

**NEW
BOAT**
REVIEW

Solar- powered CRUISING

Falcon is a hybrid boat from Mothership Marine that's primarily designed to be run by the sun. **Mark Langley** puts it to the test...



Tim Knox surprised us two years ago with a very different narrowboat called *Shine*, which was predominantly designed to run on solar power. We cruised it from Teddington to Limehouse on the tidal Thames, running purely from batteries topped up by solar panels. Two years later, we took the opportunity to see the latest iteration of Mothership Marine's design, in the form of *Falcon*.

Tom and Polly Falconer had numerous narrowboat holidays when their children were younger but had not been on the water for many years.

Wanting a leisure narrowboat, they decided that a mostly solar-powered one would suit them. They went aboard *Shine*, the first craft built by Mothership Marine, and they were sold.

Falcon has quite a lot of similarities to *Shine*, but as more boats have been built, improvements and changes have been made to the original. We caught up with the boat on the Great Ouse at Ely on a beautiful spring day, shortly after Covid-19 restrictions were eased.

Shell and exterior

The Tyler-Wilson steel shell in 10/6/5/4mm is well produced, as you

would expect, with smooth finished welds and no ripples in the steelwork. *Falcon* has a large semi-cruiser stern and quite a long bow cockpit, giving a good proportion of cabin length to the boat, with flowing lines. A conscious effort has been made not to cram the maximum amount of cabin space into the boat and it is all the better for it.

The bow has a large access hatch into the forward locker, but as this is a gas-free boat, this is given over just to storage. In the cockpit itself, full-length steel lockers are either side and, like the cockpit floor, are topped with teak-effect covering,

FRONT COCKPIT

Above: The large front cockpit gives plenty of space and has stylish teak-effect decking.

EXTERIOR

Below: The light blue paintwork is very attractive, particularly on a beautiful day.



Fast facts

LENGTH 57ft
BERTHS 2+4
ENGINE Hybrid electric
PRICE £180,000

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Right: The semi-cruiser stern provides plenty of space for sociable cruising. **Top right:** Ten polycrystalline solar panels give around 2kW of nominal power output.

Below: Tim Knox (front left) along with Tom and Polly on the boat.



plus glazed doors at the forward cockpit. A glazed steel side door is in the starboard cabin side as well.

On the roof is the solar panel array: ten panels in total, split into two sets of five, with a neat, thin glass fibre panel in the boat's colours between the two banks. This means that they all effectively sit flush with the roof (with rear junction boxes to avoid exposed cabling). There are also only three roof vents – two mushrooms plus one for the stove – as being gas-free means a reduction in the levels of ventilation required.

As well as the traditional-style solid handrails, there is a beam detail running across the roof, slightly forward of the cabin hatch. This gives just enough room for a gangplank to be mounted on the starboard side. Unusually, the boat has a glass fibre plank, which, as well as being strong and lightweight, is also maintenance free, unlike conventional wooden ones.

“ON THE ROOF, THE SOLAR BANK HAS JUST UNDER 2KW OF CAPACITY, WHICH CAN PROVIDE A SIZEABLE CHUNK OF THE BOAT’S REQUIREMENTS”



which is both inherently slip-resistant and provides a pleasant surface to sit or walk on. A hatch in the cockpit floor gives access to the bow-thruster in its own compartment.

At the stern, the cockpit has a semi-trad layout, but with the cabin side scalloped down to the rear edge of the side lockers to create a much more open space. The stern is longer than on most boats, as the aft counter is extended to allow the helm to perch on a wide, teak-covered taff rail. This layout gives enough room for guests to be at the back while cruising, without getting in the way – Tom and Polly have favoured an outdoor space to allow friends and family to be aboard in comfort.

The cabin sides and roof are finished in light blue with a white contrast, which works very well. The hull paint is taken up to the gunwales. Double-glazed Caldwells windows are fitted aft, with rounded-corner rectangular units, and large portholes forward,

Galley

The layout of *Falcon* is almost identical to *Shine*, with an aft galley, then saloon, bathroom and forward bedroom, in the classic reverse-layout, floating-cottage style, but with a few twists.

Steps down to the cabin have a storage cupboard to port, with the electrics cupboard opposite. The rear galley has a short section of worktop to starboard, with cupboards and drawers underneath, with a free-standing combination oven/microwave/grill set into a recess below. With just a coffee machine on the worktop, it gives plenty of space for food preparation.

To port the worktop is longer, culminating in an L-shape, which forms a breakfast bar. There is a two-ring induction hob, plus a deep sink with drainer grooves routed into the surface. Hidden under the worktop, as well as lots of cupboards and drawers, there is a big 230V fridge and a washer/dryer. In the floor, a couple of lockers



GALLEY
Above: Raised hammocks over the galley are somewhat unusual and as yet untried - but they roll up and store under the sofa.
Above right: The breakfast bar is a useful casual dining space. Fire extinguishers would be better spread throughout the boat rather than placing two of the three together.
Right: The galley is simple but effective.
Below: All the wood aboard is from reclaimed loft timbers.



Discreet plugs in the floor allow the table to be mounted.



“LIKE ALL OF MOTHERSHIP MARINE’S BOATS SO FAR, TIM KNOX HAS SOURCED RECLAIMED TIMBER TO FIT OUT THE INTERIOR”

provide a cool place to store beer and wine against the base plate of the shell.

Saloon

Like all of Mothership Marine’s boats so far, Tim Knox has sourced reclaimed timber to fit out the interior, particularly the floor, hull sides and bulkheads. As well as being ecologically sound it adds a level of charm. The wood is well aged, so gives a sense of maturity to the fit-out and contrasts well with the white panels of the cabin side and ceiling.

Pride of place in the saloon is a pair of free-standing sofas, which provide some quite versatile features. Tim Knox refers to them as “CBD”: chaise longue, bed and dining table. The sofas can be used ‘as is’, which is great

for one person to relax on each side. However, one or both ends of each sofa can be dropped, allowing a couple to really sprawl out or six people to sit around the large dining table, which is stored under one of the seats. Instead of large desmo-style fixing points for the table legs, discreet, small wooden plugs are removed from the floor, allowing the table legs to securely fit in.

When in ‘couples lounging mode’, a small, low-level coffee table (well, coffee plank since it can be slid back and forth) fits between the two sofas. Using the dining table, and a couple of extra infills, a 7ft-long, full-width double-berth can be made up for guests.

However, this is not the only guest accommodation. To allow for



grandchildren, or more adventurous crew, a pair of canvas hammocks (pipe cots) can be fitted... over the galley! Stored away under the sofas are two sturdy extendable poles, which fit into recesses on either side of the cabin to span the width of the boat. Canvas berths are then fitted over them. The hammocks are quite taut and should easily support quite a weight of sleeper, though access to them is via a stool or the galley worktop. When in use, you can still crawl underneath to access the rear doors, but it does preclude use of anything in the galley. Thankfully the induction hob should not pose any particular risk, unlike trying to do this if there was a gas hob here!

Back to more conventional equipment, a drip-feed diesel heater has been fitted against the forward port bulkhead. While this might be slightly at odds with the eco-credentials of the boat, it is convenient. There is also a diesel central heating system, though the convectors are Mothership Marine's own design, consisting of 15mm black-painted copper piping, which, although looking good, might not shift enough thermal load to prevent the heater from cycling on and off; larger, more conventional radiators might be a better bet. On the starboard side there is a set of shelves and a cupboard inset into the bulkhead.

Bathroom

The walk-through bathroom has a central corridor, with the loo and washbasin to port. A separating composting toilet has plenty of legroom around it, with the washbasin mounted quite high on a shallow cupboard, which makes it far easier to use. Unusually, the windows are not frosted; however, plastic inserts can be put in them to create diffused light.

On the other side of the loo is a shower, which has a square, fairly compact tray with quite tight headroom, plus bifold glazed doors. It



SALOON

Above left: The seating converts to a large and firm double bed. **Above:** The drip-feed diesel stove is effective.

Left: Natural timber and white panels work well together, with tasteful upholstery throughout.

SHOWER

Below: The shower tray is small by modern standards but perfectly useable - the plastic insert on the window affords modesty.

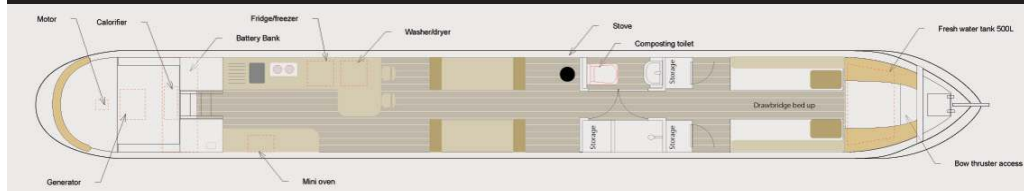


With the bathroom doors open, there is plenty of space through the boat.





BOAT LAYOUT



TOILET

The composting loo and raised washbasin are in a compartment opposite the shower - with another pipe-effect radiator.

is perfectly useable though, particularly with the neat recess in the lining of the cubicle to keep toiletries out of the way. Keeping the shower small allows more of the boat length to be used for storage either side. The doors of the loo swing open to make the bathroom one space, which gives plenty of towelling-down room. Given the reclaimed nature of the wood, it does mean a few small cracks between the planks, but not enough to invade privacy!

ELECTRICS

Below: An 8kW combi inverter charger sits below a large proper isolation transformer. **Below right:** The electrics are very neat with careful labelling of circuits.

Bedroom

The forward bedroom has a pair of long mattresses, which make a huge full-width double-berth across the boat. To gain access through the boat, they both lift on electrically powered rams at the touch of a button. There is a massive void of storage underneath, which is very easy to

get to, adding to the array of drawers and wardrobes aft in the cabin.

The bedroom has a decent amount of floor space to be able to stand and get dressed, even if the beds are in the sleeping position. This area allows the drawers in the aft bulkhead to be pulled out fully, which isn't always the case on boats. There is also another radiator in here and, with the good lighting and bright finishes, this is a very restful cabin.

Services and propulsion

Falcon is a series hybrid electric boat. This means that there is a dedicated electric motor running from a set of batteries, with a small diesel generator to provide electric power recharge if other sources, like solar or mains electric, are not available.

A 15kW motor has been fitted - this is a larger unit than on *Shine*,



and is better suited running on tidal waters (we found that, on our run down the tidal Thames, *Shine's* motor started to get quite hot under high load). The large motor, with sizeable heat sink, should keep things under control - unlike many motors, this is air cooled, rather than using a skin tank (though a cooling tank is fitted to the shell as standard in case it is ever needed). The motor drives the shaft by a heavy-duty drive-belt; this also acts as a shock absorber should the prop strike an object.

The motor runs at 48V, from a bank of lead-carbon 2V cells, giving a combined storage of 28kWh. These can be charged from a landline, via the Victron Quattro, which can provide 8kW of 230V power, or 110 amps (at 48V) back to the battery bank. Unusually, instead of the more common cheap galvanic isolator, a proper isolation transformer has been fitted, which protects not just the earth but provides complete separation of the landline and boat connections, offering a much higher degree of protection.

On the roof, the solar bank has just under 2kW of capacity, which can provide a sizeable chunk of the boat's requirements. For domestic use,





BEDROOM

Left: The forward double-berth is big but each side rises on electrically powered struts at the touch of a button to allow easy access to storage.



ENGINE BAY

Above left: A 15kW motor drives the prop-shaft via the belt, which acts as a shock absorber. This is also an unusual, but practical, location for the fuel gauge. **Above:** There is space in the engine bay for two folding bikes in dedicated storage. **Left:** The battery bank of lead-carbon cells is enclosed forward of the generator, and the calorifier is mounted on the engine room bulkhead above.

the 48V nominal supply is reduced to 24V, which is better practice than dropping to 12V, as it reduces voltage drop in cables for the same power. All of the installations are of the highest quality, with easy-to-read monitoring systems for the motor, generator and electrical systems.

A cocooned Mase generator, using a two cylinder 11hp Kubota diesel engine, provides 5kW of electric power at 3,000rpm. Although a high-speed generator is potentially more noisy than a 1,500rpm unit, the aim is that it will not be needed much, and it gives a more compact footprint than the slow-speed generator. The enclosed battery bank is mounted forward of the generator, with the horizontal calorifier above the batteries, which takes advantage of the longer-than-normal aft deck. This gives space in front of the generator for a folding bike, with another bike stored on the starboard swim on a neat pull-out shelf.

Handling and underway

One immediate difference on *Falcon* is that the engine control lever now has positive detents for neutral, with a button in the top of the lever which you have to depress to move from neutral

to forward, or to reverse. This is very handy as, unlike a conventional diesel boat, there is no significant resistance to the lever, which means it is too easy to accidentally leave the motor ticking in reverse when you don't mean to.

The motor, while not silent, is rather hushed, and far more so than a diesel boat. Having the generator aft (unlike in *Shine* where it was under the bow deck) is probably easier from a cabling and fuel point of view, as well as keeping all the systems in one place.

Drawing a miserly 0.6kW to the motor gives a slow canal speed, with 0.8kW providing a good cruising rate. On a sunny spring morning, the solar panels were churning out 0.85kW,

so more than covering the cruising consumption. On a canal with a lot of locks, where the motor is not running much, the solar panels can easily supply virtually all of the energy requirements for the boat (including hot water via the immersion heater), apart from cabin heating. Running the generator also heats the calorifier, so minimising thermal waste from the system.

If you push the engine control lever forward, there is a huge amount of thrust, so judicious use of it is required – but it quickly becomes intuitive. The motor can be spun down to zero seamlessly, which makes nudging into a mooring really easy with no need for the bow-thruster.

WW's verdict

Falcon is another great, well-engineered boat with a deceptively simple approach to the propulsion system that, for leisure use, could see it running entirely by solar for a substantial proportion of the year.

The interior is a mix of pragmatic and quirky. The hammocks, for example, might not be for most people – or even, in the real world, that practical – but they certainly make the boat

different. *Falcon* suits a cruising couple who want the facility to bring family aboard – the convertible chaise longue are very versatile, and there is a good deal of storage too.

Hybrid and electric boating are definitely where the inland market is heading and for something different from a floating cottage, Mothership Marine may well be worth a visit.