

FARR HORIZONS

An inside look at our world of yacht design.

TRANSPAC 52's Growing Interest... Three additional Transpac 52's Launched

Goetz Custom Boats have recently completed construction of three Transpac 52 yachts designed by our office. These Transpac 52's were from our second generation Design #533.

Design #533 was created to compete in a broad mix of venues including both course and distance races. Within the bounds of the otherwise tightly controlled Transpac 52 Rule, there is some room to set the balance between upwind and downwind performance. Displacement and VCG are limits set by the Transpac 52 Rule so we were left to choose the optimum beam to draft ratio to produce optimum upwind and reaching power versus downwind speed.

To determine the optimum hull characteristics FYD conducted a research program employing a combination of VPP studies and computational fluid dynamics experiments. We developed a series of candidate designs to explore the available rule space. The performance predictions for each of these designs were then combined with wind distributions for the various targeted races to determine the optimum hull parameters.

This research program addressed the following principal areas:

- ◆ Selection of optimum beam waterline.
- ◆ Maximum beam and hull flare effects examining the trade-off between heeled drag and increased crew righting arm.
- ◆ Selection of displacement within rule range.
- ◆ Effects of being above rule VCG.



*Makoto Uematsu's **ESMERALDA** is hull #1 from our Design #533. She debuted at the NYYC 150th Annual Regatta winning her class. Photo courtesy Dan Nerney.*

- ◆ Transom immersion and effective length.
- ◆ Forward section shaping to improve the onset of planing and boat handling in waves.
- ◆ Appendage size refinement and optimization for particular event priorities – offshore versus around the buoys etc.

- ◆ Bulb shaping and style for particular event priorities.

Hull - We have chosen the beam waterline to give the boat exceptional upwind and reaching speed. We have carefully crafted a beautifully fair hull shape, a by-product of the freedom of the box rule format, to minimize the wetted sur-

Continued next page...

...Transpac 52's

face that accompanies higher beam. Crew weight supplies a significant proportion of the overall righting moment so the hull exhibits a close to rule maximum beam at the deck.

We examined the average boat speed profiles for a series of events and built upon our extensive knowledge base in this area to select an appropriate level of transom immersion in sailing conditions that we felt balances the competing demands of round the buoys racing and high speed offshore sailing.

Appendage Geometry & Sizing - Within the Rule restrictions of overall draft, permitted materials and minimum keel fin strength we were free to develop low drag, good handling solutions. The rudder was sized to provide sufficient lift and good handling characteristics with minimal area and drag. The combination of optimized planform shape and our own foil sections, designed in-house, produce a high lift - low drag rudder that gives the helmsman plenty of warning of an imminent stall. The keel fin was sized to provide sufficient lifting area for starting and other maneuvering situations while balancing the competing concerns of upwind and downwind sailing.

The bulb concept also reflects efforts to balance upwind sailing and maneuvering issues with the desire to minimize viscous drag. We chose a chined bulb shape to improve the upwind performance and achieve the deepest center of gravity. The bulb shape was optimized using our understanding of transitional flow mechanics that contributes to reducing the bulb viscous drag.

Deck Geometry and Layout - Weight savings have been achieved in the aft cockpit by continuing the sole out to the hull thereby eliminating the cockpit sides. The cockpit sole has been sloped down aft of the traveller to minimize its surface area while enhancing its draining properties. Our vertical transom style has been maintained to position the topmast backstay fittings as far aft as possible, minimizing the mainsail roach and topmast backstay interference.

Advances in the deck layout are fo-



Hull #3 SJAMBOK, owned by Michael Brennan, placed 4th in class with less than a week to prepare for her debut regatta. Photo courtesy Dan Nerney.

cused on a winch system designed for forestay-less gicing, where two afterguys are required to be loaded throughout the maneuver. In this case, the secondary winches by careful positioning can be used for afterguys downwind and topmast backstay upwind. The mainsheet system is a 2:1 "half German" style system led aft to a single pedestal driven winch on centerline. The mainsheet grinder pedestal and primary pedestal are linked below deck to provide maximum horsepower during highly loaded maneuvers.

Hydraulic tensioning systems are in place for both forestay and "code 0" tack line. These systems both utilize through deck sheaves and below deck strops intended to position the actual hydraulic cylinders as far aft and low in the boat as reasonable possible.

Longitudinal jib tracks are combined with in-hauler systems to provide ample sheeting range along side the relatively large class required coach roof. Mainsheet traveller and other control lines are led below deck to maintain clutter free deck space.

Rig - The fairly standard 20-degree swept spreader rig has been combined with a cathedral style topmast stay system to support "code 0" style upwind spinnakers. In this case the combined stay envelope has been carefully optimized to

allow close sheeting of those sails.

The mast has been designed to class rule minimum weight and VCG targets. Where possible, IMS friendly mast and boom dimensions have been pursued to help ensure that the yacht can be competitive in other outside class events.

All three yachts built to our Design #533 recently made their debut at the New York Yacht Club's 150th Annual Regatta in Newport June 11 - 13.

ESMERALDA (hull #1), owned by Makoto Uematsu, had an impressive showing. Conditions during the event ranged from light and flukey northerly breezes the first two days to freshening 10-16 knot southwesterly breezes on Sunday. **ESMERALDA** dominated the series winning all five races in her 5 boat TP 52 class.

Richard Breeden's **BRIGHT STAR** (hull #2) and Michael Brennan's **SJAMBOK** (hull #3) had little time to prepare for the event but were quite pleased with the overall performance of their new toys. **SJAMBOK** had scored three second places during the regatta, only days following her launch.

We will be conducting more research and design work for the Transpac 52 as this class is certainly growing in popularity. To view promotional drawings of the interior, deck and sailplan, please visit www.farrdesign.com.

Project Updates

Our Primary Volvo Open 70 design

Farr Yacht Design is pleased to announce the completion of its Primary design of a Volvo Open 70 suitable for winning the 2005-06 Volvo Ocean Race. This design represents the culmination of months of design and research effort and years of experience in winning past Volvo and Whitbread Round the World races, and is ready and available for any team aspiring to excel in the next race.

“We’re very excited about this Primary design, as it represents our best efforts at producing a state-of-the-art yacht which will be competitive in the most demanding sailing event in the world,” says Steve Morris, Vice President of Farr Yacht Design (FYD). “We’ve been exploring a myriad of options in hull and appendage design, weather analysis, and refined CFD (computational fluid dynamics) work, and we feel this represents a unique solution to a very complex race.”

The design package available now is complete in scope and ready for build. It includes not only construction drawings, but hull and appendage design, well-developed solutions to the mechanical issues of canting keel/canard arrangements, deck layout and spar and sail plans.

“Alongside our normal Custom design services, we’re offering this Primary de-



FYD Rendering of a Volvo Open 70.

sign for groups who need to fast track their program,” said Russ Bowler, President of FYD.

“We’re very excited about this race and the new VO 70 design. The race start is still 16 months away and so it’s not too late to commit to a design and get started with building,” said Morris. “With this turn-key package available now, we’re providing an opportunity for Volvo teams to shift their focus towards winning the race by maximizing their development time on the water. We feel the winning team will have not only a fast design, but will have had the most time on the water to develop their sails, crew, and other elements of a successful program.

Besides having designed the race-winning yachts in the past five Volvo and

Whitbread races, FYD’s success in the most recent Transat Jacques Vabre has given the firm an edge in the design of offshore yachts with moveable appendages. Jean Pierre Dick’s Open 60 **VIRBAC** won its class in this very competitive race. **VIRBAC** is powered by a sophisticated canting keel and dual-daggerboard appendage package designed by FYD. This knowledge has been used in this Primary VO 70 design.

For a team interested in a more customized design approach, FYD offers additional design program management services to meet their clients’ needs. These include construction inspections, sail wardrobe assistance, spar detailing, measurement optimization and advice on sailing performance and optimized tuning.

Southern Wind 96

Farr Yacht Design is pleased to announce the latest design collaboration with Nauta Yachts, Southern Wind Shipyard and Pegaso SRL. The final product will be a 96 foot fast cruising yacht to be named the Southern Wind 96 (our Design #542).

The first yacht in the series will be a big sister to the Nauta 80 DS (deck saloon) version. Naval Architecture will be provided by FYD and deck/interior stylizing will be created by Nauta Yachts.

The new Southern Wind 96 is slated to have a light ship displacement of 58 tons in part due to the benefits of carbon construction. The weight savings from this

construction method will provide scintillating performance and ease of handling with its all carbon swept spreader rig.

Construction is underway with an anticipated launch in 2006.

For more information, please visit www.southernwindshipyard.com

Cookson 50’

Currently in production at Cookson Boats is the new Cookson 50’ (our Design #541). This high performance, canting keel yacht will be offered in full race or racer/cruiser versions.

Hull and appendages foil shapes were created by FYD. Cookson Boats have designed the concept and layout details.

For significant weight savings, the hull, deck and spars will be constructed in carbon. The Cookson 50’ has a clean and simple deck layout with an interior that’s smartly functional.

The Cookson 50’ promises to be an ideal club racer whether fully crewed or short handed.

For more information, please visit www.cooksonboats.co.nz.

Beneteau First 44.7

For over 17 years, the partnership of FYD and Beneteau have resulted in some of the most successful and stylish racing and cruising production yachts in the world. Our latest collaboration is the new Beneteau First 44.7 (Design #496).

Designed to be the bigger sister of the IMS World Champion First 40.7, the new First 44.7 should have wide appeal to those seeking a step up from the First 40.7.

The geometry of the deck was designed to comply with IMS cruiser/racer requirements. The cockpit is the traditional "Beneteau First Series" T style with forward and aft seating areas allowing ample seating for crew and guests. The aft coamings are recessed in the helm area for comfortable upwind seating. A small but functional swim platform is recessed in the transom.

The standard (cruising) version comes with a 7/8's style aluminum fractional rig with swept spreaders and 145% LP overlapping genoas. A carbon mast option is available for the optional "race" version.

The interior in the standard version features 3 separate cabins with two enclosed heads with shower. Cooking will be a pleasure in the full galley with a four burner stove, double sink and icebox. A roomy sit down navigation station and saloon settee with seating for six are also standard.

For more information, please visit www.beneteau.fr.

CM 60'

The CM 60's (Design #414) **RIMA** and **HARRIER** performed outstandingly during the recent STC 2004 Around Block Island Race. Both yachts represented the STC White Team which took first place in the event.

The CM60 **RIMA** was voted best corrected time IMS/Racer and IMS Fleet as well as the best performing yacht overall.

Congratulations to the owners and crews of **RIMA** and **HARRIER** for a job well done.

For more information on the CM60 please contact info@farrdesign.com



FYD Rendering of the new Beneteau First 44.7

New Farr IMS 54' CAM certain to turn heads

The new Farr IMS 54' CAM (our Design #539) built by MTorres in Spain under the direction of Richard Gillies has launched.

This design is a significant step forward from our past IMS successes. The distinctive hull shape was developed using our extensive suite of research tools combined with our comprehensive knowledge of the IMS rule and its recent changes. The resulting hull has powerful ends that will handicap very well with excellent performance in the relatively flat water of the Mediterranean.

The cockpit is shaped to suit the narrow deck beam while keeping the helmsman positioned as far outboard as possible. The edge of the working deck is truncated aft, behind the afterguard, to shorten the required lifeline surround.

The rig is a continuing development of our very successful no-runner, non-overlapping headsail rig first introduced to Spain and the rest of the Mediterranean on our original CAM, winner of the 2001

IMS World Championships.

The appendages were designed to achieve the correct balance between their size, rig size and keel weight while ensuring the keel, rudder and hull always operate well together. Appendage area is generous (as typical under IMS) allowing a correspondingly large sailplan for good acceleration off the starting line.

The interior is a fairly typical, modern day, IMS racing interior, meeting the minimum IMS interior regulations and providing clear open space for storing and retrieving sails. Additional bunks may be added in different configurations to suit various venues. An interesting aspect of the interior is the ability to position crew below in "hiking seats" where they will produce an equal if not higher righting moment than crew on the rail in a typical position. These seats are angled benches that allow 3 crewmembers to sit comfortably on the windward side, which should also be helpful when packing chutes below and securing sails.

Launching of *Atalanta II*

On the cool and gray morning of March 22, our Design #490, *ATALANTA II* was launched in Newport, Rhode Island. *ATALANTA II* is a custom 70ft fast cruising yacht designed to provide owners Carlo and Julia Puri with years of fast Mediterranean cruising and IMS racing trophies along the way.

The design work, originally contracted in January of 2001, was for our comprehensive design package which includes all structural detailing. The design brief presented us with several challenges as we worked to blend the cruising and IMS racing design requirements presented to us. The launching was attended by key team members from Goetz Custom Boats, Hall Spars, and our own Patrick Shaughnessy. *ATALANTA II* is quite striking with her mat gray racing inspired hull finish and large 3 spreader IMS influenced spar and should be easily recognizable on the water.

Russell Bowler was on board during *ATALANTA II*'s shakedown regatta at Antigua Race Week. The next regatta for *ATALANTA II* was the Giraglia Rolex Cup in St. Tropez where she placed a 4th and 2nd in the inshore and offshore races.

At Farr Yacht Design, we would like to thank all of the involved parties for their effort pulling the final project together. Everyone involved in this project should be very proud of the beautiful result. We wish Carlo and Julia Puri the best of luck with their new yacht.

MTN 415

In the Fall of 2003, boat builder MTorres Ingenieria de Procesos de Spain began producing the Farr IMS 42 IMS 600 Class which they later named the *MTN 415* (our design #534).

In May, the day after Hull #1 was launched she entered the "Trofeo Estrella de Levante" regatta and won IMS Class and Overall.

The crew on the new *MTN 415* were most impressed with the overall speed given the fact they did not have sufficient time to prepare the yacht for racing conditions.

For more information please contact Juan Moreno at jmoreno@mtorres.es.



A wild ride for owner Mr. Puri and crew on the new Farr 70'. Photo by Alastair Abrehart.

BMW Oracle Racing AC XXXII Challenger

Our America's Cup activity continues with research and work on improving the many tools used to search for that elusive performance margin. With the regattas in Newport, Valencia and Marseilles through 2004 and a very active research program, there is plenty going on. While the 2007 America's Cup seems a long way off, time is still the enemy and good planning of the effort through the next 2 1/2 years will be the key to success.

The campaign unveiled a new name and logo at the end of May and is now known as BMW Oracle Racing. This reflects BMW's growing interest in providing technical support. The boats have been repainted with the new identity and are ready for some interesting regattas.

25M Fast C/R Yacht

Construction work continues at the Latini Marine shipyard on our Design #535 for Italian owner Filippo Faruffini. Design #535 is a 25 meter fast cruising yacht intended to race and cruise with equal effectiveness. At the time of writing, the hull shell and major structural bulkheads have been completed with deck lamination now under way at the Rome based shipyard. Build quality looks to be extremely high and comments from Giovanni Belgrano, the construction su-

pervisor on site, are very encouraging.

Under project manager Vittorio Mariani, the design team, which includes Rome based architects Lazzarini and Pickering, has produced an innovative design which will demonstrate a new approach to mixing cruising and racing requirements. The design work, largely completed at this stage, includes several site visits by our team to the shipyard to ensure faithful reproduction of our work. While specific details of the design, and even the yacht's name, remain guarded we can say that we are very excited about the concept and are eagerly awaiting the completion early next year. Look for more updates here in the future as work continues...

Out and About

In late February 2004 many Farr designed boats converged in Miami, FL for the Acura SORC. 31 boats out of a total of 63 entries were designed by Farr Yacht Design, Ltd. Several FYD team members were also in attendance including Vice President Stephen Morris, Design Production Manager Patrick Shaughnessy and new team member Mark Bishop. The Farr CM60 *NUMBERS* (D. 414) sailed to 1st place in IMS while the Farr 53 *TALISMAN* (D. 467) took 2nd with Patrick Shaughnessy as pitman. The Farr 50 *JAVELIN* (D. 415) placed 5th in IMS with Vice President Stephen Morris aboard. The Farr 395 *SPINAL SHOCK* (D. 468)

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Designer Profile

James Schmicker Senior Naval Architect



Jim Schmicker is a Senior Naval Architect and shareholder in Farr Yacht Design. He began his career at FYD in 1988 specializing in rating analysis and performance optimization. His experience in boat building and his knowledge of the IOR and IMS were invaluable to FYD during the late 80's and early 90's when world champion IOR 50's, Whitbread Maxi's, and One Tonner's gave way to ILC Maxi's, ILC 40's and IMS Racers. Jim's responsibilities have expanded over the years to include preliminary design and concept development for all designs as well as roles in creating hulls, updating our in-house VPP and conducting research.

Jim's love for sailing began at the age of seven when he started crewing for his older siblings in 12' sneakboxes (wooden catboats). After seeing a documentary film on the 1967 America's Cup, Jim decided he wanted to design yachts. He

carried through with that plan earning degrees from the Webb Institute and MIT in Naval Architecture and Marine Engineering and gaining practical experience building race boats and 12 meter yachts, being a member of a 1987 America's Cup team and administering rating and handicap rules at US Sailing prior to joining FYD.

Farr owners work closely with Jim throughout their projects. From the initial concept through to sea trials and performance optimization he often travels to meet with them, making sure their goals are understood in the early stages and then fine tuning the final product upon launching. Jim can be found at key regatta sites around the world making sure that our designs are properly prepared for competition.

Jim makes his home in Severna Park with his wife Susan and daughters Kate and Emily.

Tidbits

Welcome Aboard... Bryan Baker & Mat Bird



Bryan Baker

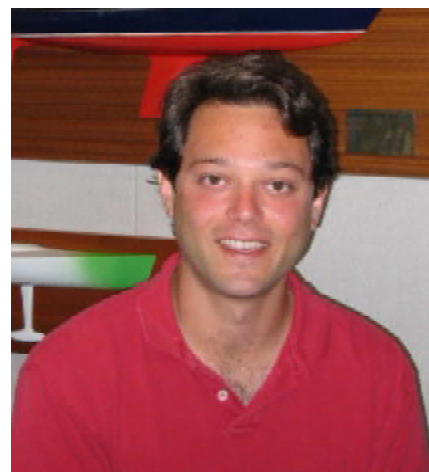
Bryan Baker joined Farr Yacht Design and the design team of BMW Oracle Racing in May 2004. A recent honor graduate from the University of Michigan he received a Bachelor of Science degree in Naval Architecture and Marine Engineering. Bryan also attended the College of Charleston and earned a Bachelor of Science in Physics with a minor concentration in mathematics.

During his tenure at college, Bryan sailed competitively. He was a member of the number one ranked collegiate varsity sailing team at the College of Charleston. Bryan competed in many regional and national championships on a variety of dinghies and keelboats.

Bryan has been coaching advanced racing on his home shores of Long Island Sound for the past five years. He enjoyed the unique opportunity growing up sailing with world-class sailors whom have inspired Bryan's competitive spirit and passion to design high performance yachts.

Naval Architect and Software Developer **Mathew "Mat" Bird** became a member of the Farr Yacht Design team in May 2004. He had the opportunity to work with FYD previously as a member of the design and full scale performance analysis teams for Oracle BMW Racing's 2003 Challenge for the America's Cup.

Mat brings several years of software development/marine industry skills to FYD. Prior to his work in the America's



Mathew Bird

Cup, Mat was a developer for the hull surface definition tool FastShip at Proteus Engineering, a division of Anteon.

Mat also has a dual degree in Naval Architecture and Marine Engineering from the Webb Institute of Naval Architecture.

An avid sailor, he regularly crews on a Farr 33 and has recently become a co owner of the J-22 *INDECISION*.

Designer's Voice

The Design Process

By Michael Price, Senior Designer

Yacht design is a fairly complex process blending art, science, experience and creativity. A large part of the practice is based on an intuitive sense of what is right and wrong and what will work and not work. Pushing and exploring the limits of what we know and understand makes the process fun and successful.

The goal of the yacht designer is to produce a design that meets or hopefully exceeds the requirements and expectations of the client. The product is the finished boat and as such the designer's job is to convey all the necessary elements of the design as concisely and accurately as possible to the builder. This is ultimately done through a set of drawings and specifications.

There have been many technological advances in the tools designers use. Some of the programs commonly used by our team would include:

- ◆ Parametric 3D modeling for keels, rudders, decks, interiors and internal structures.
- ◆ NURBS surfacing programs such as Fast Ship for designing the hull shapes.
- ◆ CFD (computational fluid dynamics) programs for hull and appendage resistance analysis.
- ◆ FEA (finite element analysis) for structural design.
- ◆ AutoCad (drafting program) is the most utilized piece of design software in our office. All geometry ultimately has to be represented in two dimension on drawing sheets so the builder has a set of plans from which to build the final product. This is essentially the modern way of producing drawings that were once drafted by hand with pen and pencil on paper and film.

Some of the advantages of drawings produced using Cad software are:

- ◆ The drawings can be emailed to the builder saving time.



Senior Designer, Michael "Mick" Price has been with FYD since 1991.

- ◆ The builder having the same capabilities can make desired alterations and email those changes for discussion/approval.

- ◆ Full size mold frames and bulkheads can be cut using computer aided machines/routers.

- ◆ The overall accuracy of the design work is very high.

Yacht design is an iterative process starting with an owner's brief and developing preliminary concepts based on prior designs and knowledge base methodically working towards the final design. There is no magic button to push and out pops a design! At our office we break this design process into four basic stages:

◆ Stage 1 - Design Brief

At this stage we identify the owners requirements and the design approach.

◆ Stage 2 - Concept Development

In this stage we develop the preliminary elements and parameters of the design. Information from previous designs, displacement, sail area, deck and interior sketches, appendages, etc are brought together to form the basic elements of the design. When we are satisfied with the concept we move towards fine tuning the design.

◆ Stage 3 - Preliminary Design

During this stage we focus more on comprehensive detailing. Structural details are resolved, appendage design is analyzed and refined, deck layouts and interiors are fully sorted, and weight cal-

culations are arduously produced. The process goes through a series of steps which is commonly referred to as the design spiral. This is essentially going over each element in the design adjusting-checking-adjusting until reaching a point where we are ready to produce the final drawings.

◆ Stage 4 - Design Detailing

Once all the decisions have been made the last task is to produce the necessary information to build the boat. All designs vary from small and large to simple and complex. Builders have varying requirements as to the information needed to build the boat. Typically a set of drawings would include but not be limited to:

- Lines Plans
- Full size Patterns (information to build the hull plug or mold)
- Deck Geometry
- Hull Construction
- Deck Construction
- Internal Structure
- Construction Details
- Deck Layout (with Hardware and Running Rigging Specifications)
- Interior Arrangement
- Sail Plan (with Mast and Rigging Specifications)
- Rudder Geometry and Construction
- Keel Geometry and Construction

After the design is complete and drawings issued there is a fair amount of continued support. This includes frequent consultation with the builder (which may include visits to the yard during construction) and suppliers such as sailmakers, spar builders, hardware manufacturers etc. After the boat is launched we are involved with rig tuning, measurement and other aspects that will help ensure the full potential of the design.

The best part for all of us at Farr Yacht Design is to go sailing! It is our passion which we hope shows in our work.

Out and About continued

placed 2nd in PHRF 2.

Peter Harrison's new Farr 115 *SOJANA* (D. 442) crossed the Atlantic to participate in the Caribbean racing circuit. The Antigua Mega Yacht Challenge was *SOJANA's* first regatta. Senior Designer Mick Price got to sail aboard the high performance cruising ketch.

The Farr 115 *SOJANA* also participated in Antigua Sailing Week. Onboard this time was Senior Naval Architect Jim Schmicker. Farr Yacht Design, Ltd. President Russell Bowler joined Mr. Carlo Puri and team on the new Farr 70 *ATALANTA II* (D. 490).

The launchings of the three new Transpac 52's (D. 533) have kept the sailors at FYD busy. Vice President Stephen Morris attended the launch and test sail of the first new TP52 *ESMERALDA* in early May. A few weeks later President Russell Bowler joined Richard Breeden's *BRIGHT STAR* team for her maiden voyage. The New York Yacht Club's Annual Regatta had more FYD team members aboard these spectacular boats. Design

Production Manager Patrick Shaughnessy was bowman on *BRIGHT STAR*. Russell Bowler was on the recently launched *SJAMBOK*.

While we always enjoy sailing Farr designed boats, some FYD team members also enjoy sailing other boats. Design Engineer Alon Finkelstein and newcomer Mat Bird recently purchased *INDECISION*, a J22. Alon sailed *INDECISION* in the 130-boat J22 Worlds fleet, while Naval Architect Luke Shingledecker and Designer Jean-Marc LeRoy crewed for Ted Morgan on *SEAFOOD*.

Luke Shingledecker has a passion for Laser racing. Luke is the Annapolis Laser Fleet Captain and is on the Board of Governors at Severn Sailing Association. It is hard to keep Luke off of the water. He spends an average of 2 days a week sailing and racing on the Chesapeake Bay.

Vice President Bruce Farr participates in local Tuesday night races onboard his Megabyte (D. 356).

On Wednesday evenings throughout the sailing season you will find several members of the FYD team participating in local races. Alon Finkelstein, Jim

Schmicker, David Fornaro, Mat Bird and Bryan Baker are all regular crew on the Farr 33 *MYTHESIS* (D. 145).

When sailing in Annapolis or abroad keep an eye open for the guys in the Farr Yacht Design shirts. We may just be participating in a regatta near you.



Bruce Farr racing his Megabyte.

FARR[®]

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