



## BOAT TEST

EACH MONTH WE PUT NEW BOATS THROUGH THEIR PACES

Performance • Interior • Specification

# LET IT SHINE

With the current clamour for alternative power and eco-friendly approach to boatbuilding, *Shine* stands out as a perfect example of creative thinking

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**I**f you read our Crick Boat Show reports last month, you'll know that the buzz at the show was all about electric drive. It's clear that the warnings about a climate emergency, and the move towards electric cars, are making boaters, the people who build boats and the people who build engines, think seriously about whether boats could also change in a more environmentally friendly way.

And that's where this boat comes in. Mothership Marine's *Shine* has an electric motor powered by a big battery bank; it

calls itself a solar electric boat, as most of the roof is covered in solar panels to charge the batteries (although there is a backup generator on board for when there's not enough sun — in the winter, for example). It's the sheer scale of the solar array which makes this boat different, and far less reliant on diesel. Mothership's Tim Knox wants part of his business to be supplying complete systems like this to other boat builders, as a one-stop-shop for electric drive.

*Shine* is Mothership's test bed boat

— but Tim hasn't only put a lot of time and thought into the drive system, he's also come up with a really interesting interior. That's because the other side of the business is building eclectic boats for people who want something a bit different with an emphasis on recycled material.

### Exterior

*Shine* may be technologically advanced in terms of its drive system and quirky in terms of its interior, but on the outside it won't frighten the horses at all. In many

Ladder steps lead down to the spacious galley



ways it's a very typical narrowboat; 57ft long, and built on a Tyler Wilson semi-trad shell. That means it both looks good and handles well. The standard Tyler Wilson bow is very pretty, and the bow and well deck are long and elegant.

There are ten solar panels of the semi-flexible type which stretch from one handrail to the other. Tim designed them so they fit exactly and had them made in Europe rather than China; they have a coating to maximise the sunlight drawn in, and you can walk on them. At first sight, the panels appear to be set into the roof; in fact they're set on top, but the space



With a big battery on board, appliances are electric

between the two sets of panels is a fibreglass sheet making the whole roof flush. All the connections are underneath, so there are no cables or boxes on show.

There's no gas on this boat, so the locker in the nose is available for storage. Behind, the bow thruster locker also contains a diesel tank for the generator, which is under the well deck. There are two linked water tanks under the bed in the forward cabin.

At the stern, there are lockers on both sides of the semi-trad deck and they're scalloped to allow room for the stern doors to fully open. The deck board is made of fibreglass so it's light and easy to lift. Underneath is the engine hole — but the electric motor is a fraction of the size of a normal diesel engine, so most of the space is given over to the battery bank (although this is only half of the batteries, the rest being in the bottom of cupboards inside). To protect the batteries from any water which might get in through the stern gear, there's a taller than usual bulkhead between the motor and battery compartments. It's also worth noting that the Tyler Wilson design of weed hatch is particularly good in this setting. It's a



An old trawler weight heats the boat

chute opening onto the back counter, meaning you can't flood the engine hole by failing to secure your weed hatch properly.

The colour scheme uses a light and dark grey, with an off-white coach line and window frames. The name is picked out in bright yellow and, rather than being painted, is vinyl. The yellow trim really sings, particularly on a nice sunny day like the one we had for our test.



Check out that whacky TV

### Technical

This is another boat where the technical side of things is very important, so we'll deal with it early on. The boat is powered by an Ashwood 48volt AC electric motor, which has a nominal output of 8.5kw, but can be pushed to 10kw. Mothership is the distributor for these motors. Looking in the engine hole, the motor is really very small; above it is the motor controller. The bow thruster is a Sidepower.

Power comes from 24 lead carbon batteries by DBS Leoch, which total 600Ah at 48 volts (that's equivalent to 2400Ah at 12 volts, so it's big). They have a long lifespan of some 4,000 cycles of 60 per cent discharge — so should be good for 15 years. The generator under the well deck is by Mase. It's based on a Yanmar engine and is rated at 7.1kva. It has a remote start so can be turned on from the stern.

But key to this boat is the huge solar

array. Each of the ten panels is 180 watts, giving a total of 1.8kw; that's the most we've seen on a narrowboat (indeed it's more than some people have on their houses).

There is a Victron monitoring system with a colour screen which tells you what's going into the batteries and where from — solar, generator, or shore line — and what's



High-tech monitors on board

being taken out. There's a phone app too which shows the same information. Tim finds it particularly satisfying when, on a sunny day like the one we visited, the monitor shows far more solar power going in than we were using, resulting in the system working out that our range was infinite! A separate screen shows what the electric motor is up to.

With such a big battery bank on board, everything inside the boat is electric. A 240-volt supply comes from an 8kw Victron inverter. Even water heating is via an immersion heater in the calorifier. Currently there's only a solid fuel stove for space heating, although there is wiring for electric panel heaters.

### Layout and fitout

*Shine* is a reverse layout boat, with the galley at the stern. This has a breakfast bar leading into the saloon. A walk through shower room comes next, with the cabin at the bow.

The fitout uses reclaimed Scots pine, which came from a hospital in Wiltshire. The boards are seven inches wide, and make an attractive floor; they've also been used horizontally below the gunwales, with the same horizontal lines continuing into the galley unit doors. Above the gunwales there's William Morris wallpaper, while the ceiling is panelled and painted white. All in all, it's a very pleasing look — both charmingly rustic and neatly stylish.

### Galley

We'll start at the stern of the boat, where some ladder steps lead down from the semi-trad deck into the galley. On one side is the electrical cupboard, while there's a coat cupboard on the other side. The units are fairly standard kitchen carcasses



### WHICH ELECTRIC DRIVE?

It's increasingly clear that electric drive is probably going to become more and more popular in the coming years, as we all try to cut our carbon footprint. The question for potential owners is which set-up to go for.

Up until now, the parallel hybrid option has undoubtedly been more popular. This involves installing a standard canal boat engine which has an electric motor bolted on. It means you can turn the propeller with either diesel or

electric power, which is a belt and braces option.

The Mothership set-up does away with the diesel engine under your feet, but puts a generator at the other end of the boat (although it could be anywhere, or absent, if other charging is available). Tim Knox says he's confident that his electric motor has more than enough power to cope with conditions that narrowboats face — even a river with a good flow on it. He points out that it takes only one

horse power to get a boat moving, and our test showed that we were only ever using a tiny fraction of the available power. Being able to buy the whole set-up could make this a much more attractive proposition.

The key to cutting carbon emissions, though is to have as big a solar array as possible, and to store the power efficiently. Solar and battery technology are improving all the time; could it be that diesel's days are numbered?

(although obviously made to fit the confines of a narrowboat), but each door is a metal frame filled with the reclaimed pine, giving a very industrial feel. The worktop is Evolve by Bush Board, which is a new compact laminate material with a solid coloured core, meaning it can be cut to shape and the edges polished up; it's just 12mm thick, so looks very sleek indeed. It both contrasts with the reclaimed wood and complements it.

With a big battery bank on board, appliances are all electric. The oven is a small countertop model by Sage, yet still has lots of cooking options, including roasting and toasting. On the opposite side of the galley is a two ring induction hob. There's also a 240-volt full-size fridge, and an electric kettle.

The worktop extends to form a breakfast bar, with a couple of stools on the saloon side. Side doors on the other side of the boat make this a very pleasant place to sit.

## Saloon

William Morris' nature-based designs feature heavily in the saloon, with wallpaper and blinds using different patterns from the 'Pure' range. They're both quite subtle but help to give a light airy heritage feel to the room. There's more William Morris fabric on the two chaise longue, which Tim rescued and has given a new lease of life.

The stove was specially commissioned from Hotpod. It's made from an old trawler weight which has had a porthole put in the front, and is only the second ever made. The double insulated flue is the same diameter as the leg on which it stands. The hearth is steel and has a lip, while the tiles behind the stove are carbon fibre, and are similar to the material used in Formula One cars to stop the engine heat getting to the driver.

The TV is a unique piece. Tim Knox took a 1950s Bush TV, made it slightly larger,



The walk-through shower room



Tim calls this his drawbridge bed

and installed an LCD screen. There's a hard drive for watching stored movies, and the box also provides somewhere to hide the wifi router. Underneath, there's a metal log store.

## Shower room

The walk-through shower room has the corridor on the centre line of the boat, enabling a view from one end of the boat to the other. When the doors at each end are open, they hide the shower. The cubicle itself is lined with fibreglass, custom made to fit the space, and unusually has a porthole; it has clear glass which some people might find off-putting but Tim says it steams up as soon as the shower is running.

On the other side of the room is a unit with a small basin on top, and a porthole mirror above. The loo is a Jabsco macerating unit. The holding tank is on the opposite side of the boat and is also unusual in being tall and narrow. It takes up a space immediately in front of the shower cubicle, with a pump-out fitting high on the cabin side outside. As it's not on the centre line, it could affect the trim of the boat as it fills.

## Cabin

The corridor from the shower room continues into the cabin, with wardrobes either side. One of these contains the calorifier. Together they provide a good amount of storage.

At first sight, the bed appears to take up the whole of the forward part of the cabin. But the platform and the mattress are split, and each half lifts electronically to reveal storage in the bed bases and a Red Sea-style walkway to the bow doors. Tim has christened it a drawbridge bed. It's



Making power as the sun shines

a clever way of getting the biggest bed possible, without losing access to the well deck.

## On the water


The big advantage of cruising on electric power is how quiet everything is. Without the noise of a diesel engine you can hear birdsong, the ripples of the water along the boat, and everything that towpath walkers are saying to you. On our test past some permanent moorings on the River Wey, one boater looked out of his side hatch and remarked on the quietness of *Shine*; we pointed out that we'd already been past the other way and he hadn't noticed at all. It is possible to run the generator to charge the batteries at the same time as cruising. With the generator at the bow, it's almost impossible to hear.

Another advantage of electric motors is that they can run extremely slowly, so you can approach lock landings for example at a snail's pace. A display just inside the boat tells you what rpm the motor is doing and how much power is being used, as well as monitoring the temperature. The Morse control is quite fine, with just a small amount of travel needed to get the boat moving. When you need a bit of power, to turn for example, there's plenty available. This is a Tyler Wilson shell, so it goes without saying that handling is excellent.

## Mothership marine

Tim Knox has had a varied career, but boats have always been part of his life. He spent five years in the Merchant Navy after leaving school at 17, but then did a degree in wood science which explains his love of reclaimed timber. He had a company making windows and other joinery for listed buildings, before taking a turn into advertising.

He lived in France, then moved to Australia for 14 years, where Mothership Marine was born. It make a solar powered house boat, with which he had help from the University of New South Wales and its Department for Photovoltaics and Renewable Energy. Returning to the UK in 2016, Tim began work on a more British type of boat.

He has a workshop at Oundle on the River Nene, and has had support from an enterprise organisation in Northamptonshire. 



Another quiet run



## VERDICT

This is a quirky boat which has a lot of appeal. The interior is undoubtedly charming and bursting with character; Tim Knox describes it as eclectic, and it would be hard to disagree.

But the foundation of the boat is the electric drive system — and this works well. The motor is small and quiet, yet offers more than enough power for driving a boat of this size. The battery bank is big enough for all the domestic appliances on board as well as propulsion. The key to being green, though, is the massive solar array, which should mean the backup generator is seldom if ever needed

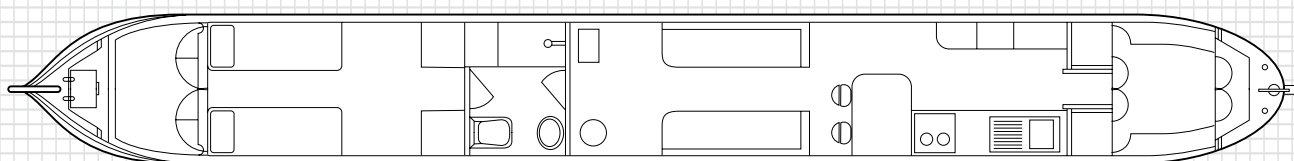
through the summer months. There's something a bit special about knowing you're living without burning any diesel.

Tim says he's in no rush to sell his test boat; but if someone offered him a figure in excess of £150,000 he might let it go. In truth, that figure is understandable when you consider that the boat has a great shell, a truly individual fitout, and a great electric drive system.

If you want really quiet cruising, electric is certainly the way to go — and to be really green, getting most of your power from the sun is a big step forward.

## SPECIFICATIONS

Total price: £150,000



**LENGTH:** 57ft  
**BEAM:** 6ft 10in  
**SHELL:** Tyler Wilson  
[www.tylerwilsonboats.com](http://www.tylerwilsonboats.com)  
**STYLE:** Semi-trad  
**FIT-OUT:** Reclaimed Scots pine  
**ELECTRIC MOTOR:** Ashwood 48v

**BATTERIES:** DBS Leoch 600Ah @ 48v  
[www.dbsleoch.co.uk](http://www.dbsleoch.co.uk)  
**INVERTER:** Victron 8k  
[www.victronenergy.com](http://www.victronenergy.com)  
**BOW THRUSTER:** Sidepower  
[www.side-power.com](http://www.side-power.com)

## DESIGN AND DECOR

**ELECTRIC OVEN:** Smart Oven Pro by Sage. [www.sageappliances.co.uk](http://www.sageappliances.co.uk)  
 £249.95

**WALLPAPER:** William Morris Pure Poppy. [www.johnlewis.com](http://www.johnlewis.com)  
 £75 per roll

**STOVE:** Nautibuoy  
[www.hotpod.co.uk](http://www.hotpod.co.uk). £poa

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