

# Hydrofoil Inventors, Designers, and Their Craft

(Last Update 11 Nov 03)

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## Gordon Baker

Gordon Baker, known for the *MONITOR* sailboat, has a separate page to himself: [Click Here](#)

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## Lindsay Cunningham

### Yellow Pages ENDEAVOUR Photo Needed

[19 Sep 00] I am an assistant editor at Blackbirch Press, Inc., a children's book publisher in Woodbridge, CT. We are currently working on a book about boats and are looking for a color photo of the Yellow Pages Endeavor. Would you know of where I can get such an image? Please get back to me as soon as possible. -- Emily Kucharczyk ([staff@blackbirch.com](mailto:staff@blackbirch.com))

### Response...

[9 Oct 00] There was an article on the Yellow Pages *ENDEAVOUR* (note spelling with a "u") in the Australian magazine titled "1994 Boat Directory" Volume 15. This is published by ACE Magazines Pty Ltd, a division of Associated Communication Enterprises Pty Ltd (incorporated in Victoria), 272 Rosslyn Street, West Melbourne 3003 VIC AUSTRALIA. Phone -61 3 3290277, Fax: -61 3 3281511. Publisher was Mark Day and Managing Editor was Geoff Hawthorne. The article has several colour photos of this stunning record breaking sail craft and its crew. I believe it still holds the world water speed record for sail powered craft. I also recall there was a photograph of it in the Guinness Book of Records. Perhaps either of those publishers would be prepared to assist. The designer was Lindsay Cunningham and I imagine he would be living in the Melbourne area as that is the city near where the craft made its speed record runs. -- Martin Grimm ([seaflyte@alphalink.com.au](mailto:seaflyte@alphalink.com.au))

[4 Jan 01] Here is the description from the 2000 edition of Guinness: "On 26 October 1993 the trifoiler\* Yellow Pages *ENDEAVOUR* reached a speed of 46.52 knots (86.21 km/h or 53.57

mph) while on a timed run of 500m (547 yards) at Sandy Point near Melbourne, Victoria, Australia. This is the highest speed ever reached by any craft under sail on water. The craft has a 12m high sail and three short planing hulls. It was designed by Lindsay Cunningham and piloted by Simon McKeon and Tim Daddo, both from Australia." \* One comment on that description: The word "trifoiler" suggests that the craft was somehow foil supported. Although I have heard that the team had explored the possibility of using hydrofoils to achieve higher speeds, this apparently never eventuated due to the difficulty in achieving steady foil lift for such an application as the foils would have transitioned between fully wetted and supercavitating operating conditions. I am keen to try to follow up on what became of the craft and plans for the hydrofoil option. Prior to the Yellow Pages *ENDEAVOUR* gaining the sailing speed record, it was held by a wind surfer. Thierry Bielak of France rode his windsurfer to a speed of 45.34 knots (84.02 km/h or 51.21 mph) at Camargue, France. -- Martin Grimm ([seafite@alphalink.com.au](mailto:seafite@alphalink.com.au))

[3 Feb 01] A few years ago I saw a photo in a windsurfing shop purporting to show the setting of a windsurfing record of 54+ mph. I can't recall where the shop was. There is a sailor named Mike Delahanty who runs Gorge Sails (in Washington state, near Hood River) who was the speed champion about that time. Perhaps he could tell you the current situation. -- Rich Miller ([rich@mail.ski.org](mailto:rich@mail.ski.org))

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## Aldis Eglajs

[17 Feb 99] I received some further information from Aldis Eglais in Latvia (Lettland), the designer of the Catri 26R MicroFoiler. At the moment I'm still in the planning phase of my project but I intend to build the boat this summer here in Switzerland. Aldis is offering the plans for a very good price (US\$ 1,300), and I'm very close to ordering them. I'm waiting now for his study plans. I will keep you informed. His E-Mail: [aldis@catri.apollo.lv](mailto:aldis@catri.apollo.lv). -- Phil Schlund (106641.71@compuserve.com) [*Note: Phil Schlund's email address no longer functions - editor*]

### Responses...

[17 Feb 99] There is a short article about the Catri 26 Trimaran on page 48 of Multihulls Magazine Mar/April 1998 edition. The address given is Aldis Eglajs; Maskavas 291/5-26; Riga LV-1063, Latvia; Tel/fax : +371 7258427. -editor

[17 Feb 99] In Winter 1997-98 I did a project for a Dutch company called PJPC Multihulls. They wanted to build the Catri 26 for the European market to sell for about US\$50,000. There were complete plans for making the (eastern European) ship suitable ( more comfortable) for the rest of Europe, which was part of my study (I was asked to design a mechanical device to lift the two swords). Unfortunately the Dutch company stopped their activities due to health problems of the owner, so I am at the moment looking for other tri-builders who could use my design. If you want to know more, contact me. -- Maarten de Jong ([m.t.dejong@wbmt.tudelft.nl](mailto:m.t.dejong@wbmt.tudelft.nl))

[21 Feb 99] We are working out two types of Catri Foilers -- trailerable cabin boat range (22' 26' 30') and offshore cruising & racing range (35' 39' 45'). After very successful prototype tests in the Netherlands there are two shipyards in Latvia started with 22' and 26' and one in San Francisco starting with 26'. The first boats will be delivered this Summer. The 30' will be started in March for delivery beginning 2000. There are some homebuilders in Australia and elsewhere. You can find our presentation and description of Catri 22, 26R, 30 as well as the draft price list in [the attachment](#). -- Aldis Eglajs, Catri Marine ([aldis@catri.apollo.lv](mailto:aldis@catri.apollo.lv))

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## Kotaro Horiuchi

### Horiuchi's TWIN DUCKS...

[11 Nov 01] Here are photos of Mr. Kotaro Horiuchi's foil sailboat called *TWIN DUCKS*. Mr. Kotaro Horiuchi (email: [horichi@ta2.so-net.ne.jp](mailto:horichi@ta2.so-net.ne.jp)) has a long and amazing career of boat building, much of it with Horiuchi Labs of Yamaha Motor. He sent me his book called *A Locus of a Boat Designer*, [ISBN4-8072-4201-6], in which there is great detail on many of his projects. Unfortunately, the book hasn't been translated from Japanese yet, but the pictures and charts are still quite useful. I asked Mr. Horiuchi to contact you and peruse your site, and I believe he will do so soon. He's an amazing engineer and designer, and very well versed on all aspects of foil technology. He's still very busy building and writing, but I hope you get a chance to chat with him. Here is his description of *TWIN DUCKS*: "Dec.14. 2000, hydrofoil sail boat *TWIN DUCKS* made the first foilborne run in 3~4.5m/s breeze. I designed this boat; it was built by a student of Tokyo University as a graduate study project. Biggest feature of this boat is that the left and right hull have independent hydrofoil systems like human-powered hydrofoil boats and has independent stability. Both hulls are connected by an aluminum tube beam, but each hull is pitch free around that tube. By this system, individual hulls can keep their own altitude and longitudinal stability. And this combination supports the heel moment generated by the sail. Another feature is that the skipper can balance the heel moment when the boat takes off. Then the loading of hydrofoils was equalized and works 100%. This fact makes the boat takeoffs in breeze and runs fast by respectively small hydrofoils. I think the boat runs 30 knot by small foils. Length: 4.5m Beam:1.9m Weight: 70kg Sail Area:10.6m & 6.5m ."

-- Ron Drynan ([info@humanpoweredboats.com](mailto:info@humanpoweredboats.com)) website: [www.HumanPoweredBoats.com](http://www.HumanPoweredBoats.com)



### Response...

[11 Nov 01] Lovely boat! Interesting concept to have independently articulated hulls in a catamaran. Much like a Trifoiler without the center hull. I'd like to see more details of her design and the analyses behind her. -- Tom Speer ([me@tspeer.com](mailto:me@tspeer.com)); website: [www.tspeer.com](http://www.tspeer.com); fax: +1 206 878 5269

[20 Jan 02] Mr. Horiuchi is now a member of IHS. He can be contacted by email at: [horiuchi@ta2.so-net.ne.jp](mailto:horiuchi@ta2.so-net.ne.jp) -- Barney C. Black (Please use the [BBS](#) to reply)

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## David Keiper

Dave Keiper has a separate page to himself: [Click Here](#)

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## Helmut Kock

Helmut Kock has a separate page to himself: [Click Here](#)

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## Tom Lang

Tom Lang, known for the Upright Hydrofoil Kit, has a separate page to himself: [Click Here](#)

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## Rich Miller

Rich Miller, known for his hydrofoil windsurfer, has a separate page to himself: [Click Here](#)

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## Peter Payne(died 10 December 1997)

### Peter Payne's *DYNAFOIL* is For Sale...

[11 Nov 01] I have a experimental hydrofoil (26' length) with shock mounted foils for sale (US\$10,000; as is - needs work). The boat is an experimental craft built by Peter Payne. The idea was to built a hydrofoil with suspension between the foils and boat hull. Mr. Payne died, and no funding was available for further research. The boat has a hydraulic system to raise and lower the front and rear foils for slow speed shallow water operation. The main (front) foil has a shock dampening hydraulic system. The boat is powered by a 454 mercuiser engine with transmission. The boat is located near Annapolis MD and can be shown to serious buyers by appointment only. The is made of marine plywood. It has not been run for about four years. -- Ed Dick ([edick@erols.com](mailto:edick@erols.com)); phone: 410-867-3516.



### Response...

[11 Nov 01] The prototype *DYNAFOIL* was launched in 1995. The late Peter R. Payne (Payne Associates, USA) describes some of the features of this hydrofoil concept in the following technical papers: (1) Payne, Peter R; 'On the Maximum Speed of the *DYNAFOIL*', Fourth International Conference on Fast Sea Transportation (FAST '97), Sydney, Australia, 21-23 July 1997. (2) Payne, P.R; 'A New Type of Hydrofoil', Proceedings of the Small Craft Marine Engineering Resistance and Propulsion Symposium, Ann Arbor, Michigan, May 15-

17, 1996. (3) Payne, P.R; 'The Response of a Hydrofoil to Wave Orbital Velocity Fields', *Ocean Engineering*, Vol.24, No.3, 1997. pp.235-263. -- Martin Grimm ([seafite@alphalink.com.au](mailto:seafite@alphalink.com.au))

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## Bernard Smith

### New Website Dedicated to Bernard Smith

[1 Jun 00] I have a website you may be interested in viewing, [Mr. Smith's Amazing Sailboats](#). It concerns the hydrofoil sailboat designs of the American scientist Bernard Smith who wrote the book "The 40-knot Sailboat" in the early 1960s detailing his ideas. Bernard Smith developed several different hydrofoil sailboat concepts over 40-plus years of experimenting. He worked with small unmanned designs as well as full-sized machines. Part of my site also features a variety of sailing hydrofoil designs made by various inventors around the world. -- Paul Dunlop ([dunlopp@admin.chchpoly.ac.nz](mailto:dunlopp@admin.chchpoly.ac.nz))

### Response...

[1 Jun 00] This is a great site, and a great honor to Barney Smith. I knew Barney when he started this work, and observed his first foil/hull model test in the Free Surface Water Tunnel at Caltech. -- Tom Lang ([tglang@adelphia.net](mailto:tglang@adelphia.net))

[2 Jun 00] You know, Bernard Smith is responsible for getting me started in this sailing hydrofoil activity with his book *The 40 Knot Sailboat*. Some of my students and I working in the AYRS context took off from there in the early 1970s and haven't stopped yet. We're still trying to develop a practical ocean-roving sail-powered hydrofoil. We won't stop until/unless somebody else beats us to it. Could happen! -- Sam Bradfield, Hydrosail, Inc. ([HYDROSAIL@aol.com](mailto:HYDROSAIL@aol.com))

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## Tom Speer

### WILLIWAU Successor...

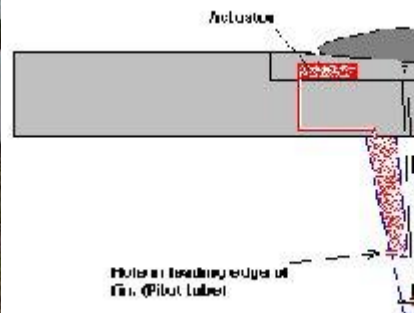
[26 Nov 01] See the following link to read all about Tom Speer's planned successor to the ocean-going hydrofoil yacht WILLIWAU: <http://www.basiliscus.com/CSYSpaper.pdf>. -- Barney C. Black (Please use the [BBS](#) to reply)

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# Alistair Taig

## Taig's ALF...

[11 Nov 01] Here are pictures of a friend's foil sailboat called *ALF* by Alistair Taig. Mr. Taig has a unique solution to automated attitude control using dynamic pressure rather than a surface skimmer. [Click Here](#) to view an article (in Adobe Acrobat format) that he wrote about that. -- Ron Drynan ([info@humanpoweredboats.com](mailto:info@humanpoweredboats.com)) website: [www.HumanPoweredBoats.com](http://www.HumanPoweredBoats.com)



## **Response...**

[11 Nov 01] I liked his analysis of the steady state gain in his feedback control system. I wish more amateur designers did analyses of this kind. A fully submerged foil that operates at constant lift coefficient is basically one that maintains its angle of attack, much like a fixed foil would if the craft were flying with a constant pitch attitude. However, the effect of

his spring would be to modify this relationship. A spring which applied a nose-up moment on the foil would result in a larger lift coefficient at low speed and a lower lift coefficient at high speed, which is in the direction necessary to trim the craft. With the right spring constant it would act like a feedforward term in his control system to trim the foil and reduce the dependence on his pitot tube feedback. This is a spring which acts in the opposite direction that he suggests. Personally, I would be more concerned about sizing the spring for after takeoff and less concerned about speeds below takeoff. The pilot can manually override the system to get low drag hullborne, and then release it for takeoff. I think he's going to be in for an interesting time when he gets it flying! Tuning the lag in the pitot-tube feedback will be tricky - it has to be enough to put the break frequency below the wave frequencies he's trying to reject, but the bandwidth still has to be high enough to stabilize the heave of the boat. And if the lag is too much, the phase lag will destabilize his system. However, the idea that the roll-off in vehicle response will attenuate the wave disturbance is valid. His pitot-tube will act rather like a bang-bang system as it dips in and out of the water, and this may lead to a limit cycle oscillation. However there may be enough dithering from wave action to smooth this out. -- Tom Speer ([me@tspeer.com](mailto:me@tspeer.com)); website: [www.tspeer.com](http://www.tspeer.com); fax: +1 206 878 5269

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