

Electric Boat **NEWS**

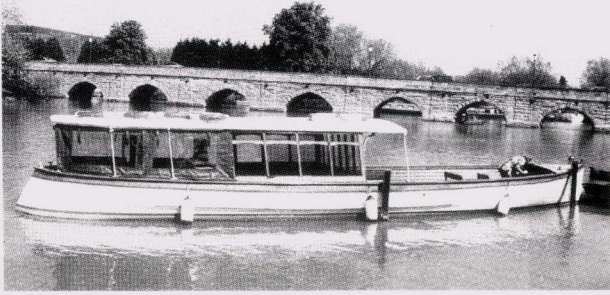
The Journal of the Electric Boat Association



***Boat Safety Scheme Review • Solar powered race
Electric Tugs on the Huddersfield canal • A front tow hitch***



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Mayflower, Stratford upon Avon, 1999

Some recent achievements:

World Waterspeed Record, 1989
Trip Boat, Castle Howard, Yorkshire
Sail Auxiliaries, Camelot Craft and S.A. Knights,
Norfolk
Dayboat Fleet, Redon, France
Norfolk Wherry Yacht Charter
Lake Tyers Day Boats, Australia
Seaway, yacht hydraulic drives

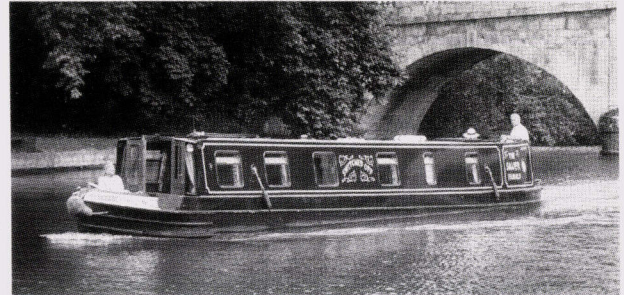
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Lynch Motor Co, PO Box 919, Hemingford Road, London
Tel: 020 7607 8141; Fax: 020 7609 3625
Email: info@lynchmotor.com

David Graham, Thames Edwardian launch
Trip Boats, Scanship, Holland
First Passenger Solar Boat, Neuchatel, Switzerland
Columbia University, First in Class, Solar Splash,
1995

Oco-Sachs/Lynch Electric Outboard
First Solar Crossing of English Channel, 1997
Reading Marine, Diesel-electric hybrid, 1999
Rose, Stratford upon Avon, 60 passenger launch, 1999

Reading Marine, hybrid narrow boat, 1999

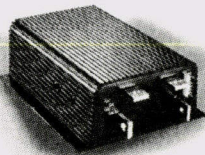


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EBA CALENDAR

July

- 21st – 22nd** **EBA Interest** Thames Traditional Boat Rally, Fawley Meadow, Henley
EBA will be exhibiting
- 28th** **EBA Event** Bi-annual General Meeting of EBA in morning, lunch at the Upper Thames Sailing Club, Bourne End and an afternoon cruise in electric boats to Marlow Weir and back

August

- 5th** **EBA Event** EB Rally at Caversham, Reading
- 25th – 27th** **EBA Interest** Electric Boat event scheduled for Langport Somerset
Details not finalised at time of going to press

September

- 1st** **EBA Event** EB Rally at Upper Thames Sailing Club, Bourne End to include parade of electric boats at Cookham Regatta
- 9th** **EBA Event** Silent Sensations in Norfolk.
EB event combined with a cruise on Norfolk Broads

October

- EBA Event** Laying Up Supper at Maidenhead Rowing Club
Date to be confirmed

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



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Electric Boat Association

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Cover Picture: **The new Frolic 36 from Creative Marine**

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On the current.....

I write this at a time when a short burst of summer weather has been spiked by the predictable downpours of Wimbledon. But in that short run – when we could walk out without thought of a jacket – ones mind naturally travelled to the river and the desire to get afloat. It is good to know that, with the weakening of the grip of foot & mouth on the countryside, we can now start to make plans again. In this issue you will hear of a range of new diary dates, with a series of activities ranging over the coming season, from the Norfolk Broads to Langport in Somerset. The visit to the West Country will open up some very new and unusual waters for many of our trailer-borne craft and I am quite intrigued as to what is planned for this location.

In this issue we report on further developments in the introduction of the fuel cell with the public demonstration of *Hydra* in Gent. The fuel cell has been no more than a promise for several years and this application makes one further step towards full economic viability for a new source of electric power. A little bird also tells me that a UK narrowboat builder is planning to install a fuel cell in a new-build in the near future.

We also bring you the story behind the involvement of electric boats in the phenomenal £32million restoration of the Huddersfield Narrow Canal.

The final report of the Boat Safety Scheme Review team is also given an extensive airing. From discussions with other user groups, I hear that developments with the review are being watched carefully to ensure that the major changes called for over a year ago are actually achieved.

All of the officers of the Association hope to meet many of you at the Biennial General Meeting on the 28th July See you there?

Tony Ellis

Editor

Copy Deadlines:

Material to be considered for inclusion in Electric Boat News should be sent to the Editor (preferably as a full e-mail – no attachments) by the following dates:

Autumn Friday 7th September 2001 **Winter** Friday 7th December 2001
Spring Friday 1st March 2002 **Summer** Monday 3rd June 2002

COMMITTEE REPORTS

NATIONAL COUNCIL – APRIL 2001

The National Council met at the Electricity Association at Millbank on the banks of the Thames in London on the 23rd April 2001 and the following are selected highlights:

CHARGING POINTS

British Waterways have supplied an initial list of charging points on their waterways. They have indicated that more information will be available shortly.

WEBSITE

It had been agreed at the January meeting of the Executive Committee that Barbara Pennial should take over the future management of the website. Barbara confirmed that the site had now been re-written and was now functioning. The final touches to the site had been completed the day before the meeting and only recently, a potential business member had downloaded the application form from the site and joined the EBA. A unanimous vote of thanks was given to Barbara for her work in reinstating this key aspect of the EBA's promotional effort.

PATRICIA

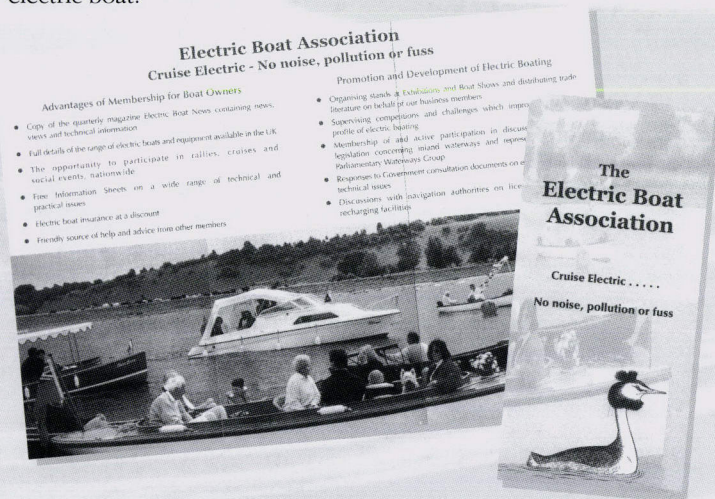
Simon Davis and Steven Schrier had met with Admiral Gick and arranged the loan of some important archives on the *Patricia* which would form useful material for future editions of Electric Boat News.

DIRECTORY

Although the Directory was a relatively expensive item to produce, the Council agreed that it should continue as an annual as it offered an important service to members of the EBA. Investigations would be made into ways of compacting the material and reducing the overall cost.

NEW EBA LEAFLET

Supplies of a new EBA promotional leaflet are now available and copies have been circulated to member companies, encouraging them to offer one year of free membership to anyone buying an electric boat.



EBA TRAILER

The Chairman had repaired the jockey wheel on the EBA trailer and John Hustwick volunteered to strip and repaint the trailer box, while Ian Rutter would provide a stencil for the EBA logo and wording.

CONSTITUTIONAL ISSUES

Discussion took place on a range of constitutional issues, ranging from vacancies on the National Council to the quorum and the number of meetings to be held each year.

DATE OF THE NEXT MEETING

A further meeting would not be necessary in 2001 because the Biennial General Meeting was due to be held on 28 July.

EXECUTIVE COMMITTEE – May 2001

The Executive Committee met at the Upper Thames Sailing Club, in Bourne End on the 9th May 2001 and the following are selected highlights:

MEMBERSHIP

Two new private members had joined in recent weeks, with one joining the Association direct from the website

TREASURER'S REPORT

With the growth in printing cost for EB News and the impact of Boat Show cancellations, the finances of the Association were under pressure. It was agreed that every effort should be made to reduce costs and raise additional revenue from a variety of sources – from increased subscriptions to sponsorship.

ELECTRIC BOAT NEWS

The committee received a report from the Editor which explained that two meetings had been held with the printers to discuss the honing of production arrangements, with a view to containing production costs. The copy for each issue is now transmitted by a single email in an agreed computer language. With the existing magazine format, there is little scope for trimming the current production arrangements in any way.

BIENNIAL GENERAL MEETING (BGM) – 28TH JULY 2001

The BGM would be held at the Upper Thames Sailing Club on the 28th July. The Notice and Ballot Papers would be circulated by the Secretary, together with details of the lunch and cruise to Marlow weir and back during the afternoon.

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NOTICE BOARD

NEW EBA REGIONAL REPRESENTATIVE FOR THE MIDLANDS

A warm welcome is extended to Heather Duncan who has agreed to be the EBA contact for the Midland Region. We were delighted to have the opportunity of spending the afternoon in her company at the Crick Boat Show on the British Waterways Electric community boat, *Roman*. Heather has been an EBA member for some time and is a very experienced boater. From the age of 17 she ran her own coal carrying business on the canals. Now employed by British Waterways she operates their community launch *Roman* as part of the Dragonfly project. If you would like to know more about the Dragonfly environmental awareness project, please contact Heather at British Waterways on 01827 252070 or her mobile 07710 175215.

AFTER FOOT & MOUTH.....

Now that the Foot and Mouth restrictions have been lifted, the EBA has been busy promoting electric boating in various parts of the country. As you will read in the next issue, there was a small event on Ranworth Broad in Norfolk at the beginning of June and another in Ware in Hertfordshire in early July which unfortunately missed the deadline for this issue.

We were advised of both these events by EBA members, and the Committee were very happy to give Association support on the day. In future, if you know of any events being arranged in your area, please do let Barbara know. We will always try to help or at the very least, offer a supply of magazines and leaflets to hand out.

THAMES TRADITIONAL BOAT RALLY:

The cancellation of Boats on Show in May was a loss to our calendar for electric boating events and we have therefore decided to take a stand at the Thames Traditional Boat Rally at Henley on 21st 22nd July. This will be our first participation in a formal boat show this year, and we are looking forward to seeing some EBA members over the weekend. Please do come and make yourself known to those helping on the stand. Barbara would be very happy to receive any helpful suggestions on how we can improve our service to members.

BIENNIAL GENERAL MEETING – 28 JULY 2001

You will have received formal notification of the Association's BGM which will take place on Saturday 28th July at the Upper Thames Sailing Club, Bourne End. The formal business of the day will be completed in the morning, for re-election of officers and presentation of trophies, but the afternoon will offer the opportunity of a cruise as far as Marlow Weir and back. We hope that as many members as possible will be able to attend with their boats to form an impressive flotilla. Everyone will be welcome and even if you arrive by car, we feel sure there will be a place for you on an electric boat for the afternoon.

This event is open to all, so please invite your friends or tell anyone who is interested in electric boating that they would be most welcome to join us for the afternoon's cruise.

CAVERSHAM PICNIC – 5TH AUGUST

If you are unable to make the BGM, then another social rally has been planned for Sunday, 5th August. Robin and Eve Bentham have again very generously offered their hospitality to host a picnic in their delightful river garden in Caversham, Reading. Last year, this event coincided with the hottest day of the year and we were very pleased to be able to take the boats on the river for a short cruise.

Again, everyone is welcome, by car or boat. Please bring your own picnic and come and join us for a pleasant afternoon. Further details of the timing and venue from Barbara.

AUGUST BANK HOLIDAY IN LANGPORT, SOMERSET

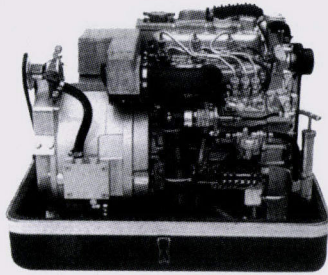
The Association has been approached to help promote electric boating in Langport, Somerset over the August Bank Holiday weekend. Although we haven't finalised details at the time of going to press, if anyone is interested in joining us or coming along to see what is happening, then please do get in touch with Barbara. We would appreciate a couple of electric boats on the water, if possible, and would welcome any support from members in that area.

continued on page 5



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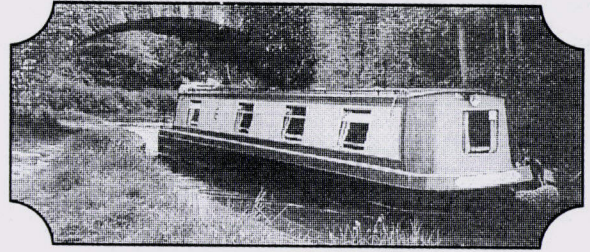
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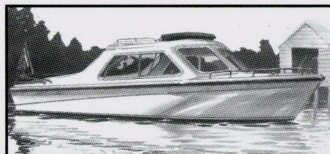
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OTHER EVENTS

● *Ranworth, Norfolk*

John Williams had been asked to take part in an event at Ranworth on the 9th June. It was agreed that the Association should take part in this event.

● *Trad Boat Rally*

With the cancellation of Boats on Show (another victim of Foot & Mouth), the Association would take a stand at the Trad Boat Rally on 21 – 22 July.

● *Picnic and Rally – Caversham*

A picnic and rally at Caversham would be a welcome addition to the summer calendar and enquiries would be made about the possibility of fixing a date.

● *Silent Sensations / Cookham Regatta*

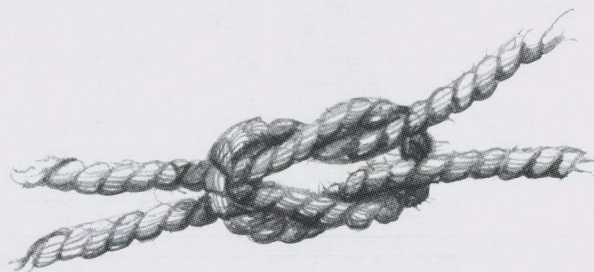
Discussion also took place on other events, including Silent Sensations on the Broads and the Cookham regatta – at which the EBA would probably form a parade and hold an afternoon's rally.

20TH ANNIVERSARY

It was agreed that further consideration should be given to the possibility of organising a summer party and boat rally to mark the 20th Anniversary of the founding of the Electric Boat Association.

DATE OF THE NEXT MEETING

The next meeting will be held at the Upper Thames Sailing Club on the 11th July.



NOTICE BOARD *continued from page 2*

SILENT SENSATIONS – 8/9 SEPTEMBER 2001

This year Silent Sensations, the environmentally friendly show in Norfolk, will be combined with an event at the Broads Museum, so we have scheduled the weekend 8th, 9th September to support our East Anglian region. At the time of writing this, we have not completed the arrangements, so please do contact Barbara nearer the date for final details. However, it is hoped that a cruise on the Broads might also be included in the weekend, and anyone who either joined us for the cruise at Hartford Marina last year, or heard about it later, will know that the unanimous opinion of everyone there was that it was the most successful social cruise of the year.

EBA BADGES FOR THE FAIRER SEX

Finally, Barbara is delighted to advise you that after a very long quest she has found a source of EBA badges for the ladies. It is, of course, our grebe, in EBA blue and white, edged in silver. 30mm high, these delicate little items will add an elegant touch to any outfit and I hope will be worn by our lady members. The cost is only £5.50 each, including p & p so please don't feel restricted to buying only one!

It is assumed, of course, that the gentlemen have already supported the EBA by buying one of our ties – a snip at £9.50 and your boat does sport the EBA pennant at £10?

THE SUMMER AHEAD..

Barbara looks forward to meeting old friends and making new acquaintances at our events this summer and would like to take this opportunity to ask you, the EBA members, to help us in promoting electric boating. Please do spread the word about the benefits, the joys of peacefully cruising close to wildlife listening to the sounds of the waterways, instead of the noise of a petrol or diesel engine.

Listen this is the sound of electric boating!

SOLAR POWERED BOAT RACE

– but where was the sun?

Barbara Pennial reports from Littlehampton Seafront

It was a blazingly hot day for May Bank Holiday Monday – except at Littlehampton, where contenders for a solar powered boat race gathered under an overcast sky and tried to keep out the bitterly cold wind.

Of the three entries, two were EBA members. Cedric Lynch, holder of the Guinness Book of Records' 2000 solar powered boat run and Malcolm Moss, whose boat *SB Collinda* crossed the Channel in 1997. Sons James and Simon accompanied Malcolm, supporting Belmont School at which Simon is a pupil. The third entrant was from Harwich School under the direction of the Design and Technology teacher, Trevor Simpson.

The contest was a light hearted race between Belmont and Harwich Schools and Cedric Lynch.

Belmont's entry was a twincat, provided by the Harvey family and powered by a Minn Kota 65T outboard supplied by Malcolm. Their crew comprised Simon Moss, Tim Crewston, Anna, Nick and Simon Harvey. Harwich School's canoe was fitted with a 150W motor and had been built in three weeks as a school project at a cost of £100. Cedric Lynch used one of his own modified Lynch motors fitted to the canoe he used in last year's record attempt.

PRACTICE MAKES PERFECT

The morning was spent in good humour, with the children (and Cedric) practising turning on the course and manoeuvring the craft against the increasingly freshening wind. Supporters were



Cedric Lynch crouching low to reduce windage. A school boy competitor passes aboard a solar-powered catamaran

kept going with hot coffee, forgetting the chilled wine and sun cream optimistically packed. Councillor John Richards who organised the event, promised that the sun would break through at lunchtime and by 1.30 it was certainly brighter, although not exactly sunny and we decided to let battle commence.

THE RACE

The race took place over a simple course marked out on the Mewsbrook Park Boating Lake and Belmont School immediately took the lead. Harwich was not far behind, but Cedric fell victim to the prolific weed on the outer limits of the course.

At the close of the race one hour later, Belmont were clear winners having completed 11.5 laps, Harwich finished with 9 and Cedric did a marvellous weed-clearing operation for the Council, but only left himself time to complete 5 laps.

Each team received a prize and the day was declared to be a success as far as enthusiastic participation was concerned.

...AND NEXT YEAR?

We understand it is Councillor Richards' intention to expand the event next year into a larger race with additional exhibits on land to promote solar and electric propulsion and we look forward to including this in the EBA's calendar for 2002.

Photos Barbara Pennial



A solar powered canoe



Boys from Belmont School celebrate winning the solar powered boat race trophy

NEWS FROM HOME & AWAY

CALIFORNIA FLIES TO VENICE! (*EBI)

On February 25, the *EcoBarca*, a Californian-built electric water taxi was air-freighted across the Atlantic to Venice, Italy where it will go into regular service taking visitors between the railway station and the canalside Hotel Residenza de Epoca, who commissioned the project. The remarkably low-wake "patented M" hull form of this 19-footer is called Mangia Onda (Italian for "wave eater") and it can take up to ten passengers. It was designed by the enterprising Charles Robinson and Bill Burns of the Mangia Onda Co. in San Diego, who asked the Duffy Electric Boat Company of Costa Mesa to realise their innovative concepts. *EcoBarca* is of standardised glass-fibre construction with solid teak trimmings. Power comes from a 2.5 hp Leeson permanent magnet motor spinning a prop at 800 rpm and deriving its energy from six, 6-volt Sealed Gel "East Penn" batteries as manufactured by DEKA. It can run for eight hours on one charge at an operating speed of 4 knots which is the canal speed limit. Interior features include heating, lighting, windows which open & close, soft retractable top enabling passengers to sit and enjoy canals, or when standing to easily see over the top and take photos.

EcoBarca is seen as a long-sought solution to the serious pollution problem threatening to destroy the once tranquil city of Venice. Built on the lagoons of northern Italy, Venice was once known as the silent city when the only means of transportation was by gondola. Today, the canals are choked with noisy, combustion-engine vessels that pollute the air and water. The Moto Ondoso (wave-making boats as they are called in Venice) not only degrade the quality of life in Venice, but are actually undermining the city by creating waves that crash against the foundations and threaten to collapse the buildings.

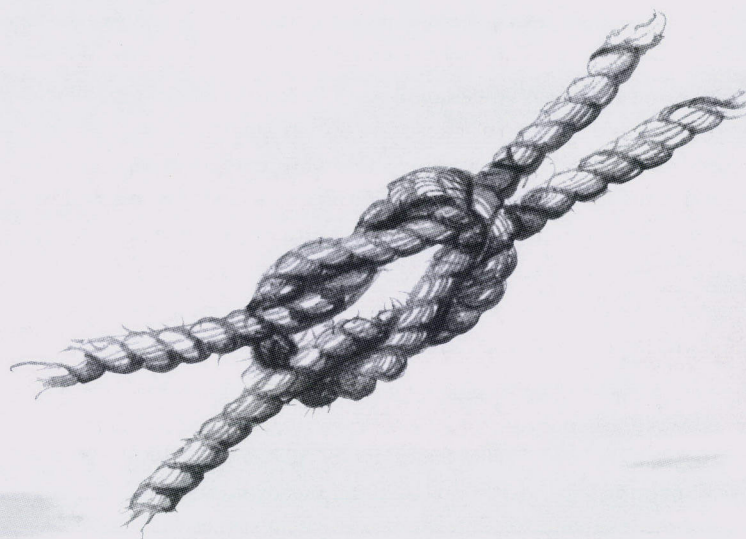
In 1989, a 200-passenger electric vaporetto, the E.1 was built by Alutekna and went into service in this beautiful but threatened North Italian City. The *Eco-Barca* water taxi is a new departure but may set a trend. Mangia Onda have also designed a 65-footer for one hundred passengers; although diesel powered it also has a very low-wash profile.

"There should be lots to do and see at the Chesapeake Bay Small Boat Festival which has allowed us to take part for the past two years. The activities will include an electric boat race, the first we have tried in a long time, it should be fun."

"Some members will be interested in knowing that a multi-faceted move is on to form an electric boat trade group that would represent builders and manufacturers or the stuff that goes into electric boats. The movement is slow to get off the ground, but it sounds like a good idea to me. I think the industry is mature enough after a hundred years."

"Part of the problem of forming such a group is that the few prospective members are spread widely across the North American continent. To get them together in one place is a challenge. Perhaps they can get a head start at St Mikes and take it from there."

It is interesting to reflect on the different ways in which organisations have developed. We are fortunate in the UK that we have an Association which balances the interests of the trade, private boat owners and those interested in the philosophical and environmental benefits of electric boating.



NEWS FROM OUR FRIENDS IN AMERICA

Ken Matthews, Editor of the Electric Boat Journal (from the Electric Boat Association of the Americas) writes:

"Again we will be meeting [the Electric Boat Gathering 5 - 7 October]. This charming village in Maryland - St Michaels - seems to fit us rather well."

AUSTRALIA FLIES TO CALIFORNIA (*EBI)

In February, Solar Sailor Holdings, the Australian company behind the world's first wind and solar-driven ferry, had discussions with several groups in San Francisco for the development of hybrid power ferries to operate a major new marine transport initiative in the Bay area. Solar Sailor founder and creator Dr Robert Dane went to San Francisco for meetings with civic officials, ferry boat operators and groups representing Bay Area commuters and for discussions on the proposed new ferry services. One proposal

continued on page 8

includes a Solar Sailor ferry operating on the world-famous tourist service from San Francisco to Alcatraz, the once-inescapable federal prison.

One of the factors behind the discussions is a recent decision by the San Francisco Board of Supervisors to call for a clean ferry demonstration project on San Francisco Bay. A new authority, the Bay Area Water Transit Authority (WTA), is studying a total upgrade of ferry services in the Bay Area to relieve the increasing traffic congestion and pressure on other mass transit services.

The Solar Sailor concept has already won support from a number of groups including the influential Bluewater Network, a US-based environmental organisation addressing the causes of climate change and fighting environmental damage from the shipping, oil, and motorised recreation industries. Teri Shore, the Bluewater Network's campaign director for clean vessels and fast ferries, said "the solar-and-wind powered ferry would be the first zero emissions ferry in the U. S. It's time to put a clean vessel on the Bay before expanding the polluting diesel fleet." More than 30 people attended a preview presentation of Solar Sailor technology at San Francisco's historic ferry building.

Solar Sailor representatives also met with executives from the Blue and Gold fleet, the largest ferry and cruise boat operators in San Francisco and the equivalent of Captain Cook Cruises, which operates the Sydney Solar Sailor on Sydney Harbour. A fleet skipper from Blue & Gold Fleet was in Sydney in January to inspect and evaluate the Sydney Solar Sailor operation and was "extremely impressed" with the Solar Sailor's quiet running, low staffing requirements, manoeuvrability, responsiveness and versatility, said Dr Dane.

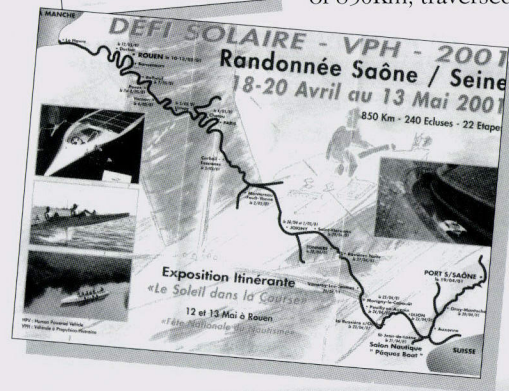
During their visit to the US, Dr Dane and his team also met with boat builders to assess opportunities to licence and build vessels powered by the Solar Sailor hybrid power system in the United States. "Under the United States' Jones' Act, all boats for commercial use must be built in the USA by a licensed ship builder, so we are looking at companies that we can partner with to deliver Solar Sailor vessels there," said Dr Dane. Solar Sailor Holdings also

exhibited at the Miami Boat Show later in February, which provided another opportunity to promote the new technology to marine operators from all over the USA and Canada. The Solar Sailor technology has been developed with assistance and support from the Australian Federal Government through the Australian Greenhouse Office; the Australian Technology Showcase, an initiative of the New South Wales State Government; BP Solar; Panasonic Australia; University of Technology Sydney (UTS); CI Technologies Pty Ltd, (Citect); Elgas and Fiber Glass International.

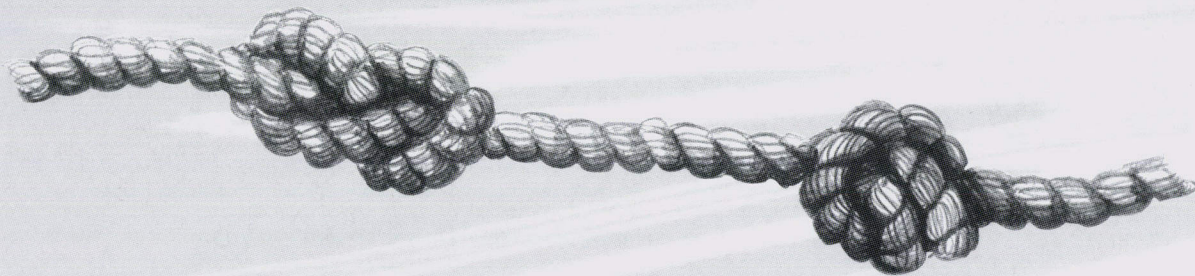
DÉFI SOLAIRE 2001

Theodore Schmidt reports from the Defi Solaire 2001 which was held on the 18th and 20th April and 13th May. The event – described as an endurance rally for solar powered and 'human-powered' boats – involved craft traversing the breadth of France, from Port s.Saone on the Swiss border to the East to Rouen on the Seine to the West.

The voyage of involved a distance of 850Km, traversed 240 locks and was divided into 22 stages.



Défi Solaire 2001 leaflet



continued on page 12



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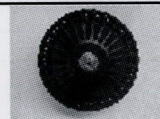
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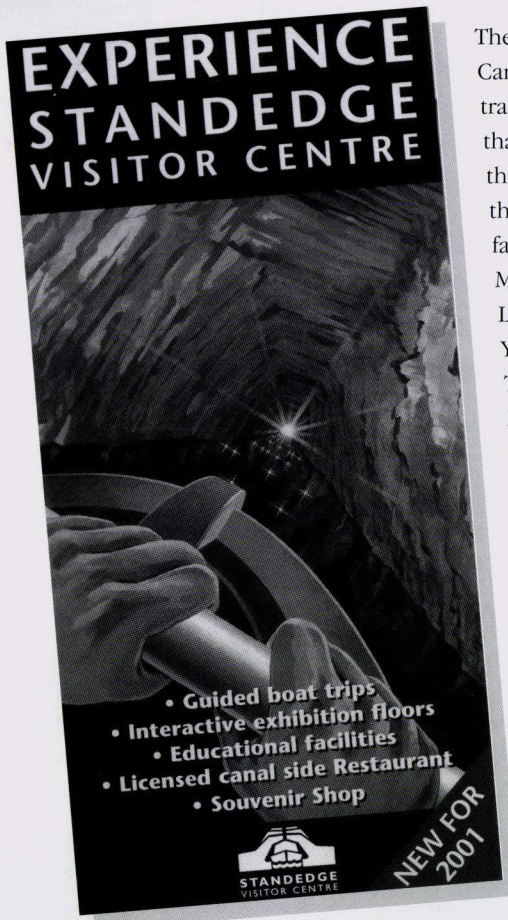
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THE STANDEDGE EXPERIENCE – Elect

by Rupert Latham

Rupert Latham of Stelco Yachttechnik introduces the history and decline of the canal, its restoration and the development of electrically powered tugs for the Standedge tunnel



The Huddersfield Narrow Canal is one of three trans-pennine waterways that were built during the canal age to serve the mills, mines and factories of Lancashire / Manchester area and Leeds and the West Yorkshire valleys.

The other two are the Rochdale and the Leeds & Liverpool, all three being completed by 1816.

HISTORY

The Huddersfield Narrow was by far the most ambitious project. Although it provided the shortest route across the Pennines, it was necessary

to cut a summit tunnel which proved to be the longest and highest canal tunnel in Britain at 3 miles and one furlong and 645 feet above sea level. Construction started in 1795 and the tunnel finally opened on the 4th April 1811.

The tunnel was built without a towing path and the boatmen had to 'leg' their boats through the tunnel. Two men lay on boards placed across the bows of the boat and they literally paced the side of the tunnel, propelling the boat through the dark, damp cavern, taking around 4 hours.

The Huddersfield Narrow Canal was finally closed to navigation by the LMS railway Act of 1944 and was retained by British Waterways as a feeder for water supplies, both for sale to waterside industry and for the Ashton Canal in Manchester and the Huddersfield Broad Canal.

RESTORATION

Work began on the restoration of the 23 mile canal in the 1980's and this major project, costing over £30million was completed in May 2001. This work involved the complete repair of the Standedge Tunnel. Given the advent of diesel powered canal cruisers, serious thought had to be given to how boats could make the lengthy journey through the tunnel without choking the crew.

To overcome this problem – which did not exist when the tunnel was first constructed – British Waterways commissioned three electrically powered tugs and two 15 metre glass-topped passenger modules. These tugs would provide towage for canal boats wishing to pass through the full length of the tunnel. The passenger modules form part of the newly-created Standedge Experience. Passengers are shunted 500 metres into the tunnel on a nostalgic trip back to 1811, with lights blazing and a brass band sound track, with dignitaries making speeches and the sound of 10,000 bystanders thronging the canal banks to cheer Mr Telford as he boards the first barge to travel through the tunnel.

THE TECHNICAL STORY

The brief was to provide a system which would tow up to three canal boats of around 20 tons. The power required to tow a canal boat at 3 mph is actually quite small and my concerns as to performance within the tunnel were calmed by the thought of those heroic boatmen who physically moved their canal boats < light or laden – by leg power alone.

In the end, two 8KW motors were chosen, driving a propeller at each end of the tug to help pass the water more efficiently past the specially designed hull. The idea of the fuel cells was rapidly dropped in favour of a standard lead acid battery of 1400 Ah capacity and a system voltage of 72V DC.

Abels shipbuilders of Bristol were commissioned to build the tugs and passenger modules. It was my job to provide the complete propulsion packages in a manner where they had only to fit the components, install the power cables, plug in my cable harnesses to the control station and turn the key!

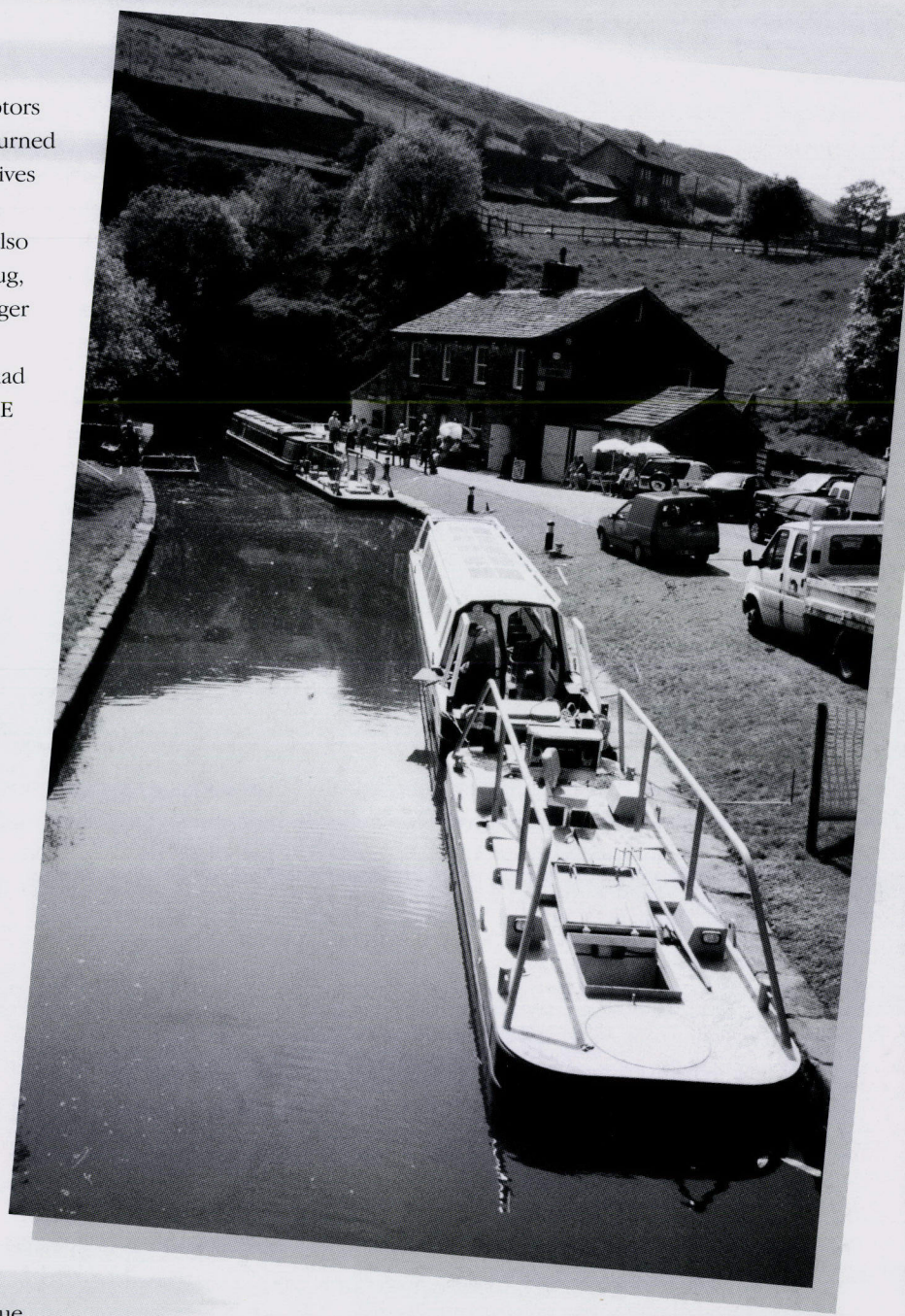
Electric tugs on the Huddersfield Narrow Canal

After a deal of deliberation, Abels decided to fit the motors to Azimuth drive pods, enabling each propeller to be turned through 90 degrees. In addition one of the Azimuth drives would be located at the front of the passenger module – 15 metres away from the tug and the battery. It was also decided to install three control stations – one on the tug, and one at the front and one at the back of the passenger module. As the tugs and passenger modules had to be 'disconnected' at the end of each voyage and they all had to comply with Maritime & Coast Guard Agency and IEE regulations and specifications, it was all beginning to become rather complicated.

The 8 KW 1800 rpm separately excited motors were mounted vertically on an adjustment frame and belt driven to the Azimuth drives and 22 inch propellers with a 3:1 reduction. The 72V 500 amp Zapi motor controllers were located in the motor compartments (one on the tug and one on the passenger module) mounted to the swim of the hull for maximum cooling effect. As a precaution, an auxiliary ventilation fan, activated by a thermal switch on the motor case provides additional cooling if the work load is persistently high. Battery supply to the tug motor was straightforward, but the passenger module motor required a heavy duty reinforced connecting cable between the two vessels for power supply to the forward controller and motor. In case of mishap a spare connecting cable was provided.

The battery pack for each tug weighed in at about 3 tons! The 8 metre tug was designed to cope with this load and floated exactly where it should have done. The 72V 70A taper characteristic 3-phase battery charger was installed to the forward compartment of the tug. Two fans ventilated the sealed battery compartment and were switched by the main contractor in the charger and timed to continue in operation for one hour after the charger has completed the charge cycle.

The provision of the 3 station control was a bit of a nightmare. Each station had twin hand levers, an ammeter for each motor, ammeter for the total battery current, station select switches with station selected coloured neon and emergency stop buttons. It was important that only one station could be activated at one time and the operator could see at a glance which station was active. The master tug station was fitted in addition with security switch and battery state indicator. With the complication of the vessels being continually connected and disconnected, I had to find a suitable, robust multi-pole connectors to link the control station wiring between the two vessels. There were over



Electric tugs and a passenger module at the entrance to the Standedge Tunnel

60 connections to make for the steering and propulsion controls. In the end, I used 5 x 15-pole waterproof connectors as used between commercial road vehicle traction units and trailers for their ABS braking systems. The connector leads were made up of 15 core reinforced cables, the pins and sockets of each connector arranged slightly differently so that it was impossible to mis-connect. In addition, to make it easier for the operator, each cable was colour coded so that the correct plug could be put in the right

Photos Rupert Latham

continued on page 19

ESCAPES FOR THE BANK HOLIDAY
– AND THE REST OF THE SUMMER



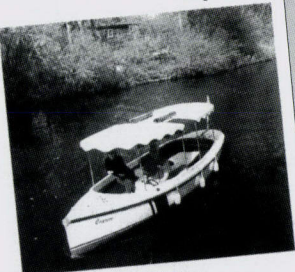
• *Thames*

In an attempt to encourage visitors back to tourism attractions stricken by the Foot & Mouth crisis, the London Evening Standard listed a number of interesting escapes for the Whitsun Bank Holiday at the end of May. First in line was a number of boating opportunities on the Thames, including the possibility of cruising from Wargrave to Henley or Sonning and Hambleden by hiring an 8-seater electric boat from Swancraft (0118 940 2577).

The Southern Tourist Board Thames & Chilterns Pocket Guide (which your editor picked up on Reading station waiting to travel to work) lists a variety of opportunities to cruise afloat under electric power, including Rivertime (01628 530 600) and Benson waterfront (01491 838304). I was certainly tempted to take a day off on the river!

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• *Essex / Suffolk Stour*

Details were also received of the May Bank Holiday programme for the River Stour Trust's two electric launches, Rosette at Sudbury and Stour Trusty II at Flatford. Further information on the programme – and details of private charters – for Rosette can be obtained by ringing June King on 01787 372602 and for Stour Trusty II by telephoning 01206 393680 or 392656.

Both launches will be running trips right through to October, offering a perfect way of enjoying the tranquillity of the river Stour.

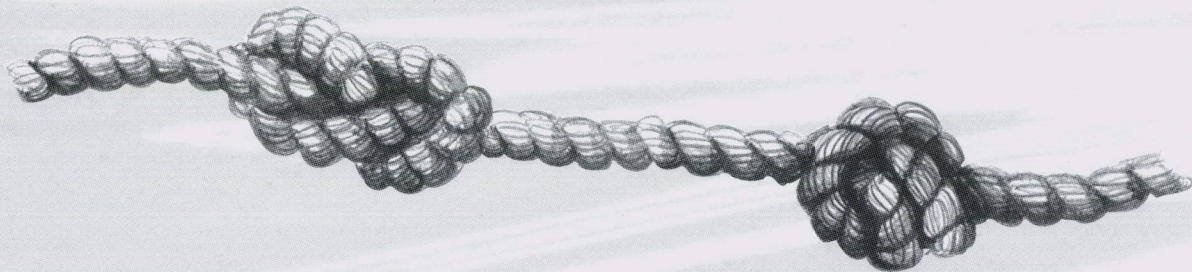


River Stour Trust

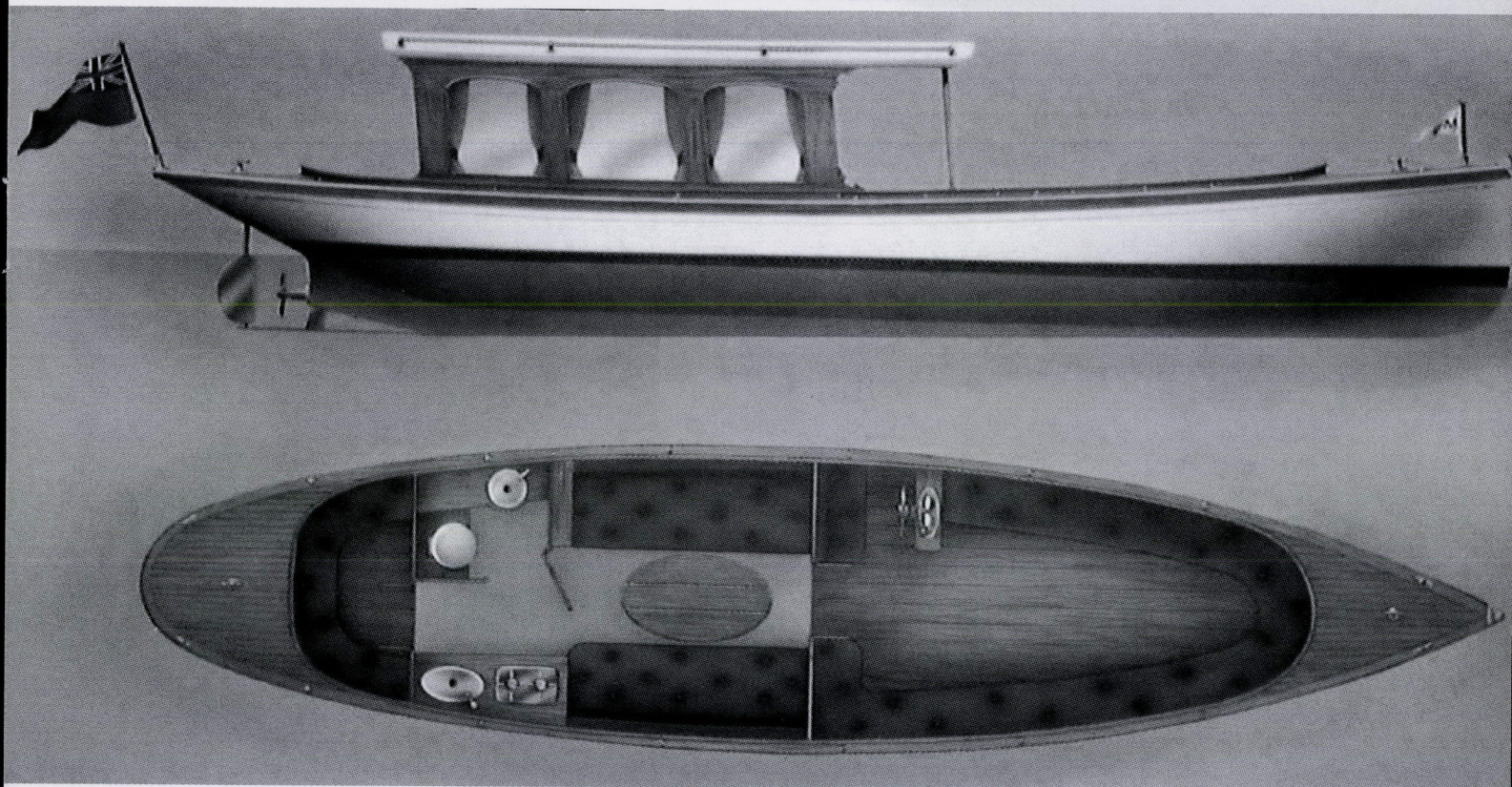
Registered charity number 257806

NOTE: Items annotated (EBI) have been kindly supplied by Kevin Desmond of Electric Boat International from his base in France.

Further information via email: desmond.writer@wanadoo.fr



TRADE NEWS



The new Frolic 36

A NEW PROJECT FROM THE SECRET BOATYARD – THE FROLIC 36, THEIR LARGEST BOAT TO DATE

At the end of last year Creative Marine moved to their new premises – a new Secret Boatyard in a range of old brick and flint farm buildings in the deepest depths of the North Norfolk countryside.

These buildings have proved to be an excellent location providing more undercover Winter storage space to house customers boats, a large workshop (with resident barn owl) and facilities for machine shop and wood store where logs of mahogany, oak and teak can be left to air dry naturally.

Since this move Simon Read and Roy Lawson, Partners of Creative Marine have been developing a new mould tool and creating their largest launch to date, the *Frolic 36*. Designed by Andrew

Wolstenholme, this cabin style craft has the classic appearance of an Edwardian style launch but incorporates all the modern facilities expected for today's living.

Seating for 12 people is provided in the open air front cockpit where you can spend a sunny summer afternoon in conversation with guests as well as enjoying the wildlife along the riverside. Seating is also provided in the 'hideaway' rear cockpit area. This is lavishly fitted out with hand printed curtains and matching cushions and seats which are wide enough to provide overnight sleeping for



The new Secret Boatyard

continued on page 14



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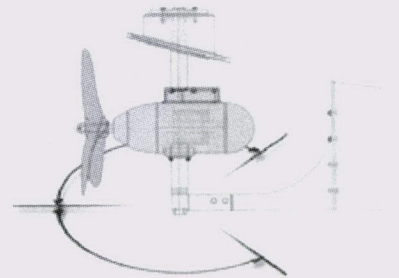
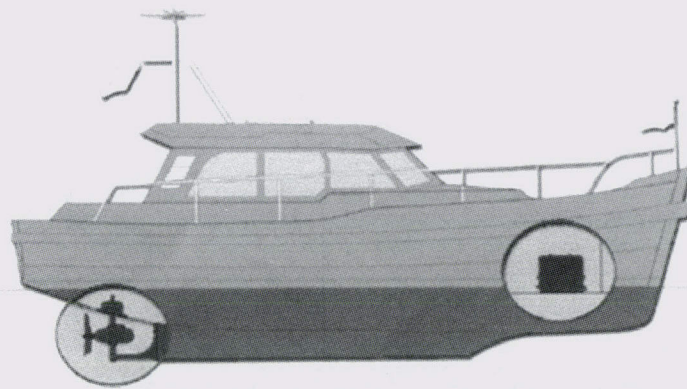
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2 people. The galley area has a two burner gas hob, fridge and sink with hot and cold water all cleverly concealed in handcrafted units. The toilet facilities include a vanity unit – and a shower can be installed.

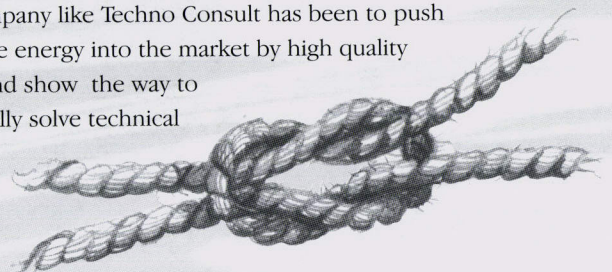
Further information: e-mail creative.marine@talk21.com
website: www.creative-marine.co.uk

TECHNO CONSULT PAVES THE WAY TO AN SHS (SOLAR HYDROGEN SHIP)

Kevin Desmond reports that while Solar Sailor is making steady progress from its Australian base (see News from Home & Away), one of its European equivalents appears to be Techno Consult. This Berlin based company was founded three years ago by Jsrg Albrecht. Jsrg is 39 years old and was born in Heidelberg, where for three years he read Physics, going on to study shipbuilding at

the University of Hamburg. He then worked in shipbuilding research for structural FEM optimisation in Hamburg and for fast catamaran hydrodynamics in Berlin. His first solar boat was designed in 1991. Four years later, he made the first finite element calculation for a 630Wp solar-roof in fibreglass. It was the sc21 from MSK in Berlin. By 1998, he was drawing out the lines and researched EC requirements for the prototype RA 27.

Since then he has progressed to a 20-metre vessel. This was the prototype for the Bodensee-ferry RA66. Albrecht's idea of creating a small company like Techno Consult has been to push regenerative energy into the market by high quality products and show the way to professionally solve technical problems.



"The highlight of my development was the hydrodynamics theory of the optimal water line length (Palstek5/99). It was the real beginning of solar boat construction for me. With this hydrodynamic concept it is possible to save about 60-80% of the propulsion energy in comparison with conventional ships."

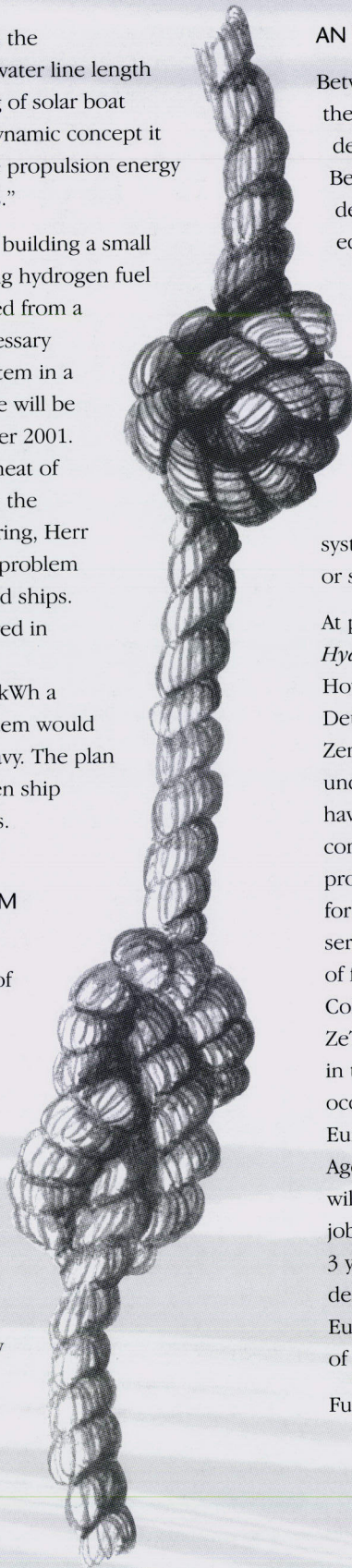
More recently, Herr Albrecht has been building a small electric boat, powered by a Sachsenring hydrogen fuel cell system. The hull has been delivered from a Scandinavian boatbuilder, with all necessary features to integrate the hydrogen system in a smart and safe way. This first prototype will be tested for serial introduction in summer 2001. For the use on colder days the waste heat of the fuel cell stack can be used to keep the passengers warm. Again with Sachsenring, Herr Albrecht is endeavouring to solve the problem of energy storage for big solar powered ships. Traditionally the electric energy is stored in expensive and heavy battery systems. For an energy amount exceeding 100 kWh a combined fuel cell/hydrogen tank system would be cheaper, more flexible and less heavy. The plan is to realise a seaworthy solar/hydrogen ship (SHS), a catamaran for 260 passengers.

NEW ELECTRIC PROPULSION SYSTEM FROM FISCHER PANDA

News has come in from Barry Fower of Fischer Panda about a new electric propulsion system the company is about to launch.

The three separate systems currently being fitted to boats in Germany include a saildrive, shaft drive and the Aziprop (or podded propeller) system.

Further information will follow in future issues. In the meantime, any reader wishing to get a sneak preview should go to the Fischer Panda website: www.fischerpanda.de



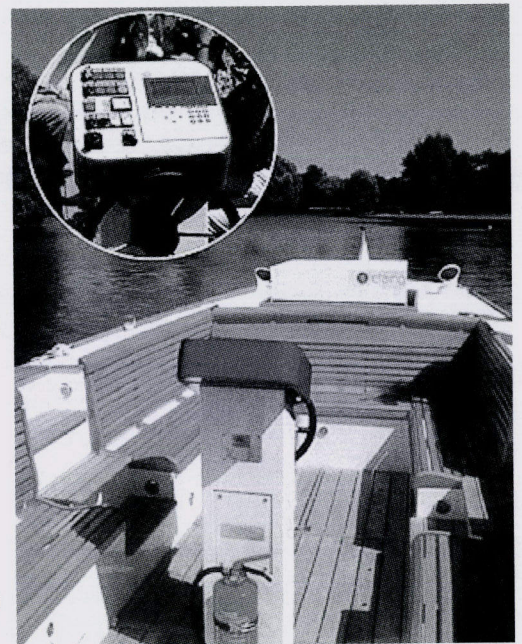
AN EVENT IN GENT

Between 15th and 21st June, *Hydra*, (see EB News Spring 2001) the world's first hydrogen fuel-cell electric boat gave public demonstrations along the Ketelvaart and Leie canals of Gent, Belgium. Her 12-metre low-wake 52cm low draught Gottwald-designed hull, built with Teflon coating by Ecoboot, Germany is equipped with the Europ 21 fuel cell electric generator made by Etaing. This company was founded in Bonn in December 1999 by its two managing directors Harald Klein and Christian Machens. A branch is situated in Leipzig.

Hydra now has official certification by Germanischer Lloyd's, and the Gent demonstrations were made in conjunction with water-taxi operators VZW Elektroboot. The boat can carry up to 22 passengers. Outwardly there was nothing to demonstrate the remarkable nature of the vessel. The fuel cell system, the metal hydride storage is "hidden" either in the bow or stern of *Hydra* or under the seating.

At present, *Hydra* is unique. However Deutsche Zentrum für Luft und Raumfahrt have recently completed a production plant for the automated series production of fuel cells in Cologne for ZeTek Power Plc in the area occupied by the European Space Agency. This plant will generate 500 jobs in the next 3 years, and is designed to be the largest manufacturing facility of fuel cells in Europe. It will produce 10 MW capacity per year in its first stage of development, rising to 40 MW within 18 months.

Further information: stuartlaycock@zetekpower.com



The control console for Hydra

TECHNICAL NOTES

John Hustwick reports



The front tow hitch provides a high degree of control when launching

Photos B Penniall

FRONT TOW HITCH

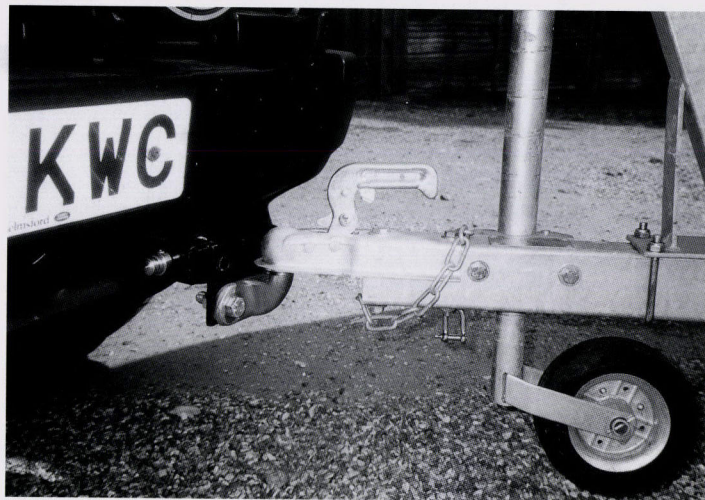
I have just had a front tow hitch fitted to my Land Rover Discovery. Although not a new idea I thought it was worth mentioning. It makes manoeuvring trailers for launching and recovering boats really easy.

My tow hitch is fitted or removed in seconds and consists of a square steel tube (socket) permanently bolted to the chassis. The end of the tube projects slightly beyond the front valance but not far enough to get in the way of anybody walking around the front of the vehicle. The tow ball is bolted to a steel plate which is welded to a square steel bar (plug) which is a telescopic fit inside the socket. The plug is held in the socket by a removable steel pin which goes through both parts. I just fit it when I am manoeuvring trailers. The parts and fitting by my local garage was under £100 inc VAT.

CRUISING SPEED AND DISTANCE

Now we are in the cruising season everyone should be able to be out and about in their boats. This has prompted me to remind our newer members about judging how far they are going to go on fully charged batteries. Quite a few people ask this question at the shows and rallies we attend. There could be no worse an advert for electric boats than to see one being towed because the batteries have been drained.

The most important thing to note is that for typical displacement hulls a small increase in speed causes a disproportionate increase in power consumption. Depending on a number of interrelated



A close-up view of the front tow hitch

factors, doubling the speed for instance could require an increase in power of at least 8 times.

The main things that need to be considered are battery capacity, motor current/power and boat speed. As an example I will use the predicted performance data I have for my 18' Frolic *Rhapsody*. I hope to get some actual data this summer to compare.

Battery capacity = 350Ah, therefore usable capacity is 80% of this, which is 280Ah.
The system is 24v.

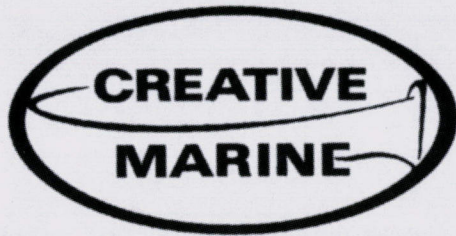
The duration (hrs) = battery capacity (Ah)/ Current (Amps)

The following is the data I have for *Rhapsody*

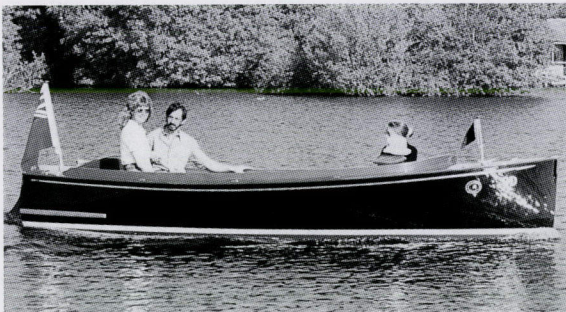
Speed (Knots)	Power (Kw)	Current (Amps)	Duration (hrs)
4.2	0.5	24	11.7
4.6	0.75	36	7.8
4.9	1.0	52	5.4
5.4	1.5	70	4.0

As you can see from this table, increasing the boat speed from 4.2 to 5.4 Knots reduces the cruising duration to approximately a 1/3rd of what it was at 4.2 Knots. This means the distance you can travel also reduces and in this case it drops from around 49 miles to 22 miles. If you are out cruising with some way to get home and your batteries are getting low, then as you can see, reducing your speed by as little as 1 Knot could mean the difference between a successful cruise and being towed home! These figures are fairly

continued on page 18



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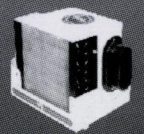
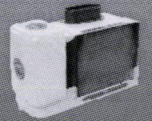
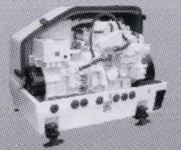
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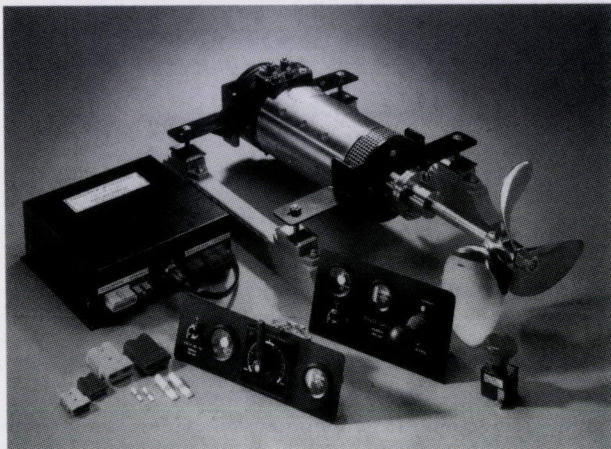
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simplistic and you will have to be aware of the current consumption when manoeuvring, stopping and going astern for instance. These are likely to be higher than in steady cruising conditions. It also helps if you have a reliable battery condition indicator.

It is important to remember that on rivers with a measurable flow you may make good progress going with the current but against it may be a very different matter. You might have to have a fairly high boat speed through the water to make even quite slow progress over land and rapidly reducing your cruising range at the same time. When going on rivers, especially with quite noticeable currents, be very careful about how far downstream you go if this is the direction you go first.

BOAT SAFETY SCHEME REVIEW



I have already given an overview in the Spring 2001 EBN, summarising the Review. However, I think it is worth quoting from the recommendations of the Review Team in full:

RECOMMENDATIONS

“In making the following recommendations, the Review team has been conscious of the interaction of the many complex issues and has sought to provide guidance on how matters might be resolved or managed in the future without being specific on matters of detail.

- The only mandatory requirements should be those justified as either essential safety or environmental requirements of the Navigation Authorities.
- Desirable best practice should be encouraged, the Scheme should do more to publicise, encourage and promote good practice and communicate risk.
- Individual boat owners and users should play a significant part in safety improvements.
- There should be a presumption against the retrospective introduction of higher standards to existing craft unless primary legislation or other safety regulations require them.
- The Navigation Authorities should reaffirm the Scheme's policy to harmonise with the Recreational Craft Directive, a simpler Scheme will facilitate this process.
- There should be an appeals process that is efficient and transparent and capable of dealing with appeals against compliance with mandatory standards in limited circumstances.
- The responsibilities, composition and Chairmanship of the Scheme Committees should be reviewed urgently. The role of the Navigation Authorities, their executive officer for the Scheme and the consultative process for future changes to the Scheme should be defined and publicised.

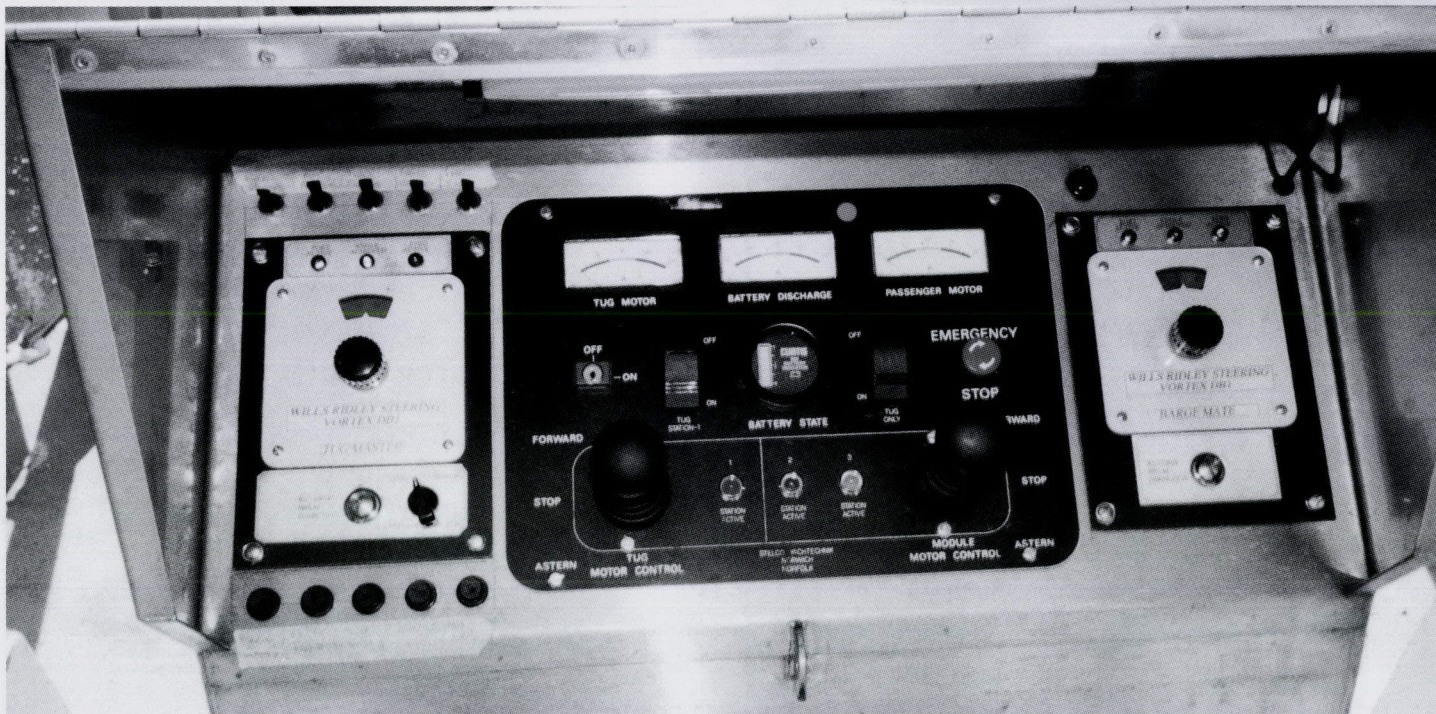
- There should be a Quality Management System covering communication and the competence, training, code of conduct and disciplinary procedures for BSS examiners.
- In addressing the specific matter of diesel injector spill racks, a technical investigation was commissioned and has found that in the craft examined the problem can be attributed to poor design, installation or workmanship and that a metallic spill rack provides the greatest level of safety. The Review Team recommends that the qualified alternative (allowed by the BSS since June 2000) should be accepted.
- Risks related to gas in boats merits special consideration and guidance. The Navigation Authorities should work with the Health & Safety Executive and other competent bodies in this specialist field and develop, as far as is possible, a pragmatic and practical way forward which is proportionate to the risks faced. The Review Team believe that a solution can be found which addresses all the concerns of those affected.
- Statistical evidence on accident rates on the waterways is poor. Sources of data are incomplete or largely anecdotal. Consideration should be given to improving accident statistics by data gathering and investigation, this would better inform future decision making and those affected.
- The Navigation Authorities should champion the boaters' case in the wider regulatory environment.”

There is still some way to go before a BSS will be in place that has addressed all the issues raised. I think though that given time and a desire by the Navigation Authorities to have an acceptable Scheme, it should become simplified with less mandatory requirements. Also, the mandatory requirements will be seen to be necessary by all because they will be based on properly analysed data and risk assessments – something that does not appear to have happened up to now.

It is also hoped that organisations like the EBA will be able to contribute further towards overall safety improvements, reflecting the risks involved with our particular type of craft. Perhaps the EBA will be able to develop an advisory service for our members, offering best practice that will help guarantee a BSS pass, hopefully saving the members money and possible frustration.

Finally, I asked for suggestions from members on those items they considered should be advisory rather than mandatory. I have had no response so I can only assume that everyone is happy with the status quo. Taken in the broader context of boating, electric boats appear to have less problems with the BSS, compared with our internal combustion powered neighbours.



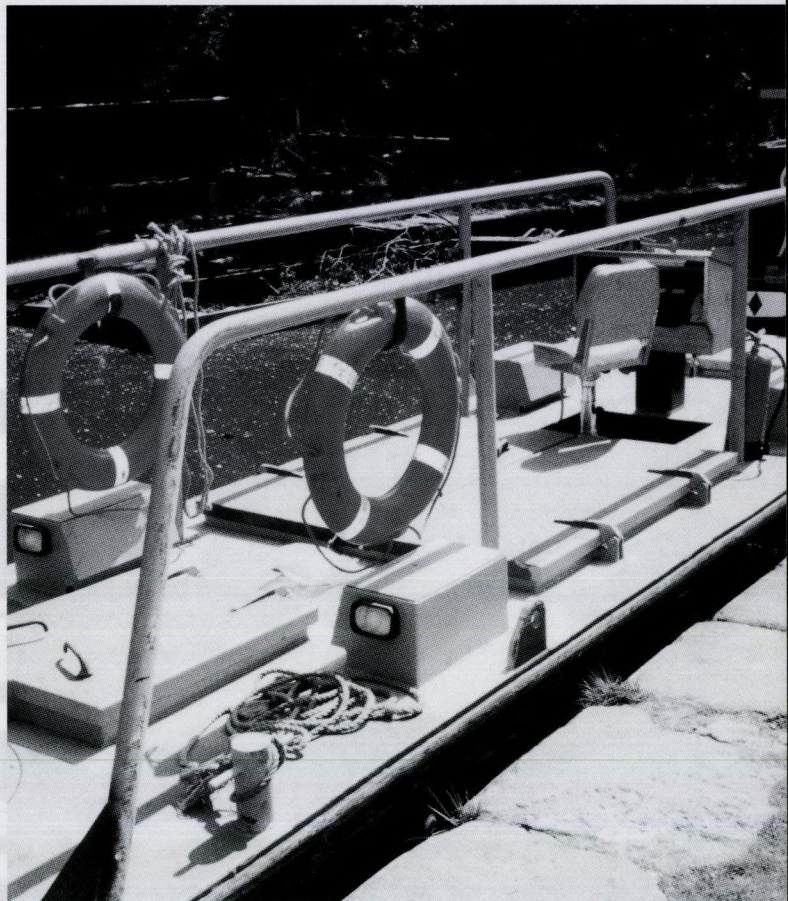


One of the control units

socket at a glance. In case of mishap, a complete spare set of 5 connecting cables was also provided.

There was no time for testing to be carried out before leaving the shipyard and the tug was loaded for delivery to Standedge. Thankfully, with the flick of a switch, all was reported well.

A few weeks later, the second tug and the first passenger module arrived at Standedge and I arrived shortly after with my colleague, Derek Rice of Electrofit Zapi to carry out inspection and testing. It wasn't very easy to get close to the equipment at first because the Maritime & Coastguard Agency were carrying out their inspections and the operators were undergoing proficiency tests. While all this was going on, workmen were putting the finishing touches to the newly arrived tug and passenger module. It was all pretty chaotic but the new units were finally connected and without further ado we drove them deep into the tunnel – the ultimate test (and I managed to return to write this article).



Close-up of one of the tug units. Note the swivel chair for the crew

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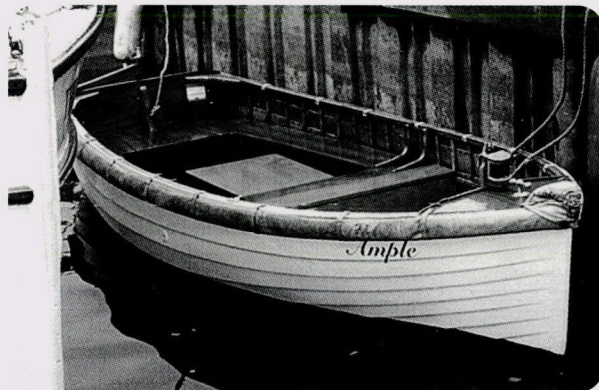
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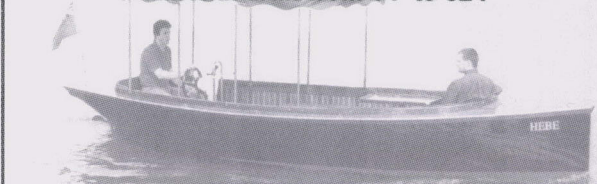
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