

Electric Boat NEWS

 Broads Authority



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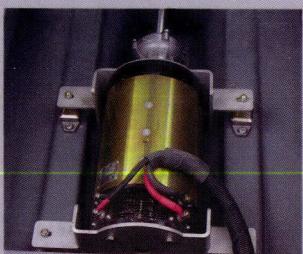
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British Marine
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EBA Calendar



Paddle power

Page 2



Solar power

Page 6



Pulling power

Page 10

July

19th- 20th EBA represented Thames Traditional Boat Rally, Henley

August

2nd – 3rd EBA represented Great Ouse Boating Association 50th Anniversary, St Ives

23rd - 25th EBA represented IWA Festival Autherley Junction

30th – 31st EBA interest IWA Campaign Rally Welshpool

September

20th – 21st EBA event Norfolk Cruising Weekend

21st EBA represented Green Boat Show, Norfolk

October

13th EBA Event Laying Up Supper

November

26th – 30th EBA interest Sail, Power & Watersports Show Earl's Court, London

January 2009

9th – 18th EBA interest Collins Stewart London Boat Show Excel

Please note that events and dates may change. For more details of the above, or notice of other events, contact the Secretary or check the websites.

Cover Picture: Young visitors to the EBA stand at Tiverton

Photo: Ian Rutter

see report on page 18

Contents & Editorial

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May and June have been busy months for the EBA with a cruising weekend on the River Cam and boat shows in Berkshire, Somerset and Devon. Members with local knowledge have been vital to the success of these events and we have been very grateful for all their help. I've enjoyed meeting EBA members in different parts of the country and welcoming new members to the association.

Here on the Thames there has been intensive lobbying from waterway groups against Environment Agency proposals to reduce the number of lock keepers and rent or sell their houses. Lock keepers play a vital part in assisting navigation and in the prevention of flooding. As we go to press we are pleased to learn that the proposed changes have been put on hold until the completion of a full review of the roles and responsibilities of waterways staff.

The EBA will be on the Thames in July for the Henley Traditional Boat Rally and we have more shows and rallies to look forward to in the Midlands, Wales and Norfolk before our Laying Up Supper at the end of the season. Our calendar and website have more details of all these events.

Editor

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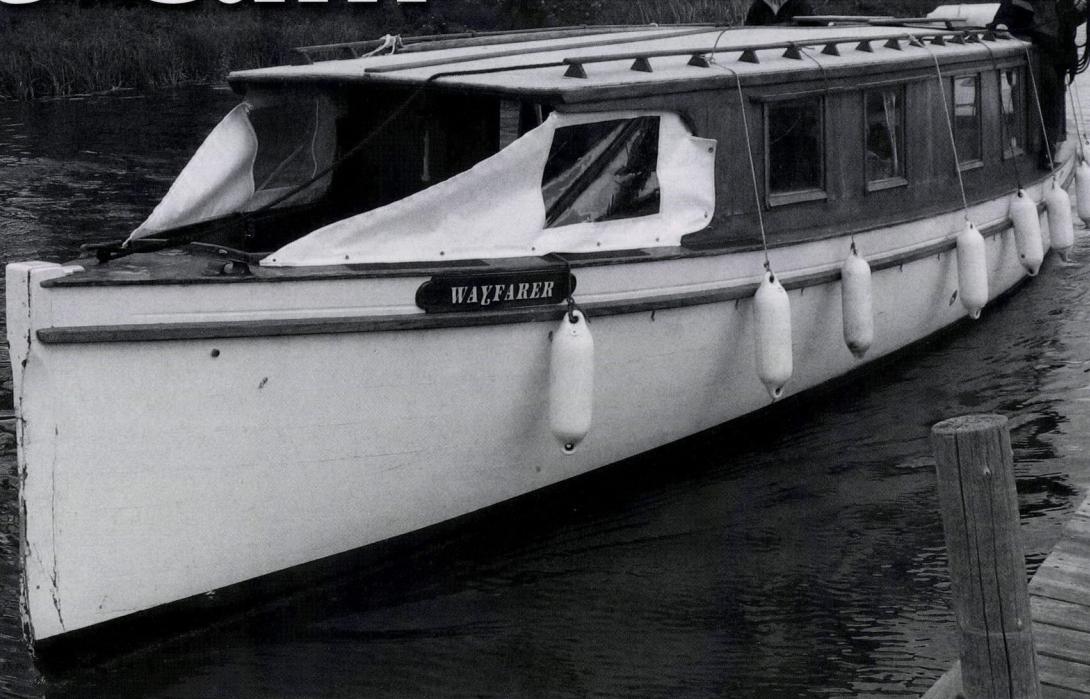
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Cruising on the Cam



Wayfarer

In a break with tradition, the Electric Boat Association Annual General Meeting this year moved from the Thames to the River Cam as part of a Cambridgeshire Cruising Weekend. Report by Sylvia Rutter with pictures from Ian Rutter.

The 'Five Miles from Anywhere No Hurry Inn' sounded a difficult place to find but, with a good map on the EBA website and help from EBA Secretary Barbara Penniall, members arrived from north, south, east and west by car and boat – and sometimes both. A varied selection of electric boats moored up at the landing stage, and in the car park the solar panels of *Solar Flair III* were

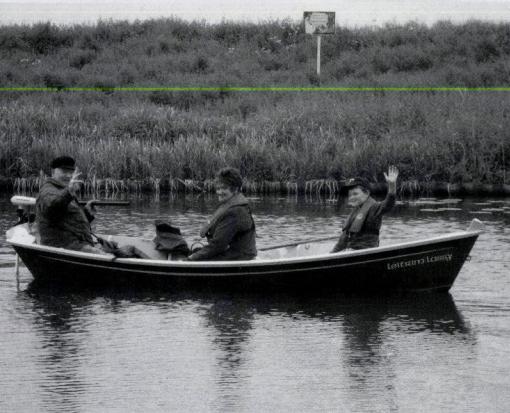
running the fridge in our resourceful Press and Publicity Officer's camper van.

After a welcome cup of coffee on a rather chilly day, members took their seats in the conference room for the AGM. A report based on the minutes follows on pages 4 and 5.

The Inn offered a good selection of pub lunches and so, well fortified, we prepared for our short afternoon cruise. Piling on extra layers of coats and cardigans in the cloakroom, the female crew members were amused to find themselves alongside a group of wedding guests, looking rather more glamorous in their summer suits and feathery hats.

On the slipway Don Wright was launching his electric Water Beetle which had travelled down from Cheshire on top of his car and Roger and Julia Woodhouse were preparing their Seahopper folding dinghy 5 Amp. Roger dismissed rumours that, fitted with a new Torqeedo outboard, the boat's name was about to be changed to 10 Amp.

Les and Elaine Fidler's cabin launch *Annie*, whose restoration was featured in EB News Vol. 17, No. 4, and Interboat *Pilgrim Minor* owned by Harry and Julia Briars-Filby had travelled by water from the River Great Ouse. EBA Chairman John Hustwick had brought his Frolic *Rhapsody*, new Membership Secretary Tom Moore his elegant launch *Merlin* and Webmaster Nick Goldring his canoe *Silent Explorer*. Also in the fleet was David Mole's Canadian



Leitrim Lassy



On board Serena



Water Beetle and 5 Amp

launch *Matilda*, Bill and Veronica Selby's *Serena* and *Leitrim Lassy* crewed by John and Marie McManus with their 9 year old grandson Thomas.

With passenger spaces found for all the members who had come without boats, the silent flotilla set off towards Ely into a keen wind and a few sharp showers (hence the need for all the layers) and when we stopped on the river bank in mid-afternoon we were grateful for the hot tea and coffee dispensed from *Annie*. Veronica's sponge cake went down very well too. We should probably draw a discreet veil over the race on the way back between *Serena* and *Silent Explorer* as no-one quite knew whether they exceeded the speed limit – and the use of paddles for an extra spurt was definitely outside the competition rules.

In the evening it was 'open house' at the Fidlers' home at Westview Marina on the Ouse with a magnificent buffet prepared by Elaine and mouth-watering desserts from Julia Briars-Filby to accompany lively conversation. A surprisingly large number of members were accommodated overnight in guest bedrooms and even sleeping bags on the floor and everyone was very grateful to Elaine for her generous hospitality.

If we thought that our venue on the Saturday was remote, our starting point for Sunday's cruise was even more of a challenge. "Turn right at the farm buildings" were our instructions as we drove along a narrow road in a flat

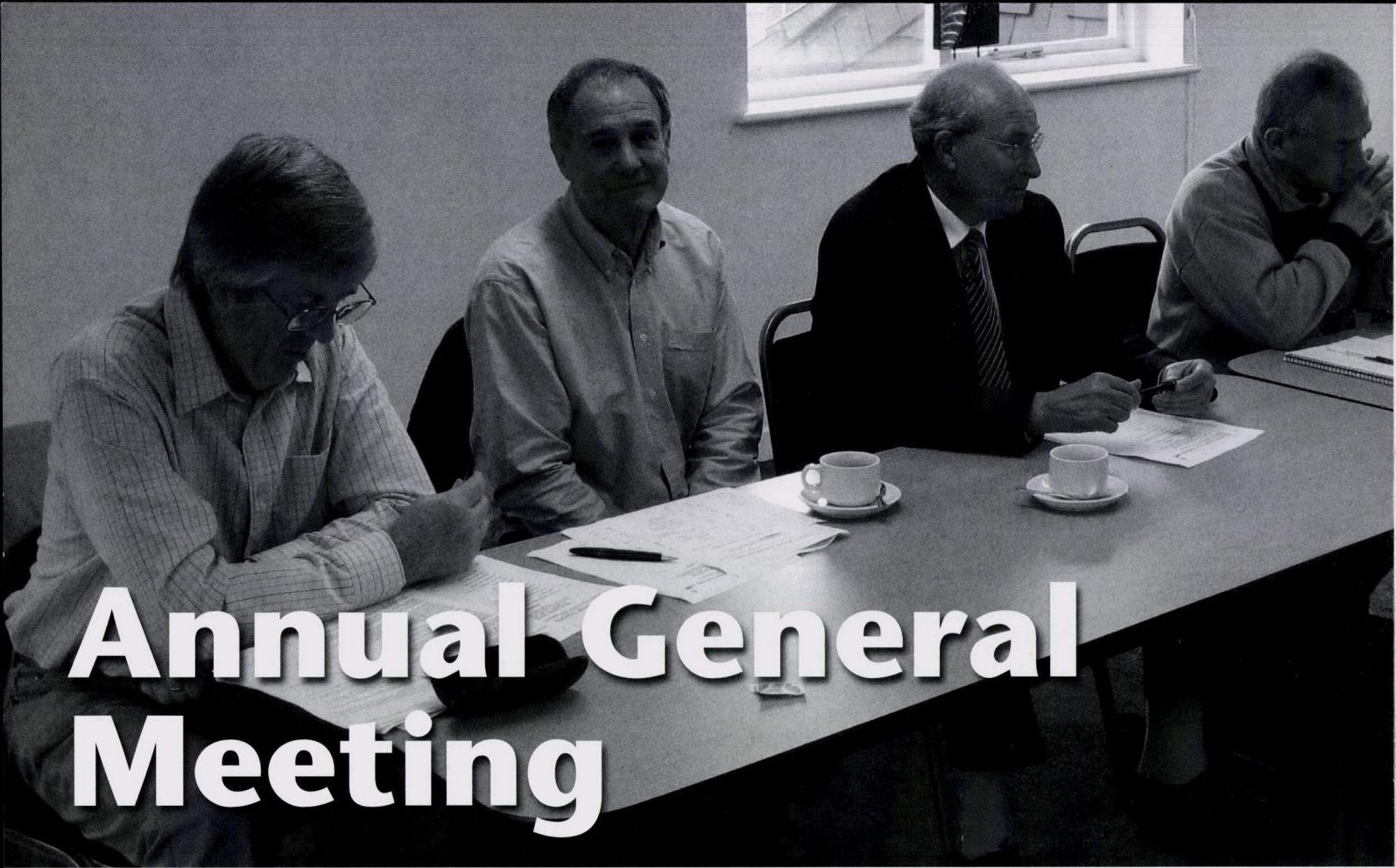
featureless landscape with farm buildings all over the place. But once tracked down, Tiptree Marina proved to be an ideal location, especially with the sun sparkling on the water. The fleet was joined by Alex Khot's 1905 teak cabin launch *Wayfarer* and those of us on board felt privileged to be taking our first cruise into Cambridge on the very first boat registered on this stretch of water. Don exchanged his Water Beetle for a seat alongside Tony Rymell in *Solar Flair III*, with its solar panels charging well in the bright sunshine.

This time we had two guillotine locks to contend with, the second of which was known as Bates Bite Lock – a name, said the Lockkeeper "which goes back to the mists of time". The locks gave us the opportunity to get most of the fleet together and to answer questions about electric boats from walkers and cyclists on the towpath. As we got near to Cambridge more and more rowing skiffs appeared and we had a brief pause in our journey to give way to competitors battling to the finish of a race. At Jesus Lock, which was as far as we could go on the Cam, we moored up for lunch – some of us were lucky enough to be invited to lunch on board. Then there was time for a walk along the river bank to look around some of the colleges and watch people punting (some with more skill than others) before returning to the boats for a leisurely cruise back to our starting point.

We all felt that choosing a different location for our AGM had been a great success, as it attracted members from different parts of the country, many of whom had not been to an AGM before, and we were very grateful for all the help and local knowledge which made it possible. We are already looking for somewhere for next year in a fairly central location so if members have any suggestions, please let Barbara know.



Merlin, Annie, Rhapsody, Silent Explorer, Wayfarer, Solar Flair III and Serena in Bates Bite Lock



Annual General Meeting

Dave Millin, Don Wright, Malcolm Moss, John Hustwick and Barbara Penniall

The 2008 Annual General Meeting was held at the Five Miles From Anywhere, No Hurry Inn near Upware, Cambridgeshire on Saturday 17th May. This is a summary of the proceedings.

President Malcolm Moss welcomed everyone, thanking the committee and all those who had supported the work of the committee throughout the year. The minutes of the AGM held on 30th June 2007 were accepted as a true record of proceedings. Those in attendance at the previous AGM passed the vote. There were no Matters Arising

Chairman John Hustwick reported on the busiest year yet. The EBA was now thought to be the only English speaking electric boat association in the world, which had resulted in many international enquiries, and he thanked Webmaster Nick Goldring for the excellent website. The EBA was attending more shows including non-boat shows such as the Royal Bath and West, which was promoting electric boating into new areas. This had resulted in increased expenditure and so sponsorship was extremely important. John thanked Malcolm Moss for his sponsorship of £500 towards the current magazine. It was noted that the Broads Authority gave a small amount towards the magazine but John asked whether any member knew of a sponsor, was

prepared to be one or to take on the task of finding one.

John said that in future only three issues of Electric Boat News would be produced, but it was hoped to move further into colour and possibly increase the content of each issue. He thanked the Editor, Sylvia Rutter for her work in producing the magazine and mentioned that with the inclusion of an EBA article in each of the six issues of Water Craft, she now had ten deadlines to meet each year. Reducing EB News by one issue and not printing and distributing the Directory each year would be a small saving. The Directory would in future be produced by the Secretary and given out to any member on request.

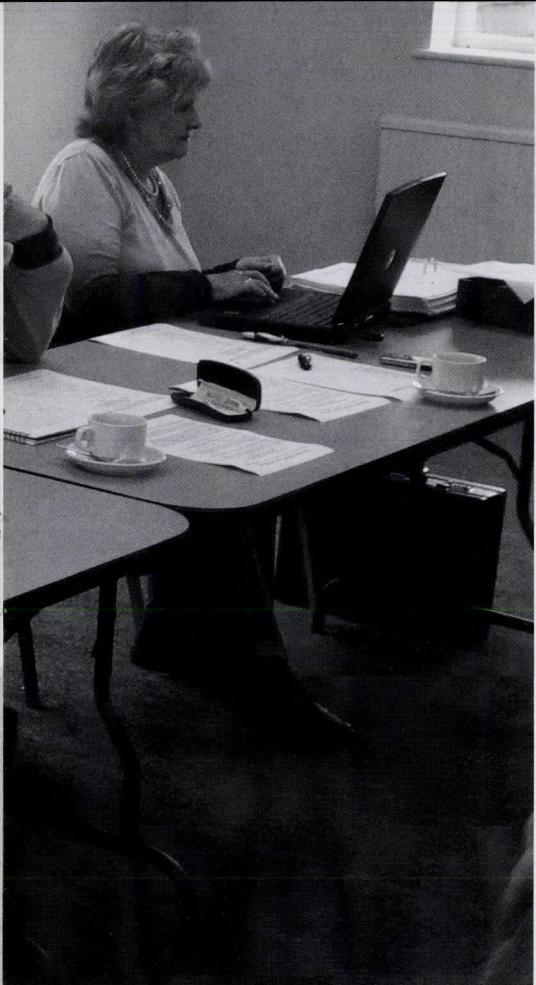
John thanked all the members who had helped on the EBA stand at shows and with the organisation of events and thanked Tom Moore for volunteering to take over the membership records from the Secretary.

Treasurer Don Wright presented the accounts and mentioned that at the last AGM it had been anticipated that the current year would show a deficit of £2,000. This had proved to be over £3,000,

which was partly due to increased expenses in printing the magazine and attendance at shows. It was to be noted that over £1,000 was held for the bursary for the Julia Moss Trophy, so the reserves were £6,000. He stressed that running at a deficit of £3,000 pa with reserves of £6,000 meant the situation was becoming critical. He thanked Barbara for her work throughout the year in providing the figures, which he put together to produce the accounts.

Don asked for the accounts to be adopted but pointed out to the meeting that they were not at present audited as the Auditor Brian Pickess was out of the country and had not yet had sight of the accounts. The accounts were accepted, subject to audit.

In discussing sponsorship it was agreed that a sponsor would be offered their logo in the magazine, information about their company on the website and would have their publicity material taken to shows the EBA attended. The question of grants was raised and Barbara said that one of the reasons the EBA was not eligible for potentially available money was because we were a joint association representing commercial members as well as private. Tony Rymell, using his knowledge of recent events with the IWA, pointed out that our business members had preferential treatment over private members with their



IAN RUTTER

voting rights, which precluded the EBA from becoming a charity. John invited comments from the membership regarding charitable status or sponsorship.

John was pleased to report that Tom Moore had volunteered to become the Membership Secretary. The positions of Technical Officer and Press and Publicity Officer had been advertised but as no applications had been received, and there were no volunteers from the floor, the current incumbents Paul Lynn and Tony Rymell were willing to continue for the time being.

John confirmed that it was everyone's wish that Malcolm Moss continue as President and thanked him for his support. Malcolm and the other existing committee members were reappointed.

Tony Rymell proposed consideration again for Regional Representatives who would represent the EBA in their area and organise one event per year on behalf of the Association. He was prepared to stand for the South West and asked whether anyone would stand for East Anglia. Les and Elaine Fidler volunteered to represent the EBA in the Great Ouse area and suggested the term 'waterway' be used rather than area. James Cox volunteered to help with the Norfolk Broads.

Tony Dunning asked when the

membership subscriptions were last increased. Barbara reported this was in the late 1990s but was reluctant to recommend an increase at the current time, particularly in view of the reduction in the frequency of the magazine.

Dennis Watts announced that he was writing the Haynes manuals for boating and would be taking photographs over the weekend.

Nick Goldring asked about recent figures of the number of 'hits' on the EBA website. Barbara did not have the figures with her, but agreed that the last time it was checked it was in the region of 1.4 million and thanked Nick for his tremendous contribution towards promoting electric boating.

It had been requested that the date for the AGM should be set a year ahead. The Chairman asked for ideas regarding a venue and Tony Rymell suggested Evesham/Stratford upon Avon as being central. Barbara pointed out that a date could not be set until a suitable venue had been found for a meeting, with slipway, charging, accommodation, etc. Nick Goldring suggested that a licence exemption be obtained to encourage members to bring electric boats.

The Chairman thanked the members for attending and closed the meeting.



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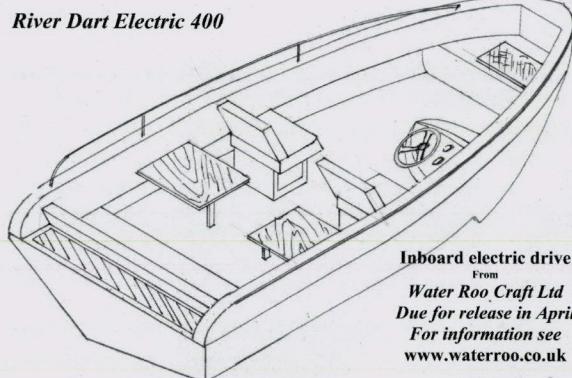
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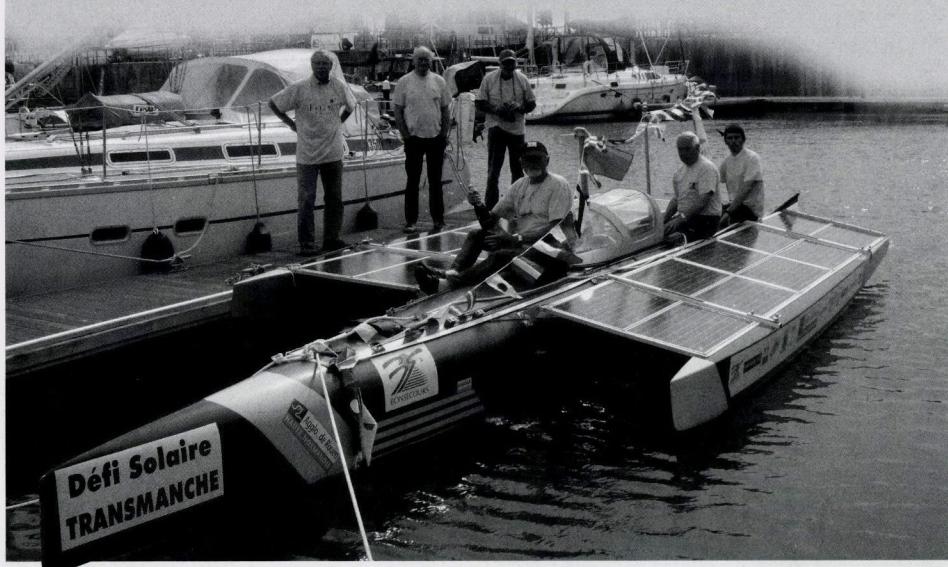
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Solar Channel Crossing

A French boat arrived in Eastbourne on 17th June, having crossed the Channel in just over 11 hours purely on solar power. *Eolios* is pictured on the high seas on the inside front cover. The journey was part of the Fourth Solar Challenge organised by Concept Helios Propulsion with the aim of developing and promoting the use of solar power for pleasure boating. Competitors in previous events have included EBA members Malcolm Moss and Cedric Lynch.

As well as the solar crossing from Dieppe to Eastbourne, this year's event included a 125 km cycle ride from Rouen to Dieppe and cycling on the UK side of the Channel along the Cuckoo Trail in East Sussex. The crew of *Eolios* said they were delighted by their warm welcome from the Sovereign Harbour Marina Yacht Club, although they tactfully refrained from making too many references to the 1066 French landing in nearby Hastings. **For more information see www.bateauxsolaires.org**



Eolios in Eastbourne

Hydrogen Filling Station

The Birmingham University Protium Project Team's vision of converting the waterways to hydrogen propulsion took another step forward in April when the University opened the UK's first hydrogen filling station, installed by Air Products.

In September last year the Protium Team led by Professor Rex Harris launched the

experimental canal narrowboat, the Ross Barlow, powered by lead acid batteries and hydrogen fuel cells, with hydrogen stored in metal hydride, which was featured in the Winter 2007 Electric Boat News.

We were invited to return for the opening of the hydrogen filling station, and EBA Treasurer Don Wright went from Manchester to cover the event. The opening attracted enormous interest with widespread national news comment and a huge attendance, including three MPs from the Birmingham area.

The university plans to conduct trials with a fleet of five fuel cell campus vehicles. Air Products is also working with Transport for London to install similar fuel stations for a fleet of 70 hydrogen powered vehicles which the capital hopes to introduce this year.



Curtis on eBay

EBA business member Curtis Instruments has opened an eBay shop, with a wide range of stock available for auction. Products include both small and heavy duty battery chargers, battery connectors, speed controllers and converters. Prices are low, with many items being sold at well under original cost price and including VAT and delivery. All previously used items have been fully tested and approved for resale.

Curtis is keen to re-use and recycle wherever possible in keeping with its 'clean and green' policy, rather than simply disposing of inactive stock. The aim is merely to cover initial production costs and put otherwise redundant stock to good use.

For more details telephone 01604 629755, email info@curtisinst.co.uk or visit www.curtisinst.com

Third Broads Green Boat Show

The only green boat show in the UK – and probably in the world – will be at Salhouse Broad on Sunday 21st September with electric, pedal and paddle boats on display alongside motors, solar panels and environmentally friendly products. Access for exhibitors has been made much easier this year with the installation of a gate between the parking area and the site.

There will be extra parking for visitors, with good access for the disabled, as well as an electric water taxi service from Wroxham. Admission is £3 for adults (children under 12 free), £5 from Wroxham.

For more information contact Peter Howe on 01603 783096 or see the website www.broadsgreenboatshow.co.uk



Thames Solar Challenge

EBA member Mike Manisty is aiming to be the first person to complete a solar-powered voyage up the Thames from Westminster to its furthest navigable point near Lechlade. The journey of about 150 miles against the current will draw on his experience in the Royal Navy, where he was responsible for the batteries driving the older diesel-electric submarines, as well as more recent knowledge gained in implementing government IT projects.

As outgoing Chief Information Officer for the National Offender Management Service, Mike will be raising money for Action for Prisoners' Families, a charity which co-manages a helpline to support family members of people in prison.

Mike set off in *Corvelia*, his 12 ft open launch, on 25th June after Alex Allan, Chairman of the Joint Intelligence Committee, had sounded the starting horn. **You can see reports of Mike's progress on www.solarthames.blogspot.com.**



IAN RUTTER

Mike on Corvelia between Cookham and Marlow

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A new service has been launched to help the boating industry reach potential employees. Anyone keen to work in the marine environment



Theme Park Boats

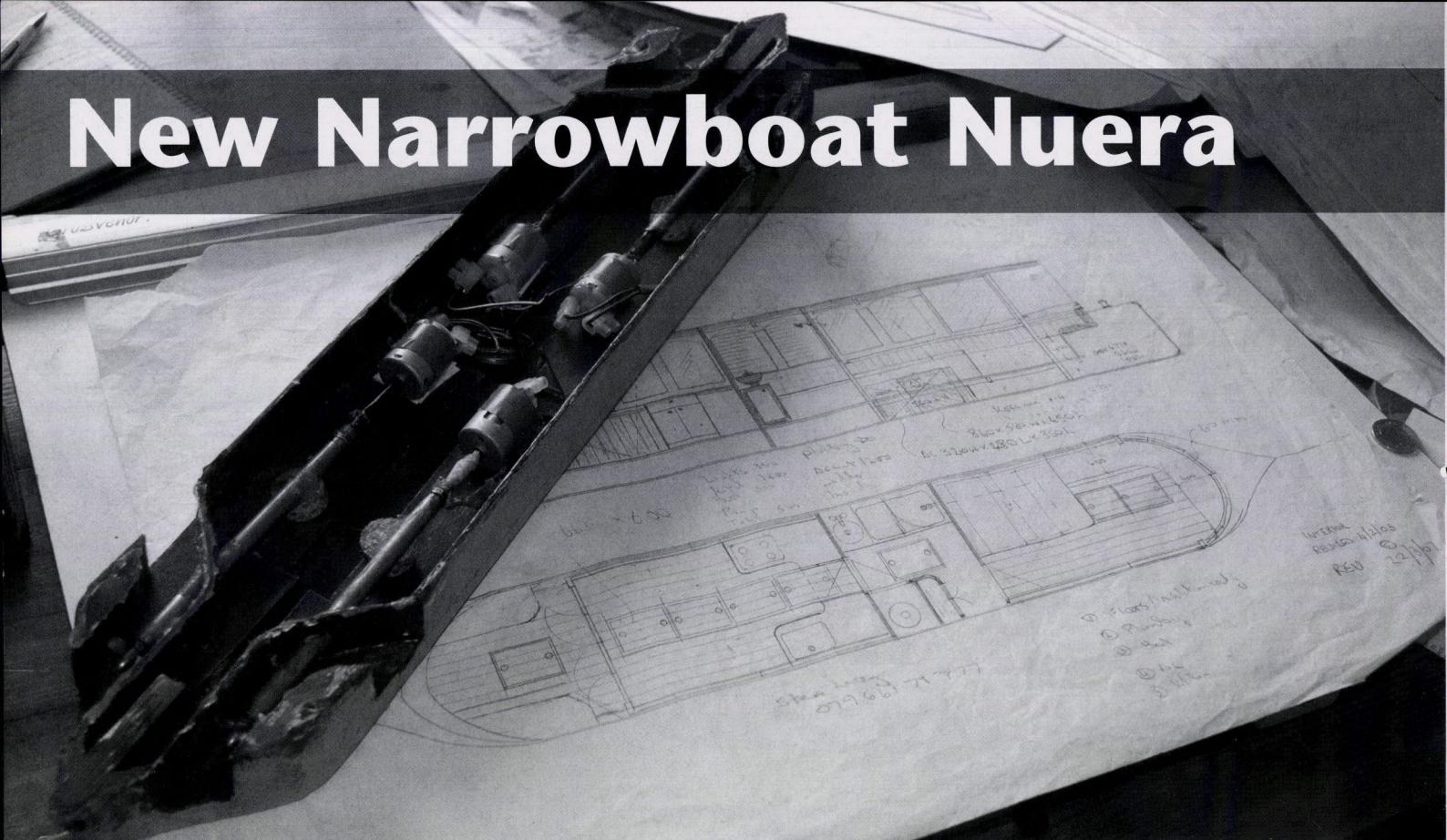
As part of their drive to become the first 'carbon neutral' theme park in the UK, Crealy Adventure Park, near Exeter in Devon, invited new EBA business members Stealthdrive UK to set up and run a small fleet of electric boats on their park lake.

So far there are two boats in use, both 'sit-on-top' kayaks: a Prowler Big Game seating one adult and one child, and a Malibu 2 XL for two adults and a child. Both are fitted with Stealthdrive SD-30 propulsion systems.

For many of the park's customers this is their first ride in any small boat, let alone an electric one. Many have said how peaceful and relaxing it is to be quietly cutting through the water without disturbing the wildlife. They enjoy seeing ducks, geese and swans, not to mention the 30lb carp, so close up in their own environment.

Plans for the third boat are to push back the frontiers by going 100% solar powered. The company is fitting out a second hand 'Topper' dinghy with seats, hand rails and a rudder-mounted Stealthdrive propulsion system and the next stage is to fit solar panels to the forward deck area. A small battery will absorb the peaks and troughs of operating power but even in overcast conditions the panels should provide enough power to keep the battery topped up. Stealthdrive say that their motor control system operates with 99.5% electrical efficiency and so little energy is wasted that no heat sink is required. Additional circuitry based on a proprietary buck-mode switching regulator will match the solar power available to the demands of the system. Stealthdrive will be sending a follow up report for the next issue of EB News.

New Narrowboat *Nuera*



Model and plans

Television viewers in the Midlands may have seen a fascinating new electric boat featured recently in the programme Waterworld. Its owner is EBA member Jonathan Evans, who lives alongside the Staffordshire and Worcestershire Canal at Stourport. Graham Booth describes how the design of the boat evolved.

Jonathan's original idea was to build a floating study and spare bedroom to supplement the accommodation in his house. At this point, his love of boats and training in industrial design kicked in and he started to think about something which could move up and down the canal for day trips and weekend cruises.

His initial feelings were that current narrowboat designs, which evolved from working boats, have helm positions that are unsafe and uncomfortable, and interiors that are claustrophobic. He also wanted a boat that could travel in reverse as easily as forward to avoid the need to press on to

a winding hole and possibly spoil a leisurely day out. As a director of Advanced Power Technology – a company supplying uninterruptible power systems and generators – Jonathan's thoughts naturally turned to using electricity to power the boat. This would require a generator and a considerable bank of batteries that could just as easily power two motors – or more – to give the required forward and reverse movement.

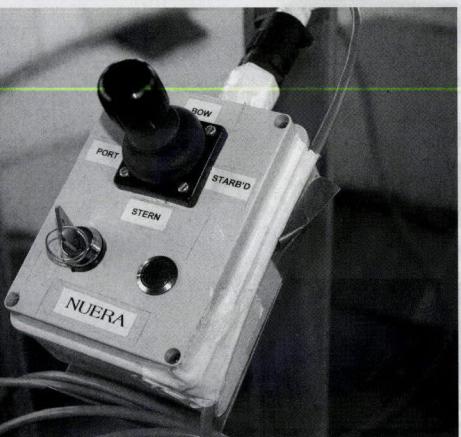
He developed the design as a double-ended boat with four cranked 'bow thruster tubes', one on either side of the bow and stern. Each tube would contain a propeller driven by its own dedicated electric motor. This arrangement, he reckoned, would not only allow the boat to travel just as easily in reverse as forward but, with the appropriate combination of propeller action, it could be steered, travel sideways or turn through 360° in its own length. Also, being completely enclosed in their tubes, the propellers would present no danger to wildlife or anyone unlucky enough to fall in.

A small balsa wood working model with four electric motors convinced him that the idea was basically sound. Although the method of propulsion was unconventional, Jonathan wanted the boat to have a

traditional appearance so that it blended in with the canal environment. Modelling it on a working boat would, in his opinion, have made it too claustrophobic so he opted instead for the classic launch style he had always admired. This would enable him to incorporate very large windows to give good views out for safe steering and for enjoying the surrounding countryside.

The full size boat – named *Nuera* – has a 40ft hull, built by M & D Engineering, with identical double-curved 'wine glass' ends. Two banks of twenty batteries are stored under the floor on each side of the base plate, leaving the centre section free for storage, accessible through lift-up panels in the floor. This results in a 'bilge' about 16in deep so, in order to give the normal floor to ceiling height inside and an acceptable air draught outside, the boat sits an unusually deep 2ft 6in in the water.

At first sight, the superstructure seems double-ended too but in fact one end has a pair of glazed doors which can fold back to the hull sides. There is also a small well deck, with a gracefully raised upstand around it. At the other end, there is no well deck so the rear glazing can curve around and form a large bay window. *Nuera* has no side decks either which means that the cabin extends the full width



GRAHAM BOOTH

Control box showing joystick

of the boat, making it feel more spacious.

The roof has a very slight camber and there are folding stanchions and a handrail on either side so that it can be used for sunbathing or dining. Access is from inside the boat via a small roof hatch and a ladder. The interior fit out has yet to be completed but it will comprise a saloon and galley at the front, a walkthrough bathroom in the centre section and a bedroom with panoramic views at the back.

The propellers are turned by four 8.5kW motors supplied by the Lynch Electric Motor Company which operate at 48 volts, each with its own speed controller. Power for these is provided by forty 70AH Yuasa batteries which should give about two days' cruising. The batteries can be charged from the mains or by an onboard 10kVA Beta generator in an acoustic casing. This starts automatically when the batteries are low.

The thruster tubes are protected from carrier bags and the like by slide-in grilles at either end. The original grilles were made from expanded metal but Jonathan is experimenting with purpose-made louvered grilles to direct the water more effectively.

For safety reasons, and to keep him dry in wet weather, Jonathan wanted to be able to steer *Nuera* from anywhere inside the boat. He envisaged a portable control box with four sliders, one for each of the motors, connected by a cable to the central control unit. The box would be mounted on a pedestal just inside the front doors but could be removed and taken to the

other end when going astern. A colleague suggested that it would be simpler to have a single joystick in place of the sliders and developed the software for this. There are plans for it to be connected wirelessly so that the boat can also be steered from the bank.

Nuera spins easily in its own length and is very manoeuvrable. A slight change in the direction of the joystick is all that is needed to give forward power but one thing that Jonathan realised early on is that it is important to keep the control panel always pointing in the same direction. If you don't, what may seem like a forward push on the joystick could result in the boat going backwards.

The motors on *Nuera* are quite quiet but the movement of water through the tubes produces the slight grating sound that will be familiar to anyone whose boat has a bow thruster – except that this is virtually continuous. Sound insulation around the motors and tubes as well as soft furnishings to absorb more general noise will make for more peaceful cruising.

Nuera was not intended to replace existing designs for inland craft but to show that, given a different brief, it is possible to come up with something that complements them. It is refreshing to find a boat that is so genuinely different from what has gone before but which works so well.

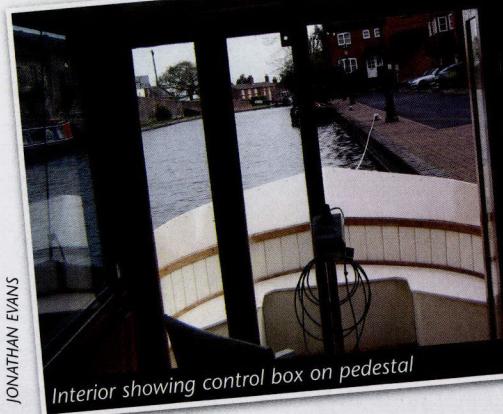
Jonathan is naturally very pleased with the way his revolutionary ideas worked almost straight off the drawing board.

As well as using it for leisure trips, he hopes that the boat can be used to raise the profile of his company. It meets his original requirement for overflow accommodation and, as a bonus, the onboard generator can be linked to his house via an automatic change-over panel to provide electricity in the event of a power cut.

He has no plans to go into production but he has applied for a patent for the thruster configuration and would be happy to allow the design to be used under licence. Its manoeuvrability and reverse running capabilities could make it particularly appealing to operators of water taxis, trip boats and restaurant boats.

For more information contact
Jonathan Evans, Advanced Power
Technology, Tel. 01943 831990,
www.advancedpower.co.uk

A version of this article first appeared in Waterways World.



JONATHAN EVANS

Interior showing control box on pedestal



*Jonathan on board *Nuera**

Boating at Beale

Many visitors to this year's Beale Park Thames Boat Show had reason to be grateful for a bit of improvisation from EBA members, as **Sylvia Rutter** reports.



Lucie Henwood in electric punt *Voltaire*

One of the main attractions for visitors to the show is taking trips on the beautiful seven acre lake with access to the River Thames. But, after heavy downpours earlier in the week, the river was so high that the passenger boats were unable to operate. Fortunately EBA members came to the rescue. New member Rod Thomas supplied one of his aluminium safari pontoon boats and work began early in the morning to fit it with a 2kW Torqeedo outboard motor and four gel batteries from the Thames Electric Launch Company. Successfully

launched, with further work on the outboard completed and a back up team of Paul and Pat Wagstaffe, the boat ran constantly over the weekend, taking over 450 visitors around the lake.

Also on the water was the electric canoe *Silent Explorer*, owned by EBA Webmaster Nick Goldring, along with the traditional launch *Serena* which had travelled from Southampton with her owners Bill and Veronica Selby. *Serena* dates from the early 1900s and operated as a steam launch for 25 years before Bill converted her to electric power in 2006. When moored in the reeds alongside the EBA stand the boats were an additional attraction for visitors, who kept John and Barbara very busy with enquiries about electric boating. Those interested in solar power could check over *Solar Flair II*, complete with the newly awarded second prize rosette in the Sustainable Transport Section at the Bath and West Show. Six new private members joined the

association over the weekend along with new business member Stowaway Boats who sell handmade wooden folding dinghies, suitable for electric outboards.

Dave Millin, who represents the business members on the EBA committee, was kept busy dealing with enquires about batteries and charging equipment on the Pb Batteries stand, with the help of his wife Jennifer. He was also 'pulling his weight' for the EBA in helping *Serena* to get to dry land. Jim and Elaine Avery of Kernowrat, on their first visit to Beale Park, were enjoying the beautiful location for their display of batteries, electric motors and small boats while their dog Tasha enjoyed a snooze in the shade.

EBA business members had boats on display on land and on water. Lucie Henwood was a picture of elegance touring the lake in her beautifully varnished punt *Voltaire*, powered by a silent Electron 800W motor. Built by Henwood & Dean in 1988, the 50 ft boat is modelled on the traditional punts of the Edwardian era but with a higher freeboard to cope with the wash from modern motor boats.

Bossoms had their Isis 14 electric launch on display and also pictures of a new 25ft



IAN RUTTER



IAN RUTTER

electric boat which will be launched at next year's London Boat Show. Max Campbell of Whisper Boats was showing Australian designed ready-to-assemble boats, intended primarily for sail with traditional rigs but all suitable for electric auxiliaries. New EBA member John Coates of Marine Classics had come from Yorkshire with a slipper launch on its way to a purchaser on the Thames. This was a diesel version but the company's slipper launches and traditional rounded 'barrelback' launches are all available with either electric or diesel power.

Salters were showing their new Electric Skipper 15, an open launch with optional cuddy or full length canopy and also their 19 ft Mystic cabin launch which is selling particularly well in the Lake District.

On the Hambleton Sales & Charter stand Gillian Nahum had a pretty electric canoe for sale. *Melodie* was built by Peter Freebody in 1997 of teak/mahogany and ash and at 22ft long is slightly shorter than the traditional double wheeled canoes.

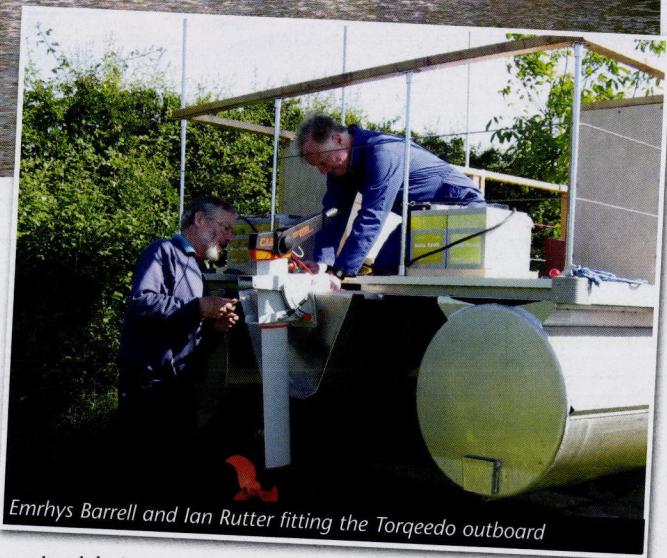
A new outboard-powered family dayboat, the Electric Explorer 13 from the Thames



IAN RUTTER

Safari boat

Electric Launch Company, was proving popular with visitors. TELCO were also demonstrating their Dragonfly 12 skiff, the Interboat 16, Pioneer 12 and two boats with wheelchair access: the Mobiboot, which can carry up to six people, two in wheelchairs, and the Wheelyboat, designed for wheelchair anglers. There was plenty of sunshine over the weekend to power *Solar Spirit*, the canoe built by students of Imperial College which was preparing for a long distance solar challenge on the Dutch canals, lakes and rivers at the end of June. We hope to have a report from them



SILVIA RUTTER

Emrys Barrell and Ian Rutter fitting the Torqeedo outboard

on the Frisian Solar Challenge for the next issue of the magazine.

Next year's Beale Park Show will be held from the 5th to the 7th of June and the organisers are hoping for similar sunny weather, but a bit less water in the Thames, for 2009.



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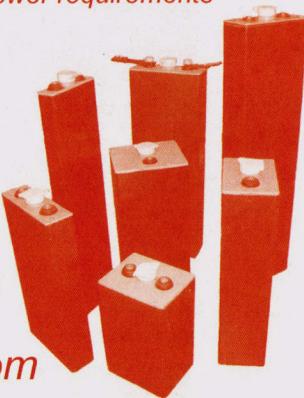
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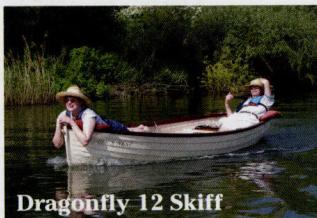
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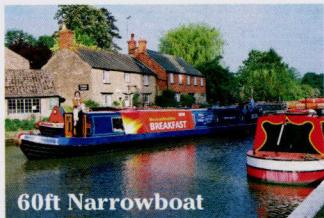
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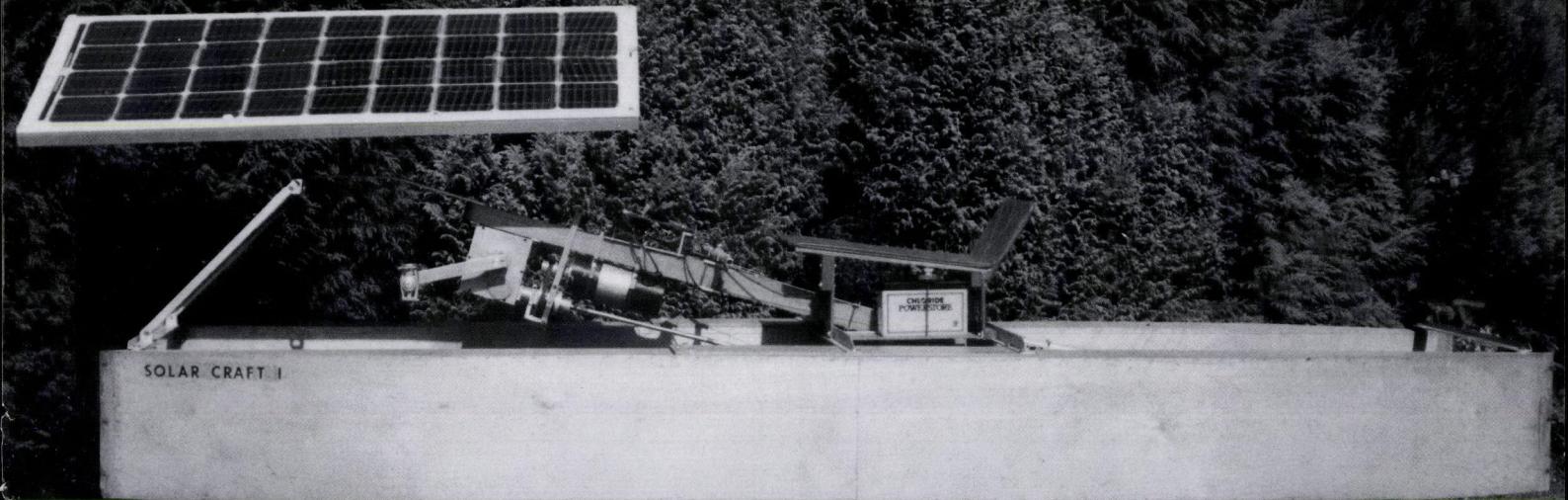


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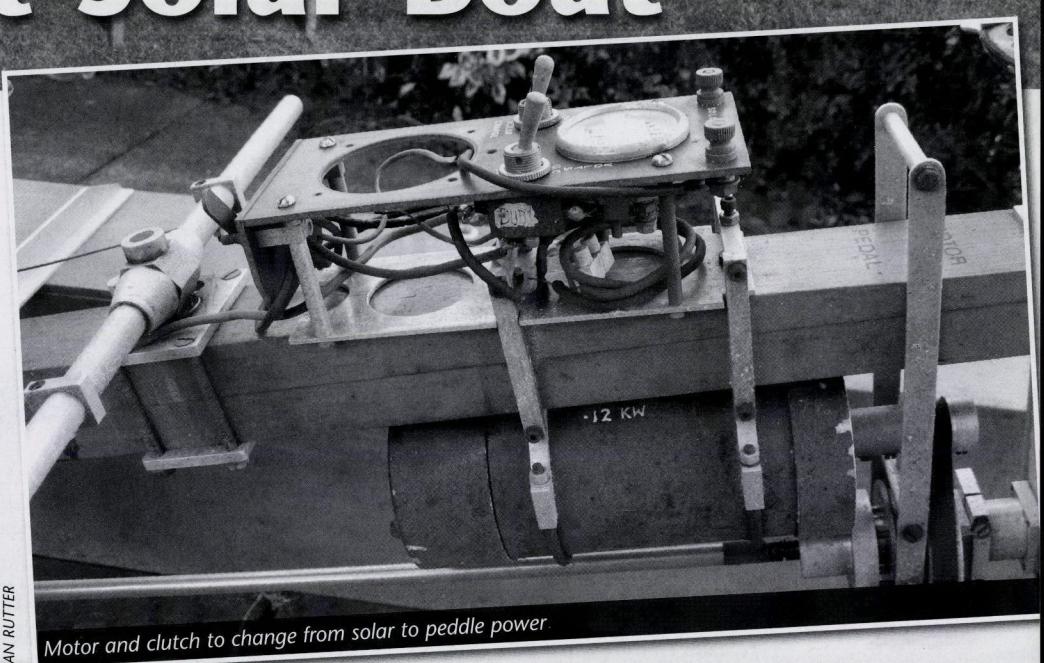
The First Solar Boat

The world's first solar boat has been donated to the Basildon Motorboat Museum. Kevin Desmond has the story.

In 1974 predictions were made that within the following ten years the cost of solar cells would be reduced to 20 pence per watt with an increase in output of 10 watts per square foot. This prompted a 65 year old former consultant on railway electrification, Alan T. Freeman of Rugby (no relation to the Top of the Pops disc jockey) to make a practical study of the viability of future uses of this form of energy.

An 8ft catamaran was constructed in marine plywood and Duralumin. Its power plant was a DC 'printed circuit' motor, powered directly from the energy of the sun's rays. Freeman named his prototype *Solar Craft I*. Fifty Lucas circular solar cells, divided up into 10 modules, were mounted on a panel and powered Freeman on his maiden voyage on 19th February 1975.

To improve performance he acquired two 60-cell Ferranti solar (4 x 7 watt) panels, mounted on tripods fore and aft. The electric motor turned an aluminium alloy propeller. With a maximum speed of 4mph (6 km/h) as imposed by Inland Waterways, on 10th May 1978 *Solar Craft I* made a trip of 4.1 miles in two hours along the British Waterways Canal at Rugby. It was



Motor and clutch to change from solar to peddle power.

an extremely sunny day, although Freeman found that his power efficiency was interfered with by the vapour trails left by jet aircraft (today known as global dimming).

Freeman's boat was in fact a hybrid, since a small, sealed lead/acid battery at the front of the boat floated across the solar supply and only gave power when passing through the shadows. The 12V 2.5 Ah battery was re-charged from the solar panels when the boat was at rest.

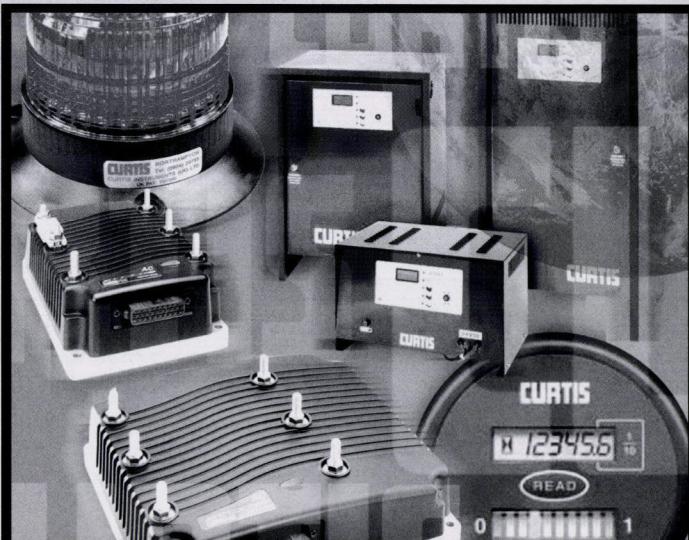
Alan Freeman also developed two solar cars (one of them the first road legal solar car in the UK, registered TRP 585W) and an 8mph solar cycle. For a growing number of

enthusiasts, he published his 60-page 'Solar Energy for Motive Power', reprints from nine technical papers he wrote.

In the 30 years which have followed, Freeman lived on to see progress with all forms of solar transport he had envisaged. For boats, large solar-powered passenger ferries and a transatlantic solar-powered catamaran called *Sun21*.

While a Freeman solar car is on show in Birmingham, it seems right and proper that *Solar Craft I* will eventually go on show at the Motorboat Museum in Basildon where it will continue to inspire others.

Alan Freeman died peacefully in his sleep on March 13th 2008. He was 95 years old.



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Technical Report

ELECTRIC POINTS: 'GET PROPELLED'

In the thirteenth of a series of short articles on technical aspects of electric boating, EBA Technical Officer Paul Lynn discusses propellers.

We may think of the drive train of an electric boat as having four main components: battery bank, control circuitry, motor and propeller. Previous articles in this series have discussed the first three, but I confess to fighting a little shy of propellers because they seem to me the most complicated. Anyway, here goes. How does a propeller work and what affects the choice of a suitable one for your boat?

The basic function of a 'prop' is to convert rotational motion of the electric motor into linear motion of the boat. It may be said to accept torque and deliver thrust. The classic way of describing a prop's operation is to compare it to a metal screw. For example let's consider a woodscrew with 10 threads per centimeter length, or one per millimeter (mm). The screw is said to have a pitch of 1mm. Every time you turn it one complete revolution it moves into the wood by 1mm. If you keep the screwdriver moving at say 3 revolutions per second, the screw advances by 3mm per second. Another screw with a pitch of 2mm would move forward 6mm per second, and so on. Note that the speed of forward movement equals the pitch multiplied by the speed of rotation ('pitch x revs').

A boat's propeller, sometimes also referred to as the 'screw', behaves in a somewhat similar fashion but with one major difference. It rotates in a fluid medium. This means that its forward speed through the water is generally less than 'pitch x revs' as there is a certain amount of slip. For example, suppose we have a prop with a pitch of 8 inches (sorry, metric enthusiasts, props are generally sized imperial!), and that the motor turns it at 900rpm or 15 revs per second. The 'pitch x revs' is therefore $8 \times 15 = 120$ inches per second (10ft/sec, or 6.8mph). If we assume 30% slip, the actual speed through the water is $6.8 \times 70\% = 4.8\text{mph}$.

Why can't the prop move the boat forward at 'pitch x revs' speed without any slip? The basic answer is that some slip is necessary to produce forward thrust. Let's indulge in a little anthropomorphism and imagine ourselves as the propeller, that the boat is stationary and the motor is suddenly switched on. Initially we find ourselves 'clawing' at the water, trying to force it backward (and the boat forward) and the slip is 100%. As the boat gathers speed and the slip reduces we aim towards

'pitch x revs'. But we can never reach it, for if we did the blades would be slicing cleanly through the water without trying to force it backwards any faster. There would be no forward thrust to counteract the drag on the hull. So a compromise speed is reached, at which the slip is just sufficient to balance thrust against drag. The actual amount of slip depends on prop, hull, and speed, and is a very complicated matter. Typical values for electric boats at normal cruising speed are in the range 20-40%.

The other major parameter of a propeller is its diameter. Indeed, props are generally classified by their diameter and pitch. For example a prop with diameter 10 inches and pitch 8 inches is described as a '10 x 8'. Clearly, the bigger the diameter the more water passes through it as the boat moves forward, and the greater the thrust. But the required torque also increases, so there is a difficult balancing act to be achieved. Too big a diameter and you are asking the motor for too much torque, too big a pitch and you are being greedy for top speed.

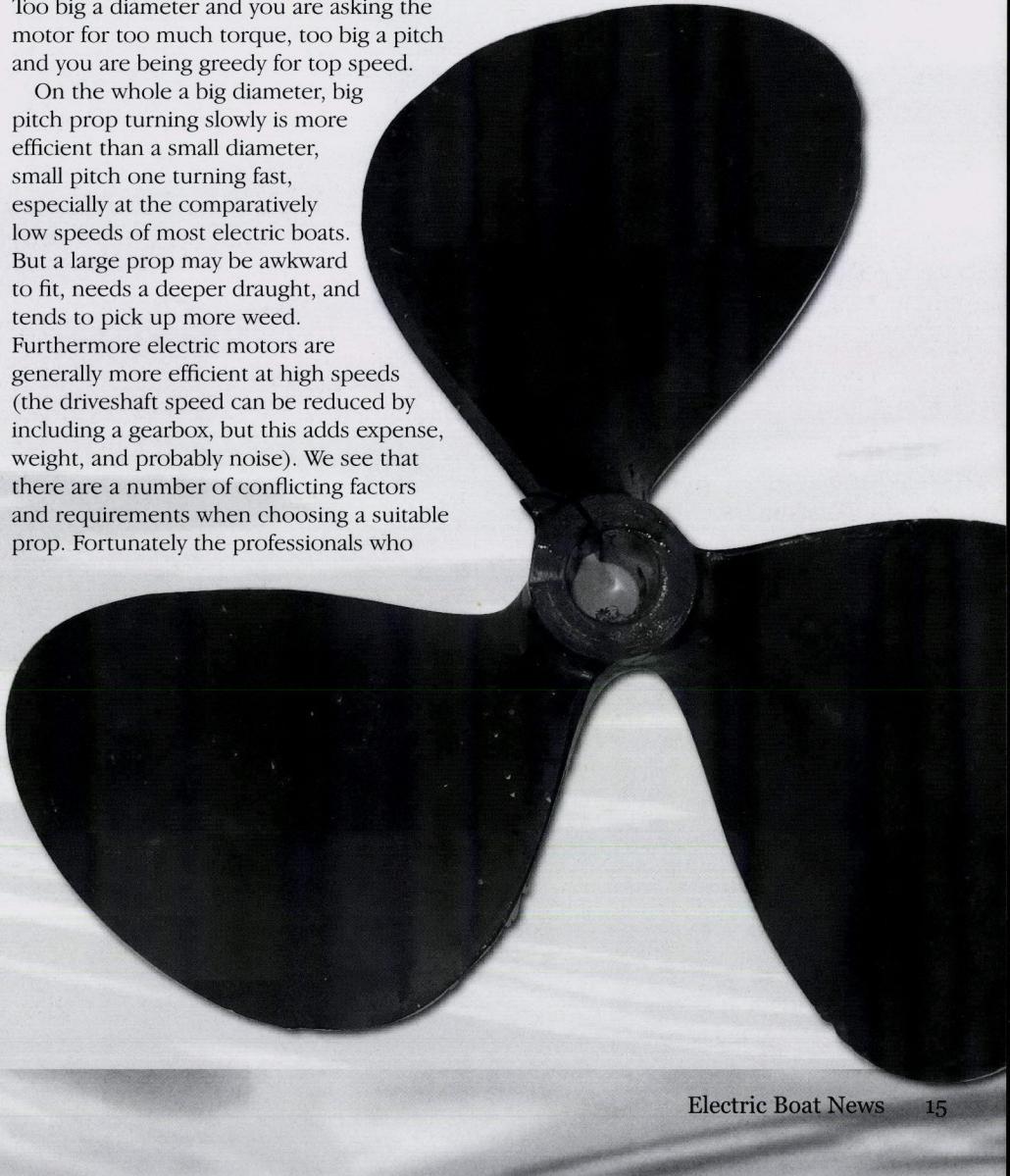
On the whole a big diameter, big pitch prop turning slowly is more efficient than a small diameter, small pitch one turning fast, especially at the comparatively low speeds of most electric boats. But a large prop may be awkward to fit, needs a deeper draught, and tends to pick up more weed. Furthermore electric motors are generally more efficient at high speeds (the driveshaft speed can be reduced by including a gearbox, but this adds expense, weight, and probably noise). We see that there are a number of conflicting factors and requirements when choosing a suitable prop. Fortunately the professionals who

supply motors and propellers are generally aware of the issues and can recommend a suitable combination for your boat, given the hull's speed/drag characteristics.

If all this seems complicated (and it is), it may help to summarise a few key points:

- A boat propeller is specified in terms of its diameter and pitch.
- Your boat can never quite reach the nominal maximum speed given by the propeller's 'pitch x revs' because a certain amount of slip is needed to give forward thrust.
- A large diameter prop turning slowly is generally more efficient than a small diameter one turning fast.

As we 'get propelled' it's good to spare an occasional thought for the complex chain of events between charging the batteries and cruising 'without noise, pollution, or fuss'!



Noticeboard

Welcome to New Members

Private Members	Location	Boat where notified
Nicholas Easterman	Staines, Middx	Evadne X Patterson Boatworks 23 traditional launch
Steve & Pam Reece	Luton, Beds	Serendipity, Pegasus 700 aux yacht
John & Anne Stevens	South Shields, Tyne & Wear	MV Sara, 14m hull c 1925
Graham Garner	Wansford, Peterborough	Chi Chi 10m seagoing catamaran
Javaid Hossany	Vacoas, Mauritius	
Steve Ellis	Worton, Devizes	Blue Skies, 14 ft plywood double ender
Paul Mann	Keithley, Yorks	Parlanchina
Timothy West	Long Melford, Suffolk	Georgie, Frolic 21
Jeremy Stattersfield	Horning, Norfolk	Domino, River Dart 4.0
Dave Gallus	New Jersey, USA	Patronus, 24 ft sloop Ark, 32 ft cabin cruiser
David Morgan	Hemingford Grey, Cambs	Lady Hamilton 1920s Gibbs launch
Richard Barnes	London	Dorothy R - Roamer
Richard Boyles	Brixham, Devon	Daisy 19 ft Memory gaff rigged sailing boat
Chris Regnart	Manchester	Nellie, half scale sailing barge
Joy Weston	Exeter, Devon	
Chris Barnes	Modbury, Devon	Quest of Salcombe
Adrian Dalziel	Glastonbury, Somerset	Alugria and Pennyless
Nigel Brookes	Yealmpton, South Devon	Canoe
Peter Brennan	West Malling, Kent	
Peter Milne	St. Albans, Herts	Dutch barge
Andrew Ball	Maidenhead, Berks	Cheetah 17 ft Canadian canoe
Andy Maskell	Lymington, Hants	c1960 15 ft sailing dinghy conversion
Robert Moulston	Studley, Warwicks	

Business Members

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Safari Pontoon Boats,	Cardiff
Sales of pontoon boats	
Electric Boats (Thailand) Co.Ltd,	Khon Kean, Thailand
Design and manufacture of electric pleasure and passenger boats	
Stowaway Boats Ltd.	Warwickshire
Manufacturers of fold-up boats	
New Era Boat Trips	
Solar Powered passenger carrying craft on the Caledonian Canal, Inverness	

New Membership Secretary

The EBA is very pleased to welcome Tom Moore as Membership Secretary of the Association. Contact details for Tom are on page 20.

Sponsorship

The EBA is still looking for sponsors for the magazine. If anyone can offer sponsorship or suggest potential sponsors please get in touch with Barbara.

Dear Sylvia,

Members with octogenarian tendencies may recall that in 1945 BBC Radio broadcast a regular programme called 'Write a tune for a thousand pounds', which had a following of which 'The Archers' would not have been ashamed. The other day I came across the words of the final winning song - some might consider it suitable for an EBA signature tune if one was ever needed. It begins:

Cruising down the river on a Sunday afternoon,
With the one you love, the sun above,
Waiting for the moon.

The old accordion playing a sentimental tune
Cruising down the river on a Sunday afternoon.

Soppy stuff, isn't it, but how we boys, waiting
for demob, loved it!

Kind regards,

**Stephen Appleby -
of the Optimist on the Lancaster Canal.**

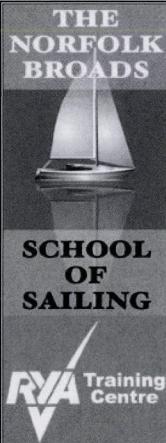


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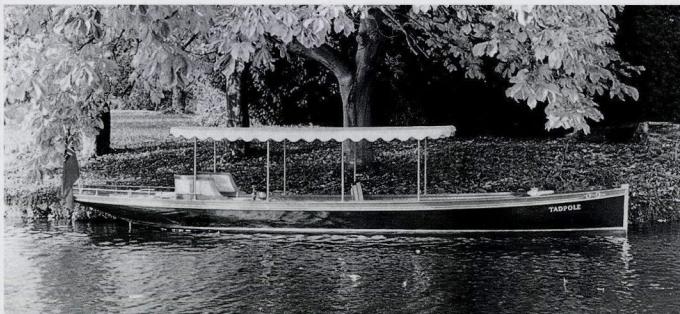
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4. **HULL DESIGN FOR ELECTRIC BOATS**
by Andrew N Wolstenholme
5. **LEAD ACID BATTERIES – OPERATION & MAINTENANCE**
by CMP Batteries
6. **HIGH SPEED ELECTRIC BOATS** by Lorne Campbell
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8. **TRAILERS AND TRAILING** by Paul Lynn

9. **FITTING OUT AND LAYING UP YOUR BOAT** by John Hustwick and Ian Rutter

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West Country Shows

Edith Elizabeth

The EBA was at two very different shows in the west of England in May. First came the Inland Waterways Association National Trailboat Festival, held over the Spring Bank Holiday weekend near Tiverton in Devon. Report by Sylvia Rutter with pictures by Ian Rutter.

The beautiful location on the Grand Western Canal had been chosen to celebrate all the work undertaken in recent years to improve this historic waterway. Large crowds enjoyed craft and trade stalls, jazz and folk bands and a variety of food and drink.

Visitors young and old, including Toby and Ollie pictured on the front cover of the magazine, stopped at the EBA stand where Paul Lynn's *Solar Flair II* and the Cellcraft skiff were a particular attraction. It was good to meet EBA members from Cornwall, Devon and Somerset, as well as some from further afield who were staying on their (non-electric) boats.

A lot of visitors were interested in the items on offer from EBA business members Kernowrat, particularly the new Pontoon Boats, inflatable catamarans which can be carried in a rucksack, and the durable inflatable Marine Pro 300. Both of these are suitable for electric outboards. Kernowrat were also selling mounting brackets for outboards, Flover and Manta electric motors and a range of leisure batteries.

EBA Press and Publicity Officer Tony Rymell managed to find time among his many duties on site for trips along the canal in *Solar Flair III*, which attracted a lot of interest from people on the bank. Also on the water was the Wheelyboat *Mark III*, powered by a Minn Kota

outboard and four AGM batteries, and designed for use by disabled anglers.

Another very popular electric boat was the *Edith Elizabeth*, owned by the Monmouthshire, Brecon and Abergavenny Canals Trust. Named after Edith Haden and Elizabeth Dommett, the mothers of two Trust members, the boat consists of two sections held together with steel cables. With two Minn Kota outboards it can

operate as one 26 ft boat or two 13 ft boats and the two sections fit neatly one above the other on its 16 ft trailer. It was kept very busy taking visitors on peaceful 20 minute trips up and down the canal.

Next year's IWA National Trailboat Festival will be held on the restored section of the Ashby Canal at Moira in Leicestershire over the Spring Bank Holiday weekend 23rd – 25th May.



Kernowrat



A few days after the Tiverton Rally came the Royal Bath and West Show at Shepton Mallet in Somerset – but should it perhaps, Barbara Penniall wonders, have been renamed 'The Bath and Wet Show'.

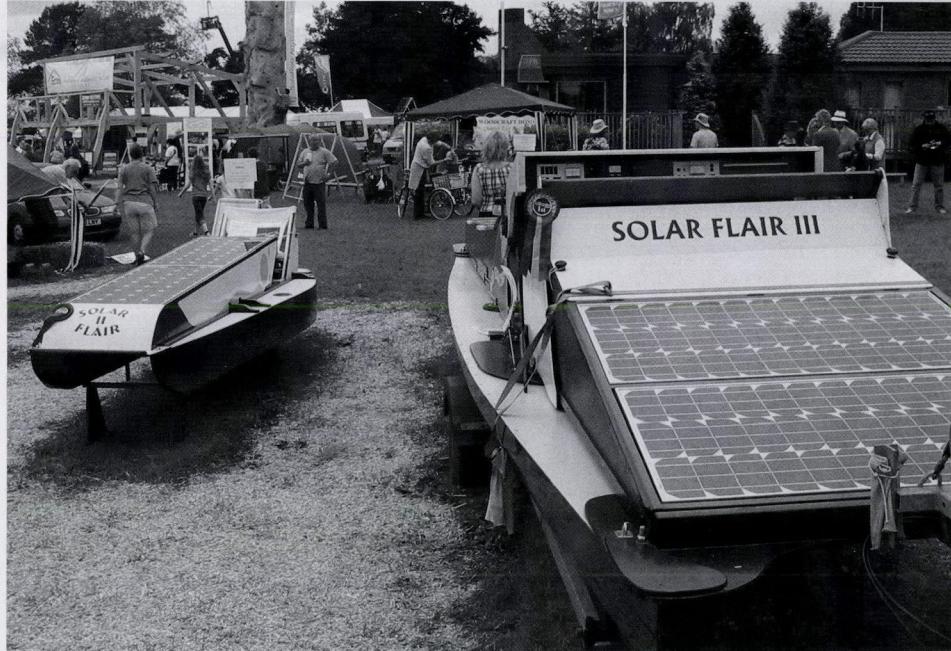
Following the success of last year's attendance at the Royal Bath and West, the EBA was again invited to have a stand in the Sustainable Transport area of the Eco Section.

EBA President Malcolm Moss arrived in a solar powered quadricycle as part of the SolaRola - six solar wheelchairs which spent seven days travelling to the site from Central London. The opening day of the Show was slightly marred by continuous drizzle, but this did not dampen the spirits of those demonstrating the efficiency of solar power, even on the dullest day.

Solar boats on display were Paul Lynn's *Solar Flair III*, which became the star of the show and was awarded first prize, closely followed by *Solar Flair II*, her smaller sister, taking the second rosette. Also on display was our Cellcraft skiff demonstrating the use of outboard motors and a new EBA member's craft, *Dasuja II*, a River Dart from Water Roo Craft and kindly lent to us by David Drennan.

It was very unfortunate that on the second day, in spite of very pleasant sunshine until late afternoon, flash floods hit Somerset and all our sympathies went out to Tony Rymell, a stalwart supporter at many EBA events. His house in Crewkerne sustained severe flood damage caused by some three feet of water appearing in a very few minutes. We were more fortunate than some traders who lost stock or were washed away, and it was business as usual for the rest of the week, with just a small tidemark at the bottom of the stand to remind us how lucky we had been.

There were several serious enquirers and lots of people were genuinely interested in either buying an electric boat or converting their existing craft to electric propulsion. New members signed up and we were able to help many more with technical advice and information. We are very grateful to EBA members Roger and Julia Woodhouse who came on the stand for a day and Tony and Janet Dunning who



Solar Flairs II and III sporting their rosettes



Noel Edmonds on the SolaRola obstacle course

were there for the whole of the show, as always with cheerful practical help come rain or shine.

Noel Edmonds gave us much amusement trying out Malcolm's SolaRola obstacle course and he then approached us with a serious interest in having an electric boat on his lake. This year's Royal Bath and West

definitely built on the success of our first outing to last year's show and again offered the opportunity to promote electric boating in an area where there are many lakes and quiet waterways ideally suited to our silent, environmentally friendly propulsion.

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Classified Advertisements

**For Sale**

Mystic Electric Launch 19' 6" Powered by 16 x 175 amp hour batteries with on board charger. Upholstered seating for 8 passengers. Internal boarding steps. Excellent condition throughout. Must be seen to be appreciated at Laleham Reach, Chertsey. £9,500 (Current price new from Salters of Oxford £22,500)
Phone 01932 560199

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Sparks 13 ft electric clinker launch. Built 1999 Devon by Adrian Noyes. Douglas fir on oak. 1.5 kW 48 volt 3 phase inboard by Stelco. 4 x Trojan 130 ah new batteries. Dipping lugsail, oars, cover and road trailer. Superb condition throughout. £6,495. Telephone Richard Frost 07789 157220 or 01328 730858 North Norfolk.

Electric Skiff: 16'3 x 4'2 black grp simulated clinker hull (moulded from original Yare rowing skiff). Pine/Jarrah planked decks and cockpit sole, mahogany inset transom. All woodwork epoxy treated both sides, high gloss varnish finish. Fitted Briggs and Stratton electric motor, 4QD controller, 4 x 12v (38 ah) batteries giving 24 volts. Side wheel steering, many brass original parts used. Complete with fully galvanised custom built trailer. £4,200. See picture opposite. Contact Paul Morton 01603 721343 Mobile 07860 731767.

Whisper look-alike. Did you like Whisper on the cover of the Autumn magazine? Do you want one? We have one for sale, just fibreglass hull and deck with hole in transom. On trailer (tyres and bearings needed). Offer around £200 will secure. Tel. Bob Cooper 01233 732751 or 07788 400659

Members wanting to buy or sell electric boats, motors, fittings or associated equipment are invited to submit a 50-word entry direct to the Editor (Note: No agents or brokers). The information contained in members' private advertisements is provided by the advertiser and the Editor is unable to vouch for their accuracy. It is the responsibility of prospective purchasers to satisfy themselves as to the accuracy of the information given and of the condition of goods advertised.

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