



# You have one new

**Jeremy Bull**  
describes the  
restoration of *Ellise*

**A**s is perhaps usual nowadays for many of us, on a new morning I went to check emails and there it was from the previous day:

'Good Afternoon. I have attached three photographs of my model steamer. To give you some background, I was given the boat about 65 years ago, it was in effect a 'hand-me-down' so it must have quite an age. When I played with it as a child, the boiler was powered by methylated spirits. It is 62cm long and 13cm wide. As you can see, it has not been used in some time and I wanted to know if it can be restored? I look forward to hearing from you and thank you for your time.'

The email was from Les' Spence, and so my involvement started with a rather nice, but tired steam powered model boat. **Photo 1** is the emailed picture of the model and how it actually was when received.

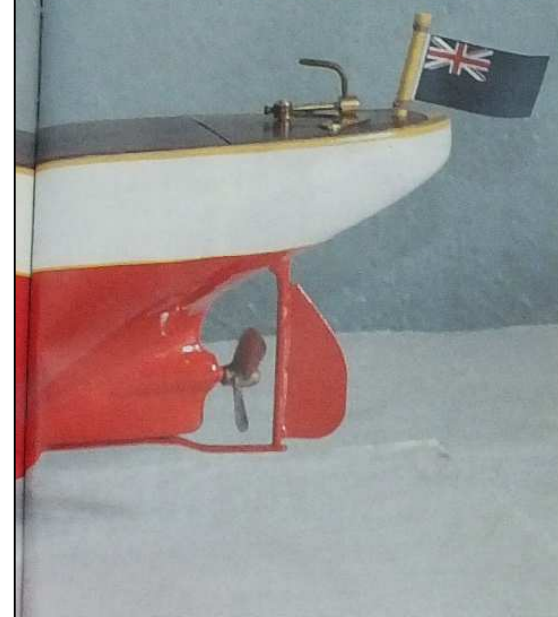
## The restoration project

The email understated the task which only became apparent once the hull was opened up, **Photo 2**, this picture being of the rear of the boiler and oscillating steam engine as received. Worse was to follow, as once the boiler was lifted out and its

casing removed, this was the sight that greeted me, **Photo 3**, all now clearly not looking good. On turning it over, things got worse as at some point in time the boiler failed as there was this obvious split (arrowed) in one of the seams, **Photo 4**, so it rather looked like 'game over' as the rest of the boiler seemed pretty rough and I was guessing that it had been soft-soldered. Thoughts of a full restoration of the steam plant to working order therefore seemed unlikely and whilst mulling things over, three possible options came to mind.

- 1)** The boiler was a low pressure type powering the single oscillating cylinder steam engine and was very similar to the old Mamod design. So, could I buy a Mamod type of boiler to replace this seriously damaged one? A quick trawl of eBay and the answer was an emphatic NO, at least for now.
- 2)** What about making a new boiler, as after all it is not a complicated design, but the cost and regulations regarding manufacturing boilers for commercial use as I would be charging the owner for the work, put me off that route.
- 3)** Could in fact the boiler be repaired, as the hull restoration could be resolved relatively easily, this being my specialty.





# email...

## Boiler repairs

Stripping the cladding off and thoroughly cleaning the boiler to bright copper was the first break, **Photo 5**, as it turned out that it had been brazed throughout, possessed an internal longitudinal stay and the copper used in its construction was of a good thickness. After carefully cleaning the split-joint area with a fine needle file, the split gap was gently tapped back into the boiler barrel using a soft copper mallet. Fluxing this area, it was then silver soldered and some fillets added for extra strength, **Photo 6**, so far so good.

The internal longitudinal stay had broken and needed to be replaced. Fortunately the builder had fitted this by threading the ends 4BA and using brass nuts had then tightened them against each endplate. To caulk it, soft solder had been run around them, so it was a straightforward process to replace the rod and re-caulk the ends. The new threaded ends extend out by a further 0.5 inch and are used to go through the cladding endplates to support the boiler and one end of this longitudinal stay can also be seen in this last picture.







### Boiler test

The next step, an essential one, was to test the integrity of the repair and of course the boiler with a proper hydraulic test. I had decided that the working pressure was not going to exceed 25 pounds per square inch (psi) and to make doubly sure of its strength the boiler was pumped up to 75psi which is three times its working pressure, the reasoning being that if it withstood that, then the boiler would stand 25psi.

The boiler was set up on the bench and connected to the water pump and the certified test gauge of my model engineering club. As can be seen in **Photo 7**, the boiler held the test pressure with no problem, so a successful repair was the end result. For those not familiar with this, a boiler is filled with water and then pressurised, so that in the event of failure, all that should happen is that it will split or an endplate come away, rather than actually exploding.

What had caused the boiler split I will never know, but my guess is that at some point during its long life the boiler got 'frosted' as there was no way to drain the boiler without removing it from the hull. The ice then found the weakest point, which was the damaged portion of the seam. It looked like the joint had not been cleaned properly in that area and so the braze had not flowed into the join, but who knows as it may have always had a slight weep in this area?

### New burner

The boiler now being restored and safe, the next job was to construct a new methylated spirit burner as the original was missing and the owner's memory after 65 years described it as; 'A cigarette tin I used to fill with meth's, light and push under the boiler'!

This could be a recipe for a huge conflagration inside the hull and examination of the fire-hole end of the cladding revealed an opening far too small to insert a cigarette tin. Also, a clip screwed into the



bottom of the hull near the bow suggested that the burner was probably a little longer than a cigarette tin. Establishing the steam raising time of the boiler from cold was 15 minutes, plus a sailing time of say 20 minutes with the engine running at full throttle, it was easy to work out that the burner required 11 wicks (in burner tubes) of 0.187 inch diameter and a fuel capacity of 50ml of methylated spirits.

Starting with a piece of 28mm diameter copper pipe 6 inches long, the burner was silver soldered together. For the wicks I use stainless steel woven wire of 60 mesh. This is rolled into a tight cylinder which can be inserted snugly into the burner tubes. This mesh gives a good capillary action to draw the methylated spirits up with the added advantage that these wicks last much longer than the regular fibre versions.

The burner tank is filled using a syringe to ensure a precise 50ml is measured. It is critical that the fill does not exceed this, otherwise the methylated spirits will flood out of the burner and an unwanted boiler room fire could quite probably result.

**Photo 8** is of the burner doing its business with the 4-3-4 lines of burner tubes.

There is a vent tube at the front of the burner for the vapour produced as it gets hot. This sticks above the deck in front of the foremast to vent the vapour away harmlessly. It looks rather like the ship's cook is stoking up the galley stove when it's venting and the vent tube runs through a piece of cork which also acts as the filler plug. This is a very simple burner, but it works and has proved reliable, even if a bit 'Heath-Robinson' in appearance.



## Steam engine

The single cylinder oscillator steam engine, despite its age, required nothing more than a good cleaning to remove the old solidified steam oil, a polish with Brasso and a thorough oiling, **Photo 9** and **9A**. Testing it on air, it at once sprang into life, hummed like a good 'un, and this was the easiest part of the whole restoration project.

## The hull

This model was not radio controlled and there was no intention of making it so. Restoration of the hull was not going to be difficult, it requiring only a good sanding, **Photo 10**, filling and making good, **Photo 11**, before repainting, but there was one conundrum to be resolved and that was a locking mechanism for the rudder and like most of these things, it turned out to be more difficult than originally envisaged.

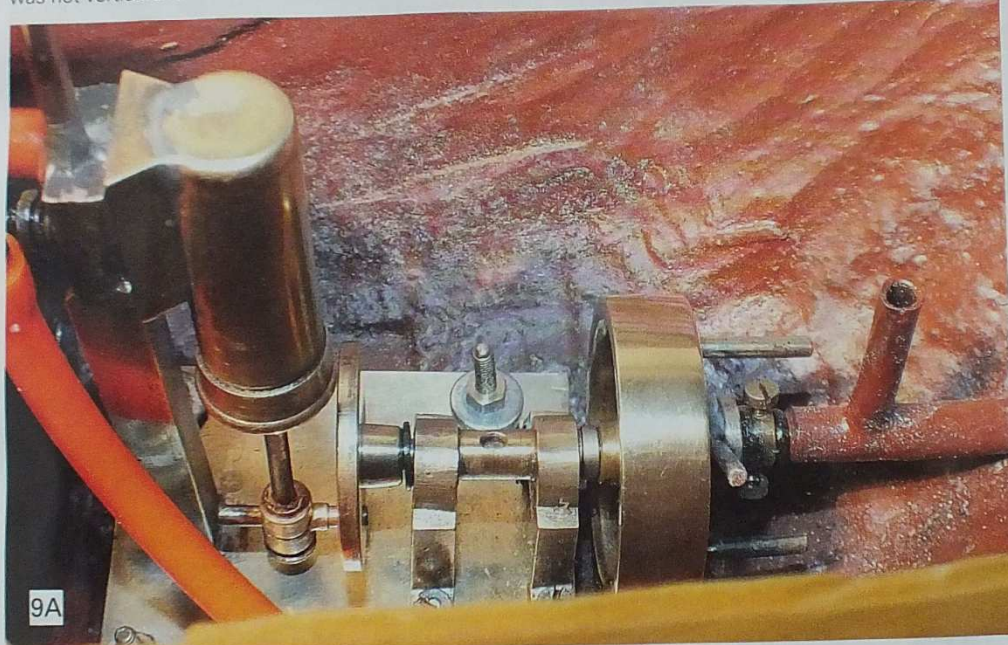
By now I should have learnt my lesson from previous restoration projects, as the rudder post was not vertical and the tiller arm scribed an off-

centre half circle and worse than that, when turned to port it was up in the air and to starboard it wanted to be 1/8 inch (3mm) below deck. So, this was now looking a bit like the previous restoration of Joanne of Kyle all over again.

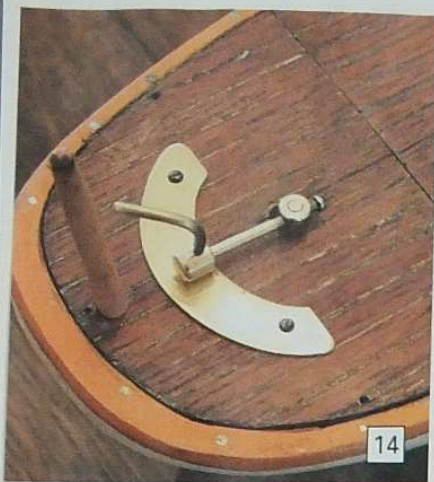
## Rudder and tiller changes

So, off came the rudder and out came its tube. The resulting hole through the hull was opened out sufficiently to get the new rudder tube vertical in all its planes. The rudder shoe was reattached to the bottom of the hull and a long length of round straight steel of the internal diameter of the rudder tube was inserted into the tube and located into the hole in the shoe where the rudder stock would fit, **Photo 12**.

With the hull now levelled fore and aft, port and starboard, the rudder tube was then set vertically in these planes using a setsquare measured against the hull and with small wooden wedges, the tube was fixed in place in the hull. A good drop of slow-setting Araldite epoxy adhesive to set the post in position, **Photo 13**, was left to harden fully (two







days to be sure), and now there was a vertical rudder post that could be trimmed to size.

The tiller mechanism now became straightforward. A semi-circular brass quadrant was cut out and screwed to the deck and a tiller arm manufactured with two collars at each end. One collar was placed over the rudder stock and secured with an 8BA screw whilst at the other end the collar was tapped 8BA to take a locking screw. This bears down onto the quadrant and prevents the rudder from flapping-about, but does not make it so rigid that if the rudder gets struck hard it could be damaged, **Photo 14**.

### Testing?

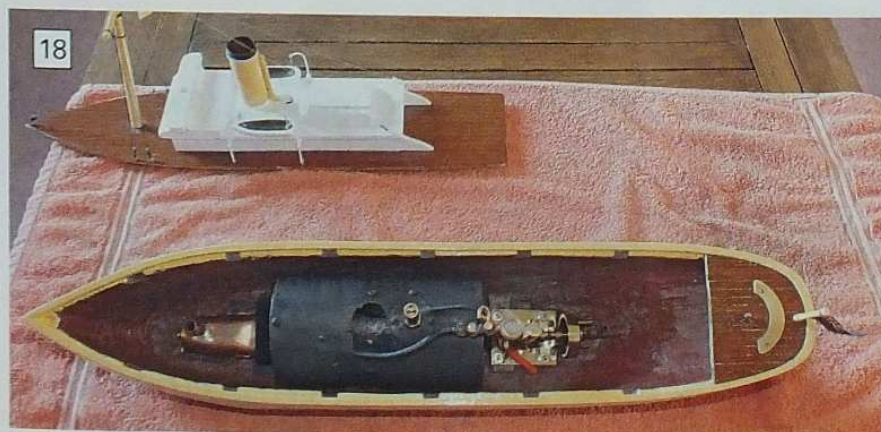
The next step was the critical 'Accumulation Test' when the burner is tested at full output with the

main steam valve shut to establish that the safety valve clears the excess pressure without a pressure rise of more than 10% of working pressure.

In this case the boiler working pressure is 25psi, therefore maximum pressure cannot exceed 27.5psi. Using the engineering club's test gauge again, the steam plant passed with flying colours, and the added bonus of seeing the steam plant ticking over once more, but now on steam, **Photo 15**.

### Shakedown cruise and final completion

After all this, a trial cruise was required to test everything worked; that the hull did not leak; the boiler and burner performed as anticipated and we did not have a catastrophic methylated spirits fire whilst out on the water. This cruise was undertaken on a local pond and despite looking forlorn in her rubbed-down and masked-up state, **Photo 16**, once Ellise (her future name) was on the water, the model had a spring in its step once again and looked absolutely grand whilst cruising round and round. This shakedown voyage was a great success and the restoration could now be completed, which followed the now familiar path of further rubbing-down of the hull, more filling and priming, undercoating, more rubbing-down, more painting and waiting for the paint to dry to result in it looking like it is in **Photo 17**. This was followed by final assembly and rigging, with **Photo 18** showing the model with its deck and superstructure removed, but basically ready-to-go.







## Handover

The job was now completed and the model sat there in all its glory. Prior to the restoration the model was never named and I had previously suggested to the owner, Les' Spence, that this should now be corrected. He had made a suggestion, but his wife thought it would be more appropriate for it to be named Ellise, with the Port of Registration being Glasgow, his city of birth. More to the point, Ellise is an anagram of Leslie and I think that is a nice touch.

To complement the name of Ellise, it has a flag set based on the Royal Northern and Clyde Yacht Club based at Rhu on the Gare Loch. This would allow the boat to fly the Blue Ensign and the appropriate burgee flag. Whilst not strictly accurate I thought it appropriate with the owner's connection to Glasgow and on a model of this type and vintage, surely one is allowed a little artistic licence?

And what of the origins of the model? As usual there was nothing inside the hull to indicate who built it or when. It could be a model that was manufactured by one of the well known Glasgow model shops and Clyde Model Dockyard springs to mind as their pond yachts have appeared from time to time at auction. Who knows? Perhaps a reader can throw some light on Ellise's origins, if they perhaps have an old catalogue in their possession with a picture.

To conclude this article, Les' provided me with a photograph taken in 1947, **Photo 19**, when in company with his father he was off to sail the same model on a pond at Dunoon in Scotland. Those were the days when you wore a suit to pursue your hobby - 'keeping up appearances' as it were.

**Photo 20** is of the handover day, myself being on the left of the picture and it is now 68 years later from the previous picture of father and son, so a nice memory of those happy days. The newly restored model now has pride of place in a display cabinet in Leslie's family lounge, **Photo 21**. A lot of enjoyment can be had from restoring and bringing-to-life old models and in this case also bringing much pleasure to its owner and renewing his childhood memories.

