



LeedsLines

Newsletter of The Leeds Society of Model and Experimental Engineers

Editorial With regular scheduled running days coming to an end the warning to check the availability of the track before travelling for a 'private run' is especially important. The shorter days and cooler temperatures slow down the track replacement and levelling operation, and this may result in the track being unavailable for longer periods of time. The track will be available for the remaining scheduled running dates. Up to date information on the state of the track can be found on the website or by telephoning Hon. Sec. Geoff

From The Chair

Jack Salter

Health & Safety We take health and safety seriously within our Society, we have for example spent considerable money and effort installing anti-tip rails in recent years, put in a separate water tank for our loco water taps so that there is no risk of contaminating the drinking water supply, and are planning to reduce the number of running days next year to ensure that we have sufficient track Marshalls to ensure safe running at all times, all good common sense measures.

However overregging safety issues does not help members of our Society trying to enjoy our hobby in a safe and legally compliant way, I may regret saying it, but if someone says we have to do something "because of Health and Safety" and it doesn't seem common sense then ask why?

We are all responsible for our own health & safety, and that of others. We have an excellent record at Leeds SMEE and long may it continue.

Firearms Law A Scoping Consultation Paper

An item in the recent Southern Federation Newsletter seemed to suggest that consultation on firearms legislation was seeking to control the supply of lathes, as they can be used to convert imitation firearms or restore deactivated firearms to their former functionality.

In a note to our Committee I explained that the Southern Federation Safety Officer had taken the consultation document out of context and interpreted it in a different way than it is intended.

There is no proposal to control the supply of lathes. The proposals seek to clarify what constitutes a 'firearm and look for ways to deactivate firearms to higher standard than in the past. The proposals acknowledge that machinery such as lathes, and other precision tools are more readily and cheaply available than they were when the current legislation was written 35 years ago.

Possession of both a lathe and a deactivated/imitation firearm that could potentially be activated will not be an offence, innocent possession will not be criminalised.

For those interested and with access to the internet the relevant document can be found on the Law Commission website by following this link.

http://www.lawcom.gov.uk/wp-content/uploads/2015/07/cp224_firearms.pdf

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Model Engineer to Marine Engineer Part 2 — Boiler Considerations

David Beale

**Photo 1**

Most enthusiasts find the boiler and all the regulations relating to construction, safe maintenance and operation to be a major hurdle. It need not be difficult or onerous if the various stages are undertaken in the correct order. So many times one hears of people having completed a boiler before even discussing the project with a boiler inspector.

The majority of steamboats are coal fired others using central heating oil and a minority using propane. The latter categories have more onerous safety requirements to comply with water-way licensing regulations.

I have constructed two boilers of the type shown in **photo 1**, this design is a three drum arrangement similar to the Yarrow with an upper large steam drum and two lower smaller mud drums. This basic pressure frame is a welded steel construction with helically wound copper steam generating tubes silver soldered into nozzles. A true Yarrow type is installed in *SL Mosquito* and is shown in **photo 2**, note the hairpin superheater located below the steam drum where it benefits from radiant heat.

Boiler Construction

But before you are put off by too many decisions let us get back to the interesting time spent in the workshop. Potential enthusiasts will see the boiler as a most daunting prospect, either expensive to buy or shrouded in bureaucracy for the home constructor. Boilers are satisfying to make and can offer a new challenge, I hope to convince you of this.

First and foremost obtain a boiler design that has been approved by a Competent Person, or produce your own drawing and have it approved. Next decide who will inspect your boiler during its construction and later when it is commissioned and put into service. When you have found a suitable boiler inspector contact him to discuss your intentions and ascertain what his requirements are.

My design was one of the many approved designs available through The Steam Boat Association (SBA).

My inspector was happy for me to purchase certified materials in compliance with those specified on the design drawings. Where formal certification was either expensive or not readily available the inspector was prepared to accept invoices which detailed the standard of the material. It was profitable to shop around, prices varied considerably and my order was comparatively small. It was easy to obtain 6 metre lengths of tube but ½ metre was often attracting extremely high cutting costs.

As previously mentioned my choice was a boiler with a Yarrow configuration but using copper coils instead of straight tube. **Photo 3** shows the steel pressure vessel before the copper coils were added. **Photo 4** shows the copper coils that are silver soldered into the nozzles of the top drum and directly into the bottom headers.

The steel pressure vessel utilises readily available butt weld fittings complying with British Standard No. 1640 or BS1965 requirements. No doubt these standards have been replaced by Euro Norms but suppliers still recognise British Standard references.

Photo 5 shows how a reducing tee is used to provide a dome and an excellent access port for the boiler inspector.

My Myford Super 7 was used to make weld preparations and bore the holes necessary for nozzles and other fittings. **Photo 6** shows an end cap being prepared to accept a downcomer tube.

The steel pressure vessel was jugged with appropriate weld gaps onto a stout wooden board. Wooden spacers were used between the bottom drums with steel ties as shown in **Photo 3**, to hold the assembly ready for welding. I was permitted to use tack welds to help hold things together on the understanding that the qualified welder would totally remove them. Unless your welding competence is to the required standard you will require the services of someone acceptable to your inspector.

I have spent a career working in power station maintenance where competent welders were readily available for private work. I recognise that welders may not be so readily accessible to all and to overcome this difficulty designs are available that require no welding whatsoever.

**Photo 2****Photo 3****Photo 4****Photo 5****Photo 6**

An interesting and satisfying task was winding the copper coils, this was achieved using my Harrison M300 lathe, the Myford has neither sufficient centre height or robustness.

The coils are ½" o.d. x 18swg wall thickness and are wound left hand and right hand with a helical lead of 1¼" to permit intertwining as seen in **Photo 4**. With copper prices being high it was considered sensible to adopt a winding method that would prevent both damage and distortion to the tube. **Photos 7** show the arrangement where a shaped roller follows the helix in the hard wood former.

Most lathes will not cut a helix with such a coarse pitch and to produce the formers it was necessary to remove the leadscrew drive gears and to fit a chain drive. A router or other wood cutting tool is mounted on the tool post and the helix cut in the same way that one would cut a screw thread.

I readily accept that a large lathe is required for the above process and if this is not available at home or the club workshop a fellow club member may be interested in the challenge. Alternatively consider a design where tubes are formed using a bench mounted pipe bender.

The finished pressure vessel is shown in **Photo 8** the coils having been silver soldered into the headers using EasyFlo 2. An economiser coil is shown formed around the top of the steam drum, this takes advantage of waste heat in the flue gas to heat feed water before it enters the bottom headers.

At this stage my boiler inspector required a hydraulic test, all outlets were plugged and twice design pressure was applied for 30 minutes. With this satisfactorily completed the boiler casing could be completed. **Photo 1** shows the finished boiler ready to go into the boat. Do not underestimate the work content required to make a gas tight casing. You may not like a painted sheet steel finish and choose a wooden exterior more in keeping with Edwardian elegance, the choice is yours.

Boiler Types

A water tube boiler giving a large heating surface within a small footprint is the Odfeldt or Lune Valley type. The construction principles are very similar to those adopted for the Blackstaff type described above. The copper coils are formed and silver soldered into a steel core. The whole is then encased to give a vertical cylindrical boiler. **Photo 9** shows the complete pressure vessel undergoing a hydraulic test at 300 lb/ins² this being twice design pressure. The vertical steel column seen in the foreground accommodates the water level gauge. This arrangement requires all external connections be they steam or water to be made via the top flange. Any connections made at the bottom of the steel cylinder would be exposed to continuous radiant and convective heat and would require continuous cooling to prevent them burning out. An intermittent feed from say an injector or pump would not provide the necessary cooling and the tube would eventually fail.

The boiler is a very rapid steamer and more suited to oil firing applications where the heat source can be regulated quickly.

Firetube boilers provide more leisurely management due to their large internal volume when compared with water tube types, but are much heavier. They are much easier to clad with insulation and finish with attractive timber. Water tube boilers often require a separate frame or crinoline to hold the insulation and onto which a metal cladding is secured.

Photo 10 shows a typical vertical fire tube boiler suitable for a launch of up to 18ft in length. A locomotive type boiler is often used where side firing optimises the best use of hull accommodation. **Photo 12** shows an example of this type being readied for testing.

For the very ambitious why not try a monotube steam generator, I made one for a road vehicle with satisfying success. The leisurely pace of a steamboat makes the all essential balance of steam take off, water feed and firing much more easily achievable. No traffic lights or hills to contend with on the water. **Photo 11** shows my arrangement but I would not recommend a monotube for your first steamboat, although a number of successful examples do exist a vertical fire tube type would be my recommendation. Once again approved vertical fire tube (VFT) designs are available to SBA members.



Photo 7



Photo 8

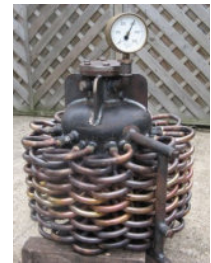


Photo 9



Photo 10



Photo 11



Photo 12

The next issue will see the concluding part of this article covering the construction of a suitable engine

Kite Aerial Photography (KAP)

Mike Waters

At the Trophy Night meeting I took along a couple of camera mounts for KAP as “work on the table”. As they are of minimal interest in the model engineering sense I didn’t enter them in the completion, but did offer to talk about them as a “time filler”. Afterwards Jack Salter proposed that they qualified for the ”One Off Trophy” and unexpectedly that is what I went home with!

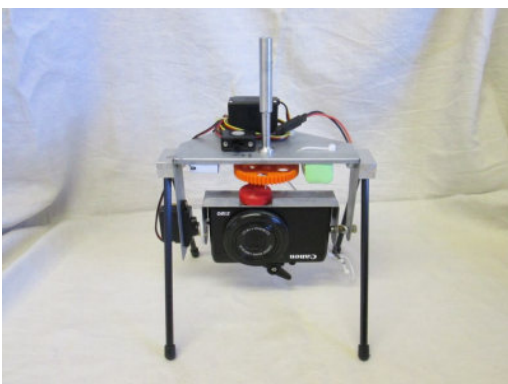
Like all things the principal of KAP is simple, loft a camera up high hanging below a kite and take pictures, the practice as usual can be more complicated.

There are two main ways of attaching a camera from a kite line, a “Picavet” suspension and a Pendulum. The earliest is probably the ”Picavet”, consisting of line and pulleys looking like a cat’s cradle and operating in a similar fashion to a “Watts linkage” which tries to keep the camera level whilst the kite line angle changes in gusts. This was developed by a Frenchman during WW1 for taking pictures of the opposing trenches. The Pendulum is just that, attached by a stiff joint to a short boom on the kite line. One of its advantages is that the boom resists the turning forces generated by the camera mount turning as it pans.

The camera, now usually digital, is supported in a form of gimbal allowing 360° pan movements and tilt from horizontal to vertical. The position of the camera and shutter control can be either by an on-board IC chip, driving RC servos, in pre-set pan and tilt steps (AutoKAP), or from the ground using a model aircraft RC transmitter/receiver.

Both methods have their merits, AutoKAP allows you to concentrate on flying a fairly large kite, but with the disadvantage that the camera may be pointing in the wrong direction for part of its 360° rotation. RC allows targeted photos, but as you can’t see the result, without a video downlink, you are left guessing slightly where the camera, which can be 100m away, is pointing. The camera though, even with one of the two methods of suspension, still moves around a lot in gusts and AutoKAP has the advantage here in that you usually end up with a considerable number. of pictures to pick the best out of.

Shown here are some typical pictures taken at Filey and Flamborough .



Above	The Brigg at Filey
Left	Pendulum mounts
Right	The lighthouse and North Landing near Flamborough
Far Right	A ‘Picavet’ attached to a large kite



IMLEC July 2015

David Beale

I left Bournemouth last year wondering what I had learned about driving a steam loco in the 50 years I have been pursuing the hobby. I left Nottingham this year very happy with my run but knowing where my performance could be improved.

IMLEC really tests your engine management skills also your ability to build and maintain a locomotive. No stopping in the station every lap to recover the fire or water level, no stopping to tighten something or other. Why not have a go to see what I mean.

The Nottingham event was particularly good because Arthur our President was able to be there on Sunday. He had come through serious life threatening conditions compounded by the need for dialysis & injections for diabetes et al. We were able to enjoy a splendid social event with John Cottam (the winner, again!) and George Winsall entertaining us with guitar and clarinet on Saturday night.

What could I have done better:

- 1 Taken one more passenger.
- 2 Soften the blast to prevent unburnt fuel particles leaving the chimney.
- 3 Paced my run better, I was 15 seconds too late to commence another lap.
- 4 The above resulted in too much fire remaining on the grate.
- 5 Consider ways to reduce the unburned fuel in the smokebox.

Overall I was pleased with what after all is a diminutive loco and IMLEC results show that small locos particularly 3 ½" gauge do not do well. It is 35 years since a 3 ½" gauge loco won IMLEC with only one other occurrence. 1975 Laurie Joyce with his King and 1980 Percy Wood with his Britannia.

The following locos have proved good performers:

5" Britannia has won 4 times.
A 2-8-2 loco has won 10 times
Nigel Gresley 2-8-0 4 times
Speedy 3 times

Drivers performance:

Lionel Flippance 5 times winner
Les Pritchard, Percy Wood, John Heslop, Geoff Moore, and Alan Crossfield each having won 3 times.



Xmas Meal 2015

Karen Bennett

Following the popularity and success of last year's Xmas meal we have again booked the conservatory at The Owl Hotel in Hambleton. The dinner will take place on Wednesday 2nd December with diners meeting at 7:00pm for a 7:30pm start.

A menu is available in the club-house and a selection sheet is available on the noticeboard in the club house. Options available for the meal are 2 courses for £12.99 or 3 courses for just £15.99.

Please put your name and that of your partner and your choices from the menu on the selection sheet in the club house before 18th November.

Thank you and Nigel and I look forward to seeing you there.

Working Party Update November 2015

Track renewal Track renewal has slowed down a little in recent weeks due to wet weather and some scheduled Running Days getting in the way. We are now about two thirds of the way through the project which was started in November 2013. Track is currently lifted for replacement on the bend prior to Signal No. 2 on the approach to the tunnel. This area is proving time consuming to relay since all the concrete beams in this area either need treating with levelling compound or removing and resetting to obtain the desired super-elevation. Even the quick setting levelling compound is taking longer to go off since temperatures have fallen! We are also getting through a lot of wood preserver and have lost count of the number of litres used. It is expensive stuff these days since the original 'clear your tubes' creosote was banned. It is surprising how much soaks into hardwood sleepers.



Hon Sec making-up a replacement track section

Other work: An important safety modification has been completed on the Steaming Bay Traverser. The limit switch arrangement has been changed to operate by the push rods which lock the carriage in place. Now, the signal remains red and the audible warning continues to sound until the locking bolts are fully engaged at each end. Praise be to our electricians and their amazing spiders webs (wiring diagrams)!

Hon Sec Geoff

79th Annual General Meeting 21st October 2015

Held at Eggborough Power Station Sports and Social Club

The meeting opened with the Treasurer reporting the good health of the clubs finances despite an unexpected increase in the subscription price for membership of the Power Station Sports and Social Club. Since this increase happened midway through the year a decision was made for LSMEE to absorb this increase rather than trying to chase-up members for the extra money.

In his Presidents address Arthur Bellamy referred to another successful year for the club and thanked the working parties for their continued efforts to improve the club facilities. He also thanked members for representing the club at national events with particular mention of IMLEC and the Southern Federation Rally.

Arthur also made reference to talk of Eggborough Power Station closure and expressed his opinion that even if this happened the clubs tenure of the site would still be safe for many years to come.

On a personal level Arthur thanked club members for their support in what had been a difficult year for him.

In his Chairman's report Jack Salter thanked members for their efforts that have contributed to the continued success of the club. Particular mention was made of the Xmas dinner and quiz, the Harrogate Exhibition, the August Rally, raffles, Portable Track, Working Parties, the Web Site and Newsletter. Too many to name here but they know who they are. Jack also mentioned and thanked the 'forgotten heroes' who made the small things, like tea and coffee, clean T-towels and empty rubbish bins, happen in the background. The quality of speakers taking part in winter talk programme was mentioned with short talks given by members proving to be especially popular. Jack appealed to members to consider giving a short talk about their special area of interest.

Jack asked us to keep in our thoughts Edwin Hughes a long time member now in full time care and Marcia Beale, a stalwart supporter of David's activities at the club, who is ill and undergoing treatment.

Jack also remembered Roger Spence who passed away in April. Roger was enthusiastic about many club activities, including working parties until his health deteriorated.

In the absence of anybody wishing to stand for election it was agreed the current committee be re-elected en-bloc and similarly the Web Master, Newsletter Editor, Accounts Validators and Boiler Inspectors were asked to continue for another year. However, Tony Wall expressed a wish to stand down from his position as a boiler inspector. Tony did agree to continue as an advisor for future inspections for a further year. Tony was formally thanked by the club for his past work

Finally the Treasurer proposed the first increase in the subscription rate for several years. The increase is needed to cover the increased cost of membership of the Power Station Sports and Social Club. A new subscription rate of £36.00 per year was approved with the junior rate remaining at £2.00 (*juniors are not required to be members of the Sports and Social Club*).

The AGM was immediately followed by a General Meeting

Society Officers and Committee

President:	Arthur Bellamy
Chairman:	Jack Salter
Secretary:	Geoff Shackleton
Treasurer:	Nigel Bennett*
<u>Committee:</u>	John Hunt
	Steve Russell*
	Peter Smith
	Nick Morley
* Boiler Inspectors plus	
	Tony Wall
	Martyn Chapman

Leeds S.M.E.E - Dates for Your Diary – Winter 2015/2016

Working Party	Steaming Days/Meetings
Working Parties every Monday whilst track renewal takes place <i>Excluding Bank Holidays</i>	4th November – Bonfire Night Steam Up
	18th November – Jumble Sale
	2nd December – Xmas Dinner
	16th December – Quiz Night
	26th December – Boxing Day Steam Up
	6th January – Members Current Projects
	20th January – Leeds Road Steam Builders
	3rd February – Tunnelling Underground

Newsletter by E-mail

You can save the Society postage costs by electing to have the newsletter, in pdf format and in full colour, delivered to your personal E-mail address.

Simply e-mail your request to **Glynne Hughes** and it should happen automatically.

Send articles for inclusion in the newsletter to the **Editor** or via mail to the Club Secretary

The Society web page can be found here

<http://www.leedssmee.btck.co.uk/>

Please note the society now has a new web address although visiting the old web site will provide a link to the new one.

THE VIEWS EXPRESSED IN THIS NEWSLETTER ARE NOT NECESSARILY THE VIEWS OF THE COMMITTEE