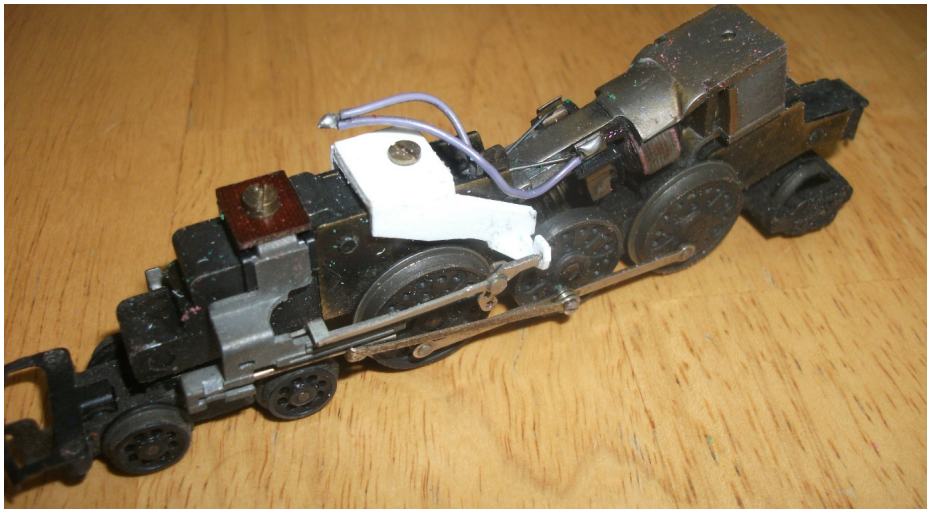
The images above and below show the near complete loco awaiting the final valve gear components and etched plates.

The Chassis

The Triang TT Chassis for both the Britannia and the Merchant Navy locos are principally the same, although the cylinder brackets are different. One disadvantage with the Britannia motion bracket design is that it has a tendency to break. Because of this, I have designed the new bracket so that the position of the Valve gear parts looks correct.

One key consideration and modification that is required is the adjustment of the lifting links for the valve gear. On a Britannia loco the lifting links are above the expansion link, as can be seen below, whereas a West Country has the lifting links behind.

The only way to get this to look correct was to purchase some Britannia valve gear and modify it to suit. One major advantage of building my own mounting saddle was that the height could be varied to get the correct height. This modification can be seen below.



To avoid some of the issues associated with the Britannia bracket, this was made up using 2 layers of Plasticard sandwiched together to create stronger joints, with fillets being used to strengthen up the other components.
Once complete the bracket was painted black to blend with the main chassis.

Now that the expansion links are fitted the return crank can be fitted to the loco, for this, new crank pins are required to be made, and the return cranks fitted.

(Ed) In his final part, Billy will describe the completion of the conversion.

Forthcoming events

Here are just some of the events coming up in the next 6 months.

November 8th - the postponed talk on Coldharbour Mill by John Jasper
December 12th - Club Christmas dinner
In the New Year, we have talks organised from hydraulic engineer Ed Wilson, and also from Anthony Mount.

Remember, all these events, and more, can be found on the club's web site at www.tivertonmodelengineering.org.uk