Smokebox

The Newsletter of the **Bedfordshire Area Group** of the Association of 16mm Scale Narrow Gauge Modellers

Steam in Beds 2023 - November Show Update

Chris Pretty, Steam in Beds Show Manager, has provided this update. Whether we attend or not, we all benefit from the show in terms of our club subscriptions, so please take a few minutes to read this.

By the time you read this Steam in Beds will be barely 3 weeks away. During the October meeting we started to gather volunteers to cover all the varied areas that needed to be covered. Looking at the Rosters following on from our meeting two things are quite clear. Only about half of the Volunteer slots have been filled. It is very clear that a few members have offered to cover multiple slots whereas some are only covering one. Indeed, some members have not offered to help with anything, which is very disappointing.

It is understood that some members are not able to help for health reasons, however there are others that can and should be helping. At the November meeting there will be the usual display board showing the areas that still need to be covered. This year's Steam in Beds can only be a success with the full support of members and without a successful show it makes it more difficult for the Committee to hold the yearly subscription at its current level.

Members know one thing; the show would not be a success without the support of all members volunteering to cover the various tasks needed before and during the show. I have listed below the areas needed to be covered:

<u>November</u>

Friday 24th	Preparation of the Church/Hall	2:30 to 5pm
	Preparation of the Hall including Ridgmont	8:15 to 10pm
Saturday 25th	Final Preparation of Hall	From 8 am
	Show Opens	10am
	Tickets Sales on the Front Desk	
	Catering support in the kitchen and selling to visitors.	
	Church Door checking tickets.	
	Selling Raffle Tickets touring both venues selling raffle tickets.	
	Managing the Member-to-Member Sales stand and cover during the show	
	Car Park Marshal.	

Cover for the above areas is broken down into 30 minutes slots. As a BAG Member you naturally have free entry to the show but in return please volunteer for a minimum of 2 slots, more if you feel you can handle it.

There will be copies of the above Rosters at our November meeting.

Traders

Ray Butler has confirmed that the following Traders will be attending this year's show:

Trenarren Models　　Jon's People

Anything Narrow Gauge	Kent Garden Railways
MacMillan	Bole Laser Craft
John Sutton Models	Coach & Wagon Works
Brandbright	Garden Railways Ltd
Timpdon Models	Black Cat Bridges
Chuffed 2 Bits	Plateway Models
Boot Lane Works.	

The layout of the Hall and St Marys will be the same as previous years.

Layouts

As you would expect our own Ridgmont in the Main Hall in full exhibition mode, Prayle Grove on the Stage and Andrew Neals “Aberwyn” will be in St Marys. I understand from Bob that the Running Roster for Ridgmont is filling up fast so if you are planning to run contact Bob ASAP. Andrew’s Aberwyn also needs runners but please bear in mind it is only suitable for small locos. If you fancy a run on Andrews unique layout, please contact Andrew or Bob.

Publicity

As I confirmed last month Garth has booked all our usual Advertisements as follows:

Garden Railway Magazine - Two entries October and November issues
Focus, a free local magazine distributed free to all households in Eaton Bray and surrounding villages.
The Associations Diary Page
Railway Modellers Show Guide
Copies of Flyers and Posters will be available at the November meeting.

Garth has also managed to make contact with Three Counties Radio with a view to Steam in Beds being featured on the air.

Catering

As confirmed last month Gunns will once again be supplying the Filled Rolls, Cakes and Savours for SIB. Thanks to John Kitchenman who has managed to arrange this with Gunns again.

Carol Regan has once again kindly agreed to cook the bacon for the breakfast Bacon Butties. We are very grateful to those members partners who have helped the Catering Team during previous Steam in Beds. If they are willing to support us again this year, do please let me know. The committee have agreed to the purchase of a second Card Terminal to enable Card Payments for catering.

Member to Member Sales

We will once again have a Member to Member sales stand, providing an opportunity for members to sell their surplus 16mm items. John Kitchenman has Co-Ordinated M2M sales for many years, but he feels it is time to step aside and give somebody else a go. If you are interested in taking on the role of co-ordination of this year’s M2M sales please let me know. I can outline what this involves, I am sure John would also be happy to give the benefit of his experience. Remember a successful M2M sale does help to generate income for the group’s funds.

Finally

With the ever-increasing cost of putting on a show like Steam in Beds the Committee have decided to increase the cost of entry to this year’s show to £6, accompanied children will still get free entry.

Chris Pretty, Steam in Beds Show Manager

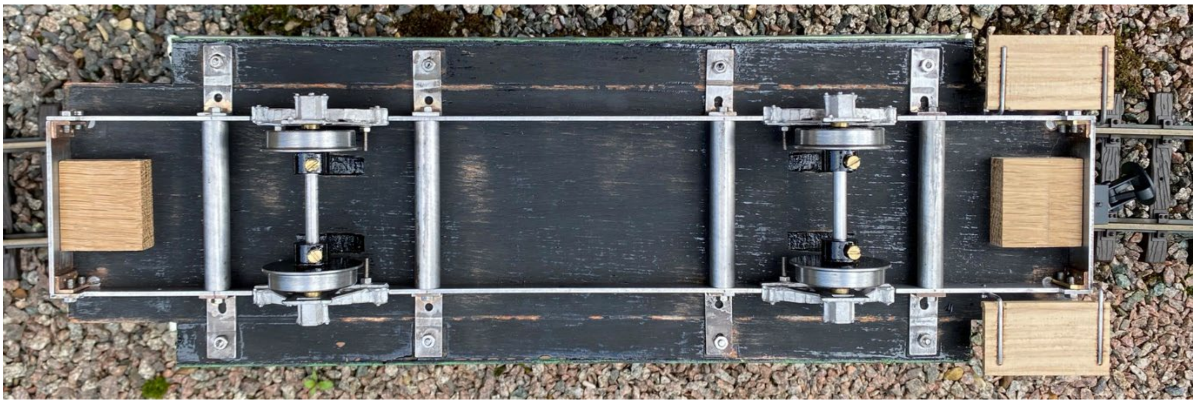
From the Editor

Unless something unforeseen arises, I will be able to make the November meeting 😊. I had carelessly made myself available for footplate duty on the W&L, but a friend has taken over my turn on 5th November, so I should be at the meeting by lunch time.

October has been a busy month but I've found a little time for modelling. I attended the Yorkshire Show at the end of September, held in Barrow Hill Roundhouse, and before I knew it, I'd bought a couple of scratch built Zillertalbahn coaches as run on the W&L. Both were set to 32mm gauge and were regaugeable, the problem was that the wheels, though the right size, were set high in the frames to lower the overall coach height and bring the centre of the buffer beams to 25mm above rail height, the "standard" for many 16mm models. Couplings on the W&L are 2 feet (32mm) above rail height, so changes were need for compatibility with all my other W&L stock. Substituting the scratch-built axleguards for the Brandbright variants fixed the problem on one of the coaches, but the frames needing reducing in depth on the other coach before Brandbright axleguards could be fitted. The frames also had to be reduced in width my 20mm! They are mild steel and came apart readily, so that the necessary modification could be made with the aid of a mill and a lathe.

My changes meant that the steps under the end balcony were too far above rail height, so one change begat another. The picture to the left show one of what we refer to as "the balloons" on the inspection pit in Llanfair. The steps on this coach are supported by forged brackets, the outermost being bolted to the drawbar. I decided to mimic this and my attempt is below. It also illustrates how much additional detail needs to be added to the coach end to make for a credible reflection of the prototype. The guard's vacuum application valve at this end of the coach will be interesting to make.

I've completed the steps and brackets at one end and hope to have the other done by Monday (before I go back to Wales), in which case I'll bring them to our next meeting. The steps are made from an offcut of oak (I made ten) and have slots underneath in which the horizontal arms of the 1.6mm rod sit. They are fixed with epoxy and the slot allows the cement to run around each rod. It seems to have formed a sturdy bond. The form of the end of roof doesn't match the prototype but I will just live with this. The roof itself, which is removeable, overhands too far from the body, but this is probably something I can remediate in the bandsaw if I make a carrier to hold the roof at the right angle as I cut it. The edges of the balcony end need rounding and I need to fit chains to the buffer beam, handrails to the balcony end and a lamp bracket.



The witness marks in the floor outside each longitudinal frame member show the original extent of the frames, which had been set to the width of the balcony ends. The eight brackets outside the frames were originally L-shaped and were heated, flattened and had a small tab hard-soldered onto each end. This enabled me to use the original mounting points on both the frames and the coach. The oak blocks at each end are to secure the balcony ends to avoid any risk of them lifting. The 2mm fixings for the couplings extend into the blocks to do this. The cutouts in the floor under the wheels, only just detectable, allowed them to sit closer to the floor without fowling, now unnecessary.

The two coaches. The balcony footboards on the brown coach need to be lowered and like the green coach, and underframe details are needed on both. The brown coach also needs the characteristic upright rails at the balcony ends along with all the same detail fittings as are missing from the green coach. The green coach doesn't have them.

For comparison, here's the W&L SKGLB "balloon" which most closely resembles the green coach. To make the model more reflective of the prototype, the vertical seam running top to bottom either side of each window needs to be added. However, it's the roof that's the real issue so I may just let make believe rule and leave it as it is, though I will repaint it. When I've made all the planned modifications, I'll write a modelling article for **Smokebox**.

Copy deadline for **December 2023** issue of Smokebox: **Friday 24 November 2023**

Alan, Smokebox Editor

From the Chair

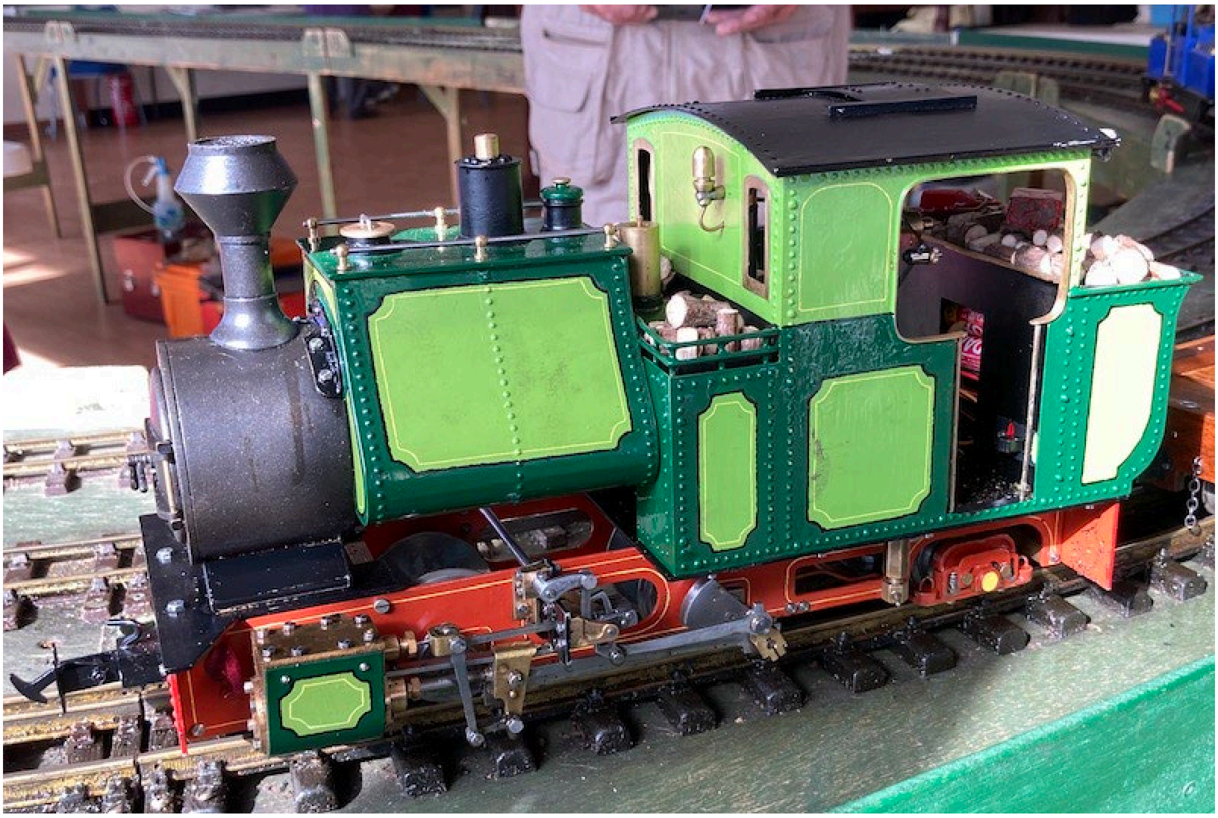
We are getting very close to Steam in Beds and I would like to bring a few details to your attention. Firstly Andrew Neal will be exhibiting his new layout in the Church and in the past members have given him a break by running for 30 minutes or so. If you can, please help out. Andrew reminded me that his layout has tight radii and only short wheelbase locomotives will get round. Secondly the running roster for Ridgmont is filling up so if you would like a run (or two) please either add your name at the next meeting or phone me up.

Ken Reade mentioned to me some time back that we could do with a toolbox holding useful equipment to enable maintenance without stress. I think this is an excellent idea. Ken has very kindly donated a smart plastic toolbox together with a few tools. From memory we need some files and a junior hacksaw. Please take a peek inside the box and consider if you can contribute!

Last month the more observant of you may have spotted a photograph entitled "Bob C's troublesome engine". After a little research on the 'net a possible solution was discovered (the engine was very difficult to fuel – it seemed as though the gas tank was full even when empty). It seems that some tanks with a close fitting and deep thread stop the valve passing gas/air through the side vent, a small, drilled hole. Bob modified a valve with a file, see the photo, to provide a passage from hole to tank. He reports that he is now getting 20 minutes plus run time rather that 5 minutes previously.

I couldn't resist including some photos of Terry Boyce's locomotives seen running at the last meeting. Twins, nearly, but just look at that valve gear, quite a step up from the standard Roundhouse offering!

Delicate and very convincing valve gear!



4 coupled

6 coupled

Bob, Chairman

Meeting Dates

Here are all meeting dates until the end of 2023. **We have access to the hall from 10.30 and need to have the layouts packed away and be out of the hall be 16.00.**

- Sunday 5th November

- Saturday 25th November for our **Steam in Beds Show**
- December, **note: no meeting this month**

Committee members

The members of the BAG committee are as follows:

Bob Gamble	Chairman	chairman@bag16mm.org.uk
Garth Bridgwood	Secretary/Treasurer	secretary@bag16mm.org.uk
Mark Cresswell	Membership	membership@bag16mm.org.uk
Ted Robinson	Track Manager	trackmanager@bag16mm.org.uk

Membership Renewal

Membership is due for renewal on 1st October 2023 and the Committee has decided to keep the Membership Fee at **£40.00** for the year ending 31st August 2024. Mark and I will be at the next Meeting on Sunday 3rd September when you can use our new Card Reader, or we will accept cash or cheques and hand-out Membership Cards. The fee can also be paid by bank transfer to:

Acc. Name: Bedfordshire 16mm Modellers Acc. No. 26041686 Sort Code 23-05-80

Garth, Secretary

Modelling Matters

Mark Cresswell writes about the importance of electrical suppression on Brushed DC Motors

Figure 1 Ruston 10 hauling some Binnie wagons at the last national show

A bit of Background!

Back in August of this year a number of members ask me how I managed to cram all the electronics into my Ruston 10hp to facilitate remote control via Wi-Fi, so I've decided to produce a few articles for smoke box to enlighten you all.

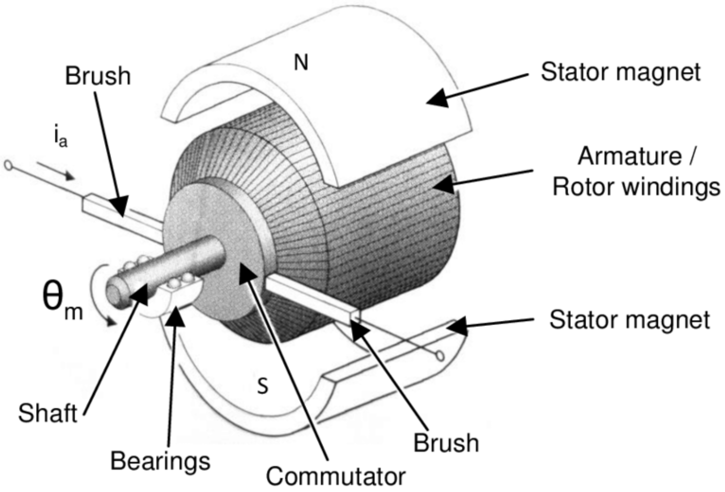
The project really started in the August 2021 when I was given a Railbus kit by North Pilton Works by my dear wife Kerry as a birthday present.(https://www.northpiltonworks.com/) Having already experimented with adding Wi-Fi control to an IP Engineering "Jack" kit using an ESP8266 SoC (System on a Chip) which had built in Wi-Fi and a collection of 12V charger Module for a small lead acid batter, a 5v Regulator for the ESP8266 and a 2.5 Amp H bridge driver boards. Following programming, this allowed me to control the speed and direction of the engine, the headlight and monitor the battery voltage from a smart Phone.

For the Railbus I wanted to tidy this up little to see how compact I could make it. So, the choice of components was crucial. I needed to get as much functionality out of each building block as possible. The choice of components will be the subject of the next article but one thing that made this easier was that, despite being designed to run on 4 AA batteries in series (6 Volts) I found it ran perfectly well at voltages as low as 2.5-3 Volts. So, code was written, and components assembled and my green Railbus has been seen running using a single3.7v LiPo battery on many a first Sunday since.

So now onto the Ruston 10. At the 2022 National Show I purchased the IP Engineering Ruston 10hp white metal kit. This comes with a 3v motor driven by 2 x AAA battery. So, again I set myself the challenge of adding Wi-Fi control. But before we go into to how there is one important elephant in the room we need to address:

The Importance of electrical suppression on Brushed DC Motors

One thing I have found in common with all the electric kits is that they are supplied with brushed DC motors. Let's take a look at the anatomy of a brushed DC motor:



- Shaft: The central shaft for the motor, around which the rotor rotates.
- Rotor (or Armature): The part of the motor that rotates. It consists of one or more windings of copper wire wrapped around a core made of a ferrous metal, usually iron.
- Commutator: A rotary electrical switch that periodically reverses the current direction between the rotor and the external circuit as the motor turns..
- Stator Magnet: The stationary part of the motor that generates a stationary magnetic field around the rotor. It usually contains permanent magnets. These Magnets create the magnetic field which interacts with the armature to generate force.
- Brushes: These conduct current between stationary wires and moving parts, most commonly in a rotating shaft.

These components work together to convert electrical energy into mechanical energy. The brushes and commutator switch the direction of current flowing through the rotor coils, thus changing the magnetic field and keeping the rotor turning. During this switching process the armature winding being switched out will generate a very high voltage as the magnetic field collapses. This high voltage is referred to as the back Electro Motive Force, EMF for short. This manifest itself as sparks at the commutator and these are bad things to have for the following reasons.

- They cause excessive wear of the brushes and commutator shortening the life of the motor.
- Generate radio interference which can block or limit the range of any your wireless activity in the area. This is known as Electro Magnetic Interference or EMI.
- When using Pulse width modulation to control the speed of the motor reflections are generated in the wiring that can cause oscillations culminating in latch-up of the FET's in an H-Bridge driver causing the device to be destroyed.

There are four easy steps that can be taken to reduce these effects.

1. **Suppression Capacitors:**
   Small Capacitors fitted across the connections to the motor brushes will suppress these sparks and radio interference by shorting out the AC components generated by the Back EMF and reducing the EMI. Generally a 0.01~0.47uF capacitor wired across brushed DC motors to reduce radio frequency EMI caused by arcing between the brushes and commutator is sufficient. I usually use 0.22uF across the terminals and add additional capacitors of 0.1uF between each connecter and the case of the motor. These should be added as close to the motor as possible.
   Capacitors marked 104 are 0.1uF while 224 is 0.22uF

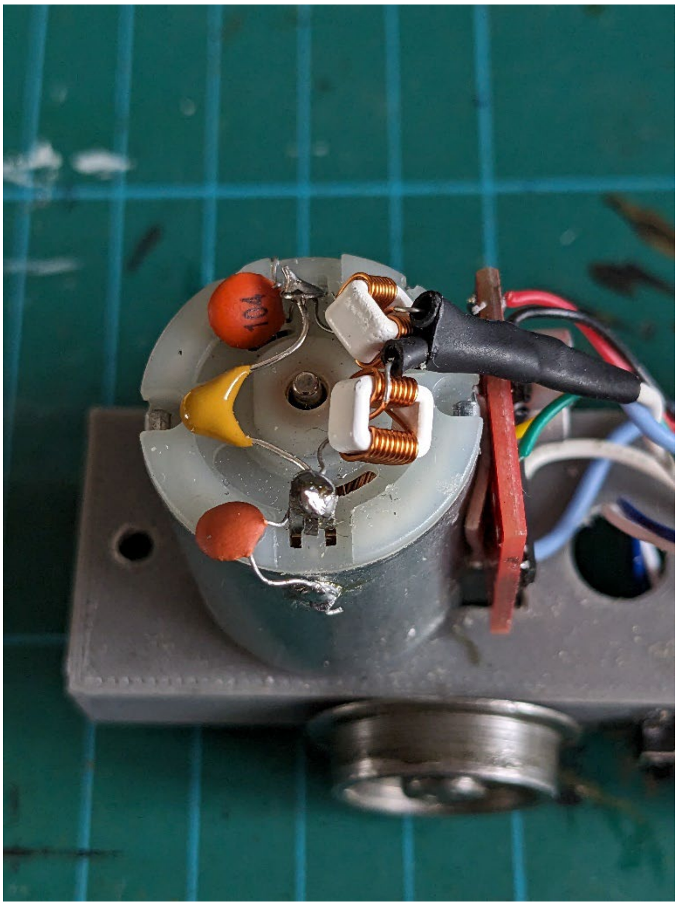


Figure 2 Ruston 10hp motor fitted with capacitors and ferrite cores.

2. **Use of Ferrite ring cores**
   Adding ferrite ring cores and looping the wires to the motor through the rings a number of turns will help control parasitic oscillation cause by the fast switching of the H-Bridge driver in a pulse width modulation controller. Again, these should be as close to the motor as possible.

3. **Keep the wires leads to the motor as short as possible.**
   Long wire can act as aerials and amplify any EMI that makes it past the suppression controls taken in points 1 and 2. By placing the H-Bridge driver as close as possible to the motor you can keep the wires as short as possible and any EMI still in the system will find it harder to escape as radio interference.

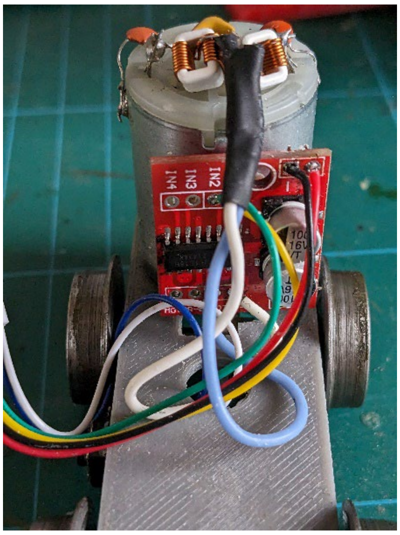


Figure 3 H-Bridge drive board attached to the motor

4. **If you must have long motor, leads twist them together.**
   If long leads to your motor is unavoidable due to the layout of your components, then twist them together. This will have the effect of cancelling out any EMI radiating from the leads.

So, by following these 4 simple steps when using brushed DC motors you will prolong the life of your motor, the electronics driving it and reduce radio interference that can limit the range of operation.

Next month I'll discuss the selection of components based on the goals of the project and how I connected them.

Bedford Area Group Sweatshirts

As reported last month, Ray Butler has found a supplier for badged polo and sweatshirts, which might make it more apparent to the public that we're BAG members. The first orders have been processed and Ray hopes to be able to deliver them at the next meeting, though there is no guarantee of this. If you've been waiting to see what they're like and you're attending the meeting, there might be an opportunity to see both garment types. If you're interested or would like more details, please contact Ray at rbutler1047@btinternet.com or on 01234 342348.

Sales & Wants

There is no meeting in December, but at the January 2024 meeting a table will as usual be placed at the back of the hall for members to place any items they have for sale. Remember that you can sell items through Member to Member at Steam in Beds, providing someone comes forward to co-ordinate the stand. See Chris's report on pages 1 and 2 of the newsletter for more information.