Sussex Miniature Locomotive Society

Wharfedale News. Issue 22
20th Aug 2020

Dear all,

Hope this finds you still in good shape and finding ways of keeping busy.

Another week has gone and no real end in sight of the Corona Virus. I have just cancelled our G scale railway show at Henfield in November as it is still too risky to assume that social distancing will be gone by then and that the public will have the confidence to come to such indoor events. I have now ventured out in the car with Lorema acting as chauffeur and I am hoping to get a clear bill of health at the end of the month with the ability to drive again.

We have had some good news as our granddaughter has just given birth to a baby girl, Imogen Elizabeth, and makes us now proud Great Grandma and Granddad for the third time.

Stay safe

Mike

Brief club house NEWS

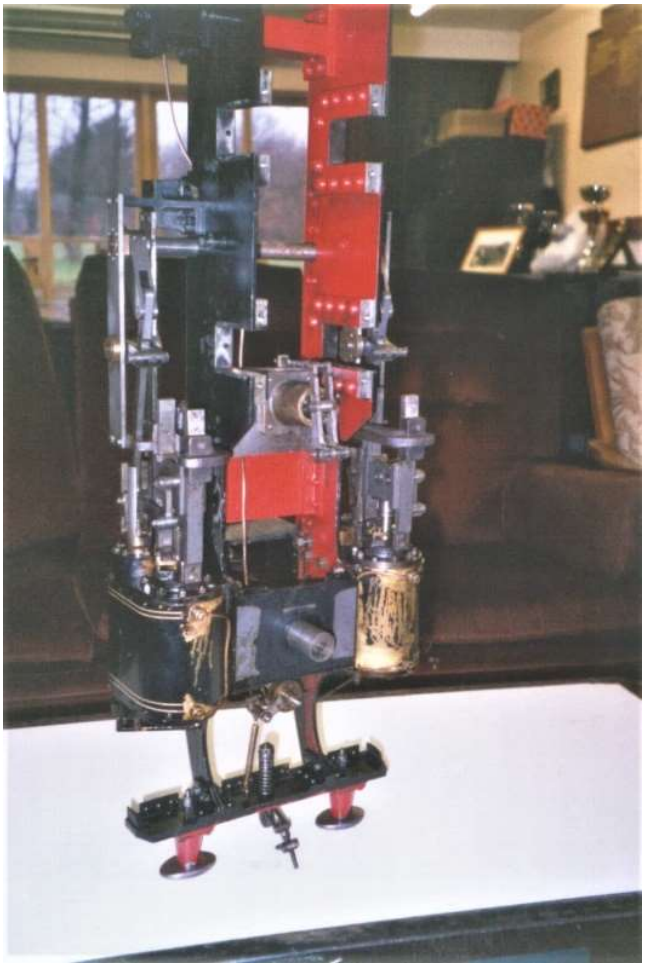
The second fun run took place on Saturday evening which again was enjoyed by those who had registered to attend.
Nick and Dan ran the City of Truro and Val came along to see it run.
The weather was very humid on Saturday and they were able to get some very good atmospheric photos of the City in steam. (See below)
The Wednesday run was cancelled due to weather conditions but it will be rescheduled ASAP.
The take up on the original dates has been low but we are still open to arrange more fun run evenings. If you would like to have a run please call Andrew S and every effort will be made to fit in with your requirements and make it possible.
The latest on the re-roofing is that it has moved back a week to early September.

The team emptying the roof on Saturday did extremely well and have succeeded in getting over 60% of the roof empty. Many thanks to Dan, Nick, Graham, Adam and Andrew S for the hard work. The second team will hopefully complete the task this next weekend.

The current working team are still at it and continue to do a good job, thanks go to Mike P, Graham Miller, Dave Mattingley Andrew S, Roy P, Mick Robinson, Sam Hope and John Green, for continuing to offer their services and thanks to Tom and Andrew S and Andrew B for continuing to maintain the security patrols.

Dan's Photos of the City.

Wharfedale Article 22



Circa 2000.

Mike's Musings No.20

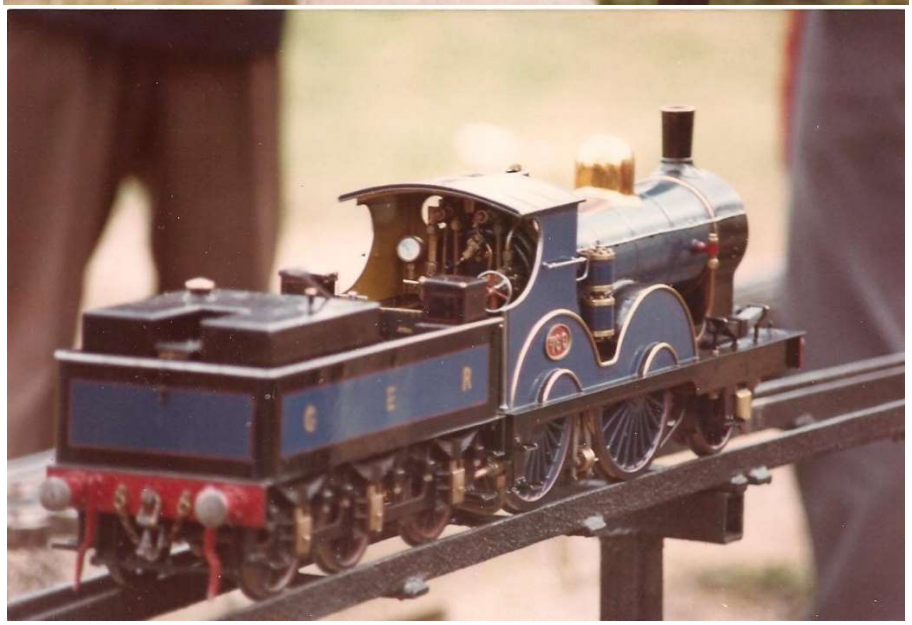
I was grateful, in my young days, to a chap called Harold Munday, who used to let me drive his engines at the club, when I was still at school. In fact, he didn't care to drive much, but rather enjoyed building and seeing them run. Here's a photo of me behind his LBSC's "Doris", ie 3.5"gauge "Black Five", on the old track. (I had hair and all my fingers in those days!)

This track sat on breeze blocks and was a bit rough! The problem was, Chichester club was on the site of an old rubbish dump. Council rubbish and old cars etc. were continually sinking underneath the topsoil and in some places there were 5 or 6 breeze blocks above ground and 8 or 10 below! Really! It was a fight to keep it more or less level. What was a problem then though, actually became a salvation about 20 years ago when the council wanted the club site for flats. When taking soil samples, the results came back as "highly toxic, and they deemed it unsuitable to disturb, so the club remains there to this day!

Harold also built in 2.5" gauge and made a lovely little coal-fired schools class which I used to drive as well. The firebox was only about an inch wide and 2 or 3 inches long, and the best I could do was a couple of laps without stopping for water and recovery (about a fifth of a mile). I only knew Harold for a few years, and then he was tragically killed on his bike one night whilst cycling home on the old Chichester to Bognor road.

Once I started to earn some money, I wanted to have an engine larger than a "Tich", so I could keep up with the other locos on the track and also haul a passenger or two. I found a very worn out 3.5" LBSC "Petrolea". On testing, the boiler behaved more like a colander, so I scrapped and replaced it. I bashed out

new boiler plates and a friend in Southampton, with a nice propane torch, helped me “stitch” it up. Some work on the chassis, and then a repaint, had it back in action. Like many LBSC engines, I couldn’t get forward and reverse to work equally, so set the valves for forward gear, and she would notch up a few turns without going out of beat and flew like the wind! I once handed her over to our worthy chairman at the time, to “have a go”, and he found out the regulator shut the opposite way to his own engine. Attempting to shut down, he opened up, the engine leapt away like a greyhound and his fingers came off the regulator. By the time he realized he “went the wrong way” and got hold of the controls again, she was nearly in orbit! I was watching and almost had a heart attack, such was the acceleration, and when he got back, I found out our dear chairman had similarly thought both he and the engine were “toast”! Somehow they clung to that rickety track, ha,ha.



Andrew Ellis.

Fishing Village

Caravan restoration with Andrews mum's having made the interior decorations,

Andrew E. To be continued.

News From Afar - 19 Aug.

Crested Pigeon

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Members - Sunday 16 Aug - Optional

Tim with his Shay out for a spin. I expect you are familiar with these , but just in case:

Ephraim Shay (1839–1916), was a schoolteacher, a clerk in a Civil War hospital, a civil servant, a logger, a merchant, a railway owner, and an inventor who lived in Michigan.

In the 1860s he became a logger and wanted a better way to move logs to the mill than on winter snow sleds. He built his own tramway in 1875, on 2 ft 2 in (660 mm) gauge track on wooden ties, allowing him to log all year round. Two years later he developed the idea of having an engine sit on a flat car with a boiler, gears, and trucks that could pivot. The first Shay only had two cylinders and the front truck was mounted normally while the rear truck was fixed to the frame and could not swivel, much as normal drivers on a locomotive. He mounted the 3-foot

(914 mm) diameter by 5-foot (1,524 mm) tall boiler centered on the car with the water tank over the front trucks and with an engine supplied by William Crippen mounted crossways over the rear trucks. Shay experimented first with a chain drive from the engine through the floor to the truck axle. It is not known if he powered one or both axles, but he soon found that the chain drive was not practical and he next tried a belt drive. It did not take long for the idea to become popular.

Lima Locomotive Works of Lima, Ohio built Ephraim Shay's prototype engine in 1880. (Source - Wikipedia)

Tim deep in thought about something. The question is 'What'? "Why is it taking so long to raise steam? What am I doing wrong?" Who knows. It got going and he had an enjoyable day which is the main thing.

Nathan Six Chime Whistle Update.

The reducers and other fittings arrived from Sydney. It has an American thread, 11.5 tpi, 2 inch, NPT thread. The joiner will require some work as it is too tight and it would be undesirable to try and re-machine the whistle. ‘Baxters Engineering’ who found the parts for us are heavy engineers here in Canberra, and are more used to fixing heavy excavators than our little ‘stuff’, but have been very helpful in times of need. They have offered to work on the thread.

To be continued:

The trip to Nimmitabel to pick up the donated track. 17 August.

Nimmitabel (main street left) is an old ‘timber town’. Logging was the main industry in this area and continues to be to some extent but at present from bush fire affected plantation timber and not natural growth forests.

The donated track looking a little forlorn in the donors late fathers garden.

The property is up for sale minus the railway track.

Peter below getting stuck in.

Mick our Secretary chatting with Ian, the donor, after loading and prior to our departure back to Canberra. They look cold and the wind was the culprit. As we were at 1120 m above sea level and in ‘plains’ country the wind was like a knife.

Mick is getting to look more like ‘Santa’ every week with his ‘growth’.

Above the track and the support blocks loaded ready to depart.

The track, 3.5 inch gauge, is not large, probably around 100 m, and was located in the garden of the house shown left.

Stay well. David - Canberra - 19 August 2020

Building a miniature engineering business – Published in 'The Manufacturer' 10th Oct 2017

Adam Cro explains discusses how he turned a hobby into a business that blends traditional and modern engineering practices – Matt Pulzer reports.

It's not every day you meet a 25-year-old engineer with 17 years of experience under his belt. But then Adam Cro and his company Cro Fittings (www.crofittings.co.uk) are neither your average engineer nor engineering company.

Adam Cro, owner-founder, chief mechanical engineer, sales rep and bottlewasher, Cro Fittings.

Model engineering, the art and science of creating working engineering miniatures (see box) runs in his family – both his father and grandfather were talented model engineers, as confirmed by a well-stocked, glass-fronted cabinet of beautiful locomotives, and Adam caught the bug when he was just eight. By day he is a degree-educated design engineer for a company involved in fire hazard test systems. In his spare time he is the owner-founder, chief mechanical engineer, sales rep and bottle washer for Cro Fittings. He manufactures and sells super-detailed parts for model engineers constructing coal-powered, British steam locomotive models. I met him on his factory shop floor – a small room next to his parent's kitchen – to find out how he ran his miniature engineering company.

I can see an array of very small bronze components on your workbench – what are they and how are they made?

Cro model's parts in 3D CAD, drawing in a 1:1 ratio – in other words full size, attempting to make a perfect virtual replica.

You are looking at scale, mostly working fittings of original parts for 1950s-vintage British Rail steam locomotives. That black pedestal includes items such as a fully operating vacuum-breaker blower valve. The manufacturing is quite complicated. You could summarise my approach as a mix of 'old-fashioned' and 21st-century engineering techniques. On the one hand I like to use traditional lathe and mill work, and given the nature of the parts (and customer base) everything is in imperial measurements. But on the other hand, I use CAD, additive printing and outsource via the web some aspects of fabrication to countries as far afield as New Zealand. Plus, of course, I can promote my business via social media and assorted online fora. It's a nice blend of old and new, which is a pretty good reflection of the product and market in which I operate.

So talk me through your production system, and how does New Zealand fit into scheme?

Once I've chosen the part I want to make I do my research. I prefer to work from original engineering drawings (for example from the National Railway Museum archive in York). However, if I can't find drawings then I will take measurements from an actual loco – that pedestal comes from *Camelot* (www.73082-camelot.com) at the nearby Bluebell heritage railway.

Next, I model the part in 3D CAD – the kind of system any modern, professional engineer uses. I start off drawing 1:1, in other words full size, attempting to make a perfect virtual replica. In fact, I have had inquiries about manufacturing full-size parts, but for now I am happy focusing on miniatures. Next, I scale down the CAD model, typically in the ratio 11.3:1 for 5-inch gauge (the distance between rails) – one of the most popular sizes used by model engineers.

At this stage, I have to do some finessing of the part, particularly if it is designed to operate and not just look pretty. The thermodynamics and fluid flow of a system do not scale proportionally with a part's reduction in size, so I need to keep an eye on what works and what needs tweaking. Plus, more mundane aspects of construction such as wall thickness need to be watched carefully because a part may simply be too delicate if scaled without consideration for final dimensions, machinability and operating conditions. Fortunately, modern CAD is very helpful here – for example, I can set minimum wall thicknesses and

ensure there is enough material to produce a viable part. Then there are standard engineering matters to consider, for example leaving enough extra metal on port faces to ensure I can hold and machine them properly. It's a long list of things that need to be right and CAD is definitely a huge help.

So now that you've got your virtual piece finessed and finished; is this where additive printing comes in?

Almost, I now have to think about where to attach sprues for molten metal flow, and last, but not least – as anyone involved with casting will tell you – it is vital to take account of shrinkage as the liquid bronze cools and solidifies.

The writing on this vacuum brake cover is less than a millimetre tall.

Now it's time to print. I have a partner/supplier/colleague in New Zealand – Mike Jack – who has invested in some very high-quality tools and we cooperate on the additive printing side. We share a Dropbox folder, so all I have to do is send him the completed CAD files and he can print them off for me on his industrial-grade 3D Systems wax printer. Next, the part is UV cured and we're ready for casting. By good fortune, Mick has access to several nearby precious-metal jewellery foundries. They are just the right kind of partner for understanding the kind of fine quality work we want – we simply substitute silicon bronze for gold and platinum. They operate a vacuum lost wax process, which is how we achieve the superb resolution of the castings. If you look at some of these parts the original maker's text cast into the parts has been reproduced in my models, and you need a magnifying glass to read it. That is the level of quality our combination of modern additive printing and the ancient lost wax process can achieve. And then, finally, the castings are posted to me.

I should point out that New Zealand is not my only source of castings. Depending on the size and cost of parts I also use suppliers in the Netherlands and here in the UK, but my main sub-contractor is Mick.

Now that you have your castings, what happens next?

I essentially offer two kinds of products. A machined and finished part ready to be plumbed into a locomotive, or a small bag of castings, material and fixings that

model engineers can complete themselves. I advertise on Facebook, have my own website and have an active presence on model engineering forums where I get the chance to meet customers and present a human face to the company.

Most of my sales are in the UK, but I have sold parts to Australia, South Africa, New Zealand, Spain and Switzerland. Plus, I've just had contacts and inquiries from the US.

Engineering in miniature

From the broader perspective of British manufacturing, the story of model engineering has very much mirrored that of the full-sized sector. In fact, model engineering first started in Britain at the end of the nineteenth century when it was still a world-leading metal basher, drawing in adherents from the large pool of highly trained engineers, technicians and tool makers. As British engineering contracted, so too did the number of model engineers, and today there is a commonly heard concern within the hobby that not enough young people are involved – a worry that will sound very familiar to the rest of engineering. Now, just as the manufacturing sector is recognising the importance of attracting the next generation of engineers and investing in techniques such as additive printing, model engineering is also starting to adapt itself and use more up-to-date manufacturing techniques, which may well help to attract younger, more computer-oriented modellers.

To some extent the two rise and fall together. Full-scale engineering supports and underpins much of what modellers achieve, but just like Adam, young people brought up in the model engineering world learn very early what a fascinating and attractive career engineering offers and are a ready source of new entrants to manufacturing. In other words, it's a great way to 'catch 'em young'.

What's the future for Cro Fittings?

Although I am happy with the current level of business – and in fact have just about reached the limit of what time permits me to do – there are always new parts to model. I keep an eye on the falling cost and rising quality of additive printers, so I am may well try my hand at making my own waxes. It may even be possible one day to go directly to metal additive printing, but that is certainly a good few years down the line – it's still a very expensive process and the price would have to come down considerably – but time is on my side, we'll see!

3 years Later – What's the story now?

Since meeting with Matt in October 2017 a lot has happened and changed in my life, I'm now married, I have 2 dogs and a cat (no kids yet thank you!) and I have bought my first house which in turn means my own workshop.
The workshop is full of both engines (5 on the go now in some form or another) and fittings on the go with something like 20 open orders for machined or completed parts. I have very little time for my own model engineering, but I still make sure I do something for myself each week. The list of parts available has essentially doubled in those 3 years and the quality and the detail in them has gone up above what anyone else is able to do.

2 1/2" Gauge Schools Class Nameplate 'Brighton'

5" Wakefield Lubricators to suit a Merchant Navy Class, now seen on Howards 'Cunard White Star'

I have ventured briefly into the world of CNC machining with a small desktop CNC router/mill but time is not on my side to learn more about it to make it a useful addition so it's time to move this on and make space for more equipment such as the lovely BCA Jig Borer Andy S. is currently storing for me (thanks!).
In the coming months I hope to work through a lot of the orders and aim to start the new year with a clear book and keep my lead times down now that I have a well set up and functioning workshop which will allow me to spend more time on my own projects and helping others as my door is always open to anyone who needs help, please come visit the kettle is always on! **Adam Cro.**

Puzzle Corner.

Lorema's last week's Challenge:- Ditloids.

1	3=S in a T	3 sides in a triangle.
2	5=R on the OF	5 rings on the Olympic flag.
3	9=L of a C	9 lives of a cat.
4	11=P in a CT	11 players in a cricket team.
5	12=S of the Z	12 signs of the Zodiac.
6	21=S on a D	21 spots on a dice.
7	24=BB in a P	24 blackbirds baked in a pie.
8	70=SL on M	70 speed limit on motorways.
9	90=D in a RA	90 degrees in a right angle.
10	100= C in a D	100 cents in a dollar.

Lorema's this week challenge.

Word search:- Steam engine and its Bits and Bobs. (20 to find)

X	R	O	T	A	L	U	G	E	R	H	P
B	L	O	W	D	O	W	N	V	L	I	B
S	B	U	F	F	E	R	A	I	S	N	K
W	Y	T	B	Z	X	C	O	T	Q	J	S
E	A	D	L	R	N	M	O	F	T	E	R
R	E	T	A	W	I	N	A	A	V	C	E
A	G	J	S	Z	W	C	T	L	L	T	L
X	U	S	T	T	X	T	A	A	U	O	I
O	A	F	P	R	E	V	M	T	L	R	O
B	G	I	I	Z	Y	A	K		O	X	B
E	B	D	P	T	H	G	M	F	I	R	E
K	V	Y	E	N	M	I	H	C	A	J	X
O	X	F	J	S	A	L	R	K	R	F	F
M	A	L	E	E	H	W	E	F	A	T	S
S	I	G	H	T	G	L	A	S	S	D	T

My thanks go to all who keep sending me the material.

If you have something for the NEWS please contact me

mike.wakeling@btinternet.com **Mobile** 07921819724