

**Reading Society  
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**Free to members**

# The Prospectus

**July 2021**



Mark Kirton looks pleased with his latest industrial loco out for its first run on 12 June. Photo John Billard

**FIRST BUILD SWEET PEA  
TUESDAY RUNNING  
CREWE IN 1963  
COUPING RODS  
OLD MOTOR**

## **A VIEW FROM THE CHAIR**

**John Billard**



I arrived at the club house earlier last month to find that persons unknown had smashed a hole in the side of the building over the left corner of the 00 layout and entered. Thankfully nothing appeared to be taken although there was some damage to the layout and of course to the structure of the building. Thankfully Nigel Penford made himself available at short notice and things were made secure and a permanent job done a few days later. Security measures are being updated accordingly. On a more positive note a club running evening was held on the 22nd June that was well attended and a large order of fish and chips consumed! This is being repeated on 6 July from noon onwards—lets hope it stays dry. The trustees

again met on 14 June. This as just after news that the projected 21 June lifting of restrictions was delayed. This has affected our hoped public running that we hope will now take place in August .

## **FROM THE TRUSTEES**

**Stuart Kidd**

### **First Aid Training**

The trustees have agreed to arrange first aid training for members, particularly those involved in Public Running and Birthday Parties..The object is for members to have a basic knowledge of first aid (it could be described as ‘pitch side’ first aid) It is not the intention for the training to be equivalent to ‘First Aid at Work’ with the issue of certificates etc. It is planned to organise the courses in the autumn.

### **Defibrillator**

The trustees have also agreed to purchase a defibrillator, it will be installed in the club room. It has also been agreed that familiarisation sessions will be organised for members (could be as part of the first aid training) as it is felt it would be useful to get the feel of a defib, before using one with intent, in an emergency.

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

# First Loco Build by a Sweet Pea Convert

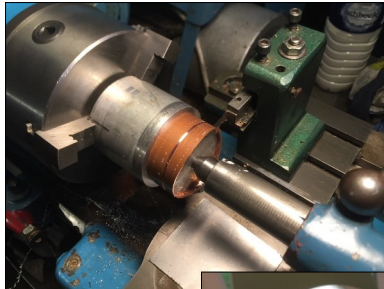
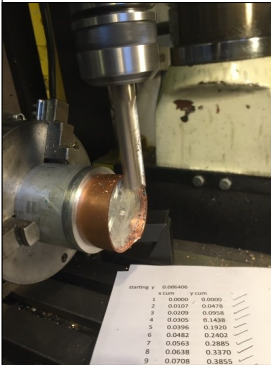
## Part 1 by Stephen Millward

In 2015 I decided to take up model engineering again and re-joined the RSME. I think I had previously been a member in the 1990s, but then got distracted by seeing how fast I could ride a bicycle. (I've currently got 8 bicycles in my garage/workshop competing with machine tools, etc). My previous experience had been building a Stuart 10V and then a 2.5" x 2.5" single cylinder steamboat engine and I decided it was time to embark on building a locomotive.

At one Thursday evening meeting I asked around for advice on what to build and got a wide range of opinions. Peter Harrison asked if I would be interested in a set of Sweet Pea un-machined frames and wheel castings that had been donated to the club. So, I did some online research and concluded the wheels look a bit naff, the cab looked like a shed, the water tank lid resembled a teapot lid and who would call a loco "Sweet Pea"? On the plus side there was a book with full building instructions, it is a proven design and, as I've found out, it's an ideal first-build loco. I made an offer for the bits and started machining in 2015.

I received, at the outset, two really helpful tips from the Thursday evening group: Les Dawson recommended I kept a diary of the build as it helps to maintain motivation when progress seems slow, and someone else said try and do something every day, even if it's only for 10 minutes. I spent 1380 hours on the build, with a few setbacks along the way. The worst was at 20 hours into machining the cylinder blocks and finding a void in the casting.

I bought the boiler from someone on the ME forum who started their Sweet Pea build about the same time as me. He threw in the towel after a suc-



cession of mis-  
haps and con-  
cluded the Sweet Pea wasn't for him. Me? I have thoroughly enjoyed the process of building my Sweet Pea, and despite my initial misgivings about its appearance, I now appreciate the design's charm.

Lockdown assisted the progress of construction and one of the first jobs I completed at the start of this period was making the saddle tank. This was



constructed from a Blackgates Engineering kit, which included the rolled brass sheet and flanged copper ends. Photos here show making the copper filler ring, which I could have been done by filing, but I opted, however, for the machined approach:

a short bit of copper tube was

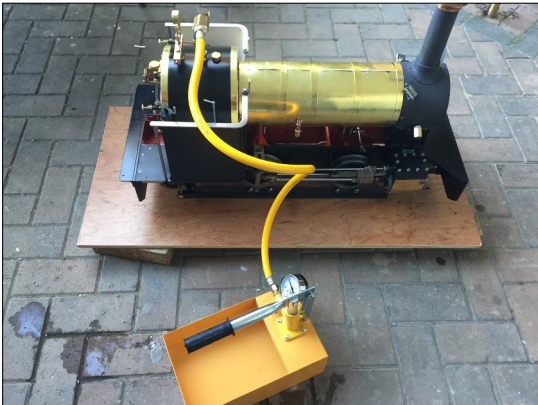
forced onto an aluminium mandrel, the curved profile was then milled with a long series mill plunged in at calculated coordinates and then parted off in the lathe.

The commercially available clacks for the locomotive didn't look right to me and I decided to make my own (*photo left*) This was my first attempt at making boiler/pipe fittings. My initial attempt with steel balls didn't work. I then changed these for Viton balls which did the trick. It will be interesting to see how long they last.



I also made a pair of mechanical lubricators to the Martin Evans design (*photo right*). One has been fitted to the Sweet Pea and the other is reserved for a Jubilee tank, which I've begun and will tell more about this in a future "Prospectus".

I arranged for a Hydraulic Test with the RSME Boiler Testers on the 24<sup>th</sup> April. I noted from "Prospectus" that the Testers prefer some prior checking



by the loco owner to ensure the boiler is leak-proof so that the test proceeds smoothly. I bought a hydraulic pump last year for this purpose. (*See photo below*) I am pleased to report the formal test went fine. The locomotive has a simple marine type of boiler which means the combustion chamber is easy to inspect for leaks. The boiler test on the 24th of April was the first seri-



ous steaming of the engine and the first time I had ever driven a miniature steam locomotive, which was very exciting. I am very grateful for all the helpful advice from the club members present (Peter, Nigel, Mike and Bill): using paraffin-soaked wood, the Sweet Pea firing technique, which seems to be keep putting coal in until you can't fit in anymore), someone pointing out the blower would work much better on 24V (with the right polarity of course!). I did have one problem, which was a broken linkage to the mechanical lubricator. This I managed to sort out in the club workshop with a bit of drilling out of a broken thread and rethreading.

A memorable day and something special to record in The Diary!! *(to be continued)*



Everyone appeared to enjoy themselves and have asked for another Tuesday run. This will now be on July 6<sup>th</sup> 12 noon onwards, fish and chips later.

*Top*—A tender moment with the Jones Bros A4.

*Above*—Karl Trussler couples up his Gresley 2-6-2

*Right*—a busy scene “on shed”.

Photos P Harrison



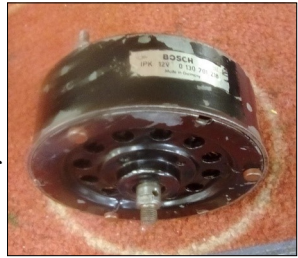
## Tuesday Running

**Peter Harrison reports**

On 22 June we had 14 locos in total running not all at the same time. 5 electric and 9 steamers, and there were 17 fish and chip meals ordered.

# RESTORING AN OLD ELECTRIC MOTOR by TERRY WOOD

Ever since I was little, I have been fascinated by electric motors the fact that you can turn an invisible energy (electricity) into mechanical movement was an endless interest. I used to take toys apart much to my parents annoyance just see how the motor inside worked. I even tried to make an electric motor at school to find out how they worked but the science teachers weren't much help one said " if I want an electric motor I'd just go out and buy one" which when you are young and don't understand something wasn't much help. Even the books I looked at weren't much help the ladybird book on electricity called Magnets Bulbs and Batteries is a great book until it shows you how to make an electric motor by winding the armature coil around a cork which would never work because you need to wind the coil of wire in order to create an electro magnet. It even shows you how to make an electro magnet in an earlier chapter by winding a coil of wire around a nail if you had wound it around a Biro or a wooden dowel it would never work.



So it took me a long time before I actually found out what materials you need to make an electric motor.

This motor that I restored is a Bosh disc motor which is unusual in that it has a very wide diameter compared to the body depth and the brushes rub on the back of the armature instead of on the side as is usual. The original plastic brush housing overheated and melted so I replaced it with some thick paxolin and made some new brush holders out of sheet brass which should be able to withstand the heat better.



Re assembling the motor was a bit tricky due to some powerful permanent field magnets so you had to clamp



the armature in a vice at the front then offer the rest of the motor to it making sure you don't get your fingers in the way! For some reason the motor wouldn't go together the rear bearing was hitting hard up against a shoulder on the armature shaft and the only way to prevent it was to machine the phosphor bronze bearing down, because the bearing was very soft you couldn't just place it in the lathe jaw chuck because it would crush or distort it so had to make up some holding tool and as luck would have



it I found a small Allen screw that had just the right size head diameter and smooth surface to be a press fit onto the bearing and act as a holding tool.

After machining down the bearing the motor then bolted together OK but then the armature was rubbing against the front bearing housing so then I had to make up some shims so that the armature was no longer rubbing. After much swopping of shims I finally got the clearance correct so that I could re-assemble the motor so that it would run

properly. It is quite a powerful motor so may be used in a future electric loco project.

## A VIST TO CREWE WORKS—58 YEARS AGO

**With photos by the editor JB and words by WP and JB**

This was an enthusiast train trip on 17 November 1963 I think organised by the RTCS or the SLS. It was hauled from Euston by immaculate Duchess Class Pacific 46245 City of London in red livery, with LMS carriage stock. For we London boys on the LMR 46245 was much a favourite and how sad we were when she went to the scrapyard the following year.

It was a wet day. As I recall we went to the works and visits to both sheds 5A and 5B at Crewe. However for the latter it was too dark for photography when we arrived there. This day was confounded when, horrors of horrors, my camera malfunctioned so my many of my pictures were much spoiled.



However all was not completely lost.

**WP adds** This picture John took in the Erecting Shop at Crewe shows in the foreground a Fairburn 2-6-4T 42442 and an eclectic mix of parts from several steam locos.

There appear to be on the left hand side two LMS cabs facing right and a BR Standard cab facing left.

To the right of the Fairburn are visible four boilers. The leading one is tapered. The boiler to its right has the top-feed cover well forward, suggesting a Black 5. To its left and behind the first taper boiler is a large boiler with a thick ring between the smokebox door and the outer edge, suggesting a Duchess, Princess Royal, Royal Scot or a Britannia.



The Stephenson Locomotive Society (SLS) monthly magazine for December 1963 has a report on the contents of Crewe Works as recorded on Friday 15<sup>th</sup> November, the last working day before John's visit. It shows among other things in the works, 15 Black Fives, 3 BR 2-6-0s, 6 9F 2-10-0s and a solitary Britannia 4-6-2 no 70045 Lord Rowallan, all in the erecting shop. It is reasonable to assume therefore that the LMS cabs are from Black Fives and the large rimmed boiler is from 70045, as there were no Duchesses/Princess Royals/Royal Scots shown on the SLS list as being in the erecting shop. Though there were listed two Royal Scots (46119 Lancashire Fusilier, 46143



The South Staffordshire Regiment) and three Duchesses (46227 Duchess of Devonshire, 46231 Duchess of Atholl and 46232 Duchess of Montrose) withdrawn and in the yard.

**JB** And here is 46227 Duchess of Devonshire. **WP** says, using the SLS list of what else was in the yard on

15th I reckon the other locos visible are :-

Left of 46227 is BR standard 2-6-0 78028 (16D Nottingham), behind 46227 Britannia 70025 Western Star nameplates removed (5A Crewe North), BR 2MTT 2-6-2T 84013 (9K Bolton), then a Black Five and a 9F. But on second thoughts that is another 9F and not 70025!

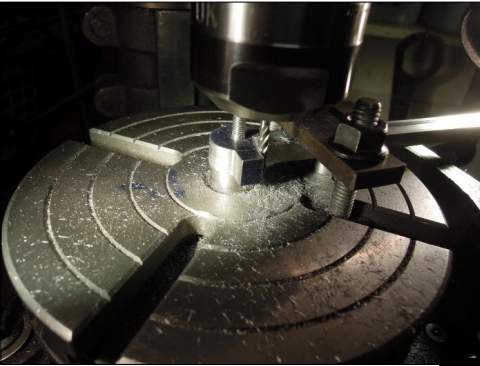
And finally **JB** adds, here is a rarity, in a one way visit to the works, rebuilt Jubilee Class 45736, a Phoenix that sadly did not arise from the flames.





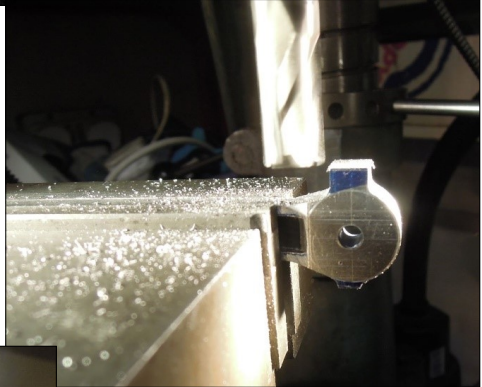
## IN SHOPS THIS MONTH—BUILDING A CLAUD

by John Billard  
The Coupling Rods Part 2



Having completed the flutes and narrowed down the body of the rods (not shown) the next stage was to round the ends. I used a long series 1/8" endmill for this. Care had to be taken around the oil boxes and also the bush locking feature opposite.

The oil boxes were machined to height with a 1/2" end mill and with the rod reversed the bush locking flat dealt with in the same way. This can just be seen in the picture facing down.



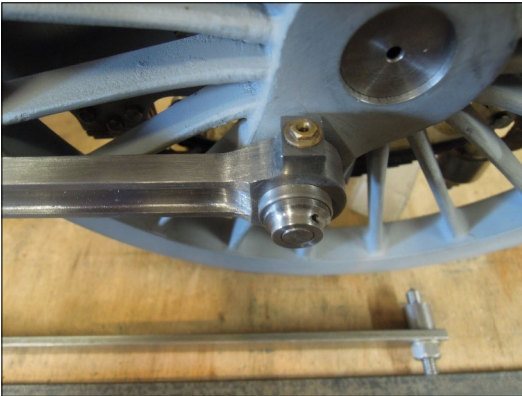
The next stage was to drill the rod ends to take the bushes. The centres were registered by lining up a 1/4" silver steel rod in the chuck before drilling.



And here we are with the rod end drilled out to  $31/64$ ths in  $1/32$ ” steps. (I love these imperial measurements—how certain they are!)

The rod was then reamed  $1/2$ ” at slow speed with plenty of lubricant (not shown).

Photos John Billard



The bushes were turned from cast iron. This is prototype practice and looks much better than the usual bronze.

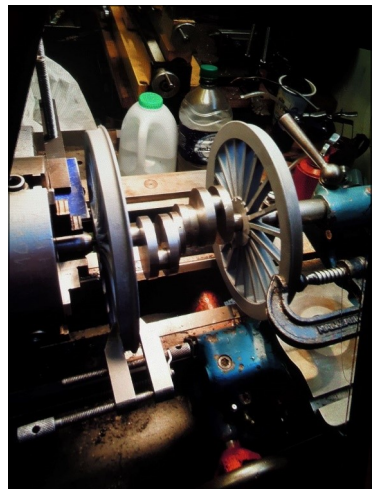
The rods were finished by creating an oil reservoir in the box topped by a lubricator approximating from the works drawing.

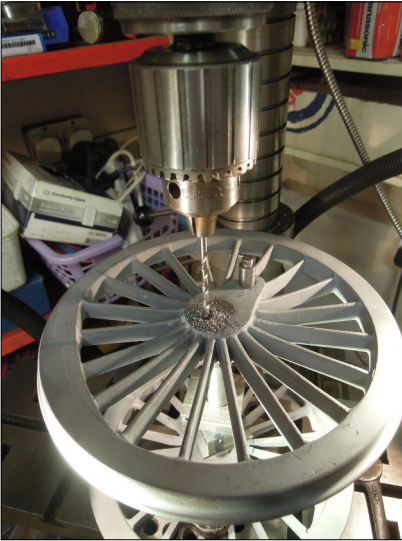
Note that the wheel is not fully home on the axle as it is yet to be secured.

I had been thinking for a long time about how to quarter the driving wheels. Previously I had done this on the lathe but at over  $7.25$ ” diameter this method would not fit my Myford,

Fortunately fellow member Stephen Millward came to my rescue offering the use of his Smart and Brown lathe that has a larger swing.

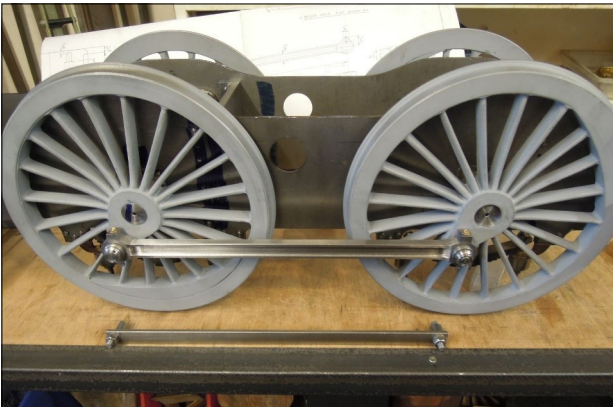
Quartering was easily achieved with reference to a 4 jaw chuck with the crank balanced against the cross slide and then using Loctite 603. Each wheel set was left overnight to cure.





The final operation was to pin the wheels on to the axles. I am sure that the Loctite will hold but this is a usual precaution.

The receiving hole was drilled No 31 and a 1/8" silver steel pin inserted having been given a slight taper so it pushed in by hand about half way. It was then knocked home with a copper drift.



The moment of truth is when the coupling rods are fitted and the wheels rolled. How good it would have been to say that all worked perfectly—but it didn't. Despite all the care taken there was one sticking point that I wasn't happy with. This was rectified with a bush modification.

The trammel used to measure wheel centre can be seen.

This concludes this part of the construction for now as attention is now turned to the boiler.

As already described I have modified the Martin Evans Belpaire box design to a round top and followed this up with the purchase of a boiler kit from Western Steam. More of that next time.



## 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 August issue is 18 July**

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

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