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Volume 18 Number 2 Summer 2005

Electric Boat **NEWS**

The Journal of the Electric Boat Association



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EBA CALENDAR

July

16th – 17th	EBA Represented	Thames Traditional Boat Rally Henley
29th – 31st	EBA Interest	Severn Boat Festival Worcester Racecourse

September

10th – 11th	EBA Event	Norfolk Cruise weekend incorporating
11th	EBA Represented	Broads Electric Boat Show

October

tba	EBA Event	Laying Up Supper
30th –	EBA Represented	Speed Records Week
3rd November		Coniston Water (subject to confirmation)

**For further details of the above, or notice of other events,
please contact the Secretary**

Honorary President: Malcolm Moss

Chairman: John Hustwick

33 The Street, Latchingdon, Essex CM3 6JP

Tel/Fax: 01621 742367

e-mail: john@mhustwick.freeserve.co.uk

Secretary, Membership Secretary: Barbara Penniall

150 Wayside Green, Woodcote, Reading, Berks RG8 0QJ

Tel: 01491 681449 Fax: 01491 681945

e-mail: eboat@mail.com

Advertising Manager, Electric Boat News: Position Vacant,

Please send advertising to EBA Secretary, Barbara Penniall

Treasurer: Brian Pickess

22 Temple Mill Island, Bisham, Marlow, Bucks SL7 1SG

Tel/Fax: 01628 823089

e-mail: brianpickess@waitrose.com

Technical Officer: Paul Lynn

Sages Mead, Butcombe, North Somerset BS40 7XF

Tel: 01761 462089

e-mail: paul.lynn@btconnect.com

Vice-Chairman – Business Members: Dave Millin

Pb Batteries (SE) Ltd

Unit 2 Oyster Park

Greenstead Road, Colchester CO1 2SJ

Tel: 01206 792449 Fax: 01206 860438

e-mail: davidmillin@fsbdial.co.uk

Vice Chairman – Users Group: Ian Rutter

Riverwood Heights, Gibraltar Lane, Cookham Dean, Berks SL6 9TR

Tel: 01628 476158

e-mail: ian_rutter@onetel.com

Founder Editor: Kevin Desmond

Cover Picture: Cruising on the River Great Ouse

Photo: Barbara Penniall

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The World Wide Web Address is: www.electric-boat-association.org.uk

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The sun shone on the EBA for the Biennial General Meeting on 18th June and we were delighted to welcome Malcolm Moss as our new Honorary President. Malcolm holds the record for the first Channel crossing under solar power and has been an enthusiastic promoter of electric boating for many years.

On such a beautiful day Cookham Reach Sailing Club was the ideal venue, because once the formal business was over members could sit outside to enjoy picnics followed by cruising in a variety of electric boats on a beautiful stretch of the Thames. A full report of the day's events will appear in the autumn magazine.

Sunshine seems to be the theme for this issue, with news of a sunny weekend on the River Great Ouse, the conversion of the Coniston ferries to solar power and reports of two large 'live aboard' boats on opposite sides of the world using solar power for propulsion.

The EBA has been undertaking a lot of promotional activity recently at shows and seminars and the new colourful brochure about the association is bringing in new members. The website too is attracting a lot of interest. It was good to have new members at the BGM and I'll look forward to meeting members new and old at events over the coming (hopefully sunny) months.

Editor

Editorial Address:

Riverwood Heights, Gibraltar Lane,
Cookham Dean, Berkshire, SL6 9TR
Tel: 01628 476158

Email: sylvia_rutter@onetel.com

Copy Deadlines:

Material to be considered for inclusion in the next edition of Electric Boat News should be sent to the Editor (preferably by email) by the following date:

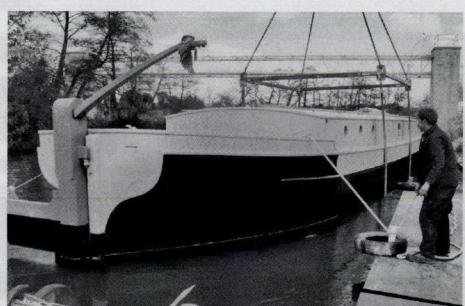
Autumn 1st September



Solar boats... Page 8



...get bigger Page 10



...and bigger Page 18

THE GREAT OUSE CRUISE

A first for the EBA was a whole weekend of electric boat cruising on the River Great Ouse in the middle of May. Report and photographs by Barbara Penniall.



Saturday picnic

As the song goes – ‘When the weather is fine, there’s no finer time, for messing about on the river’. And we did. We have tried evening cruises, afternoon cruises, but never a weekend cruise and what a success!

The idea of cruising over two days gave members the opportunity to join us for either Saturday, Sunday – or both. Half a dozen boats and eighteen EBA members and their guests gathered at Westview Marina, Earith on a Saturday morning in mid-May when in spite of a poor forecast the day dawned bright, sunny and dry with a cool breeze. Les and Elaine Fidler in their solar powered craft *Whispers* led the way out of the marina, cruising with guests Dave and Sue. Jeff and Georgina Waterson followed in their distinctive pale blue *Frolic*, *Georgie*, crewed by daughters Briege and Chloe and their grandparents, Alan and Valerie.

An inflatable with an electric outboard owned by new EBA member John James had its first outing on the river and John was shepherded amongst the other craft, ensuring he felt very much part of the convoy. Tony Rymell had travelled from Somerset to join us with *Somerset Dream* and we also welcomed *Pilgrim Minor* owned by Julia and Harry Briars-Filby with Harry’s sister and brother-in-law and their grandson, Luke. Eight year-old Luke was visiting from Australia and had brought his own (model) electric boat to join our cruise when we moored for lunch.

Our Chairman, John Hustwick and EBA Secretary Barbara Penniall completed the convoy in John’s launch *Rhapsody* as we set out for Hermitage Lock on the Old West River. This is the only manned lock on the River Great Ouse network and the lock-keeper expressed a degree of surprise to find himself in charge of a lockful of electric boats, but was very complimentary about the range of craft and their quietness.

Saturday’s cruise maintained a leisurely pace and the highlight of

the day was an impromptu stop when we decided to pool resources and share a picnic lunch, rather than proceed to the next pub. The proverbial loaves and fishes were shared around and we got to know each other as the chaps talked technical jargon, we ladies relaxed and chatted and Jeff kept us up to date with the football scores.

The river was tranquil and very quiet, with high banks bordering farmland and we saw only three or four other craft on this very rural stretch of waterway. Unless you have cruised with us in a flotilla of electric craft, you cannot imagine the pleasure of being able to hold a conversation between boats, without having to raise your voice – but remember to be careful what you say and don’t criticise anyone on the banks, as they will also be able to hear you!

We passed under Aldreth High Bridge, where the river is crossed by one of three ancient causeways to the Isle of Ely. It is possible that William the Conqueror used this route to Ely when he was fighting Hereward the Wake and you do get the impression that the 21st century has yet to reach this unspoilt stretch.

At the end of that very pleasant day, a dozen met for dinner at the Pike and Eel, a 17th century inn once frequented by Oliver Cromwell, where, once more, the conversation flowed amicably. The evening passed all too quickly with an excellent and inexpensive pub meal in very pleasant riverside surroundings.

Everyone wrapped up well for Sunday, armed with flasks of coffee,



John James



Brownhill Stauch

but the weather really caught us by surprise. Tessa and Anthony Oliver joined us with their skiff *Hale Bopp* and Tony Fogarty travelled from Norfolk to join Les and Elaine on *Whispers*. Tony had written the article recently featured in EB News Vol. 17 No. 4 on their solar powered boat and perhaps *Whispers* had somehow arranged the weather so she could demonstrate her efficiency to Tony. Whatever the reason, quite unexpectedly, the wind disappeared and we enjoyed the hottest day of the year by far. On Sunday, we were passing glasses of wine from boat to boat, not the cups of coffee of the previous day.

John Hustwick invited Andrew Turton to join us on *Rhapsody* as Andrew had expressed an interest in seeing electric boats in action in his capacity as a consultant. Andrew's company is looking at possible future developments for propulsion technology: he was delighted to have the opportunity to combine work with pleasure and appeared to enjoy talking to EBA members, particularly as we were fortunate in having several technically adept brains for him to pick!

This time seven boats and 20 people cruised from Westview Marina in the other direction, towards St. Ives and soon encountered Brownhill Stauch. This electrically operated guillotine lock dates from 1834 and most of us stayed on board while Elaine and Briege controlled the gates. For those more used to conventional lock gates, do bear in mind that first out of a guillotine lock runs the gauntlet of a mini-waterfall, but by this time the weather had reached heatwave temperatures and a few drips of cool water seemed extremely welcome!

I thought the Saturday cruise had been through a beautiful stretch of totally unspoilt countryside but, on reflection, the stretch of waterway we cruised on Sunday was even more

delightful. Brownhill Stauch marks the end of the tidal stretch of waterway and Elaine tried to point out a seal, but he disappeared on her shout (but not at the noiseless boat). We saw a 'blue chicken' on a nest. Yes, it is bright blue and looks similar to a chicken. I have the photos to prove it, but there didn't seem much point in putting them in a black and white magazine. However, if anyone cares to email me, I can forward a picture and perhaps we can identify this fair fowl.

After Brownhill Stauch, we journeyed on in a companionable convoy, through countryside opening out into wide flood plains. The river meandered in an unhurried fashion, mirroring our relaxed passage. Les told us that the zero meridian line that also passes through Greenwich runs close by this stretch. Passing the Pike and Eel, we headed to the Old Ferry Boat Inn, where we moored and either picnicked or pub-lunched in glorious sunshine and attracted much interest from fellow customers. The Inn is reputedly the oldest in England and it is believed that liquor was sold here as early as 560. A slab is set in the floor of the public bar under which lies Juliet Tewsley who hanged herself at a nearby crossroads in 1050 for unrequited love. She is reputed to walk from her grave to her place of death each St Patrick's Day, but on this busy hot Sunday lunchtime, Juliet stayed firmly in place.

After lunch we said goodbye to *Pilgrim Minor*, as she continued to her home in St. Ives. Luke had been a delightful companion during the weekend and after a farewell hug we wished him safe journey back to Australia.

Turning back towards Westview Marina we contemplated the benefits of the weekend. For two days we had cruised in great company with a very respectable number of boats demonstrating the wide range available. From a small inflatable with a simple outboard and battery to various open, canopied or covered launches to the 27ft solar powered ex-Broads' inspector's launch, this variety of craft promoted the benefits of electric boating to a particularly beautiful and unspoilt waterway, ideally suited to quiet electric propulsion.

This was one of the most laid-back cruises ever organised by the EBA, with a relaxing and enjoyable dinner on Saturday, complete co-operation between cruising crews and great company throughout the whole weekend. But above all our thanks go to Les and Elaine Fidler of Westview Marina, who welcomed us as friends, craned the boats in and out in minutes, making launching and recovery a speedy and simple task, and then joined us during the whole weekend, whether cruising or socialising.

So this was our first cruising weekend – but it won't be our last. **Editor's Note: See Letters on page 16 for more information about the 'blue chicken'.**



Les Fidler drives the crane ...

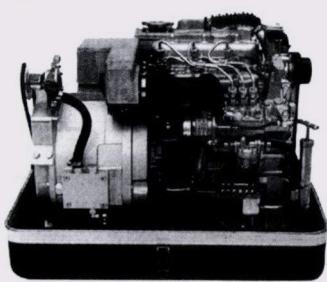


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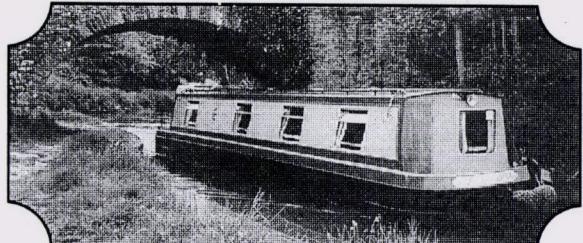
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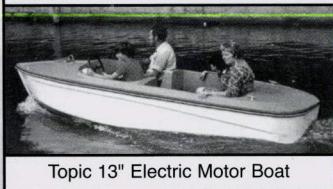
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BEALE PARK BOAT SHOW

Boats of all types from canoes to cruisers were on display over the weekend of June 10th - 12th at the Beale Park Thames Boat Show. Many visitors took advantage of the lake and riverside setting to try out boats for themselves. Report by Sylvia Rutter with pictures by Ian Rutter.

A boat attracting a lot of admiring glances was the beautifully varnished electric punt designed and built at Hambleden by Henwood & Dean using traditional construction methods. Based on the classic punts of the Edwardian era, but with a higher freeboard to cope with the wash created by modern motorboats, *Voltaire* is 25 feet long, and built of single planks of solid mahogany with treads of seasoned teak. With a 500W electric motor powered by two 12V marine batteries it can cruise for up to six hours on one charge.

In complete contrast was the Tom Tom fibreglass boat on the Bossoms stand, developed originally for Legoland. Powered by a Combi motor this is a fun boat for use mainly on boating lakes and in leisure parks. Also on the stand was the new Isis 16, a redesign of the Oyster 16 with upgraded Vetus 2.2 kW engine. The Isis 14 and 16 launches have GRP hulls with hand crafted mahogany interiors and stainless steel fittings.

The Thames Electric Launch Company were kept busy demonstrating a variety of boats on land and in the water including the new Mobiboat which is available with an 8hp Yamaha electric start 4-stroke outboard or the MinnKota E-Drive electric motor, four 100Ah batteries and charger. With a polyethylene hull the boat is 16 ft 6 (5.05m) long by 6 ft 6 (2m) wide and has a hinged bow ramp for wheelchair access with the helm positioned so that wheelchair users can drive it. Also on display was

the new Kingfisher 14 dayboat as well as the Dragonfly 12 skiff, the Interboat 16 and 19 launches and a range of MinnKota outboards.

New EBA members Openworld Yachts were showing the very elegant Openworld 30 classic Windermere launch, a roomy dayboat



Electric punt by Henwood & Dean



Tom Tom



Emrys Barrell demonstrating the Mobiboat

30 ft (9.17m) long which can carry twelve people. The boat on display was a diesel version but had originally been designed as an electric boat with battery compartments built in. With a 2.5kW electric engine Openworld estimate that the efficient hull shape would allow over 8 hours running time.

Creative Marine this year were without a boat on their stand but with lots of photographs of their boats on display. On Rupert Latham's stand were pictures of the Norfolk wherry *White Moth*, which he is converting to electric power, and *White Admiral*, the electric boat built for the Nancy Oldfield Trust as well as a 50 seater passenger ferry for Trentham Gardens, Stoke in which he is installing two 4kW SEM direct drive motors.

Former EBA Chairman Gillian Nahum, based at her houseboat in a good position on the lake, was kept busy answering enquiries about boats for sale or charter. Another former Chairman, Phil Horsley was on the CMP Batteries stand, along with Mike Williams, and EBA committee member Dave Millin was nearby with the Pb Batteries display. Dave Hill, from new members Squadron Batteries, came to look around the show and had his first trip on an electric boat.

On the EBA stand Chairman John Hustwick and Secretary Barbara Penniall were very busy all weekend answering enquiries about electric boating. EBA Webmaster Nick Goldring had his canoe *Silent*

Explorer out on the lake so was able to take a number of visitors on demonstration trips. Seven new members joined the association at the show and a large number of people took away information sheets, magazines and the new colour brochure.

NEWS

WORLD RECORD ATTEMPT

An Stradag's attempt to recapture the world speed record for battery powered electric boats is scheduled to take place on Coniston Water in the week of 30th October to 3rd November, subject to final approval from the Lake District National Park Authority. Agni Motors with Cedric Lynch, CMP Batteries and the Thames Electric Launch Company have all agreed sponsorship and support.

Fiona, Countess of Arran, who set the first officially acknowledged record of 50.825 mph in *An Stradag* in 1989, has sent the boat's new owner Henry Engelen a length of her family tartan for good luck. The current record, held by the United States, is 70.6 mph.

More information from henry.engelen@tinyworld.co.uk

RECORD INVESTMENT IN WATERWAYS

A record £9 million to provide improvements for boaters is being invested in Environment Agency waterways this year, thanks to extra funding from the Department for Environment, Food and Rural Affairs. In the Anglian region money will be spent on powering guillotine gates and replacing treadmills.

On the non-tidal Thames over £4 million will contribute to 12 projects including the refurbishment of Godstow Lock and a new layby at Chertsey. More works are planned on the River Medway where boaters will see new high visibility booms upstream of weirs and control gates and grab chains along the walls of the locks.



Alwalton powered guillotine gate on the River Nene

LOWESTOFT BOAT SHOW

Tony Fogarty reports that Go Electric! was in action at the Lowestoft Boat Show over the weekend of 7th and 8th May, fielding questions about grants and electric boating in general. John and Sandy Williams with Albert and Val Lambert and John Hustwick and Tony Fogarty shared the work of manning the stand, allowing time to visit the other stands and get something to eat.

Tony felt that attendance was a bit down compared with the previous year when Go Electric! was first launched but there was enough interest to make it worthwhile. He says that undoubtedly many more people in the Broads area are now aware of electric boating and that it is by continuing to fly the flag that more electric boats will appear.

Go Electric! would like to convert more larger boats – over 27 ft – and after discussions with Leader + will give no more grants for day boats. They plan to increase the grant to 40% of the cost, with a cap of £2,800.

SEVERN BOAT FESTIVAL

Worcester Racecourse is the venue for the Severn Boat Festival from 29th - 31st July. A wide range of boats and marine accessories will be on display along the river banks together with food and drink stalls, hot air balloons, bands and entertainers.

On the Sunday over 20 local teams will be taking part in the Dragon Boat Challenge.

For more information and tickets visit

www.severnboatfestival.co.uk or contact Chris Carless on 01905 28547



CHARGING POINTS ON THE BROADS

Electric boaters on the Norfolk and Suffolk Broads this summer will find a number of new charging points available for their use. The Broads Authority, with the aid of a grant from the European funded Broads and Rivers Leader + Programme, has been installing eight new charging points, operated by a card, which can supply power at 32 or 16 amps. As well as electric boats, diesel powered boats will be able to use the supply for their on-board electrical items, saving the need to run diesel engines at moorings.

A leaflet showing the locations of the charging points, which now number 17 throughout the Broads, will be available from early July from Broads Tourist Information Centres.

More information on the Broads Authority website www.broads-authority.gov.uk

LAUNCH SUPPER

41 EBA members and friends launched the boating season at Maidenhead Rowing Club on 18th April with good food and wine





and some lively conversation. Dinnie Hawthorne drew the winning numbers for the raffle for a bottle of champagne and a basket of fruit which was kindly donated by Pb Batteries and beautifully arranged by Jennifer Millin. Jo Fairman went home with the basket of fruit and Chairman John Hustwick got the champagne after two of his numbers were picked out. Webmaster Nick Goldring took the picture of Dinnie with the prize-winning ticket.

NEW EA HEAD OF NAVIGATION

Julia Simpson has joined the Environment Agency as its new head of navigation, managing nearly a thousand kilometres of waterways in England and Wales. Working with 150 people in four regional waterway teams, she will manage some £400 million worth of assets covering the Anglian region's fenland rivers,



Julia Simpson

the River Medway, the Wye and the non-tidal Thames. Before joining the EA Julia worked for the National Trust where she was Area Manager for Oxfordshire, Berkshire, Hampshire and the Isle of Wight.

Julia will be responsible for the Agency's ambitious waterway development plans laid out in the strategy 'Your Rivers for Life' launched a year ago. These include the Fens Waterway Link, development of the Thames and promotion of recreation on the Wye.

'Your Rivers for Life', which sets out the Agency's river development plans, can be seen on www.environment-agency.gov.uk/navigation or by calling 01454 624376.

ELECTRIC BOAT TRIALS ON THE STOUR

Owners of small electric boats are invited to visit the Essex/Suffolk River Stour over the August Bank Holiday weekend and report back on their experiences. The Environment Agency has granted special permission for small boats with electric propulsion to visit parts of the river where motorised craft are not normally allowed: Bures, Nayland, Dedham and Flatford.

Under byelaws introduced in 1977 only manually-propelled vessels are normally permitted to navigate the whole river, while powered craft are also allowed on the upper river between Henny and

Sudbury. Certain powered craft are permitted to travel the whole length of the Navigation, including one of the River Stour Trust's electric passenger-carrying launches. If electrically-powered craft were to be allowed, their maximum size, weight and power could be set in byelaws and would be controlled by the EA who issue boat licences.

**For more information contact Mrs. Lesley Ford, River Stour Trust, The Granary, Quay Lane, Sudbury, CO10 2AN
Tel. 01787 372171**

NEW BOAT FROM CREATIVE MARINE

To commemorate their 10th Anniversary this year Creative Marine have redesigned 'The Caprice'. Although the first to be built had a Nanni diesel engine they can also offer an electric version of this streamlined day launch with handcrafted solid mahogany decks. The interior is fitted out with helmsman's seat and curved passenger seating and extras on the first boat included a fridge and radio/CD player.

In recent months Creative have been busy building steam or diesel versions of their launches but the next two boats due for delivery are an electric Frolic 21, and an electric Mayfly 16 Classic which will be based on the Broads. Creative have also acquired the mould tool for a slipper stern launch, making a total of 18 models now available in their product range.

See www.creativemarine.co.uk or telephone 01263 570100 for more details



The Caprice 'Moro' on Lake Windermere

SOLAR LAUNCHES ON CONISTON

Report and pictures from Jim Andrews:

Coniston Water, made famous by Donald Campbell in his quest for the water speed record, saw yet another 'record' on May 19th 2005, when his daughter Gina inaugurated the very first solar powered passenger launch service to be licensed by the UK's Maritime & Coastguard Agency. Dark clouds and a stiff breeze greeted guests on Coniston Launches' *Ransome* and *Ruskin* that day, yet instruments showed that over a quarter of the current used to drive them came directly from the invisible sun.

Developed by Coniston Launches' Gordon Hall, in connection with Solomon Technologies of Florida, with help and approval from the DTI, Lake District National Park Authority, Friends of the Lake District and others, the 1920s-built traditional wooden launches are now on average 70% driven by solar power alone. A quiet Fischer Panda generator automatically cuts in if required, but battery banks down the centre line replace the original ballast, and their solar panels are barely noticeable on top of the cockpit canopies. The result is astoundingly efficient – and virtually pollution-free.

Totally silent and smooth in operation, cruising speeds are the same as with the original noisy diesels, so schedules around this stunning



Gina Campbell being filmed



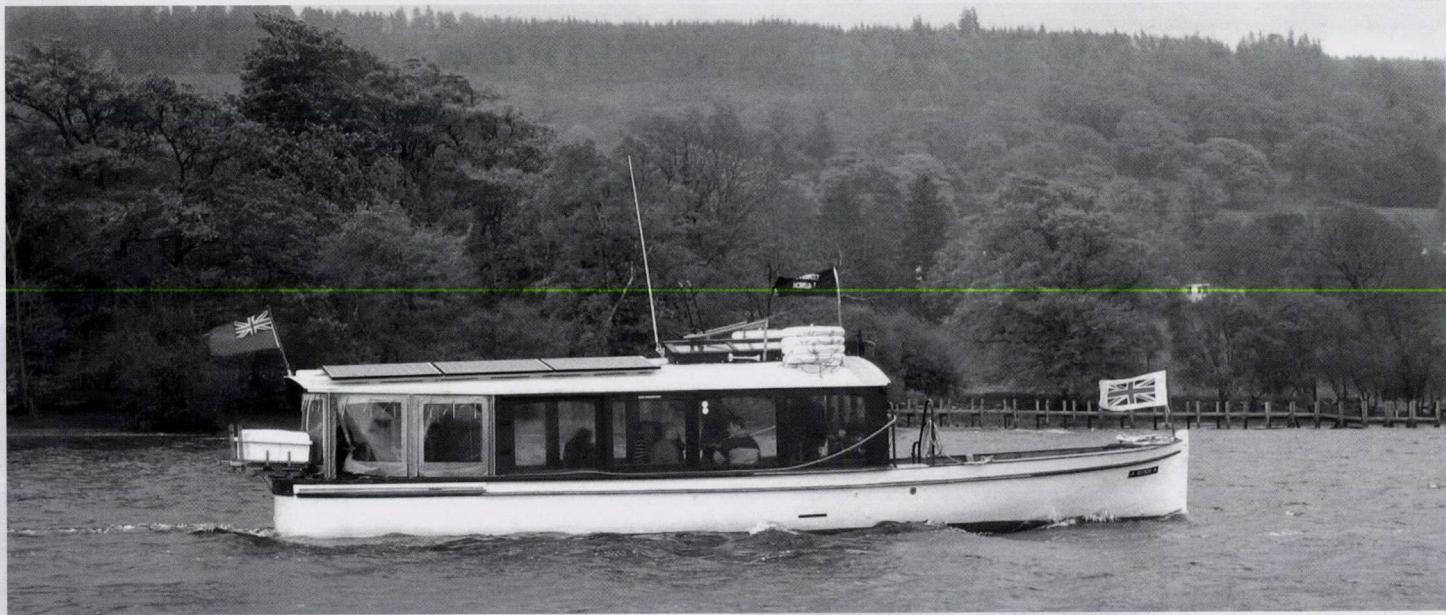
Ransome's solar panels

lake are unchanged. Top speed remains an impressive 7 knots, but the vibration-free electric motors will give the charming wooden hulls a greatly enhanced life expectancy.

There are other advantages: lack of noise and judder means that crews are noticeably less tired at the end of the day. "It's a lovely quiet job now" one said. "The boats manoeuvre better because power comes on immediately – you don't have to wait for the old diesels to 'spin up'."

Most importantly of all, delighted passengers now chat without raising voices, enthusing about the smoothness and peace as the boats slip silently past tree-lined shores and mountains, to Ruskin's house and scenes from *Swallows and Amazons*. "If people stop talking," said a delighted lady, "all you can hear is the water lapping past the hull. The experience is amazing."

As word gets around that a solar boat trip is now an absolute 'must-do' thing for visitors and locals alike, Coniston Launches and their ferry services are set to find themselves increasingly busy. Gordon Hall and his team are thrilled; he's willing to offer advice to anyone interested in setting up a similar solar-powered operation. E-mail him at gh@conferry.co.uk, or visit www.conistonlaunch.co.uk.



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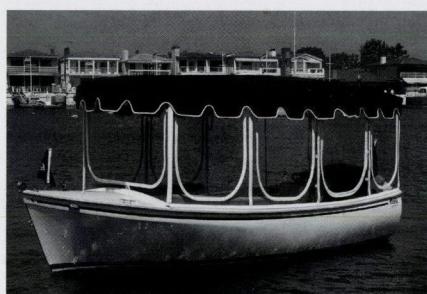
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NOMAD TRAVELS BY THE SUN

Charles Fitzhardinge, who runs The Electric Boat Company in Sydney Harbour, has sent news from Australia about the biggest solar boat for which he has provided the drive unit: *Nomad III*, a unique 'live aboard' solar boat launched at the beginning of this year.



Nomad III

Nomad III is a Mundoo class river cruiser, a design developed over the years by Phil Bolger from an original Tennessee River Boat. She is a comfortable (yet trailable) two cabin cruiser set up for a 'live-aboard' couple plus two overnight guests. 10.6 metres long, displacing 3 tonnes, she has shallow draft and a beam of only 2.5 metres. She has a bow thruster to assist turning in cross winds and has every comfort, including a fridge freezer, a 240 volt inverter for DVD and radio and TurboKool evaporative air conditioning (the Murray Riverland where she is based can reach 40 degrees in the height of summer).

She is a true solar boat, normally able to cruise for several hours a day without drawing from her batteries. Battery capacity and an on-board Honda generator using unleaded fuel allow for longer cruises – some lengths of the Murray River have long distances where even farm power supplies cannot be accessed near the river, and towns can be two to three full days cruising apart.

The story of *Nomad III* began in early 2004 when John and Gabriel Francis visited Robert Ayliffe of Duck Flat Wooden Boats in

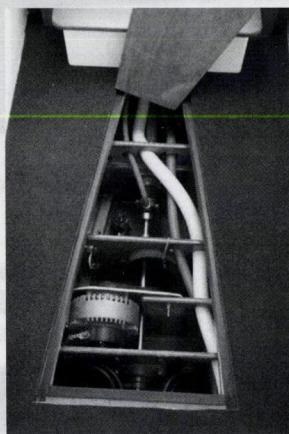
Adelaide to discuss the building of a new river cruiser. Robert was the builder of Charles Fitzhardinge's 19 ft electric launch *Geehi*, which made history with the crossing of the 40 mile/70 km Gulf St. Vincent, using solar panels from Troy Ryan of Offshore Energy Pty to supplement the battery power (the voyage featured in Electric Boat News Vol. 16, No. 2 Summer 2003). John and Gabriel decided to use this combined expertise to take a stand on the future shape and powering of boats on the River Murray.

During the building at Duck Flat, John and Gabby made regular visits to work on the project and be part of the evolving design process. Nearly a year went by between first meeting and the launching in January this year. A small crowd gathered to see this new cruiser as she slid off the trailer into the wide brown waters of Long Island Marina at Murray Bridge. The deep green hull and cream cabin sides attracted admirers but the silence when she set off caused amazement among the onlookers.

Nomad III is powered by an ETEK (Lynch design) motor running at 48v, with a Sevcon Milipak controller. Troy Ryan said he was initially surprised at how little power was required to push the boat along and initial teething problems were largely related to making the chosen products suit the task. There was a lot of tuning and setting to do on the inverter, motor controller and solar regulator and during the commissioning process there were some problems cooling the drive motor.

On trials the boat recorded 4.5km/h at 1kW, 7.8 km/h at 2kW and 9.5km/h at 4kW. On a very sunny day she used less power to drive her than the sun was putting in through the banks of panels on the roof. The efficiency is a combination of the highly efficient motor, sophisticated electronics and a hull shape that has evolved around low power, fuel efficient motors at Duck Flat over the past 16 years.

After acceptance of the boat in Murray Bridge, the owners proceeded



Nomad's motor



on a maiden voyage travelling 400km upstream to their home at Renmark in the wine-making Riverland of South Australia. For this very long trip the generator needed to run for around half the cruising time to assist the solar but it is much quieter than an outboard and uses less than half a litre of fuel per hour. But in normal use, such as weekend cruising, it is estimated that solar would provide 90% of the power required.

John and Gabriel Francis intend to make regular lengthy voyages up and down the River Murray, Australia's longest river which provides 1987 km of sunny cruising between the Murray Mouth and Yarrawonga in Victoria, impeded by only 13 locks. At Yarrawonga there is a dam, around which *Nomad III* could be 'portaged' on her trailer, opening up another 250km of river to the Hume Dam near Albury New South Wales.

So far the owners are reported to be very happy with their new 'toy'. We hope to have more reports on their experiences in the future.

Technical Information from Troy Ryan:

Gross tonnage	3
Length OA	10.6m
Beam	2.5m

Boat speed at given power consumption:

At 1 kiloWatts (kW) it will do 4.5 km/h

At 2 kW it will do 7.8 km/h (cruising speed)

At 4 kW it will do 9.5 km/h

Kilo Watt hours (kWh) = KiloWatts x time

There are about 12kWh usable in the batteries.

A good day of sun returns around 7kWh usable.

Therefore you get six hours running at cruising speed with no sun plus four hours including sun or four hours per day sustainably, and more of course if you go more slowly.

Fridge uses .5kWh/day.

TurboKool evaporative air conditioner uses around .75kWh/day.

Generator or shore power puts in about .75kWh/hour.

A possible future generator upgrade will give improved performance on recharging on both shore power and generator.

You have six hours running from storage plus 4 hours running from solar.

Other specifications:

Batteries – 300 AH 48V sealed (lead acid) gel + 12V 75 AH for domestic power.

Solar panels – 1100W Monocrystalline 6x185W

Solar Regulator – Maximum power point tracking

Drive Motor – ETEK rare earth permanent magnet motor max 3200 rpm driving an HTD 3:1 reduction belt

16 inch prop custom made by Astral propellers, Melbourne

48V variable speed Sevcon MilipaK controller max 5kW

Inverter Charger – 3kW sinewave

Generator – 1kW silenced inverter type (2kW next time!)

Bow thruster – 2kW 12V

In Summary:

You can run for four hours a day or seven hours every other day as often as you want

Alternatively you can do two seven-hour runs then pull up for a day or two, or you can run the generator or find shore power

If your main use of the boat is at weekends you can use it without restriction and no charging of any kind needed



Solar panels, gas water heater and air conditioner on the roof



The aft cabin



Gabby and John's granddaughter in the galley

BOATS FOR A SUSTAINABLE FUTURE

Over three years ago the Norfolk and Suffolk Boatbuilders' Association began the Eco Boat Project to increase awareness of sustainable boating on the Broads – covering the design, construction, operation and decommissioning of boats to minimise impact on the environment. With funding from Leader+ and the Sustainable Development Fund the Boatbuilders commissioned a study by the School of Marine Science and Technology at Newcastle University. The project leader Peter Howe reports on the findings of this study, which were presented on 17th May at a seminar held at The Norfolk Broads Yacht Club, Wroxham.

The study reviewed appropriate sustainable technologies, and included consultations with boat builders and operators in the Broads. It evaluates the various alternatives and provides some recommendations for implementing the ideas.

Naturally, reducing carbon and other noxious emissions featured strongly. A change to biodiesel could offer significant advantages, particularly as the skills base for this type of fuel already exists. However, it may not be the most environmentally suitable technology, and electric boats with solar/photovoltaic power or hydrogen fuel cells may be more appropriate. While the public perceives such technologies as 'green', there is a current lack of operating experience with them and an expensive infrastructure may be required. Wind-powered craft, using sails, turbines or wingsails, are a real alternative, but customers may be discouraged by the degree of skill thought to be demanded of the operator.

Hull materials range widely in sustainability terms.

Appropriately sourced wood rates highly, but the need to coat the hull to prevent rot reduces its rating. Steel hulls also require coating, and both steel and aluminium processing is energy intensive. Moreover, there is relatively little expertise in metal fabrication in Broads yards. The most widely used material, GRP, does not rate highly, but this could be improved by using low-styrene resins and infusion moulding to reduce emissions, and by re-cycling old GRP to make road surface material or for inclusion in new mouldings, perhaps up to 20% of new hulls. Another improvement could be the use of natural reinforcement instead of glass. Reinforced thermoplastic composites might become an option if development can overcome problems with reliability, strength and water absorption. At present, such mouldings have been produced for craft up to 22 ft long.

Could the propeller be replaced as the standard propulsion system, so reducing problems of screw fouling and riverbed disturbance? Low-speed water-jets are a possibility; the PDX marine drive uses superheated steam and has no submerged moving parts. The 'Whale Tail Wheel', resembling a horizontal Voith-Schneider propeller, can extend the full width of the hull and is very suitable for shallow waters. It offers a significant increase in efficiency.

Neither system is as yet sufficiently developed.

Most of the boating impacts on the surroundings, such as noise, and air or water pollution from engines and exhausts, should be easily improved by better filters and silencers. Pollution from anti-foul systems can be reduced by new low-toxin coatings or cleaning systems. Bank damage and disturbance to other boats by wash can be reduced by several low-wash hull designs, though some are only fully effective over a narrow boat speed and trim range. Waste handling and soiled water treatment is obviously another important topic rightly receiving attention – though extolling the virtues of the

adopted system in the hire fleet brochures could be an interesting test of the copywriters art!

What could happen next? The data analysis available in the full report gives rankings to the many variables considered which could help boat designers. For example, one possible specification (out of many) based on current technologies might be a boat

powered by wind or biodiesel, built of wood or GRP, with a low wash hull coated with CuProtect or Seajet, with a composting toilet and grey water filtration system. Broads boatbuilders are well placed to further these ideals. Electrically powered day-boat fleets are already in service, and experience is being gained on biodiesel trials. Many hire fleets operating elsewhere in the UK and Europe are based on Broads designs.

Our builders are adaptable - for example, boats combining a GRP hull with a wooden superstructure are more common on the Broads than elsewhere. The survey had shown much good practice already in use, and people seemed generally receptive to the idea of developing an ecologically sustainable Broads cruiser, if finance can be arranged. Thus a prototype eco-cruiser remains a possibility, perhaps leading to a fleet and then a revived hire boat sector based on eco-tourism and the natural advantages of the region.

When the research report is finally published in a few weeks time, the Norfolk and Suffolk Boatbuilders Association plan to set up a working party, including representatives from business, the Broads Authority, local authorities and other relevant groups. The working party will consider the recommendations in detail and put together a plan for the design stage of the project.



BRIDGWATER RIVER FESTIVAL

The weekend following the Great Ouse cruise found the EBA team in Somerset, supporting the Bridgwater River Festival. Words and pictures from Barbara Penniall.



Somerset Dream (centre) gives a demonstration ride

Over the past three years, Somerset County Council's Parrett Catchment Project has staged river festivals in Langport, Taunton and this year Bridgwater. The Catchment Project was established to reduce flood risk, but in such a way as to enhance the environment and make people more aware of the influence of the rivers on our society, culture and landscape. Visitors to the Festivals have seen the progress made over the years through displays and exhibitions.

Conflicting dates with other commitments prevented the EBA from attending over the past two years, although various private members have supported and flown the EBA pennant on our behalf. However, the calendar was carefully considered this year so we could be there with the Association's stand, business members' literature and the usual technical support and encouragement.

The EBA's first official foray to promote electric boating in the South West was heralded with a roll of drums and appropriate flashes. No, sorry, that was thunder and lightning – and we felt our stand looked rather fragile when we were told there had been a mini tornado a few hours before. What a contrast to the previous weekend when we had been cruising during the hottest (so far) day of the year. In view of the unsettled weather, we were particularly grateful that EBA member Tony Rymell had provided and erected his own gazebo for us, so we could set up the stand quickly without worrying about whether it was going to rain before we could get our literature under cover.

The venue was excellent with the EBA stand by the water overlooking Bridgwater Docks Marina development. The basin was ideal for viewing the moored craft as visitors could look down on all the boats, and then walk around them on floating pontoons. We were delighted that we could point out two electric craft moored close to the stand – Tony Rymell's *Somerset Dream*, which had also been with us the previous weekend, and the sporty *Riverette* from business members Jim and Sue Sawers of Water Roo Electric Products. Among the variety of exhibits at the Festival were impressive displays

of the work of British Waterways and the Environment Agency, together with Somerset County Council's information on the progress of the Parrett Catchment Project.

Tony worked very hard all day, being passionate about promoting his local waterway, but also taking people for cruises in *Somerset Dream* and extolling the benefits of electric boating. Water Roo's *Riverette* is incredibly stable and manoeuvrable for a small craft and with its unique impeller drive system, became a major attraction for anyone who might be interested in 'fun' boats. As this was often an introduction to electric craft, everyone was astounded by the silent running of both boats.

In spite of the very mixed weather the event was well supported by the public and the organisers estimate that at least 6,000 people attended. It confirmed our belief that it is essential for the EBA to promote our environmentally friendly form of boating in as many areas of the country as we can. This is borne out again and again by the reaction of the visitors to the stand, but with our limited resources of manpower and available weekends in the boating season it has not always been possible to accept the many invitations we receive to events throughout the country.

We were kept busy all day with a constant stream of visitors, some of whom had made a special trip knowing the Association would be there. We were delighted to recognise a couple who had previously visited the stand at a Beale Park Boat Show and had since moved from the Thames Valley to the West Country. They had come to the Festival with the express purpose of finding the EBA stand to seek reassurance on their transition to electric boating.

We were very grateful that Paul Lynn, our Technical Liaison Officer, had offered to give us support during the busiest part of the day. Paul actually arrived on the stand incognito as a visitor thumbed through an issue of EB News, saying how impressed he was by the technical content. Similar comments are frequently made to us regarding the quality of the magazine, both editorially and technically, but it was gratifying that Paul was able to hear it for himself.

The Bridgwater River Festival was one of the friendliest and most colourful shows the EBA has supported and we felt we had effectively promoted electric boating in an area ripe for development and particularly suitable for silent, pollution free boating.



John Hustwick meets Deputy Mayor Cllr Pat Parker and his wife



Jim and Sue Sawer in the Riverette

NOTICEBOARD

WELCOME TO NEW MEMBERS

Private Members	Location	Boat where notified
John James	Newmarket	
Philip Nugus	London	Silhouette – 31ft Frolic
Adrian Softley	Devizes	Unity – solar powered 68 ft electric Kennet barge
R E Chase	Guildford, Surrey	Rita C – Canadian Electric Launch
Dr Lee Winter	London	Lady of Lingen – Canadian Electric Launch
Henry Louis Engelen	Penrith, Cumbria	An Stradag (The Spark)
R W G Bucknall	London	
Haken Skatredt	Norway	
Louise Dudgeon	Guildford, Surrey	
William Selby	Southampton	Steam Launch Serena
Ken & Gladys Anderson	Darlington	Whispering Waters – 16ft launch
Sally & John Lawrence	Cheltenham, Glos.	Whisper Not – dinghy
Ian Webb	Maidenhead	
J M Worthington	Shrewsbury	Gem – auxiliary yacht
Jeremy Moore	Cheddar, Soms.	Katje – auxiliary yacht
J H Barchard	North Ferriby, E Yorks.	
Peter Brandt	Oxford	
Ray Castell	Witney, Oxon.	

Business Members

Watermarque Yachts	Chatteris, Cambs
Watermarque are importers of the Duffy range of electric day boats	
Squadron Battery Co. Ltd.	Northants
Distributors of Trojan Batteries	

NEW TREASURER NEEDED

Brian Pickess, who has done an excellent job of managing the EBA finances over the past six years, would like to hand over his responsibilities to a new Treasurer. The main requirement is to prepare the EBA's accounts which are available to the membership each year. If you have accounting experience and would like to help the EBA, please contact EBA Secretary Barbara Penniall who will be happy to discuss the role in more detail.

LAKE DISTRICT VISIT



BARBARA PENNIALL

The Lancaster Canal

EBA Chairman John Hustwick and Secretary Barbara Penniall had a very useful meeting with the Recreation Management Adviser for the Lake District National Park Authority and are currently working with the Authority to promote electric boating in the Lake District.

During their visit they also met members of the Inland Waterways Association to discuss the trail boat rally to be held on the Lancaster Canal next Easter and walked the newly navigable section of the canal to assess its suitability for electric boats. They recommend members to make a note of this event for April next year.

WATER CRAFT MAGAZINE

The July/August issue of Water Craft magazine features an eight page article by EBA member Andrew Wolstenholme about electric boats. Appropriately this edition of the magazine will include the new EBA colour brochure. The brochure will also be sent out to a third of the subscribers to the magazine Practical Boat Owner.

EBA SHOP

EBA pennants, ties and brooches are available from the EBA shop, along with sweatshirts and polo shirts in pale blue or bottle green. Contact EBA Secretary for details or look on the EBA website for colour pictures.

BRITISH WATERWAYS ADVISORY FORUM

The EBA has joined the British Waterways Advisory Forum, which held its inaugural meeting on 11th May. The Forum includes representatives of a wide range of groups associated with the wider use of the waterways networks and will provide the opportunity for all groups to make a co-ordinated representation to British Waterways on matters affecting their members.

TECHNICAL REPORT

ELECTRIC CONTACT

In the sixth of a series of interviews with members, EBA Technical Officer Paul Lynn talks to Pat Brady about *Black Dog*.

EBA: Yours is the first canoe in this series, and I believe she is 'Canadian'. Can you tell us a bit about her origins?

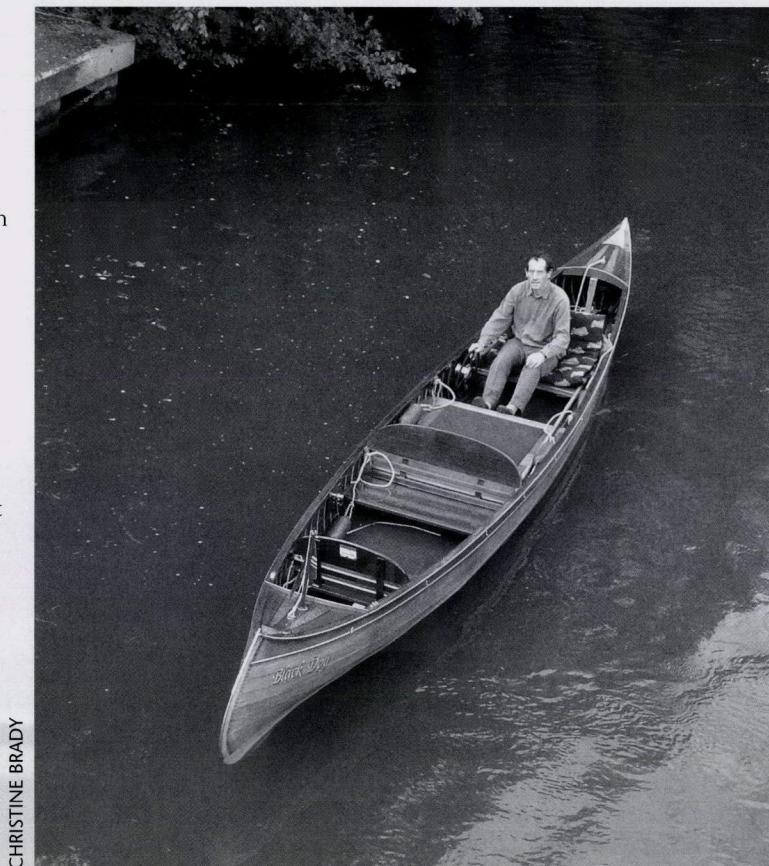
PB: Yes, the 'Canadian' comes from her shape, particularly the raised bow and stern. I believe she was built in 1910 by Hughes of Maidenhead, although ownership is unrecorded until 1950 when she was bought by Wallingford Rowing Club for use as a coaching boat. Christine and I took the boat over in 1972 in a very sorry state and after a 4-year DIY restoration project she was regularly used by umpires at skiff regattas. In recent years we have shared ownership with Mike and Jane Phillips, leading to full restoration and reconversion to electric power by Stanley & Thomas Boatbuilders at Romney Lock, Windsor. Very sadly, Mike Phillips died before the restoration was completed, but we feel he would have been justly proud of the final result.

EBA: Well *Black Dog* certainly looks superb now, and we recall that she even graced the BBC's Ground Force programme!

PB: That was an interesting and amusing episode, described by Barbara Penniall in the Winter 2003-4 number of EB News. Basically, we supplied one of the unusual craft which gave background interest to the 'make-over' of a Thames lockkeeper's riverside garden.

EBA: Could we now move on to some technical aspects? What is *Black Dog*'s length overall and how many people can she carry?

PB: Length is 27 ft (8.2m) and she can take up to 6 people. I must admit that the boat feels a bit wobbly with 6, although stability is undoubtedly improved by having the electrics and batteries mounted low in the hull.



CHRISTINE BRADY

Black Dog

EBA: And the electric installation is presumably as modern as the restoration?

PB: Yes, we have a very nice system supplied by Stelco Yachttechnik (UK). The motor is a Best (Italian) model rated at 1.5kW and 48V which is directly coupled to the propeller and gives about 6.5 mph (10.4 kph) at full power. We reach the Thames speed limit of 5 mph (8 kph) on a current draw of about 20A. The four Elecsol 220 Ah batteries, connected

in series to produce 48V, give us around 8 hours cruising at 5 mph, assuming we don't run them below about 20% of their full capacity, and this is enough for 2 days normal use. We find a 40 mile (64 km) range more than generous for the type of river cruising we enjoy so much.

EBA: Has your experience with *Black Dog* taught you any lessons which you would like to pass on to other EBA members?

PB: I suppose the main lessons relate to care of the batteries – a topic which seems to exercise the mind of just about every electric boater! First, I think it's a good idea to use the full range of the batteries (from full charge down to 20%) several times through the season, recharging them immediately afterwards. Secondly, when laying up the boat, recharge fully and then disconnect all the

terminal connections to minimise charge leakage. During the winter, take the opportunity to recharge your batteries individually up to full charge, which helps even up any unbalanced charging during summer service. And finally, check all battery terminals carefully and regularly for corrosion. If laid up at a boatyard, it's a good idea to arrange for battery charging to be included in the contract.

EBA: This all sounds like good advice, which we will recall when *Black Dog* is next seen moving gracefully and reliably through summer waters! Thank you very much for an interesting account of a splendid boat.

GO ELECTRIC! WORKSHOP

Tony Fogarty reports on the workshop held in Wroxham on 13th April to promote electric boating on the Broads:

Over a hundred boatyards and boat builders were invited and there were valuable presentations and displays by six companies. There was a disappointing turnout – 18 – which must reflect the deeply-held suspicions of electric boating in general.

Richard Torrens of 4QD was demonstrating his controllers, Howard Webb of Stelco took the place of Rupert Latham, and David Millin did sterling work answering questions on batteries and their problems. Cedric Lynch was represented by Arvind Ravinda of Stybrook to promote the new Indian-made DC motor. Emrhys Barrell had loaned his model of the Combi pod, with accompanying literature, and HFL provided literature on their electric-diesel solution.

The session was opened by Tony Fogarty with a resumé of the Go Electric project – eight boats completed or in progress of conversion, with three more lined up. Peter Howe followed with an outline of existing technology, which was then well demonstrated by Alan Alexon of Multicell Batteries. Multicell have combined with 4QD to produce a package comprising a Lynch motor, 4QD

controller and control panel, 8 x 260Ah batteries and a 48v 50amp charger, with all connecting chargers, for £3,573.

Kerry Green of Curtis Instruments gave a professional presentation of his company's monitors, controllers and chargers. Bob Ellis concluded with an outline and working demonstration of an AC motor with controller and inverter – this attracted a lot of attention for its simplicity, quietness and low cost, using commercially available industrial products.

In a panel discussion questions on batteries, AC versus DC motors and charging protocols were well handled by the accumulated experts.

It was an excellent presentation of today's electric boating solutions – and a great pity that there were not more in the local boating industry to learn about the possibilities of electric boats. This is at least in part due to the poor economic climate for boating on the Broads and the cost of electric conversion.

LETTERS

From Theo Schmidt, Steffisburg, Switzerland

Dear Sylvia and Paul,

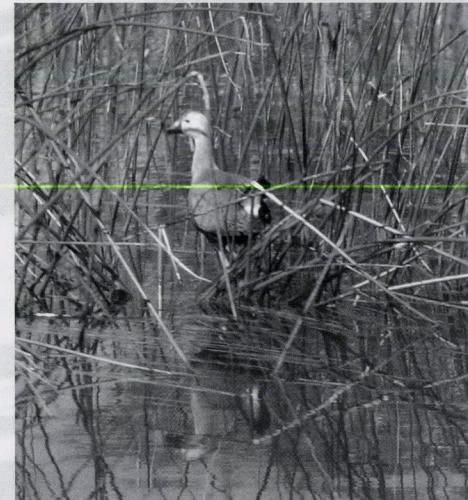
In 'Electric Points: Charge and Discharge' Paul Lynn recommends using an ampere-meter measuring the motor current in order to check for weed and to work out the remaining cruising time. I agree with the first reason, but for the second, the ampere-meter should be in the battery circuit and not the motor circuit. The reason is that when using electronic controllers the battery current will not be the same as the motor current except at maximum speed, and it is the former which counts for range calculations.

For example with a permanent magnet motor, if a 24V battery is supplying 12A to the controller set for 50% of maximum motor speed, this will be 12V and 24A at the motor, neglecting losses. When using solar panels, you must of course also account for the charging current as well, and using a true ampere-hour meter is easier. I have found Ah-meters to be quite accurate provided they are reset to zero now and again e.g. when the battery is known to be fully charged and before setting off. Some do this automatically. I wish you a lovely boating season. I regret missing all the fun of the various EBA events!

Best regards,

Theo Schmidt

Julia Briars-Filby has sent a copy of GOBA, the magazine of the Great Ouse Boating Association, which includes letters about the 'blue chicken' spotted on the EBA's Great Ouse Cruise. Speculation about this bird has apparently been going on for about two years. Although it was believed at one time that it might be a 'purple gallinule' it now seems that it is a 'purple swamp hen' (porphyrio porphyrio). Barbara Penniall's photo of 'Swampy', as it has been nicknamed by Ouse boaters, can unfortunately only be shown here in black and white.



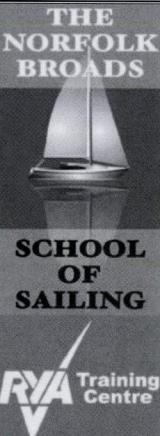
The 'blue chicken'

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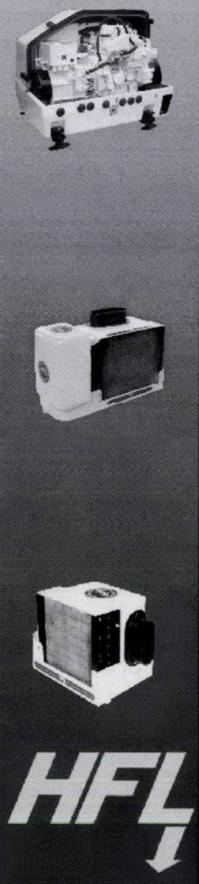
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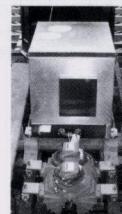
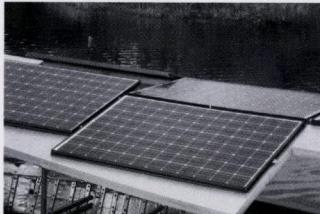
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Just untie and unwind

UNITY

New EBA member Adrian Softley tells the story of the building of a unique solar powered traditional barge.



Unity on launch day

Late in 2003 my wife Nikki and I were considering selling our house and living on a boat. Many hours were spent looking at boats of various types and wide-beam seemed to be the way to go for us. There are a lots of wide-beams: old ones, new ones, Dutch ones, some good looking and others, well, enough said. One thing that did stand out was the fact that there is little or nothing remaining of the once magnificent barges that were built and traded on the Kennet and Avon Canal.

The big question was – Could we build one again? The answer – Why not? We began plans to build a replica of *Unity*, the last barge to trade on the Kennet and Avon which was built by Robbins, Lane & Pinniger Ltd at Honeystreet in 1896. It would, of course, have been fantastic to build an original oak barge, but we needed to be practical. As we only had a small three-bedroom house to sell it wouldn't have been financially viable to build in oak, so steel was chosen for the project.

I thought I had done a lot of research, finding photographs of *Unity* and reading reference and history books, but then I had the good fortune to meet Warren Berry, curator of the Kennet and Avon Canal Trust museum. It would probably be fair to say that Warren was somewhat sceptical of the idea that I wanted to build a real Kennet and Avon barge, but nevertheless excited at the prospect. I have to say that Warren's knowledge of Kennet and Avon barges is second to none and proved to be invaluable as he was so willing to share it with me. Warren's

model of the barge *Harriet* stands as testament to this man's incredible research. His drawings have made the task of our build so much easier.

We wanted our barge to be built on the Kennet and Avon and, after making quite a few phone calls to various boat builders, I arranged my first meeting with Rod Boyce of RLL Boat Builders at Keynsham. Rod and his team have won awards for excellence in building wide-beams and, after a few hours deliberating over the drawings and specifications for the original barges, Rod decided he could do the job with the words "If it's in steel, we can build it".

The original schedule was to start building in Spring 2005, so we put our house on the market last summer, 2004. Six months to sell the house and find accommodation to rent should be no problem! Imagine our surprise when six days later we had sold the house. It was proving difficult to find a landlord who would accommodate our two dogs, Charlie and Rolo, so there was only one thing for it, we would have to buy a narrow boat to live on while *Unity* was being built. Our boat *Baltic* was too small to live on full time.

We are both great believers in things being meant to be, and everything just fell into place. We had sold our house and our little boat and purchased another boat *Foxglove* all within a few weeks and then to crown it all there was a cancellation at RLL boats, so work began on *Unity* in October 2004.



Externally the overall look of the barge is that of the original as built in 1896 except for the height of the hatch covers, which have been raised by approximately half a metre to allow for our accommodation within the hold. We have had to make some alterations to the specifications: *Unity* is sixty eight feet long and thirteen feet beam, which is two feet shorter and one foot narrower than the original. This will enable the barge to navigate our locks as they are today.

Unity's maiden voyage from Keynsham to Devizes was from April 27th to April 30th and went well, even though we had to move a couple of obstacles and rescue a dog from the canal on the way. Yes, the barge fits the locks, goes under the bridges and handles like a dream. Many people have expressed their surprise at the size of the barge and the fact that it is powered completely by solar generated electricity all with no exhaust fumes, little noise and no vibration, very much in fact like the original Kennet and Avon barges.

As the original barges were horse drawn, it occurred to me that not only did we have the chance to recreate an important piece of canal history, we also had the chance to use the latest technology to create an environmentally friendly barge for the future.

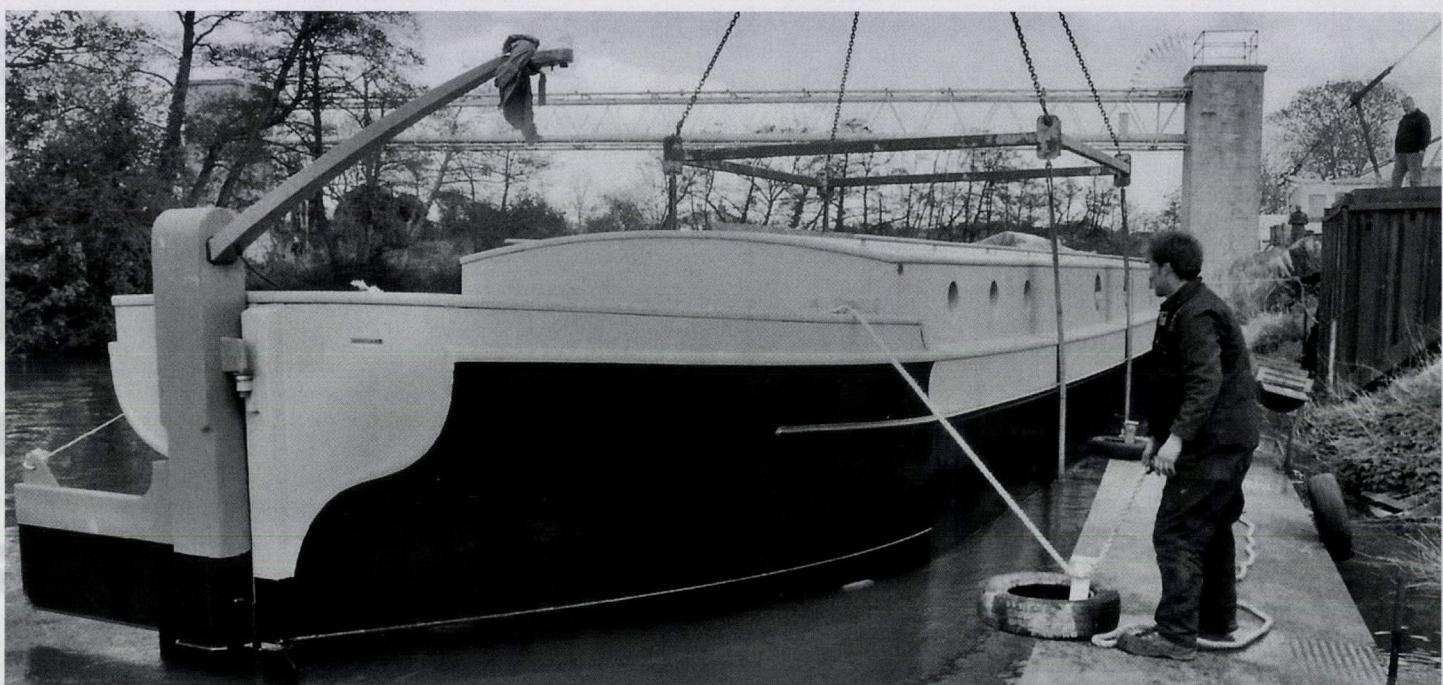
So, back to the internet, and lo and behold there is just the man, Dr Hugh Swann of The Solar Narrow Boat Company in Reading. Hugh came up with what we believe is the best solution: electric propulsion by thirty horse power Lynch motor, with forty eight volt power pack charged by solar panels. There are approximately ten square metres of photovoltaic laminate solar panels glued to the roof, which can be walked on so don't cause any access problems. They have a maximum rated output of just over 1kW, so even on a dull day our system is collecting a reasonable charge. Our power pack consists of 24 x 2v lead acid cells with auto top up; this feeds two 'millipack' controllers, which in turn feed the Lynch motor. The fingertip controls on the tiller are for speed, forward, neutral and reverse. For domestic power we have a 6kW inverter-charger, which supplies 240v to items such as freezer, fridge, washing machine, tumble drier etc.

It has to be said that we really did not want to use any fossil fuels at all and to this end we looked long and hard at hydrogen fuel cells, sterling cycle units and more, but to date none of these offer the reliability or economy of diesel for heating, cooking, hot water and standby generation of electricity. We have a diesel powered Rayburn on board and are hoping to install under floor heating. We have bought a diesel generator for charging the batteries if necessary but don't envisage having to use it unless we need to travel every day for more than three days without a break in poor weather conditions.

Another area where we have steered away from the norm is our toilet. As usual we have read endless articles about what is best and think we have found it in the form of a Biolet XL waterless composting unit from the USA, which should only require emptying every nine to twelve months. The biolet is a biological composting unit that uses the process of evaporation and aerobic decomposition to transform waste and toilet paper into a hygienically safe product (humus) that may be used as compost. The bonus here is avoiding the cost of pumping out. Fitting the unit is very simple: it can be placed wherever you like and requires a vent pipe through the roof of the boat and, in the case of the XL, a power supply (average 65W per day). There are however models available that do not require power.

So far we are extremely pleased with the barge. The hull has been beautifully made and we take our hats off to Rod Boyce and his staff at RLL. Hugh Swann has proved to us that running on solar power really does work, even in a boat as large as *Unity*. Our congratulations go to him too. We thank Rod and Hugh for making our dream a reality. It has been a pleasurable experience and we have made several new friends in the process.

We have started work on the inside of the back cabin where the electrics are housed and have the hard work of fitting out and exterior painting to come. We will be attending the Newbury Waterways Festival at the end of July with *Unity* and supporting the Kennet and Avon Canal Trust at this event and others throughout the year - so come along and see for yourself.



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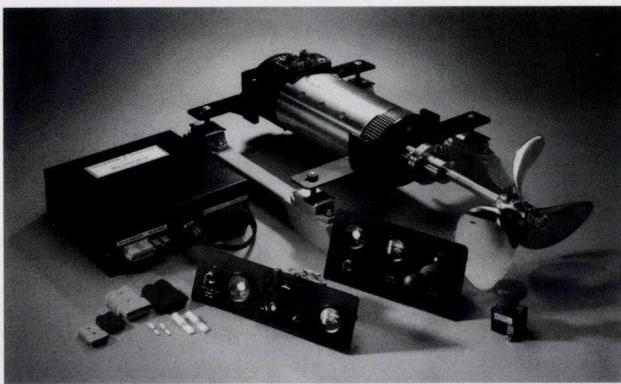
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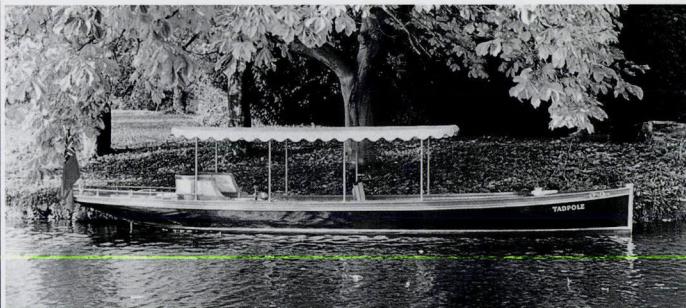
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