Flectric Boat Association Flectric Boat Association The Journal of the Electric Boat Association

Farewell to an electric visionary • Broads conversion – Moonglow Electric events for 2002

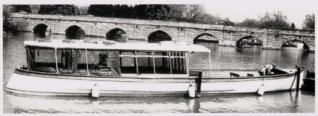
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EBA CALENDAR

April			
15th	EBA Event	Launch Supper Maidenhead Rowing Club	
May			
4th – 5th 6th	EBA Event	Electric Boat Event Hartford Marina, Huntingdon Cruising day – River Great Ouse	
16th – 19th	EBA attending	Boats On Show Penton Park, Chertsey	
June	e.		
3rd	EBA attending	UK Solar Boat Contest Littlehampton	
23rd	EBA Event	Thames Rally, Bourne End	
July			
13th	EBA attending	Electric Boat Rally Beale Park	
14th	EBA attending	Electric & Steam Boat event Sudbury, Suffolk	
20th - 21st	EBA attending	Thames Trad Boat Rally	
August			
23rd – 26th	EBA represented	IWA National Festival Huddersfield	
September			
tbc	EBA Event	Thames Cruise, Cookham	
tbc	EBA Event	Norfolk Cruising Weekend	
October			
tbc	EBA Event	Laying Up Supper	

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

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Cover Picture: Sailing yachts Electric Excalibur (left) and Cutlass 2 (which both have electric motors) from the Camelot Craft fleet, moored on Horning Staithe, Norfolk Broads in September 2001.

Photo: Tony Ellis

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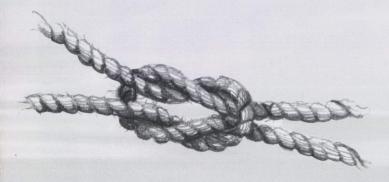
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On the current.....

In prospect, I felt that this edition would be the equivalent of a speaking engagement after the audience has had a good lunch. However, (and I hope you will agree) we have some really meaty issues to report, with a lot to think about for the coming season.

Sadly, we start with the obituary for Rear Admiral Percy Gick. But before long, we are into plans for a summer season of events the length and breadth of the country – and we know that Percy would be quietly applauding the energy and effort put in by such a small team, promoting the interests of electric boating – an area in which he led from the front for so many years.

The committee is a small but active group, but they do depend upon your support. There are currently two vacancies on the Notice Board (Page 13), and further help is always welcome, particularly when the EBA stand is on display at one of the many events throughout the season

The criteria for the Guinness Record attempt are discussed in detail in the new Letters to the Editor section – a part of the magazine we wish to encourage. Details of new engines and equipment are reported, and we also record the enthusiasm of Tony Fogarty for his conversion of an old Elysian Broads diesel cruiser.

I look forward to meeting many of you during the coming season, whether at the Launch Supper or one of the many other shows or events (and if the latter, make sure you're wearing an EBA sweat shirt or polo shirt).

Tony Ellis

Editor

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:

Summer Monday 3rd June 2002

OBITUARY: Rear Admiral Percy Gick

by Kevin Desmond

Kevin Desmond honours just one aspect of the remarkable life of a one-time EBA Chairman and former President

Rear Admiral Percy Gick stood down as President of the EBA at the Biennial General Meeting last summer due to deteriorating health. Sadly, in early January we heard the news of his death, at the age of 88.

Rear-Admiral Philip Gick – or 'Percy' to his friends – was one of the founders of the revival of electric boats throughout the world. In 1975, seven years before the birth of the EBA, his Emsworth Shipyard in Hampshire converted one of their 18ft launches into a decorated dhow and fitted with milk float transmission, delivered it to the private lake of a Middle East oil sheikh. The following year, the Admiral demonstrated a 2hp 12ft electric boat at the Agricultural Exhibition. His omnidirectional twin-engined waterjet-propelled Waterbeetle was a star feature at the 1977 London International Boat Show. In 1978 five relay crews, including the

Admiral, silently motored the 23ft Trentcraft *Electra of Emsworth* a total of 600 miles, through the Midlands canal system, with simple overnight recharging from 13-amp sockets. From 1981 Emsworth Shipyard were importing the only series-manufactured electric outboard available in Europe: the Austrian *Accumot*.

In early 1982, the Admiral was one of the founder-members of the EBA. Soon after, his 32ft Edwardian-style dayboat, *Patricia* (Bossoms grp hull with electric transmission by Emsworth) was used for the official opening of a lock on the Warwickshire Avon and was admired at the Henley Regatta and at Cowes Week. She motored across the Solent to the latter event under her own steam, with the Admiral's friend, a certain Duke of Edinburgh enjoying the ride. (*NOTE:* My initiation into electric boating was as a passenger on *Patricia* and I can honestly say that for everything I have since written and done to promote electrics, I have the Admiral 'to blame'!)



Percy Gick at the helm of Electra of Emsworth in 1978 Photo: Kevin Desmond



Percy Gick at the controls of his Waterbeetle in 1977 Photo: Anthony Linton

Although Percy was not the first to consider using an electric motor in a yacht keel for auxiliary drive, in 1984 he was demonstrating a keel-mounted Eska in a 5-metre *Bellway Sunbird*.

When Latham and I did our 24-hour 100mile cruise around the Norfolk Broads in an electric Frolic and Mystic, the Admiral, as part of his two-year tenure as EBA Chairman, was part of the support team. Indeed to encourage long-distance electric cruising he later presented the Emsworth Trophy, having personally commissioned and paid a retired-captain sculptor to carve the magnificent Great Crested Grebe Emsworth Trophy (Percy affectionately nicknamed it the 'scruffy duck'). Even then he considered that the real future for electric boating lay in fuel cells, although he was then referring, with characteristic boldness, to nuclear rather than hydrogen!

Through contact with Viscount Norwich in 1986, the Admiral launched the idea of providing Venice with electric vaporetti – the *E.1* being launched in 1989. When we organised an electric outboard race at Little Venice, London, in December 1987, it was the Admiral who persuaded a 31-year-old 'unknown'

continued on page 8

Farewell to an electric visionary

This obituary in the Daily Telegraph for 19 January 2002 gave over a third of a page to Percy Gick. Extracts from this report will give readers just a taste of his remarkable life and times.

In 1941 he piloted a Swordfish biplane launched from the carrier *Victorious* against the German battleship *Bismarck*. He was the only pilot of nine to score a direct hit with his torpedo. In December of the same year he commanded a squadron in the Western Desert where he set Italian prisoners of war to work, some cooking for his men while others – former employees at Alfa Romeo – repaired aircraft! He later transferred to dealing with piracy in the China Sea.

Promoted Captain of the new destroyer *Daring* in 1952, he impressed the crew by becoming the only naval officer fined for speeding on the Suez Canal!

Rear Admiral Philip ('Percy') Gick 1913 - 2002

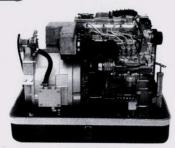


Extract from The Daily Telegraph



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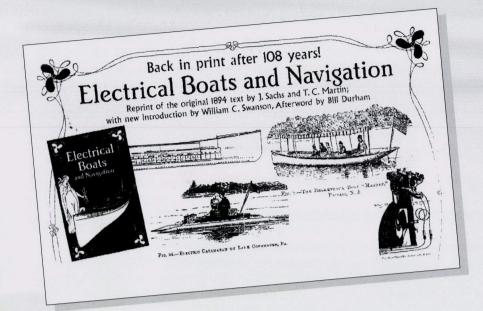
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BOOK REVIEW





Electrical Boats and Navigation by Martin and Sachs ISBN 0-9641204-1-0

John Hustwick reviews the latest historical reprint

This is a reprint of a 256 page book with 105 illustrations which was first published in America in 1894. There is a new introduction by Bill Swanson and an afterword by Bill Durham. The original book was dedicated to the memory of Anthony Reckenzaun, who was considered a pioneer of electrical navigation who died of pleurisy at the age of 43. Bill Swanson speculates that his injury could have been caused by inhaling battery acid fumes, a warning to all!

For those interested in the history of electric boating, this is a fascinating book, giving as it does a very good flavour of the thinking behind electric propulsion at the time. What comes to light is the enthusiasm that the authors had for the future of electric boating, at a time when the steam boat was the only competition. Little did they know what would happen within 20 years with the development of internal combustion.

The details in the book show that there was significant forward thinking to do with battery-powered boat propulsion in the 1890's and it makes you speculate as to what might have happened if the internal combustion engine had not been successful. The book covers a range of different boats, with significant emphasis on canal

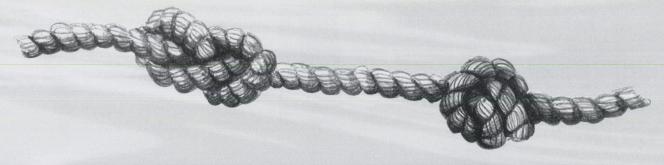
boats and methods of propulsion, including propellers versus motors exterior to the boat – the latter being a hauling system on shore. The authors have even compared the cost of operating different systems and included an idea of the cost of boats and equipment. Another chapter is dedicated to submarines and another called "Dirigible Electric Torpedoes For Warfare And Life-Saving" – referring to the latter as "electric craft without a crew "! These make interesting reading, even if they are not strictly electric boats as we know them.

Other more appropriate chapters include electric launch requirements, the resistance of boats and propellers, batteries and motors, boat design, types and size of motors, propellers and different types of batteries. Mention is also made of paddlewheels. There are a number of good line drawings illustrating details of points discussed in the text, plus some interesting photographs.

To summarise, we are almost going full circle, back to where this book began – but, instead of looking for an alternative to the steam engine, we are looking for ways to replace the internal combustion engine and return peace and tranquillity to our waterways.

As mentioned in the Winter edition, if you are really keen to get a copy quickly, you should log onto www.steamlaunch.com.

However, we hope to be able to get stocks but before ordering we need an idea of likely demand. Please let the Secretary know if you would be interested in a copy at around £35.



MOONGLOW - a Broads conversion



Moonglow

Tony Fogarty tells how he converted his Broads cruiser *Moonglow* from diesel to electric

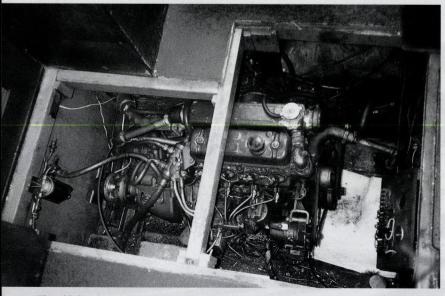
My 30 year old Elysian 4-berth GRP-hulled diesel-powered cruiser *Moonglow* is now converted to electric and I love her to bits.

The conversion was completed in June 2001, a year after the first discussions with Cedric Lynch at the EBA Rally at Hartford Marina. I planned to keep the diesel engine and add the electric motor. Cedric dissuaded me and advised a 24v system, with sufficient current from an average 40 amps, powered by solar panels.

Acquiring information was easy, reading EBA News from 1996 and all available web sites. I also borrowed Douglas Little's Electric Boat Handbook (USA) from the library.

Cedric gave unstinting help and answered my questions with patience and courtesy. Another invaluable source was Bob Ellis, now our technical officer, and his predecessor John Hustwick.

My 30 year old Elysian 4-berth GRP-hulled diesel-powered cruiser *Moonglow* is now converted to electric and I love her to bits.



The old diesel engine

Andrew Wolstenholme also gave his opinion that an *Elysian* was probably one of the better cruisers for electrical propulsion.

I was also fortunate to find Rory
Torrens who did all the work
at Oulton Broad. *Moonglow* was built for the hire trade

and the old diesel gave hot water for washing and a shower – which I wanted to keep.

The toilet was an evil-smelling thunderbox. Heating was by gas heaters which gave out moisture.

I chose a second-hand diesel Eberspacher heater for the hot water and heating to avoid the regulatory hassle of gas. Removal of the engine and fuel tank left abundant space for a proper holding tank and a new Jabsco toilet is the height of luxury.

To assess drag, the Broads Authority River Inspector measured her speed with a radar gun while Moonglow was towed, the pull required being measured with a spring

balance. At 5mph the equivalent power required was about 1.2kW – at 50% efficiency this would need 2.4kW from the motor – the Lynch motor would do up to 8kW.

I fitted a 24 volt system with Lynch 200 motor and Brusa controller. Six Elecsol batteries of 270 Ah are connected to provide 24 volts and 810 Ah nominal. A 24 volt 25 amp Stirling charger is used for charging the batteries. A 24:12 DC converter powers the existing domestic system - lights, pumps, horn, windscreen wiper. An £80 Magellan GPS 300 is used for measuring the speed. The 310 model would have also given mileage and I regret not getting it. A Links 10 battery monitor gives battery voltage, current, ampere hours used, and percentage of charge remaining.

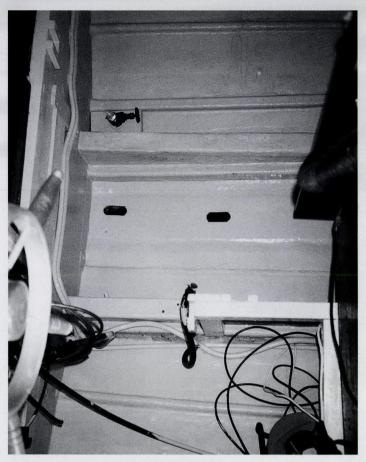
On Cedric's advice

A voltmeter also gauges motor speed, with 1 volt equalling 60 rpm. The GPS and monitor give all the information required to measure performance and to forecast the charge needed for a given mileage.

The propeller was 13x16. John Hustwick reckoned from tables he has that the ideal would be 12x10. We decided to try the existing propeller and change to the lower pitch later.

Rory calculated that a 1.2:1 reduction gear ratio, with a toothed pulley system, would be suitable.

The first outing was on 16 March. The records of current at different speeds were lost, except for the current at 4 mph – 64 amps – but it worked! This was so exciting. One problem then



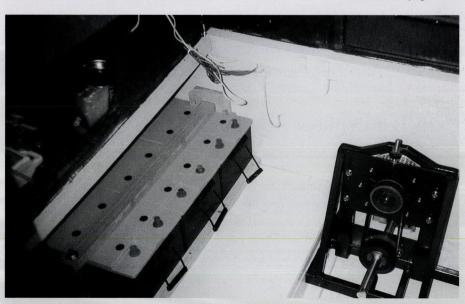
The space left after removing the diesel engine

was that the maximum continuous current was limited by overheating of the controller, in spite of a fan.

Changing the propeller from 13x16 to 13x10 resulted in dropping the current at 3.5 mph from 60 amps to 45, a big improvement in efficiency.

The first long outing – 24 miles – was the voyage from Oulton Broad, home to Norwich. Wrongly advised on tides we spent the first 11 miles against the current – about 70 amps gave us 3.0 mph,

continued on page 8



The new electric motor and batteries before connection

MOONGLOW – a Broads conversion continued from page 7

until we reached Reedham. Here we had the support of the incoming tide and speed shot up to a giddy 6.2 mph. We arrived safely at Norwich, 8 hours after leaving Oulton Broad, having consumed 471 Ah. What a triumph! Subsequently the motor:shaft gearing has been increased from 1:1.2 to 1:1.4 and finally to 1:1.6, on Cedric's advice. Overheating has ceased to be a problem.

Our first holiday was for three days, covering 38 miles without mishap. I took *Moonglow* to Silent

Sensations at Stalham in September,
50 miles from Norwich via Breydon

Water and Yarmouth. By using the tides she managed the journey on one charge
- 556 Ah consumed, an average 4.1 mph at 46.6 amps. The return journey across

Breydon Water was against winds of

Force 5-6 and there were no problems.

The quietness of the engine, the lack of vibration and smell, and the new heating and toilet system have transformed life aboard'

The whole journey took 535 Ah, an average 4.3 mph at 46.5 amps.

The quietness of the engine, the lack of vibration and smell, and the new heating and toilet system have transformed life aboard.

And the cost I hear you cry? The total cost was about £7,400, less £800 for the diesel and tank, of which the electric conversion comprised about £4,600 and worth every penny. There must be

of many.

many other GRP cruisers suitable for conversion to electric propulsion – *Moonglow* could be the first

A separate article on speed and power calculations for *Moonglow* – with graphs – will follow in a later edition.

Photos: Tony Fogarty







OBITUARY: Rear Admiral Percy Gick

continued from page 3

called Cedric Lynch to convert his innovative permanent magnet radial armature motor into an outboard for the winning skiff. Indeed, it was Percy Gick's vision to convert Great Britain's motorised fleet of inland and offshore craft to electric propulsion. As sharp-witted as he was impatient, at EBA Committee meetings in the 1980's he would complain and goad others about the lack of progress, be it with charging point installation, hull design projects or the poor availability of electric-drive packages.

As President of the EBA he saw, during the last few years, a rapid growth in the use of electric boats not only in the UK but worldwide. Although his vision has still to be fully accomplished it is steadily being fulfilled by the increasing enthusiasm for the 'no noise, pollution or fuss' world of electric boating.



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NEWS FROM HOME & AWAY

NEW SKIPPER FOR ROMAN

Sarah Phillips has taken over from Heather Duncan as skipper of the electrically-powered British Waterways community boat Roman (EB News, Autumn 2001). The Editor met Sarah at the 'Birmingham Boat Show' at the NEC in February where she was busy promoting the Dragonfly Project, which is particularly aimed at promoting water safety in schools.

Further information: www.britishwaterways.co.uk; email: dragonflyproject@britishwaterways.co.uk



Photo: Tony Ellis

CAMELOT AFLOAT

While the rest of the EBA crew were busy enjoying themselves at Silent sensations last September, Tony Ellis and his son were elsewhere below bridges on the Broads, battling force 6 winds, gusting to force 8, under two-reefs. Finding safe moorings at Horning Staithe (sadly too late and too weary to join up with the team for supper) Tony was pleased to find in the morning that two of the yachts from the Camelot Craft fleet - which have electric motors -- were moored just upstream. Comments from the crew were that the engines were reasonably efficient, but care had to be taken to avoid adverse tides. Also, more charging points would be useful.

Further information: camelotcraft@breathemail.net



Electric Excalibur moored at Horning Staithe Photo: Tony Ellis

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Controllers

- Brimbelow Engineering
- David Cartwright Boatbuilder
- Curtis Instruments (UK) Ltd
- Designeta Consultants
- · Ecocats Ltd
- Peter Freebody & Co.
- Lakeland Electric Boat Centre
- L.E.M.C.O.
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

DC-DC Converters, DC-AC Inverters

- Brimbelow Engineering
- Chloride Motive Power
- Curtis Instruments (UK) Ltd
- Designeta Consultants
- Ecocats Ltd
- Peter Freebody & Co.
- L.E.M.C.O.
- Morven Electronics Ltd
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd

Electric Conversion

- Brimbelow Engineering
- David Brownjohn Boatbuilders
- David Cartwright Boatbuilder
- Creative Marine
- Curtis Instruments (UK) Ltd
- Designeta Consultants
- Ecocats Ltd
- Peter Freebody & Co.
- Haines Marine
- Henwood & Dean Boatbuilders
- Lakeland Electric Boat Centre
- L.E.M.C.O.
- Lynch Motor Co.Ltd.
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

Electric Fun Boats/Leisure Craft

- Amourelle Products Ltd.
- Bossoms Boatyard Ltd
- · David Cartwright Boatbuilder
- Salter Bros. Ltd

Electric Fuel Cells

• Ecocats Ltd

Electric Inboard

- Brimbelow Engineering
- Designeta Consultants
- Ecocats Ltd
- Peter Freebody & Co.
- Haines Marine
- Lakeland Electric Boat Centre
- L.E.M.C.O.
- Lynch Motor Co.Ltd.
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

Electric Outboards

- Ecocats Ltd
- Lakeland Electric Boat Centre
- Lynch Motor Co.Ltd.
- Nauticalia Boats
- Thames Electric Launch Company
- John Williams Boats

General Boat Builders

- David Brownjohn Boatbuilders
- David Cartwright Boatbuilder
- Creative Marine
- Ecocats Ltd
- Peter Freebody & Co.
- Haines Marine
- Henwood & Dean Boatbuilders
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- G H Rose & Son
- STELCO UK Ltd
- Thames Electric Launch Company
- John Williams Boats

Generators

- Brimbelow Engineering
- Fischer Panda UK Ltd
- Peter Freebody & Co.
- Nauticalia Boats
- Reading Marine Co.
- Stelco Yachttechnik (UK)

Hour Meters

- Curtis Instruments (UK) Ltd
- Designeta Consultants
- Peter Freebody & Co.
- Lakeland Electric Boat Centre
- · L.E.M.C.O.
- · Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)

Hybrid Motors

- Brimbelow Engineering
- Ecocats Ltd
- · L.E.M.C.O.
- Lynch Motor Co.Ltd.
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

Insurance

• Navigators & General

Plugs, Sockets, Connectors

- Curtis Instruments (UK) Ltd
- Ecocats Ltd
- Peter Freebody & Co.
- Lakeland Electric Boat Centre
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

Repairs

- Bossoms Boatyard Ltd
- David Brownjohn Boatbuilders
- David Cartwright Boatbuilder
- Creative Marine
- Peter Freebody & Co.
- Haines Marine
- Henwood & Dean Boatbuilders
- Lakeland Electric Boat Centre
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company
- John Williams Boats

Restaurant/Party Boat Charter

• Grebe Canal Cruises

Sterngear, Steering Etc.

- Brimbelow Engineering
- Peter Freebody & Co.
- Lakeland Electric Boat Centre
- Nauticalia Boats
- Phoenix Fleet Ltd
- Reading Marine Co.
- STELCO UK Ltd
- Thames Electric Launch Company
- John Williams Boats

Surveyors, Consultants

- Paul E Bennett
- Designeta Consultants
- Ecocats Ltd
- Engineered Solutions
- Peter Freebody & Co.
- Haines Marine
- Lakeland Electric Boat Centre
- Morgan Marine Surveys (also Boat Safety Examiner)
- Nauticalia Boats
- Reading Marine Co.
- Stelco Yachttechnik (UK)
- Thames Electric Launch Company

Trailers

- Lakeland Electric Boat Centre
- Nauticalia Boats

Trip Boats

- Coniston Ferry Services
- Grebe Canal Cruisers
- G H Rose & Son

Contacts for Product Guide

Amourelle Products Ltd

Tel: 0118 969 4657 Fax: 0118 962 8682

e-mail: nick@amourelle.co.uk website: www.ElectricCanoe.co.uk/

Mr Paul E Bennett

Tel: 07811 639972

e-mail: peb@amleth.demon.co.uk website: www.amleth.demon.co.uk

Bossoms Boatyard Ltd

Tel: 01865 247780 Fax: 01865 244163

e-mail: info@bossoms.co.uk website: www.bossoms.co.uk

Brimbelow Engineering

Tel: 01692 582707 Fax: 01692 580036

e-mail: sales@brimbelow.co.uk website: www.e-drive.co.uk

David Brownjohn Boatbuilders

Tel: 01491 412580

Castle Narrowboats

Tel: 01873 830001 Fax: 01873 832341

e-mail: castle.narrowboats@btinternet.com website: canaljunction.com/castlenarrowboats

Chloride Motive Power

Tel: 01204 64111 Fax: 01204 62981

e-mail: sales@cmpbatteries.co.uk website: www.cmpbatteries.co.uk

Classic Launches

Tel/Fax: 0118 948 2629

email: info@classiclaunches.co.uk

Coniston Ferry Services

Tel: 01539 436216 Fax: 01539 436216

e-mail: conferry@lakefell.co.uk

Creative Marine

Tel/Fax: 01263 570100

e-mail: creative.marine@talk21.com website: www.creative-marine.co.uk

Curtis Instruments (UK) Ltd

Tel: 01604 629755 Fax: 01604 629876

e-mail: e-mail@curtisinst.co.uk website: www.curtisinst.com

Designeta Consultants

Tel/Fax: 01628 636500 e-mail: designeta@btclick.com

website: www.home.btclick.com/designeta/

Ecocats Ltd

Tel: 01752 822 703 e-mail: info@ecocats.com website: www.ecocats.com

Engineered Solutions

Tel: 01780 754327 Fax: 01780 754327

e-mail: h.s.arbon@ukgateway.net

Fischer Panda UK Ltd

Tel: 01202 820840 Fax: 01202 828688

e-mail: info@fischerpanda.co.uk website: www.fischerpanda.co.uk

Peter Freebody & Co

Tel: 01628 824382 Fax: 01628 820238

website: www.boatbuilder.co.uk

Grebe Canal Cruises

Tel: 01296 661920 Fax: 01296 661920

Haines Marine

Tel: 01692 582180 Fax: 01692 582441

e-mail: mary@hainesmarine.co.uk

Henwood & Dean Boatbuilders

Tel: 01491 571692 Fax: 01491 411514

e-mail: hdboat@globalnet.co.uk website: www.henwoodanddean.co.uk

Lakeland Electric Boat Centre

Tel: 01768 840211 Fax: 01768 840212

e-mail: martin@lakelandelectricboats.co.uk

L.E.M.C.O.

Tel: 01404 44132 Fax: 01404 47050

e-mail: sales@lemcoltd.com website: www.lemcoltd.com

Lynch Motor Co.Ltd

Tel: 020 7607 8141 Fax: 020 7609 3625

e-mail: info@lynchmotor.com website: www.lynchmotor.com

Morgan Marine Surveys

Tel: 01772 690232 Mobile: 07713 419321

e-mail: peter@jrbc.freeserve.co.uk website: www.jrbc.freeserve.co.uk

Morven Electronics Ltd

Tel: 0141 810 3100 Fax: 0141 810 3111

e-mail: sales@morven.co.uk website: www.morven.co.uk

Navigators & General

Tel: 01273 863420 Fax: 01273 863401

e-mail: enquiries@navigatorsandgeneral.co.uk

website: www.navandgen.com

Nauticalia Boats

Tel: 01932 254844 Fax: 01932 254775

e-mail: info@pushtheboatout.com website: www.pushtheboatout.com

Pb Batteries (SE) Ltd

Tel: 01206 792449 Fax: 01206 860438

e-mail: pbbatts@FSBDial.co.uk

Phoenix Fleet Ltd

Tel: 01692 670460

e-mail: boats@phoenixfleet.com

Reading Marine Co

Tel: 0118 971 3666 Fax: 0118 971 4271

e-mail: readingmarine@compuserve.com

Rivertime

Tel: 01628 530600 Fax: 01628 810550

e-mail: boating@rivertime.com website: www.rivertime.com

G H Rose & Son

Tel/Fax: 01789 267073

e-mail: boats@stratford.u-net.co.uk

Salter Bros

Tel/Fax: 01865 243421

e-mail: Admin@salterbros.fsnet.co.uk website: www.salterbros.fsnet.co.uk

STELCO UK Ltd

Tel: 01491 838304

Stelco Yachttechnik (UK)

Tel: 01603 737830 Fax: 01603 722117

Swancraft

Tel: 01491 836700

Thames Electric Launch Company

Tel: 01491 873126 Fax: 01491 872217

e-mail: thameselectric@goring.co.uk website: www.thameselectric.com

John Williams Boats

Tel: 01692 580 953 Fax: 01692 582132

e-mail: Johnwboats@aol.com website: www.electriclaunch.co.uk



ELECTRIC HAPPENINGS ON THE ESSEX & SUFFOLK STOUR

The River Stour Trust is a charity devoted to the restoration and maintenance of navigation on the the River Stour which forms much of the boundary between Essex and Suffolk. In recognition of the environmental value of the river, the Trust operates a number of trip boats which are powered by electric motors. Details of the special electric and steam event on 14 July are included in the list of 2002 events. However, there are also regular electric trips available from Flatford and Sudbury throughout the season. The runs started over the Easter weekend and the boats will next be available on Sunday 5 and Monday 6 May. The Jubilee will be acknowledged by the electric launch Rosette running from Sudbury between 2 and 4 June.

Further details of the boating programme for 2002 Tel: 01787 372602.

The river is only navigable in sections and much work will be needed to restore navigation over the full 23.5 miles between Sudbury and the Brantham Barrage where it meets the sea. In recognition of the strong interest in the future of the river, a partnership of the Trust, the Environment Agency (the nominal navigation authority), the Dedham Vale & Stour Valley project and Essex & Suffolk Water have commissioned a feasibility study into the most appropriate future for the river - including full restoration. Further details of the study - including a copy of the summary report - can be obtained by phoning tel: 01473 727712. The closing date for comments on the report is May 31.



Stour Trusty II under way on the River Stour

ELECTRIC BOAT ASSOCIATION OF THE AMERICAS (EBAA)

NEW YORK STATE CANAL CRUISE & TREK



The EBAA will be taking part in this annual event which begins on Monday July 8 and runs through to July 26. The cost of the event is \$175 and this includes a Seasonal pass on the canal, a cruise

guide, T-shirts, daily meals and much more! Further information on taking part can be obtained from EBAA Executive Director Ken Matthews at: elecboat@msn.com.

BRIEFLY NOTED... SOLAR ENERGY

The EBAA report that worldwide demand for solar PV modules has grown by 300% since 1997, or 31% per year. The largest regional markets are recorded as Japan, Germany and the United States.

BUSINESS NEWS

In a report on the Fort Lauderdale Boat Show, reference is made to the appearance of the hybrid-electric Duffy Heresshoff 30 (EB News, Spring 2001). Mention is also made of Wilde Evolutions of Lynwood, Washington State who have recently been appointed as distributor for the British designed Lynch motor, which is under licence to Briggs and Stratton.

INTERSOLAR SECURES DTI FUNDING

Intersolar Group, one of the leading UK renewable energy specialists, has secured funding of £500,000 from the Department of Trade & Industry to build a factory to manufacture solar cells. The overall project will cost an initial £1.2.million and will take two years of research. Intersolar aims to produce solar cells at a cost of about 70p per watt.

The funding is an indication of the pressure the Government is under to develop environmentally friendly sources of energy to meet the Kyoto target of 10% of energy from renewable sources by 2010.

2002 EVENTS

The basic information on these events is listed on the inside of the front cover. This further information will help you plan your late spring / early summer of electric boating

Further events taking place later in the year will be announced in the next issue of the EB News or on our website. For further information, please contact the Secretary Barbara Penniall – details on the inside of the front cover.

If you want to stand out from the crowd and become part of the team at any of these events, why not wear a personalised EBA sweatshirt or polo shirt? These come embossed with the grebe logo and can include the name of your boat. These garments are available at a very reasonable price (see EBA Shop on page 20).

MONDAY, 15TH APRIL - LAUNCH SUPPER

Once again we shall meet for this very successful evening at the Maidenhead Rowing Club. This is an opportunity to meet socially, bring guests, and enjoy an evening with fellow electric boat enthusiasts.

SATURDAY 4TH MAY 10am - 6pm & Sunday, 5TH MAY 10am - 5pm ELECTRIC BOAT EVENT 2002 - HARTFORD MARINA, HUNTINGDON

This is the only all-electric boat show in the UK with boat builders, outboard motors, battery suppliers and other marine equipment on display. There will be boats on land and on the water and it will be an opportunity to try a variety of electric craft. The EBA committee will also be there to answer your questions and provide technical information on all aspects of electric boating. Entrance is free. Hartford Marina has easy access from the A14 and offers superb facilities on site for both visitors and boaters.

MONDAY, 6TH MAY - OUSE CRUISE

This is a cruise day on the River Great Ouse. EBA members are welcome to bring their boats for the weekend, or just for the cruising day. The Environment Agency has waived their usual licence fee in support of our event and the Marina has offered a nominal one-off charge of £10 for the launch and recovery of boats.

Those EBA members who joined us for a cruise on this stretch of the Ouse two years ago will know what an enjoyable day was spent gently meandering in a flotilla of electric boats, stopping at a friendly pub/restaurant for lunch and then a peaceful afternoon cruise to complete the day. If you are unable to bring your boat, please don't let this stop you coming – there will always be a welcome for you on one of the craft taking part. If you are bringing a boat, perhaps you could let Barbara Penniall know so

that arrangements can be made with the Marina for launching and mooring.

16TH-19TH MAY - BOATS ON SHOW, PENTON PARK, CHERTSEY

This is a major inland waterways boat show, previously held at Beale Park, Pangbourne. There will be EBA business members with boats on the water and on land and the Electric Boat Association stand to offer advice and information.

3RD JUNE – JUBILEE SOLAR FEST 2002, LITTLEHAMPTON, SUSSEX

This competition between solar powered boats is a follow-on from last year's event, reported in Summer 2001 EB News. This year we are promised a bigger event with additional attractions to the main race. For further details contact jrichards@aol.com, or visit the www.futureenergies.com website and enter Littlehampton in the search box.

SUNDAY, 23RD JUNE - THAMES RALLY AT BOURNE END

This year the Thames Rally will be held at Bourne End where Terence and Ann Casey have very kindly offered us use of their mooring and garden. We shall meet at noon and bring a picnic, and the afternoon will be spent socialising and cruising together on the Thames.

This event has proved very successful over the past few years and, as always everyone is welcome – friends, guests and members. Bring your own picnic and if possible your boat. As always on these occasions, it is a welcome opportunity to meet other electric boat enthusiasts and enjoy the social side of the EBA.

SATURDAY, 13TH JULY - RALLY AT BEALE PARK, PANGBOURNE

If there is enough interest from EBA members, it is proposed to hold an event at Beale Park for electric boats. Details are still being finalised, but it is proposed that members bring their own picnic lunch and there may be a barbeque in the evening. A small charge will be made per boat to cover costs incurred.

If you are interested in taking part, contact:

Emrhys and Linda Barrell, Tel: 01491 873126 email: emrhysbarrell@goring.co.uk or Paul and Pat Wagstaffe, Tel: 01628 524376 email: paulvw92000@aol.com





SUNDAY, 14TH JULY – STEAM AND ELECTRIC DAY ON RIVER STOUR

A regatta and cruise has been organised by the River Stour Trust, supported by the EBA. This will be a lively event on a very picturesque stretch of the River Stour at Sudbury in Suffolk. There will be lots of boats and organised activities and members of the EBA are invited to join in the fun with or without their boats. If you plan to bring your boat or want further information, contact the Trust Secretary, David Rayner on **Tel: 01473 310923.**

The electric trip Boat Stour Trusty II, operated by the River Stour Trust will be exceptionally busy on 14 July

NOTICE BOARD

VACANCIES

PUBLIC RELATIONS OFFICER:

We still have a vacancy for a Public Relations Officer. it is very important that we fill this vacancy as soon as possible.

SOUTH EAST REPRESENTATIVE:

Following the departure of Steven Schrier, there is also a vacancy for a South East representative. Any volunteers interested in either of these posts should contact our Chairman, John Hustwick.

STANDING ORDERS

Last year, the Secretary, Barbara Penniall, encouraged members to pay by standing order. About 10% elected to do so, for which we are grateful as it reduces the number of subscription reminders that have to be written. If you would like to set up an annual order for £25, payable on the date of your renewal, the following information should be passed to your bank:

THE ELECTRIC BOAT ASSOCIATION

a/c 4273 7084

Girobank plc, Bootle, Merseyside, GIR OAA

Sort code: 72-00-04

Please ask your bank to identify the payment with your name on the EBA Bank Statement.

Name	Vicinity	Boat(s) where appropriate
PRIVATE MEMBI	ERS	
Howard and Pam Jacobs	London	Hamsini (Frolic 31)
Ian Sinclair	Beccles, Suffolk	
Derek Vivian	Taunton, Somerset	(welcome back Derek)
Peter Wight	Heaton Chapel, Stockport	
James Moore	Witham Friary, Somerset	Gnat

ERRATUM:

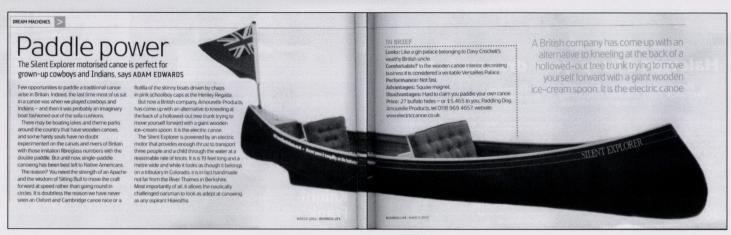
Union Jack

Technologies

The caption on page 16 of the Winter edition should have read "Edward Hawthorne, EBA Vice President". Apologies to Edward.

Witney, Oxon

BUSINESS NEWS



The Silent Explorer electric canoe is flying high with British Airways – Extract from Business Life magazine

SILENT EXPLORER CANOES

The editor of the British Airways Business Life magazine spotted Nick Goldring's *Silent Explorer* website on the internet a couple of months ago. He contacted Nick to ask if he could send his photographer along to take some pictures of the canoe for a double page spread in his Dream Machines feature.

As a result, the March 2002 edition of the British Airways Business Life magazine with a two-page reference to *Silent Explorer* is currently in the seat back pocket of every British Airways First class & Business class flight worldwide. Nick is optimistic that this high profile entry might spark some interest in electric boating amongst the rich and famous!

Further details: Nick Goldring, Silent Explorer Canoes, Amourelle Products Ltd, 8 Ambleside Close, Woodley, Reading, Berks. RG5 4JJ

Phone 0118 969 4657 Fax 0118 962 8682 mail@ElectricCanoe.co.uk

CREATIVE MARINE

This Spring Creative Marine are launching another version of their popular *Frolic 31* – The Picnic Launch. This is in response to calls by customers for a day launch with cabin and toilet facilities.

The launch is fitted out to a high standard and has seating for 10/12 persons. The decks are mahogany with high gloss varnish. The forward cockpit has Lloyd Loom chairs, and an elliptical hardwood table with folding leaves that can also be moved into the saloon.

From the cockpit partly glazed hardwood doors lead into the cabin. The saloon has seats to port and starboard and there are facilities for toilet and cooking as required.

Prices from £66,446 plus VAT.

Further details: Tel: 01263 570100, www.creativemarine.co.uk

Creative will also be taking part in the EBA event at Hartford Marina and Boats on Show.

INTERBOAT 16 – New range of electric launches

The Thames Electric Launch Company has been appointed UK distributors for the Dutch-built Interboat range of electric dayboats and cruisers. The range includes 16, 19, 20, 21 and 25 open launches, and a 25 Cabin model.

The boats all have GRP hulls and a wide range of optional interior finishes. These include teak cockpit soles, teak decks, mahogany engine boxes, wooden steering wheels, and colour choices for the hull and cushions of Blue, Green, Burgundy and Cream.

All the boats have substantial rope fendering round the gunwale, removing the need for loose fenders in locks. 2kW electric drives



The Interboat 16 newly arrived in the UK

and heavy-duty batteries give cruising ranges of up to 6-8 hours. And (though we shouldn't be saying this) diesel versions are also available.

The 16 is a roomy family boat, with seating for 6-8 people, plenty of locker space for the picnic, and a sturdy simulated clinker hull. A large steering wheel and rudder make it a delight to handle on the river. Price starts at £12,950 inc VAT.

The 25 can be supplied as an open boat, or with a cuddy cabin at the bow, two berths and a toilet, or a full cruising cabin, with standing headroom, toilet compartment and galley. Prices start at £25,000 inc VAT.

The first boats will be on show at the Huntingdon Electric Show, and at Boats On Show 2002.

Further details: The Thames Electric Launch Company, Tel: 01491 872217.

e-mail: thameselectric@goring.co.uk. Website: www. thameselectric.com

HI-TEC BATTERY CHARGERS

Tony Fogarty reports on a range of French battery chargers called Hi-Tec which were displayed at the London International Boat Show. The 24v/30A at £485 incl. and the 24v/50A at £580 will be of interest to electric boaters. The smaller model can be used in conjunction with the quiet and lightweight (13kg) Honda EU10i 1KW petrol generator at about £680. This unit can also be converted to gas by Edge Technology (or they can provide a DIY kit at about £120). As a result, £1400 could buy you an environmentally friendly generating system.

Further details: Hi-Tec from Merlin Equipment Ltd, Unit 4 Cabot Business Village, Holyrood Close, Poole BH17 7BX, Tel: 01202-697979.



Edge Technology, The Gas Power Centre, Wistaston Rd, Crewe CW2 7RL, Tel 01270-509296

Honda Generators from Honda dealers.

NEWS FROM STELCO YACHTTECHNIK

NEW SAPPHIRE ELECTRIC LAUNCH FROM STELCO

The first of the new 29ft Sapphire electric launches was delivered in summer 2001 to her new owner on the Thames. The hull is grp and has a beaver stern, fitted throughout to a high standard in varnished mahogany. The interior cockpit has a remarkable amount of space for entertaining, batteries and motor being tucked away beneath the floor. Lloyd Loom seats are provided and passengers are protected by a canopy. A member of the staff at Val Wyatt Marine, Wargrave commented "This is undoubtedly the best electric launch I have ever handled". This launch was fitted with a 2.5 kW separately excited (SEM) system. Sapphire launches in future will be fitted with low voltage 3 phase asynchronous motors and inverters. Price is around £34,000 including VAT.

ELECTRIC PASSENGER BOATS FOR SKEGNESS

At the start of 2001 East Lindsey District Council commissioned the conversion of three 20 seater passenger boats to electric. The boats work continuously throughout the season on the closed canal system at Skegness sea front passing through the parks, golf course and nature reserve. Each has been fitted with 2.5 kW SEM systems and between them carried 40,826 passengers last year without a single hitch. Amenities manager Dave Conroy reports "big cost savings and high customer acceptance". Following this success the fourth vessel was converted and commissioned in March 2002.

MORE ELECTRIC BOATS FOR 2002

Conversions this winter included 6kW for 50ft. *Humble*, 4 kW for 30ft *Eluva* (both undergoing restoration by Stanley & Thomas, Windsor), 4kW for boatbuilder David Brownjohn's new 26ft. slipper launch (his 3rd electric slipper to be commissioned) and 4 kW systems to 3 electric 22ft. ECO's operated by Broads Tours of Wroxham. SEM systems are regularly supplied to STELCO (UK) LTD for fitting to the CAPRIOLE range of electric cabin boats bound almost exclusively to the German market. Benson Waterfront will be hiring out this season the new 'ECO' 28 with all onboard luxury facilities and fitted with a 4kW motor.

continued on page 16

RESTORATIONS AT STELCO WORKSHOPS

Admiralty harbour launch *Snipe* (42ft.) has undergone an extensive 2 year restoration, which included the replacement of the petrol/paraffin engine with a diesel electric hybrid system. *Snipe* will be launched in May for trials and will most likely be transported to the River Dee.

Swift is a most elegant 35ft. counter stern Thames launch undergoing full restoration which will be fitted with a 6 kW 3 phase asynchronous motor direct drive to the propeller shaft. She will be delivered to the Thames in June and will no doubt be making regular appearances at EBA events.

NEW STELCO ASYNCHRONOUS PROPULSION

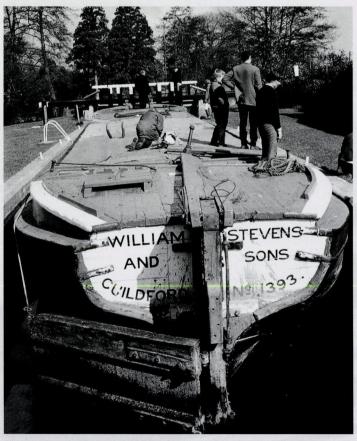
A new generation of low voltage 3 phase 850 rpm AC motors and inverters from 1 kW to 20 kW are now available from STELCO. Advantages are namely maintenance free (no brushes to wear or rattle), high torque at low speeds (850 rpm), high efficiency, smaller in size and weight and lower cost!

Further details of STELCO YACHTTECHNIK products and services Tel: 01603 737830 or 01603 722117.



CRUISE REPORT-A week on the Wey

Paul and Pauline Jackson report on a recent journey up the Wey aboard their Deltic cruiser



The Wey barge Diligent in a lock on the river in the early 1970's Photo: Tony Ellis

Anyone considering a mini-trek should think seriously about the River Wey and Godalming Navigations which run some 20 miles from the Thames (opposite Shepperton Lock) to Godalming in Surrey.

The navigations are owned by the National Trust, and remain one of their best kept secrets. Despite the proximity of the M3 and the M25, the navigation is very quiet, with some 16 locks to navigate between Weybridge and Godalming. The Wey is one of the oldest inland navigations in Britain, built in 1653, one hundred years before the outburst of the canal age. In 1764 the upper navigable limit of the Wey was extended from Guildford to Godalming, with the opening of the Godalming navigation.

Our *Deltic* made a four day journey from the Environment Agency charging point at Old Windsor up to Godalming and back on one charge. Even so, there are a number of charging points available on the river, as well as Nauticalia in Shepperton (01932 254844). If you don't have overnight accommodation on your boat, it shouldn't be too difficult to find an overnight base in Guildford or Godalming.

Our Godalming destination proved charming and has the distinction of being the first town in the world to to have an electricity supply to houses and for street lighting (not many people know that!).

Further information: The Manager, Wey Navigations National Trust, Dapdune Wharf, Guildford, GU1 4RR Tel: 01483 561389

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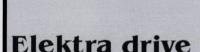




www.creativemarine.co.uk

Creative Marine, 'The Secret Boatyard', Barningham Barns, Matlaske, Norwich, Norfolk, NR11 7LE – Tel/Fax: 01263 570100





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LETTERS TO THE EDITOR

A safe home wanted for a Silver electric outboard

Would you be able to advise me, I have an electric outboard, a 'Silver' made in the USA in possibly the early 1950's, although it might be prewar. It belonged to my grandfather and I remember it in use in the 1950's.

Would anyone be interested in adding it to their collection. It must be of interest to someone, but who!? If you have any ideas I'd be pleased to receive them.

John Murch john_murch@hotmail.com

John: The River & Rowing Museum at Henley already has a full collection, but you might like to try the National Motorboat Museum at Wat Tyler Country Park, Pitsea in Essex, Tel: 01268 550 077. This museum is devoted to the history and evolution of the motorboat in the sports and leisure field, and has over 31 motorboats on display, dating from 1823 to the present, as well as collection of inboard and outboard motors. **Editor**



Guinness record attempt

We have read with interest of the Guinness record attempt. It is always a challenge to do better, but in order to avoid eggs with pumpkin comparisons a clear set of conditions needs to be spelled out for future challenges.

We would like some details of the 'rules' under which this 'record' was set.

- **1.** What is meant to be the record 30 hours endurance, or 137 miles range, or 137 miles covered within 30 hours?
- **2.** If 137 miles why 30 hours not 24? Was this an unplanned accident (still had power available after 24 hours)?
- **3.** Was only the normal load of batteries for the boat carried or were extra batteries carried for the attempt?

Thirty hours at of the order of 30 amps at 24 volts implies 900 ampere hours or 21600WH. This could require about 500kg of batteries against a probable normal load of 250kg. Given say 4 banks of batteries, they could be cycled, allowing some recovery, thus extending the range. Of course for the record one might be prepared to totally discharge the batteries, which is not good for them and therefore not normal practice. Without limits the competition boils down to carrying the maximum number of batteries – hardly a useful measure of progress.

Whilst 'attention grabbing' a record without rules does little to advance the engineering (science, art and practice) of electric boating. In my mind the most appropriate rules for a meaningful competition would have the following limits:

- 1. The weight of batteries carried to say 500 kg. This would help measure advances in storage systems.
- 2. The time over which the distance may be measured should be limited to 24 hours.



Guinness Record

Recharging (mains, generator, solar or other), replacement of batteries (other than with batteries carried on board throughout the trial) should be prohibited.

In combination these rules would encourage efficient batteries, motors, propellers and hulls. It will also lend a bit of spice to the driving tactics – should I go faster and cover more distance in a given time, but run the risk of running out of puff before the time limit, or should I go slower to ensure running for the full time but risk still having power when the time runs out?

Give us the conditions and we will try to meet the challenge! Regards

Charles Fitzhardinge, Managing Director, Woolwich Marina, NSW 2110 AUSTRALIA

Phone 61 2 9879 4222 (ah 9879 7054), Mobile 0421 339 050 E-mail: charles@woolwichmarina.com; website www.woolwichmarina.com

Emrhys Barrell of The Thames Electric Launch Company, who set the Endurance Record replies:

In the UK, nearly all inland waterways have a speed limit. For the canals it is 4mph, for the River Thames on which we are based it is 5mph (8km/hr). Four years ago we set a record of 116 miles in 24 hours, or 4.83mph. We wanted to repeat the process, this time notifying Guinness World Records, so we decided to try and improve on last time. We set 135 miles in 30 hours as our target, at 4.5mph. In the event we achieved 137 miles, or 4.57mph.

To go any faster than this in a 30ft boat, with a 25ft waterline length would mean using a lot more power, just to make waves, and since electric boating is all about protecting the environment, we did not see any point in this.

We also used a standard boat, not one specially built for the attempt. It has a cabin, two berths, a cooker and a toilet, and when it is not setting records, it carries its owners Richard and Anne Leeson and their two daughters on day trips and cruises. The fact that its hull is 100 years old is a tribute to the skills of early boatbuilders.

We added 25% more batteries than the boat normally carries, but in fact this just brought it up to what we had originally calculated when we carried out the conversion 4 years ago, and we removed an equivalent amount of ballast, so the boat was not overloaded. This gave us 800Ah at 36V, with a weight of approximately 720kg.

We travelled continuously, stopping just to change crews, and used no means of charging during the 30 hours.

Whilst we accept that the record was not done to precise rules, 90% of its purpose was to draw press attention to the potential of electric boats, and to underline that they do not run out of power after a couple of hours. It also highlighted the environmental benefits for inland craft. The extensive coverage we got in the boating media, local newspapers, and TV justified this.

Regarding a challenge to other electric boaters, we are open to suggestions as to what additional rules should be applied. We think it is in order to run the batteries down to flat, otherwise you end up with long discussions as to whether 50% or 80% is the best discharge regime.

We also think two classes may be needed, for existing boats, or specials. One way of limiting the batteries carried may be to specify a maximum battery weight as a percentage of the overall displacement. Say 33% of the boat, batteries and one or two crew.

To bring in smaller boats, you could set classes by overall weight including batteries and crew. Say 250kg, 500kg, 1 tonne, 2 tonne.

To avoid someone running at 1mph for a week, you could set a minimum speed, or a minimum percentage of the boat's maximum speed. Or you could just make them carry all their food and drink and waste on board for the whole attempt, plus books, videos and mobile phone batteries.

Well, you have heard from Thames Electric. What do other readers think? *Editor*

Mooring sought on the Thames for an electric canoe

Can you help me find a permanent under cover mooring for my electric canoe, between Maidenhead and Sonning? My canoe *Silver Dart* is 25ft 4ins (circa 8m) long, with a beam of 5ft.

If any reader can help, could they please phone me on 01628 822862.

Yvonne Tomkins



Information sheets from the Electric Boat Association

- 1. PRODUCT GUIDE & EBA TRADE MEMBERS (free upon request)
 - 2. SOLAR POWER by Solar Energy Alliance
- 3. **ELECTRIFYING YOUR BOAT** by Hawthorne & Wagstaffe
 - 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
 - 7. HYBRID POWER by John Hustwick

Available: Free to members Nos. 2-7 Non-members @ £1.50 per copy

The Secretary, Electric Boat Association, 150 Wayside Green, Woodcote, Berks RG8 0QJ

Tel: 01491 681449 Fax 01491 681945 e-mail: eboat@mail.com

ELECTRIC BOAT ASSOCIATION SHOP £9.50 EBA Tie - navy blue with narrow green/white diagonal stripe EBA Pennant - good quality cotton, royal blue with 'Electric Boat Association' and grebe in white £10.00 £5.50 EBA Brooch - delicate blue and white grebe edged with silver Safety pin clasp, 25mm high **EBA Sweatshirts and Polo Shirts** Good quality, both in pale blue with royal blue logo sweatshirts £20.00 Please state Small, Medium, Large or Extra Large - polo shirts £16.00 \$2.50 Why not add the name of your boat for an extra All prices include post and packing (UK only) Please send cheque for &..... made payable to the Electric Boat Association to: Barbara Penniall, 150 Wayside Green, Woodcote, Reading, RG8 0QJ Tel: 01491 681449 Fax: 01491 681945 email: eboat@mail.com Polo Shirt Brooch Sweatshirt Tie Pennant (Please indicate quantity and size required plus additional boat name as appropriate) Name Tel No:

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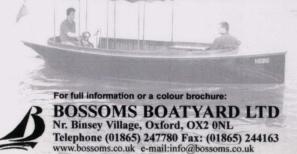
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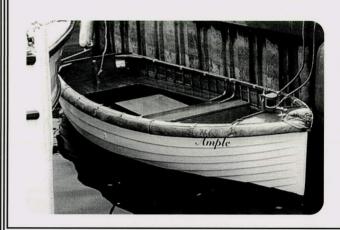
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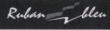
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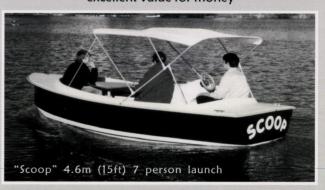
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