

The Journal of the Electric Boat Association
Supported by the Broads Authority

www.electric-boats.org.uk

Volume 19 Number 4 Winter 2006/7

Electric Boat **NEWS**



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Solar Crossing of the Atlantic • Solar Cruising in Canada***



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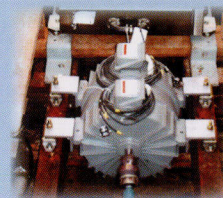
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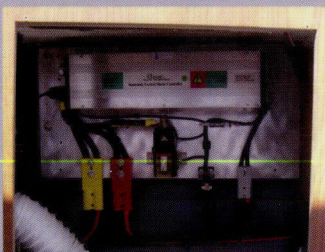
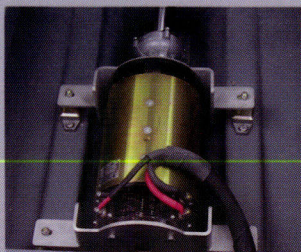
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EBA Calendar

February

9th – 14th	EBA interest	Boot Holland Leeuwarden in Friesland
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March

6th – 11th	EBA interest	HISWA Boat Show, Amsterdam
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May

12th – 13th	EBA Event	Cruising weekend on River Great Ouse
19th – 20th	EBA represented	Taunton River Festival
26th – 28th	EBA represented	IWA National Trailboat Festival Grantham Canal

June

8th – 10th	EBA represented	Beale Park Thames Boat Show, Pangbourne
30th	EBA Event	AGM, Cookham followed by a Thames Cruise

July

1st	EBA represented	Steam and Electric Boating Festival Sudbury, Suffolk
4th	EBA Event	President's Pimms Party, Henley
14th	EBA represented	River Festival, Evesham
21st – 22nd	EBA represented	Thames Traditional Boat Rally, Henley

August

25th – 27th	EBA represented	IWA Festival St. Ives, Cambs
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September

8th – 9th	EBA Event	Norfolk Cruising Weekend
9th	EBA represented	Green Boat Show, Salhouse Broad

October

tba	EBA Event	Laying Up Supper
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This is a provisional calendar and events and dates may change.
For more details of the above, or notice of other events, contact
the Secretary or check the EBA website.

Cover Picture: George Thetford at the Green Boat Show
Photo: Barbara Penniall



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Details of the other EBA Committee Members are on page 20.

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:

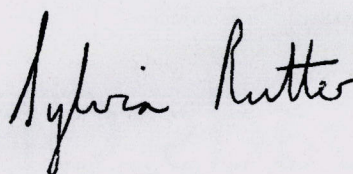
Spring 1st March



The EBA has written to the Waterways Minister to protest at the recently announced cuts in waterways funding and asked for electric boats to be exempt from the increase in licence fees. EBA committee members have also written individual letters to their own MPs and EBA members were involved in a nationwide weekend of protests in November.

The grant reductions mean that boat licences for the Thames and other Environment Agency waterways will rise by 12% a year for the next three years. Cuts to the British Waterways budget will lead to redundancies and reduced maintenance work as well as increased charges for boaters.

The Inland Waterways Association has joined many other boating associations in a campaign against the cuts. Their information leaflet is enclosed for UK EBA members with this magazine. The EBA will continue to lobby ministers and authorities, not only on behalf of those who participate in our own environmentally friendly form of boating but also for everyone who uses and enjoys our inland waterways.



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David Williams demonstrating his solar powered boat Terrapin

The Broads Green Boat Show

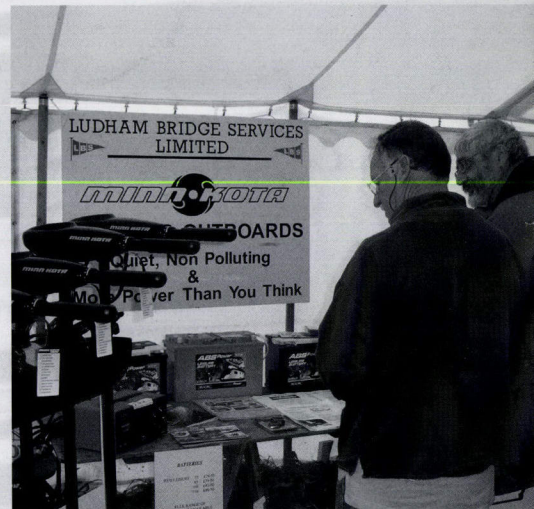
EBA members were out in force at a new show exclusively for environmentally friendly boats. Report by Tony Fogarty with pictures by Barbara Penniall.

A sunny early autumn day was a fitting welcome to the first Green Boat Show held on 30th September on Salhouse Broad in Norfolk. This show had evolved from a Silent Sensation, organised for many years by Pat and John Atkins, and drew a large crowd. The organisers were Peter Howe, Pema Marriott and myself with the financial support of the Broads Society, the Sustainable Development Fund and the RYA/BMF Green Blue Initiative.

Salhouse Broad is a beautiful and secluded site, with moorings



Lumiere Rouge band



Minn Kota outboards on the Ludham Bridge stand



and a shelving beach which the owner Henry Cator had kindly offered for the show. To add to the green credentials a free boat service (on an electric launch) was provided from Wroxham.

Traditional jazz from the Lumiere Rouge band, with Albert Lambert, owner of the electric Freeman *Patience*, on trombone added a sparkle to the pleasure of the day.

Exhibitors included the EBA where John and Barbara dealt with a large number of enquiries and signed up four new members. They were helped by EBA Business Representative David Millin of Pb Batteries and the Broads Authority was also there to fly the flag. In the marquee the twenty exhibitors included Colin Facey who was showing a 12V 5.5A fuel cell, powered by methanol, for around £2,000, and Gordon Hall who had come down from the Lakes to exhibit the Solomon Technologies motors. Rupert Latham reported good interest in conversions, and Filgris were displaying recycled plastic for panels and posts. Robert Paul from Ludham had a good range of Minn Kota outboards.

At the water's edge, electric boats on show included Peter Howe's sailing boat *George Thetford*, pictured on the

front cover. Twelve years ago Cedric Lynch installed a Lynch motor and 720 Ah of battery capacity in the boat and since then it has cruised extensively on the Broads as a hire yacht, with the electric auxiliary well loved by her crews. Also on display were David Williams' *Terrapin*, my own boat *Moonglow*, Albert Lambert's *Patience* (being demonstrated by John and Sandy Williams), Tom Moore's elegant Brooke's launch *Merlin*, Les Hoare's Electroboat (a new venture by three local entrepreneurs who have produced a 4-person day launch with an elegant canopy for just under £3,500 inclusive), the yacht *Mock Turtle*, the electric passenger boat *Helen of Ranworth*, Rod Birk's small launch *Winsome*, the Broads Authority's diesel/electric patrol launch *George Collier* and the hire boats *Electric Mystic* and *Kingline* (the latter with wheelchair lift).

Muscle-powered boats included a new range of lightweight pedal kayaks (which can also be paddled) from Hobie Kayak whose drive is described as being from flippers working like penguins' fins; sizes range from 2.92m to 4.88m at prices between £1,116 and £1,939. A different version of pedal power was used by *Winsome* from Swallowboats of Wales:

a propeller driven by two people facing each other with a bicycle action (based on David Williams' design) priced at around £5,000.

Paul Wagstaffe had brought Cellcraft, the EBA's fuel-cell powered skiff which attracted a lot of interest, and Brian Ellis demonstrated his solar powered generator for remote charging by topping up *Merlin's* batteries. The 40 ft *Fair Countess* was a good example of a Faircraft Loynes hire boat fuelled by bio-diesel (recycled cooking oil) which has been running successfully for two years.

Many of the visitors took the opportunity to try out the boats, with the pedal boats being particularly popular, and people of all ages were delighted by the ease and speed attainable. Demonstration runs on electric boats by EBA members convinced any doubters of the pleasure of electric boating. The highlight of the event was a sail-past of all the boats for the benefit of the photographers.

This was a very successful day and Peter and I are already planning next year's Green Boat Show, provisionally to be held on Sunday 9th September on Salhouse Broad. This will be even bigger and better – put it in your diary.



The new Electroboat

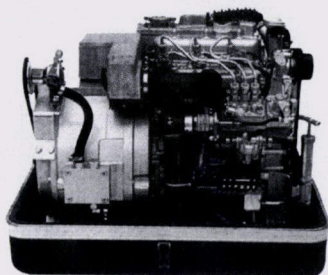


Tony Fogarty's launch *Moonglow*



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Solar Transatlantic

A Swiss catamaran is aiming to be the first boat to cross the Atlantic under solar power. Kevin Desmond and Theo Schmidt have been sending reports on its progress.



The 14 metre long boat, christened *Sun21*, is an Aquabus C60, built by MW-Line. C60s have already cruised through high waves in the Mediterranean but *Sun21* has been designed to cope with a more serious Atlantic swell. The frontal area of the boat has been reduced to meet oncoming winds, with the deck and roof modified to take the impact of large quantities of water, and there are several watertight compartments in both hulls. At 6.5 metres wide, the boat has sleeping accommodation for 8 people, although it can take large groups for visits or short excursions. There is a galley in one hull and sanitary installations in the other.

Linking the two hulls is a large deck roofed with photovoltaic modules which power the two Agni 8kW motors, one in each hull. Each motor has a MillipaK 4 quadrant controller and there are two 520Ah 48V DC battery packs to enable the boat to travel day and night. The carbon propellers have been specially designed to obtain the maximum efficiency at speeds of 5 to 6 knots. A Datalogger has been installed to record information such as speed, power, wind (direction and strength) and prop rpm which will be used in the development of the high speed round the world solar trimaran *PlanetSolar*.

Sun21 began its long voyage in Basel on 16th October 2006. Swiss EBA member Theo Schmidt accompanied it for its first few miles in a solar powered Frolic 21 whose owner, Matthias Wegmann, was piloting *Sun21* down the Rhine to Rotterdam. The transatlantic boat attracted a great deal of interest in towns along the way at official receptions and media events. At times it was quite a hazardous journey as the crew had to travel both in fog and at night to keep to the timetable. The fast moving Rhine has groynes which force all



The Frolic 21 alongside Sun21 at the start of the journey in Basel

shipping to use the often narrow channel marked by unlit buoys. Sometimes when progress was slow *Sun21*, rather reluctantly, had to take an occasional shore charge to get to Rotterdam on time. Here a freighter was waiting to take her to Cadiz as deck cargo, thus avoiding the crossing of the notoriously rough Bay of Biscay.

After the start of the Atlantic leg from the Spanish coast on December 3rd, *Sun21* averaged 70 miles in 24 hours, a speed of about three knots, travelling day and night in a rough sea. She successfully weathered her first serious storm with force seven winds and five metre high waves but took refuge in Casablanca from even worse weather conditions. She then resumed her passage to the Canary Islands, arriving at Lanzarote on December 18th, with a stopover for repairs at Christmas. As EB News went to press, *Sun21* was heading across the Atlantic to Martinique. The journey will continue up through the West Indies and Bahamas to Miami. The final leg will be a cruise up the American coastline to a welcome, if all goes well, by the Mayor and people of New York on 8th May 2007.

For regular updates on *Sun21*'s voyage see the website www.transatlantic21.org

Rivertime Boat Trust Launched

EBA members Pat and Simon Davis, who sold their Rivertime electric fleet to Hobbs of Henley in October, have launched a new charity to provide a day boat for disabled and disadvantaged children and adults. The boat will be based on the Thames at the Henley River and Rowing Museum. After getting off to a splendid start with a £5000 donation from Invesco, the trust has already raised over half the money required.

The specially designed 35 ft community vessel will be built in Norfolk and have a hybrid transmission system using both diesel and battery power with the addition of solar panels. A group of experts from the EBA are helping to prepare the specification.

For more information contact Simon Davis on 01628 777727 or see www.rivertimeboattrust.org.uk



Jonathan Hobbs, Hobbs of Henley, Jes Easson, Invesco Perpetual, and Simon Davis, Rivertime Boat Trust

Amateur Boatbuilding Awards

Water Craft magazine is inviting entries for their sixth competition for backyard boatbuilders. Boats can be of any size or type but must be predominantly of wood or plywood and have been built by genuine amateurs from scratch. As well as winning vouchers for marine products, the best boats will be put on display at the Beale Park Boat Show in June.

Entrants should send a brief description of the boat with one or more colour photographs by 1st May to Water Craft Amateur Boatbuilding Awards, Bridge Shop, Gweek, Helston, TR12 6UD. For more information telephone 01326 221424 or e-mail ed@watercraft-magazine.com.

Broads Authority Bill



Chairman of the Broads Authority, Professor Kerry Turner, with the Broads Bill

The bill which will give the Broads Authority new powers to make the Broads a safer place to navigate, and enable government funding to be used for maintaining the waterways, has been deposited in Parliament. The bill will allow the authority to licence hire boats, introduce compulsory third party insurance for boats, control pollution from rogue boats and enter land to manage overhanging vegetation which poses a hazard to navigation.

A wide range of interested parties was consulted on the bill including the IWA, RYA, the British Marine Federation, Norfolk and Suffolk Boating Association, Broads Hire Boat Federation and the Environment Agency. The bill is expected to complete its passage through parliament by autumn 2007.

National Small Boat Register

A register for small boats worthy of preservation for future generations has been set up by the National Maritime Museum Cornwall.

This will be the first database of the most important small craft in the UK and the NMMC is asking owners, individuals and organisations to send details of boats under 40 ft in length which are of historic interest. Almost any boat which is still on the water after 50 years, they say, would be an obvious candidate for inclusion.

Owners' names will not be published and all privately owned boats will be listed as 'Private owner'.

For more information contact George Hogg at the National Maritime Museum Cornwall, Discovery Quay, Falmouth, Cornwall TR11 3QY or e-mail georgehogg@nmmc.co.uk.



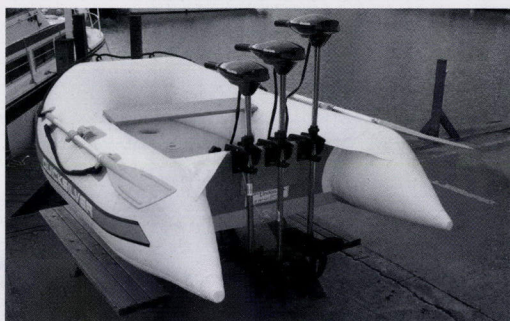
Electric Ferries Silent Cruising in Amsterdam for Paris

Kevin Desmond reports that a company in La Rochelle has just received an order for two electric ferry boats to carry 75 passengers along the Canal Saint-Denis in Paris. Passengers will embark at the Quai de la Charente for a seven minute trip to the Millenaire shopping centre.

The company, Alternative Energies, has supplied two similar electric ferries for La Rochelle, which have already transported some 400,000 passengers. The Paris boats will have AC motors and nickel cadmium batteries and will be partly recharged by solar panels. The first will be delivered in April 2007 and the second in June.

Visitors to Amsterdam can now enjoy exploring the city centre canals in the peace and quiet of an electric boat.

There have been attempts to get electric hire boats on to the canals since 1993 but it was not until April 2006 that Canal Motor Boats was finally given permission to operate its fleet of silent electric boats, whose motto is 'music you make for yourself, not for your neighbours', from its base within walking distance of the Central Station. The company has five aluminium open boats with 1.5kW Combi outboard motors available for hire and plans to increase this to ten for the forthcoming season. The Amsterdam local authority has also issued permits for a number of other companies to operate a further 65 electric boats (25 for touring and 40 for hire).



Outboard Motor Tests

Twelve electric outboard motors were put through a variety of tests by Motorboats Monthly magazine, with the assistance of the Thames Electric Launch Company, at Shepperton Marina in November. The results will appear in the February issue of Motorboats Monthly.

The January/February issue of Water Craft magazine also has a survey of electric outboards with contributions by Emrhys Barrell and the EBA's Press and Publicity Officer Tony Rymell.

Join the Jet Set

The Lear 204 electric boat, featured in the Spring 2006 issue of EB News, 'is a hit at all the boat shows' the company says and they are now actively looking for dealers world wide.

For more information contact Shanda Lear-Baylor, Lear Baylor Inc., 7215 Garden Grove Blvd. Suite C, Garden Grove, CA 92841, USA. Tel. 714 799 9396 or see the website www.learboats.com.



Lake District Consultation

Boaters on Windermere, Ullswater, Conistoun and Derwentwater are being invited by the Lake District National Park Authority to take part in a survey about lake services and registration fees. A review of charges will look at the possibility of registering all boats on all navigable lakes which enjoy a public right of navigation. A Lake Users Forum specifically for Windermere will be set up by the spring to provide advice and comments on the priorities for England's largest lake.

More details about the consultation exercise are on the Authority's website www.lake-district.gov.uk.



Bossoms Isis 16

The London Boat Show

Among the powerboats and superyachts at this year's London Boat Show were some interesting electric boats, electric outboards and generators. Report by Sylvia Rutter with pictures by Ian Rutter.



Salters Mystic



Christoph Witt with the new Torqeedo

The largest electric vessel on display at the show was too big to fit into the ExCel Centre and moored at the quay outside. *HMS St Albans*, just back from Iraq, is the newest Type 23 Duke Class frigate, commissioned into the Royal Navy in November 2000. When operating at her maximum speed of 28 knots she uses direct drive from her gas turbines but for efficiency and stealth the diesel generators drive her GEC electric motors at 190 rpm. Under electric power, at a cruising speed of 16 knots, her range is a rather impressive 9,000 miles.

Inside the exhibition halls, EBA members were attracting visitors with rather smaller electric craft. The Isis 16 on Bossoms stand was just over a year old, having been finished in time for last year's London Boat Show. Leigh French of Bossoms said that the Isis 16 and 14s were the most popular model in their range of river and estuary launches. The low maintenance GRP hulls can be supplied in a range of colours with hand crafted wood interiors, seat cushions and a choice of brass, chrome or stainless steel deck fittings. Their electric drive system uses a Vetus 2.2 kW electric motor with battery pack and automatic charger, all operated via a single joystick driving a variable speed solid state controller. Fully charged, the battery pack will give up to seven hours cruising at normal speed.

Salters had a variety of boats on display, among them the 19 ft 6 in electric Mystic in white with white trimming. A day cabin launch, the glass fibre Mystic has an enclosed cockpit with upholstered all-round seating for up to eight passengers. It has a low wash hull, a sunroof, and windows made from toughened glass in anodised frames. The boat can be supplied with either eight or sixteen 6V 175 Ah lead acid traction batteries. John and Linda Salter, kept very busy manning the stand, say the Mystic is ideal for both the hire trade and private use.

Fischer Panda were showing their range of generators including the Whisperprop diesel electric drive. This uses a permanent magnet electric motor in combination with a highly efficient and quiet AGT diesel generator and the latest version will have new advance warning systems and new safety features.

Navigators & General, who operate the EBA insurance scheme, were very pleased with the increase to 55 policies from 46 in the previous year and the 96% retention rate. In a discussion about covering passengers at charity events, they recommended that anyone planning to offer several charity trips would be better off getting extended coverage for the whole year, rather than paying extra for each event. Joe Field and Richard Colman will be happy to advise EBA scheme members. on the best course to take.

Nauticalia were attracting people looking for traditional marine products and boating accessories. On the Classic Boat stand Colin and Lucie Henwood seemed to have a permanent throng of visitors discussing traditional boatbuilding techniques. The stand was the venue for a talk by Captain George Hogg of the National Maritime Museum Cornwall about the National Small Boat Register (see news item on page 6). It also hosted the presentation of the Motorboat Heritage Trophy by Kevin Desmond, founder editor of *Electric Boat News*, to Arthur Benjamins, the painter of two pictures of *An Stradag* on her 1989 and 2005 world speed record runs.

Among other exhibitors at the show, Barden Energy Solutions had a range of solar panels and batteries on display. Other stands were showing electric outboards, including the new Torqeedo with built in battery. This has been on the market for a year and, following customer feedback, has been modified to be less noisy. The electronics have been improved and it is now completely digital.

The opening day of the show saw large crowds of visitors. Roy May of Bisham Abbey Sailing & Navigation School described it as the busiest first day for a long time. All the exhibitors were bracing themselves for some hard work, and a lot more enquiries, over the next ten days before the close on January 14th.

Congratulations to Helen Loney & the rest of the team

for setting the

World Unlimited Electric Waterspeed Record

of 68.09mph, at Coniston on 1st November 2005



But we don't just set records...



*Colne - The Environment Agency's first hybrid diesel/electric River Thames Patrol Boat**



Charles Collier - The Broads Authority's diesel electric patrol boat

Photo: Paul Wagstaffe



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Filling up with Sunshine

Canadian EBA member Monte Gisborne describes a solar-powered voyage on the historic Rideau Canal.



The Loon prepares for departure from Kingston

In 1826, under the direction of Lieutenant Colonel John By of the Royal Engineers, work began to build a military canal linking Montreal, Ottawa and Kingston to protect the British territory of Upper Canada from American invasion. Six years later, at a cost of £822,000 and the loss of many lives from malaria and blasting accidents, the *Rideau* made the first voyage along the full length of the new waterway and sailed into Bytown, named after the Rideau Canal's champion Colonel By. The town, renamed Ottawa, was later chosen by Queen Victoria to be the capital city of Canada.

At the same time, and half a world away, there was a wellspring of interest in all things electrical and some great minds were very hard at work unlocking the mysteries of this seemingly godsent force. In 1826, the year that construction began on the Rideau, Georg Ohm discovered perhaps the most important mathematical relationship in this field: $E = I \times R$, a simple equation revealing the interdependence of volts, amps and electrical resistance. By the time that the canal officially opened in 1832, Michael Faraday, slaving away in merry olde England, had studied the effects of magnetism and invented the DC electric motor, which remains virtually unchanged today. Was there a serendipitous connection between the invention of the motor and the opening of the canal? If Faraday and By had envisioned such a union they didn't make it public, but on the eve of the canal's 175th birthday the benefits to mankind that these two men brought would come into clear focus for myself and my family. I thought of this as the latest Loon, my 20 by 8-foot solar-powered electric craft, slipped free of its trailered perch and gracefully descended into Colonel By's engineering marvel, near the now-bustling city of Kingston, the first ever to do so.

If last year's trip along the Trent-Severn waterway in my crude early

prototype was a 'voyage of discovery', then this year's trip was going to be a pleasure cruise in comparison. Although last year's boat had the same basic DNA - solar panels, batteries, electric motor and double pontoon-style hull - the comparisons would end there. The newest Loon had the fit and finish of a polished, manufactured product and was fitted with such luxuries as full weather protection and sleeping accommodation for four people, a galley complete with fridge, sink, microwave and barbecue, on-board AC power, a heating system for cold nights and more. The new Loon is more like a solar-powered, electrically propelled 20-foot long camper (or caravan if you prefer) designed for long-distance waterway touring and the Rideau Canal, a full 202 kilometres (126 miles) long, would present the perfect opportunity to test it out. Like the previous trip along the



Sunshine cruising



Trent-Severn in 2005, my family boarded this newest Loon and seemed to marvel at the comforts and luxury it provided over its predecessor. To me, it wasn't unlike watching the proverbial ugly duckling blossoming into a beautiful swan and without hesitation we cast lines and headed north to the first of many lock stations we would encounter en route.

Colonel By would probably have favoured the presence of a mighty naval steamer on his waterway, charging off to supply much-needed support at York or Montreal to defend the country from foreign invaders, but somehow I think that Michael Faraday would have preferred the Loon and taken solace in the fact that so many of his and his contemporaries' ideas had indeed stood the test of time. On reflection, both men would likely be pleased by the fact that the waterway was never used for the military purposes intended. In fact, relations between America and Britain improved after the canal was finished and the two would go on to serve side by side in many conflicts.

One of the most interesting experiences during our trip was a little situation we encountered on the second day of our journey. We had intended to travel from the base of Jones Falls Locks to our leg's end at Portland, but ran into a 'newbie' snag - we didn't know that it would take us three and a half hours to travel through the system of four locks at Jones Falls and found ourselves well behind schedule. This was compounded by a late start in the morning as well. We ended up falling about ten kilometres short that day, resting overnight at Newboro Lock Station instead, with Parks Canada offering us an opportunity charge to help top up the batteries. This meant an earlier start the next day and as we were travelling along I felt a slight wind at our back, not much, but enough to warrant zipping down the rear curtain which effectively gave us 40 square feet of sail. This bumped up our cruising speed from five knots to almost six, which was more than enough to make up the shortfall and to cruise into our intended destination of Rideau Ferry well ahead of my original estimate and with half of a charge of batteries still in reserve. I didn't feel like I was 'cheating' by doing so; in fact, the sun provides the wind so in my way of accounting, el sol gave me a double helping that day! And besides, utilising the wind to my advantage offsets those times she worked against me. Fair is fair, I say.

The rustic settings and opportunities to dock and stretch our legs were abundant. The canal wends its way through a collection of little

towns, the biggest of which is Smith's Falls, the Canadian home of Hershey's Chocolates. When not passing through a town, the canal - a system of lakes, slow-moving rivers and man-made waterways - cuts a path through the dense wilderness and generously offers up species of animal life. We saw an eagle nested in the wild, numerous heron, beaver, fox and deer to name a few, not unlike the workers would have experienced in the 1800s. Overnighting opportunities at marinas, lock stations and parks were everywhere and we would plug into the readily-available shore power to keep the batteries topped up, waking each day with a fully charged set of batteries. When asked by gas dock attendants whether we preferred regular or premium fuel, I usually responded with "no thanks, we're filling up with a happy blend of sunshine and relaxation today!"

Technically, this trip wasn't a great challenge for the modern production Loon. Equipped as she was, the boat cruised the average 34 kilometre (21 mile) daily legs at about four knots (4 mph), give or take, drawing about 20 amps from the eight 6-volt deep cycle batteries and up to 15 amps from the sun. The Maximum Power Point Tracking electronics built into the solar controller helped to maximize the output from the solar array, often reporting over 800 watts from the 720 watt rated system. The propulsion system, utilising an Etek DC motor, is coupled to a highly-efficient Kort nozzle and helped to squeeze every ounce of thrust from the available electrons.

There are 49 locks in total and the Rideau Canal is the oldest continuously-operated canal system in all of North America. When the Rideau celebrates her 175th birthday in May 2007 the United Nations will declare her a World Heritage Site, guaranteeing to Colonel By and Canadians that his magnum opus will be enjoyed and appreciated by many, many generations to follow. The waterway is an integral part of Canada's history and a symbol of what hard work and determination can achieve. Low-wake, non-emitting electric boats will also do their part to reduce contamination and erosion of the waterway, further ensuring its suitability for future use. Faraday and Colonel By would both approve.



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Overnighting at Kilmarnock Lock Station



Deanna, Denise and Monte Gisborne

Norfolk Cruise Weekend



Picnic at How Hill

Barbara Penniall reports on a sunny weekend of cruising in good company.

Following the success of a weekend cruise on the River Great Ouse and the fact that the new Green Boat Show in Norfolk was to be held at the end of September, it was decided that the traditional Norfolk cruise could be expanded to fill a weekend. It was hoped this would provide a more relaxed atmosphere and the opportunity for members and guests to join us for either Saturday, Sunday or the whole weekend.

Crossed fingers worked and the weekend of the 9th and 10th September was pleasantly warm and sunny. Members came from as far away as Cumbria, Yorkshire, Cambridgeshire, Hampshire, Oxfordshire, Essex (and I brought my 92 year old father from Wales!)

Once again John and Sandy Williams welcomed EBA members with or without their boats, providing a base and mooring if required at their boatyard in Stalham. Five craft (it was six but *Merlin* and Tom Moore left

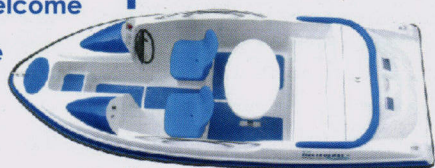


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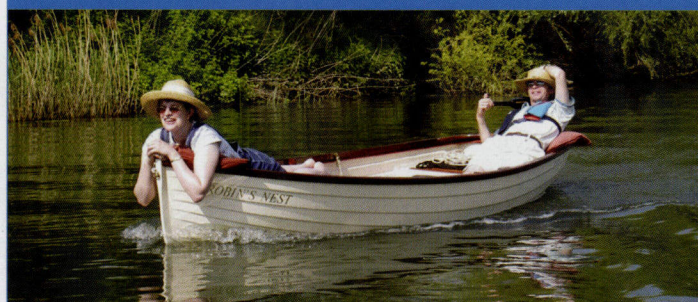
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early to light the barbecue) and twenty two assorted crew members (or so they said) cruised gently from the moorings down to Barton Broad, round to Barton Turf, then back up the River Ant and on to Dilham.

The boats were *Moonglow*, *Rhapsody*, *Serena*, *Winsome* and Roger and Julia Woodhouse' folding dinghy. 'Why hasn't it got a name yet?' we keep asking. 'Well', Roger replied, 'if it had perhaps it should be 5 amp'. OK, that set the mood for the afternoon. We progressed jauntily and in very good spirits and eventually we passed the venue of many previous cruise dinners, the Wayford Bridge Hotel. For those who know the area, the road bridge at Wayford is quite low. You either need more ballast, Tony, or get the windscreen down faster!

Virtually unscathed, we all arrived at Tom and Mary Moore's house at Dilham to be greeted by an idyllic summer setting of the evening sun shining through the bridge leading into their private dyke. In times past, this dyke was used to load craft with bricks made at the works which is now part of Tom and Mary's home. With Tom acting as Harbour Master, the boats were turned and moored and in the process we were joined by John and Susan Thornicroft with *MIM*.

Heather Moore had been press-ganged by her parents to help over the weekend and the variety of food that was produced was quite amazing, with something for everyone's taste. The Moores would not accept payment, but invited guests to make a donation which resulted in a cheque for over £150 being sent to the East Anglia Air Ambulance.

The barbecue continued until long after the sun had set, and happy boaters turned their bows back towards Stalham. It was dark – very dark. No shooting stars that night as the boats slipped ethereally through the rising mists, but we managed to provoke a couple of potential heart attacks from fishermen we passed. They had to shine a spotlight in our direction to convince themselves we were not an apparition as we had not disturbed the silence of the night and one was heard to enquire whether we were rowing. (As all electric boaters know, rowing makes more noise!)

Next morning we gathered again at the Williams' boatyard and set off for a rendezvous at Barton Broad, having been joined by Jeff and Georgina Waterson in *Georgie*, who had been cruising the day before on the Thames. Tom and Mary Moore had invited us to stop for coffee at the Norfolk Punt Club, and following a hint the

previous evening that cake would be welcome too, both Heather and Mary had been baking since the crack of dawn to provide a wonderful selection of home-made goodies.

This was such a pleasant surprise that everyone relaxed and seemed quite reluctant to set off again. We also had the opportunity to see the Thornicrofts again, this time in their yacht *Sceres* and Tom Moore brought *Moonsshadow*. In the distance we could see the Broads Authority's solar powered trip boat *Ra* and their hybrid inspection launch, *Charles Collier*. We had to be encouraged to board and continue our journey to How Hill, where we had decided to stop for our picnic lunch. John and Sandy Williams joined us with their Dutch sailing boat *Harmony*.

This proved an ideal venue for a very relaxed and informal gathering with good moorings and appropriate facilities nearby in a glorious setting. Unfortunately the house itself was not open that day, which was a pity as this is a well-known

attraction for visitors in the area.

We are not quite sure how he organises it, but every year for quite some time the Norfolk Cruise has coincided with our Chairman's birthday! Some members muttered that perhaps John was moving his birthday to make sure we celebrated it in style, but yes, he managed it again this year. A birthday cake was produced, having been surreptitiously purchased that morning and hidden on one of the boats. It was presented, complete with candles, to the traditional rendition of 'Happy Birthday'. The cake was divided, distributed and consumed by all present and everyone agreed it became quite a party.

Good food, good conversation and a lot of hilarity made the afternoon disappear all too quickly and so reluctantly we turned for home, content that this had been a very successful and enjoyable weekend covering some 17 miles in beautiful scenery and glorious weather.



Fidler on the Roof – Les Fidler on Moonglow



John and Sandy Williams on Harmony



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Technical Report

ELECTRIC POINTS: 'START MOTORING'

In the eighth of a series of short articles on technical aspects of electric boating, EBA Technical Officer Paul Lynn discusses that ubiquitous workhorse of electric boaters – the DC electric motor.

Michael Faraday started at the Royal Institution in 1813 as a young assistant with no formal academic training, and when he subsequently discovered his famous laws of electromagnetism he can have had little inkling of the vast electricity industry that was to develop around them – including, crucially, the design and operation of electric motors. These all rely on the mysterious interaction of an electric current with a magnetic field. He demonstrated that a length of wire carrying a current, if placed across a magnetic field, experiences a force which tries to move it at right angles to both current and field. In other words current, field, and force are *orthogonal* like the x, y, and z axes of 3-dimensional geometry.

Since the batteries of an electric boat supply direct current (DC), unlike the alternating current (AC) of our domestic electricity supply, the natural choice for us is a DC motor. Fundamentally this comprises a magnetic field system in which a large number of copper wires, wound as coils, experience force when battery current is passed through them. The force results in a torque producing a twisting movement of the motor shaft linked to the propeller. In such a rotational system, the x, y, and z directions may be recast as *axial*, *radial*, and *tangential*; so that if the current flows in the *axial* direction and the magnetic field is *radial*, then the force must be *tangential* (as required to provide rotation). This is indeed the conventional scheme for the DC motors used in most electric boats, including electric outboards. But in the highly innovative Lynch motor, invented by Cedric Lynch, the scheme is reversed. Here the magnetic field is axial, and the current flows radially from the centre to the periphery of a rotating disk. Once again, the resulting force is tangential.

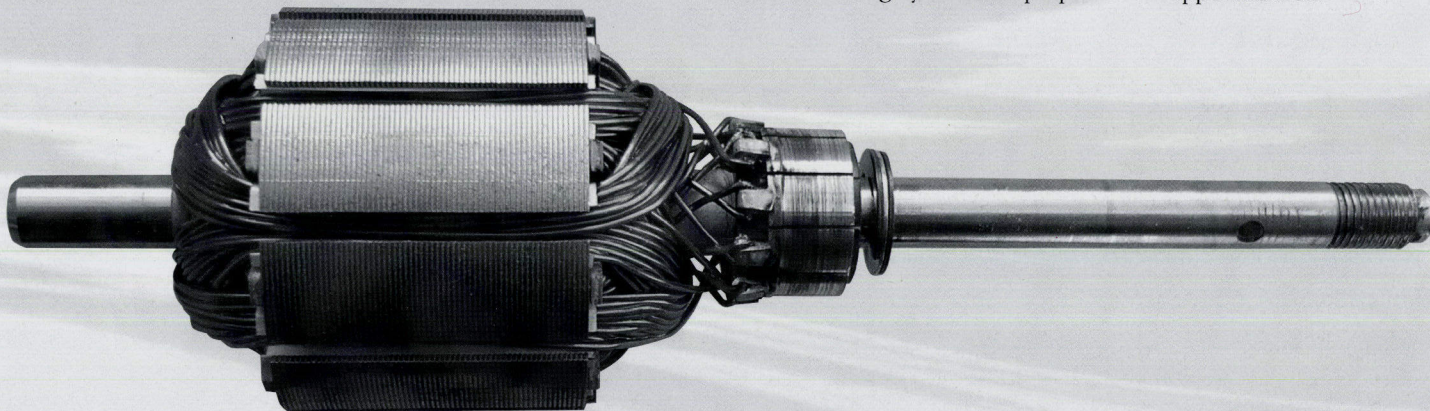
The picture shows the rotating part, or *armature*, of a small conventional electric outboard. It is formed of iron laminations with many axial slots filled with coils of copper wire. The coil sides sit in a radial magnetic field provided by permanent magnets attached to the motor's casing. When you switch on the motor, current is passed

through the coils producing a torque to turn the propeller – the greater the current, the greater the torque. There is one other vital component, shown on the right of the picture: a rotary switch known as the *commutator*, comprising many copper segments. Its task is to reverse the current sequentially in each coil every half-revolution, to ensure that the torque always remains in the correct direction. A pair of *brushes* (not shown) placed opposite one another and bearing on the commutator provides the necessary contacts for the battery current.

An alternative way of producing the magnetic field is by further sets of copper coils on the stationary part of the motor, forming electromagnets. This is used on many of the more powerful inboard motors and has the advantage that the torque-speed characteristic can be controlled by altering the field strength.

One of the most important properties of any DC motor is its efficiency. That is, the fraction of electrical power drawn from the batteries that is converted into mechanical power to turn the propeller – a major concern of every electric boater. Small electric outboards generally have rather disappointing efficiencies of around 50%; larger inboard motors may typically achieve 75-80%; the Lynch motor can reach over 90%. A motor's power losses are normally subdivided into three main categories. *Copper losses* are caused by electrical resistance in the copper windings which produces heat when current is passed through them. *Iron losses* are caused by unwanted hysteresis and eddy currents in the iron parts of the motor as the armature rotates, and may be reduced considerably by using thin iron laminations. And *friction and windage* losses represent friction at the bearings and brushes plus the effects of wind resistance on the rotating armature. Of these, copper losses are normally the most significant when the motor is running near its maximum power. They could be reduced by making the coils of thicker copper wire – but this in turn would require a larger and heavier armature, with increased overall weight and cost.

When you next flick the switch and start motoring, spare a thought for Michael Faraday's pioneering investigations in electromagnetism, and for the highly fortunate properties of copper and iron!



Noticeboard and Letters

Welcome to New Members

Private Members	Location	Boat where notified
Anthony M Leigh	Bourne End, Bucks	Shillelagh, Mayfly 16
Ray Elmitt	Kingston-on-Thames	P & Q, Interboat 16
D S Anderson	St Neots, Cambs	
Roger Hopkinson	North Walsham, Norfolk	
T R Warren	Norwich, Norfolk	Abutilon, Siesta dayboat
Peter Frost	Daventry	
John Oakman	March, Cambs	Riverette from Water Roo
Ian Wilson	Purleigh, Essex	
Paul Diprose	Slough, Berks	Electrofun, inflatable
Gavin Petrie	Sunbury-on-Thames	Sea Blue, 15ft Harbour boat
Laura Lion	Maidenhead, Berks	Canadian Electric Launch
Bob Harris	Altrincham, Cheshire	Brendan, Sailing Yacht
Rob Bruce	Australia	Mini Houseboat
Nigel Thomson	Shepperton, Middx	Hero, 1890s launch
Trevor Cole (welcome back Trevor)	Rutland	Tranquillity, 60ft narrowboat
Trevor Thorn	Waterbeach, Cambs	Solar powered narrow boat
Andrew Mayo	Stratford-on-Avon	
Mr and Mrs John Bland	Reading, Berks	Hope, electric canoe
Tom Lynn		Frome, Somerset
Business Members		
Riverside Boat Sales, Horning, Norfolk Distributors of Electroboat		

EBA Directory

The latest issue of the EBA Directory and Product Guide is enclosed for members with this issue. Please send any corrections or missing details, such as e-mail addresses, to EBA Secretary Barbara Penniall. Please also let her know if your postcode is not in bold type but you could offer a charging point for EBA members.

Red Diesel

The European Commission has rejected the UK Government's application to continue the tax concession for the use of red diesel in private pleasure boats. Although a number of boating associations campaigned to retain the concession, the EBA pointed out to the Waterways Minister that red diesel is the worst quality diesel available and yet boat exhausts are discharged into waterways which are wildlife habitats and often used as a source of drinking water. As an organisation promoting quiet pollution-free boating, the EBA welcomes the EC decision.

Press and Publicity

Tony Rymell, the EBA Press and Publicity Officer, would be pleased to hear from members with news about electric boats or boating events, so he can pass the information on to the local, national and boating press.

EA Resignation

As a result of the financial cuts to its budget, the Environment Agency has not renewed its subscription to the EBA. We are very sorry to lose the Agency, which has always been a very supportive member of our association.

Thames Slipway Project

In November, Ian and Sylvia Rutter represented the EBA at a meeting with the Environment Agency, the Thames Traditional Boat Society and Sport England about improving access to the Thames for trailed boats and small craft. The slipway section of the EBA website was given special praise by the TTBS. A study report and action plan for slipway improvements is to be produced by 1st April.

The EBA Webmaster, Nick Goldring, is always pleased to get feedback from members about slipways so he can update the information on the website.

Dear Readers,

Can anyone help? I own what is believed to be the last AMPHICAR BOAT.

It has been modelled on the original German AMPHICAR, but instead of being an amphibious vehicle it is an electrically powered catamaran boat. It was believed to have been built in Holland and probably for use in amusement parks. Apparently there were approximately twelve built, but this is the only one in the world that is known to exist. Unfortunately, apart from the charging socket, all the engine and rudder system are missing. I would love to find out any information regarding manufacturing and details of the engine and rudder system. If you know anything please get in touch.

Many thanks

Adrian Gray
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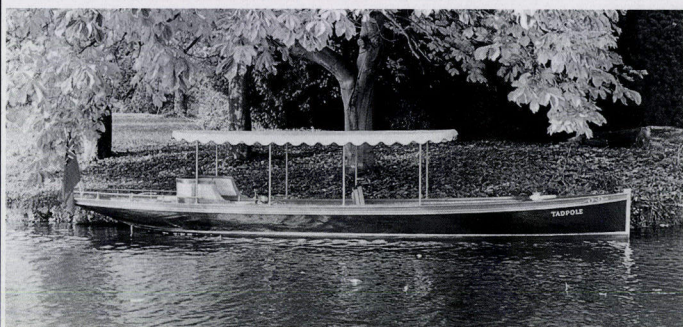
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4. **HULL DESIGN FOR ELECTRIC BOATS**
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5. **LEAD ACID BATTERIES – OPERATION & MAINTENANCE**
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Annual Report

A summary of the activities of the Electric Boat Association during 2006

2006 has been a very busy year for the EBA, with events from the Lake District down to the South West and across to East Anglia. We are delighted with the way the Association is progressing, enabling us gradually to introduce colour into the EB News, which we hope meets with our members' approval.

The year is ending, however, with concern about the cuts in grant aid to the Navigation Authorities, which is likely to have financial implications for all boat owners and boating associations. Rest assured that the EBA has been very active in campaigning on your behalf, protesting against these cuts.



Colin Henwood with electric launch Polly at the Beale Park Boat Show

2006 saw the third London Boat Show at ExCel, and EBA Business Members exhibiting were Bossoms, Fischer Panda, Nauticalia, Phoenix Fleet and Salters. Navigators & General were offering their discounted policy for electric boats and the Broads Authority, British Waterways and the Environment Agency were represented at the show. The Environment Agency launched their waterway plans for the Thames, Medway and Great Ouse.

The show season began in earnest at Easter when the EBA went to the Lancaster Canal in the Lake District for the IWA Trailboat Rally. This was very successful and we were delighted to have *An Stradag* on display, which of course attracted a lot of interest, having so recently taken the UIM World Water Speed Record for electric boats. Her driver, Helen Loney, joined us on Sunday on the stand. EBA business members EnviroBoat Developments were supporting the show, promoting their solar powered launches on Coniston.

In May, the EBA were once again on the River Parrett, this time at Langport for the annual Somerset River Festival, ably supported by Tony Rymell who ensured that, unlike other stands, the EBA was neither blown nor washed away during a weekend of high winds and

torrential rain. Eventually the sun shone and a lot of interest was shown in the first outing of the year for *Solar Flair II* and Tony's electric boat, *Somerset Dream*.

The Beale Park Thames Boat Show in June is the most popular show appropriate to electric boating. Business Members were well represented by Agni Motors, Classic Launches, CMP, Creative Marine, Hambleden Sales and Charter, Henwood & Dean, Pb Batteries, Salters Steamers, Silent Explorer, Swancraft and Thames Electric. Having acquired a fuel cell boat a few days before the show, the EBA was delighted to be able to demonstrate potential power for the future with both a hydrogen and a solar powered craft on the stand. Many visitors who had heard the term 'fuel cell' without ever seeing one for themselves were able to study at first hand what this new technology looked like.

This year for the first time the EBA stand was at the Evesham River Festival. Although we had been invited in previous years, the date had always clashed with other events. The venue for the event was well placed, allowing large numbers of visitors to attend the riverside festival and once again it proved a very successful outing for the Association.

A perennial favourite, the July Thames Traditional Boat Rally took place as usual in Henley with Peter Freebody, Henwood & Dean, and Hambleden Sales & Charter exhibiting. Once again the EBA stand was there to support our Business Members and promote electric boating.

Over the August Bank Holiday, the IWA Diamond Jubilee Festival was held at Beale Park. Although typically a major gathering of traditional narrowboats, this year there was a marked increase in interest for electric propulsion. Again both the fuel cell boat and *Solar Flair II* were on display. It was interesting to note that, although visitors were curious to see a hydrogen powered craft, it was the more practical option of solar power which attracted most attention. As well as our Business Members Creative Marine, Pb Batteries, Salters Steamers, Swancraft and Thames Electric, private members Adrian and Nicki Softley cruised to the show in their replica 68ft Kennet barge, *Unity*, which is solar powered.

Another first in 2006 was the new Green Boat Show held in September at Salhouse Broad, Norfolk. This was the last show of the year and for only a day, but in fact proved to be one of the busiest. The initiative for the show came from EBA members Peter Howe and Tony Fogarty and business members exhibiting were Pb Batteries, EnviroBoat Developments, Rupert Latham and the Broads Authority, sponsors of EB News.



Victoria Fash on electric launch Humble at the Thames Traditional Boat Rally

BOTH PICTURES IAN RUTTER



IAN RUTTER

Edward Hawthorne, Barbara Penniall and Valerie Field at Cookham

Social Gatherings and Events

The Launch Supper held at the Maidenhead Rowing Club at the start of the social season provided the opportunity for guests to watch a film about *An Stradag's* new speed record.

Les and Elaine Fidler again hosted the EBA's Ouse Cruise weekend from Earith in mid May and included an impressive Saturday night barbecue. Nine craft of varying design and size with their assorted jolly crews made this a most enjoyable weekend and set it firmly as a fixture in future EBA calendars.

June took us back to the Thames at Cookham and an afternoon cruise followed a relaxing picnic lunch at the end of the morning's AGM. The cruise ended at our Vice President, Edward Hawthorne's riverside house where a most welcome afternoon tea was provided.

A very successful weekend of cruising took place on the Norfolk Broads in September, once again including the starlit cruise on the Saturday night. John and Sandy Williams offered mooring facilities and a base at Stalham and over the weekend ten craft joined us for cruising. Tom and Mary Moore made their home in Dilham the venue for a splendid barbecue which they very generously provided. Instead of paying for their meal, members were invited to make a donation to the East Anglia Air Ambulance. The Moores also provided a welcome morning coffee break on Barton Broad en route to our lunchtime picnic destination at How Hill.

To complete the social season, once again the Laying Up Supper took place at the Maidenhead Rowing Club in October. The event was marked by the presentation to Paul Lynn of the Julia Moss Solar Trophy, which was accepted on his behalf by Tony Rymell.



Tony Rymell receiving the Julia Moss Solar Trophy from Malcolm Moss on behalf of Paul Lynn

NICK GOLDRING

Membership

Again the membership has increased significantly, including new Business Members. It has been interesting to note that several private members who had resigned in the past rejoined during the course of 2006, reflecting increasing support for electric boating.

Committee Matters

The Executive Committee has been meeting throughout the year to handle the regular administration and organisation of the Association. This year saw the first of the Annual General Meetings, offering members the opportunity for more frequent liaison with the EBA. There are still a few issues outstanding regarding the revised Articles of Association, which will be finalised before the next AGM.

Executive Committee Members have been attending meetings, presentations and making approaches to various government and other authorities, which have an influence on decisions affecting electric boating and EBA members. This has become particularly important in the light of the government's recent funding cuts to navigation authorities.

I am very grateful for all the support and help members have given us over the past year, especially as we have attended so many shows and events throughout the country.

Regarding Committee Members, I am delighted to welcome Janet Dunning as our new Advertising Manager. Janet and her husband Tony have already been very supportive and bring to the Association many years' experience of working with the IWA at their shows and events. I am also particularly pleased to welcome Tony Rymell as Press and Publicity Officer. Tony has already been very active on our behalf this year promoting electric boating across the country with his particular interest in solar power. His association with the IWA and Somerset authorities will prove very valuable to the EBA.

2007 is already looking as busy, if not busier, than 2006 as we will be consolidating attendance at the new events we supported this year as well as our old favourites. Any way members can support us physically would be greatly appreciated, either in helping to set up and break down the EBA stand at shows or providing an opportunity for us to leave the stand for a short break to canvas potential business members or speak to our current members.

Finally, to help the administration, if you haven't already done so, please would you consider paying your annual subscription by Standing Order. Also, advising the Secretary of your e-mail address would assist with future correspondence.

I would like to wish you good boating in 2007 and I hope to be able to meet many of you personally at events and shows in your area.

JOHN HUSTWICK
Chairman

Electric Boat Association



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Honorary Vice Presidents

Fiona, Dowager Countess of Arran

Edward Hawthorne

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Electric Zelec, as new, unused. 5.5m loa, 5.25m lwl, 2.10m beam, 0.45m draft, displacement 825 kgs. CE Category D in sheltered waters.

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Wanted

'Vintage' Electric motor suitable for a 30ft river launch, power in the region of 4HP but anything considered, or if anyone has any information on vintage electric motors, or a steam launch called WILLIAMETTE, I would very much like to hear from them. Frank Kitching. Evenings, Tel 01642 723848.

BOAT SHARE – BOURNE END. Considering buying Water Roo (see ad opposite) to moor at Marina. As past launch owner, 4 or 6 sharing seems more sensible. Per person costs say, capital c£1.5K; fees say £10-15 pm – about 60 days use each. Interested? Contact Peter Willingham 01628 850 999 07973 224 999 or ptw@acceleratedmortgages.co.uk

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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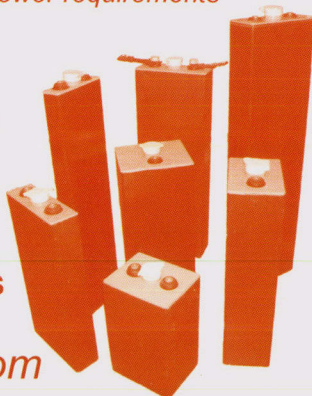
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