



# The Masthead

News from Westlawn Institute of Marine Technology

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September, 2008

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If you are not already an ABYC member, you should be. [Click Here](#) for information on membership benefits

If you are not already a subscriber, [Click Here To Sign Up For Our Free Email Newsletter](#) and receive your very own copy next time.

## Welcome

Dear Students, Alumni, and Friends,

On July 30, President Bush signed the Clean Boating Act of 2008 into law. Thanks to all who contacted their legislators to let them know how important this bill was to the recreational boating community. To learn more about this vital legislation, read the story on page 9.

Let us hear from you. We'd like to publish your news, comments, and ideas.

**Address your E-mail to: [nnudelman@abycinc.org](mailto:nnudelman@abycinc.org)**

We reserve the right to determine if the content is appropriate and if space permits.

*Norm*

Norman Nudelman, Editor

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## WESTLAWN AND PMM DESIGN COMPETITION 2008 SPONSORED BY IMTRA MARINE LIGHTING

Here is something to really get excited about! The Westlawn Institute of Marine Technology is joining with **PassageMaker** magazine in a new design competition that focuses on the trawler niche and which is being sponsored by **Imtra Marine Lighting** with matching donations from **ABYC**.



The contest is similar to Westlawn's sailboat design competitions of the past, with the difference that this challenge aims at creating a new trawler yacht design that is capable, affordable, and economical for a couple on a budget to operate.

For this competition, we profile the fictional couple that wants this boat: Jane and Bob. Both are in their mid-40s, and they're looking to take some time to go cruising in between other life commitments. They have a 5-year-old chocolate Lab, Bart, who loves the water and loves being aboard boats.

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## Imtra Marine Lighting Sponsors Grants For New Enrollments in Westlawn Courses

**Imtra Marine Lighting**, in conjunction with matching funds from **ABYC**, has generously sponsored a new student-grant program for new enrollments in Westlawn's entry-level courses: Module 1 of the full Yacht & Boat Design program, or in Elements of Technical Boat Design (formerly Yacht Design Lite).



Even in the current economic climate, Westlawn consistently has more positions on its job board than we have advanced students and graduates to fill them. The boating industry needs more students in the program to meet demand. Imtra Marine Lighting's grant will award \$200 for each student enrolling in Module 1 or in Elements. This is a great opportunity to start your Westlawn study with financial support. Take advantage of this soon. The combined Imtra Marine Lighting and ABYC matching funds are limited. The grants are available to all, but only until all the funds are expended.

## DESIGN COMPETITION, Continued from pg. 1

Jane and Bob got serious about boating in college. Jane was on the varsity crew team at Villanova University, and Bob raced Lightning at the University of Washington and later on Lake Michigan. Jane's parents, in their later years, cruised New England aboard their Chris-Craft, and the family has many fond memories of Block Island, Cape Cod, and Florida's Biscayne Bay.

The boat they seek is one that intentionally compromises on luxury and amenities to achieve a desirable level of affordability and economy of operation.

To give Jane and Bob the boat of their dreams, we have settled on the following criteria for the design contest. The winning boat must sort through the many issues of vessel construction and integrity in a world of \$6-a-gallon diesel. While affordability and economy are subjective terms, to be sure, the winning design(s) will interpret these factors in realistic yet creative ways and will provide a design that a boatbuilder could produce for this market.

The following criteria are presented as critical in this competition:

- 1) The design must be a powerboat capable of extended cruising in coastal and inland waters, such as the Great Circle Route and the Inside Passage to Southeast Alaska, as well as tropical cruising in the Caribbean and Mexico. Inland waterways will include bridges.
- 2) The boat must be seaworthy but is not intended to cross oceans and therefore does not require the long range needed for such passages.
- 3) The ergonomics of the vessel must be suitable for the crew: Jane is 5 feet 5 inches, Bob is 6 foot 2, and Bart weighs in at 65 lb. Basic tasks, such as moving around the boat under way and getting safely on and off in an anchorage or at a dock, are vital. Judges will look at such elements as handholds, railings, and other safety factors in the overall design. Dinghy storage and handling will also be reviewed.
- 4) The design may have one or more hulls and may be traditional, modern, or radical.
- 5) Length is not specified, but the winning design will offer adequate living spaces for the couple to live and cruise for extended periods (up to several months' duration) within the constraints of construction affordability. The couple's cruising plans do not require long-term self-sufficiency; it is expected that provisions and other supplies will be generally available.
- 6) The designer must include a clear mission statement that explains the design spiral and how the requirements are met, all of which carry equal weight. The maximum length of this statement is 1,000 words.
- 7) In addition to the above, the designer must include general specifications (LOA, beam, draft, displacement, D/L ratio, air draft), deck plans, arrangement plan, inboard profile, and at least four joiner cross sections, with at least one construction section at midships. Hull lines also are required.
- 8) Drawings must be submitted to scale as either manual drawings or CAD files. CAD files may be submitted on CD, either in AutoCAD DWG or DXF format, and must be finished 2D drawings (not 3D files) ready to print. Print size is to be set up for paper no wider than 24 inches (609mm). Renderings must be submitted in JPEG or TIFF format. Manual drawings must be no larger than "E" size (36 by 48 inches; 914 by

1,219mm).

- 9) Do **not** send original drawings. Drawings will **not** be returned.
- 10) The design must not have been previously built or published elsewhere, other than in preview form on a designer's website, before PMM's announcement of the winner(s) in the September 2009 issue.
- 11) No more than two designs may be submitted by any one entrant.
- 12) The design remains the sole intellectual property of the designer, however, by submitting the design for this contest the designer grants PassageMaker & Westlawn Institute the right to publish the design as submitted for the purposes of this competition.
- 13) The competition is open to all except employees of Westlawn Institute of Marine Technology, the American Boat & Yacht Council, or Dominion Enterprises, and their family members.

**To enter**, mail your design entry to: PassageMaker Design Competition, Westlawn Institute of Marine Technology, 613 Third St., Suite 10, Annapolis, MD 21403. All entries must be postmarked no later than May 15, 2009.



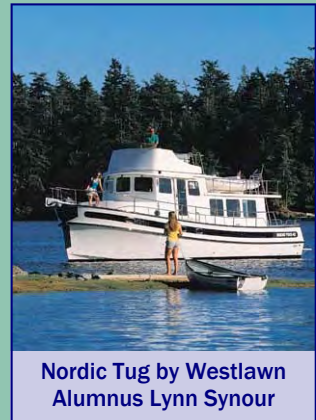
Westlawn grad Jim Backus designed the Victory Tug

The judges will be top designers and powerboat experts. They will judge entries in:

- The design's potential success and utility as a cruising boat;
- How well the design meets the mission statement;
- Beauty (classic, modern, or ultramodern) and innovation (whether in a modern or traditional design);
- Ease of handling, comfort, and safety.

All criteria will have equal weight. The judges will select a group of 10 or 12 finalists from all entries. From the final group one winner and up to four honorable mentions will be chosen. The winning design will be featured in an article concluding the competition, along with the honorable mentions designs.

**The winner will receive their choice of either a \$2000 scholarship to Westlawn or a \$1000 cash prize.**



Nordic Tug by Westlawn Alumnus Lynn Synour

Competition sponsor **Imtra Marine Lighting** is a leader in the design and manufacture of lighting for boats and a pioneer in marine LED lighting. Safe, dependable, and long-lasting, Imtra's eco-friendly "green" LED lighting includes spots, fixtures, reading lights, courtesy lights, chart lights, engine rooms lights, and other LED products. Combined with its extensive line of switches, dimmers, and transformers, Imtra offers a complete one-stop-shop for marine lighting and delivers the most advanced solutions on the market. For more information, visit [www.imtra.com](http://www.imtra.com).

## 2008 Westlawn Mystic Meet at our Mystic Seaport Campus

### Rod Johnstone Talk Highlights Westlawn's Third Annual Student Gathering



Westlawn alumnus Rod Johnstone explains how the first J-24 was built

Forty one students and guests turned out for Westlawn's 2008 annual Mystic Meet. All were riveted by speaker Rod Johnstone's presentation on the history of J-Boats and on his thoughts on boat design and performance. A Westlawn alumnus, Rod also recounted a bit of the personal side of his sailing life. This included the time, on his honeymoon, that his wife went off on the trapeze of an Olympic-class 470 sailing dinghy to learn the ropes while Rod waited nervously ashore. Returning after a fair while, the instructor clambered back onto the dock with nothing more than the gruff comment, "She'll do."

The Westlawn crew toured Mystic Seaport's model collection, which features nearly every imaginable type and size of model of nearly every type and size of boat, and—as always—the not-to-be missed Ships Plans Collection. Here, the entire Westlawn group studied plans by Bill Garden, L. Francis Herreshoff, and C. Raymond Hunt. The precision and expertise in the drawings by these master designers was both a challenge and inspiration for all. Even with their divergent drafting styles, the beautiful drawings each clearly delineated construction to a fantastic level, including details of structure, fasteners, ballast, exhaust piping, steering systems, and all the other critical items and features needed to ensure a successful design.

After Ships Plans, it was on to the steamboat *Sabino*, with a brief visit to the engine room followed by a cruise of Mystic River along the Seaport. From here,



Westlawn Director Dave Gerr with students at the Westlawn office

not only were the Seaport's regular collection of boats on view (including the L. Francis Herreshoff *Araminta* and the Sparkman & Stephens schooner *Brilliant*), but dozens of other exquisite craft at the Seaport for the weekend's "Antique and Classic Boat Rendezvous." To list just a few, there was the magnificent Sparkman and Stephens yawl *Bolero*, the Purdy-built commuter *Aphrodite*, a pair of original Elco cruisers, numerous Chris Craft runabouts, a Rybovich sportfisherman, and many, many more. All the while, Mystic Seaport's own Marshall catboat swooped gracefully about the harbor.

Following the *Sabino* cruise, it was on to lunch at the Seaport's Galley Annex, and then back to the Westlawn office for Rod Johnstone's talk, and one-on-one questions and answers with student-work review for the remainder of the

afternoon. Discussion ranged far and wide, from the practicality of tractor-kite sails, to CAD drafting technique, the importance of weight calculations and detailed specifications, to the future of the boating industry. Students all said they were reenergized and excited by the Meet and they universally expressed the sentiment, "We have to do this again next year."



Students studying plans at the Seaport ships plans library.

MYSTIC  
SEAPORT

THE MUSEUM

OF AMERICA

AND THE SEA

Westlawn is affiliated with [Mystic Seaport](#). Visit the Seaport to learn about the history of boats, boatbuilding, and design

### Drafting Table Size and Use

Westlawn book 103, "Practical Drafting," in Module 1, covers the recommended size of drafting table on page 9a. This recommends a drawing table 36 in. x 60 in. (914 x 1524 mm); however, it notes that some students get by with smaller tables. An A0 table is somewhat smaller than recommended as best at 36 in. x 50 in. (614 x 1270 mm) but should be acceptable.

Keep in mind that some students have done all their drawings on the kitchen table. Others, have done their drawings while sailing or at sea in commercial vessels on the chart table or on the dining table onboard.

Lessons for Module 1 and Elements of Technical Boat Design (formerly Yacht Design Lite) must be completed using manual drafting. As you progress in the

Continued on Pg. 22



## Destino. . . .

### A modern day Phoenix on the water

*Westlawn student Ole Nielsen is a highly skilled shipwright who works at Dutch Wharf Boat Yard & Marina, 70 Maple St., Branford, CT 06405.*

*I met Ole at the Dutch Warf display at the Wooden Boat Show at Mystic Seaport Museum in Mystic Ct. this past June. The display featured Destino, a magnificent 25 foot mahogany runabout (see photos on page 5). Ole was the project manager, but artistic and mechanical choices were joint decisions between himself and Jim Pyle (the director of Marketing) and Paul Jacques (the owner of Destino and Dutch Wharf Boat Yard). Ole designed the hardware, and researched and chose everything he thought fitting for the boat and then discussed it with Jim and Paul. He also sought the advice of the foreman in the yard, Sam Smith and sometimes needed advice from the mechanic, Richard Walsh, but Ole installed the engine, the running gear, steering, electrical, and of course did most of the woodwork and hardware installations. Keith Johnson was in charge of the finishing of the boat which consisted of stain, sealer, 10 coats of traditional varnish and three coats of clear coat, sprayed, followed by wet sanding and buffing. Ole stated that "It was a great project to be part of because of the generosity of Paul. Every time we had a decision, to make, the answer would be, "how can we make the best boat possible", not how much is that going to cost. I believe by sparing no expense we have turned out an extraordinary project, rather than "just" a great project."*

*Norm Nudelman*

*Things were proceeding according to schedule until.....*

## Fire !!!

No word in the English language invokes more fear, anxiety and panic, especially when it's juxtaposed with: "in your boat yard". But those five words greeted Paul Jacques when he was awakened by a phone call at 11:00 pm on a Saturday night last May.

It takes only 15 minutes to drive from Jacques' home to the boat yard that's been in his family for over 50 years, the Dutch Wharf Yard in Branford, CT. But they can be the longest 15 minutes of your life, even while driving at 70 mph, as you imagine the maelstrom awaiting you. First thought – *Was anyone injured – or worse?* The caller didn't know.

Second thought – *How extensive is the fire?*

There are 12 buildings at the yard, 10 containing customer yachts in varying stages of maintenance or repair. So far, it's confined to one building said the caller. So far?

Third thought – *How did it start?*

Mechanical failure? A furnace? A disgruntled ex-employee? Arson?

Miles creep by and minutes seem like hours as you finally cross the Q-Bridge in New Haven. Where are all these people going at midnight? Unfortunately, no answers yet exist for any of these questions.

Finally, pulling into the yard the scene is bedlam. Fire

trucks and emergency vehicles are everywhere. Hoses snake in from the street. A fire boat is parked in the lifting well. Flashing lights illuminate the night sky. How did they all get here so quickly?

Then it hits you. The building that's ablaze houses your pride and joy – a 25' classic mahogany runabout that has taken three years to design and build. She is on a trailer wearing a new, form-fitted cover; ready to be transported on Monday morning to Essex where her upholstery was to be installed. That was to be the last stop on the way to the Wooden Boat Show at Mystic Seaport on June 27th.

The good news – if any can be found on a night like this – is the performance of the Branford fire department. They were on the scene within ten minutes of the alarm being called in. Their quick action and professionalism prevented total disaster. They kept the fire contained to one building, prevented its spread to adjoining neighbor homes and, somehow, had the presence of mind to pull the runabout from the burning building before it was totally destroyed. The burning building also houses thousands of board feet of lumber – mostly hardwoods: oak, teak, mahogany, etc. all used in building and repairing classic wooden vessels. Dutch Wharf being, most of all, a wooden boat yard.

Another section contains customer booms. Over 100 aluminum and wood booms are stored here. Why couldn't this have happened one month later when they would have been shipped and controlling sails on the owners' boats? Lots of questions – very few answers on what is now early Sunday morning.

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**Destino Continued from Pg. 4**

Two hours later, the fire is contained and it's time to assess damage and begin planning recovery. The world does march on.

Incredibly, consultants, seeking to be hired as public insurance adjusters, appeared like flies at a picnic. One week later the fire department has condemned the building, the crew has moved the lumber to safety and work has resumed getting customer boats launched and rigged for a summer of fun.

Customers (including Westlawn director Dave Gerr) owning the damaged booms were notified but not one was angry. They are all wonderful people, sensitive to the plight of the yard in dealing with the problem. Arrangements were made to either repair or replace their boom dependent on its condition.

**Destino**

But the boat yard crew is heartsick that the runabout is badly scorched and may not be repaired in time for the Wooden Boat Show. It's a real downer. Originally, the plan was to build her during the summer seasons when customer work usually slows, then sell her to someone who appreciates the old-world charm of such boats.

But as the building progressed the crew and management developed a love affair with this boat; she became known as the "yard's boat". No one wanted her sold but they did want the world to see what a beautiful work of art they created. Custom deck hardware was designed, cast in bronze and triple-chrome plated. The best available engine and electronics were acquired. Even the mahogany steering wheel was custom made in England. It was truly an exceptional effort by some talented craftsmen, Paul Jacques included. Not owning a boat himself, he had decided to keep the boat for his own use.

To say that everyone in the yard was dejected by the fire would be an over simplification. There did not appear to be enough time to repair her in time for the show.



Enter Ole Nielsen, a young, Danish-born carpenter and shipwright who built more than 90% of the boat himself assisted by Keith Johnson, one of the premier refinishers on the New England

coast. Keith and his crew of 5 had just finished applying 10 coats of varnish and 3 coats of clear coating before the fire.

Now, much of the decking and both engine hatches were badly burned. But fortunately, no structural damage had

been sustained; due in part to the form fitted cover which slowed the fire's advance long enough to permit the fire-fighters to pull her from the building. Ole, now working alone and against all odds, determined to get the newly named *Destino* to the boat show – now only 8 weeks away.

The race was on. The fire consumed two work bays at the yard so finding a place to house *Destino* was the first problem. Thank heaven for heavy plastic sheeting. An isolated work area was constructed within another bay by draping plastic from the ceiling and insulating the painting and repair of other customer work from this job.

A bigger challenge was to do the necessary work after hours because customer work had to come first. No problem. Ole volunteered his evenings and week-ends to get the job done.

Once secured in the new work area, Nielsen worked every night from quitting time at 3:30 pm to 9:30 pm, plus every week-end to strip the old finish, sand, stain and seal the exposed wood to get an exact match with the original grain color, and apply the new finish. Allowing for drying time between treatments, the refinishing took five weeks until June 11 when the boat was finally ready to deliver to the upholsterer. Two weeks now remained until the Boat Show in Mystic.

Sue Lennox, owner of Nautical Needles in Westbrook had been collaborating with the yard regarding fabric choices and upholstering styles ever since the boat was in the planning stages. Sue and her company were as committed to seeing *Destino* appear at the show as was the Dutch Wharf crew. She managed to re-schedule other work to immediately begin work the day it arrived at her workroom in Essex. Only 11 working days remain until the show opens.



Six days later the boat is back from the upholstery shop and the workmanship is perfect. The last-minute tasks of striking a water line, connecting instruments, and final hardware installation were finished Thursday after-

noon. Thursday night, June 26 at 5:00 pm *Destino* was rolled into position for her "debutante-like" introduction. The Seaman's Inne at the Seaport was the scene of never ending toasts that evening.

The response from boat show attendees was overwhelmingly positive. So enthusiastic was the praise that the yard is now planning to build a first production run of 10 additional boats for delivery in early 2010.

Reprinted from [www.dutchwharf.com](http://www.dutchwharf.com)  
With permission from Dutch Wharf Marina and Boatyard

## Westlawn *Profiles* / Michael Hartline of Cabo Yachts

"I started working in the boat building business as a clean-up man for Ocean Yachts a few years back. Like everyone else, I was amazed at the beauty and the satisfaction of a yacht that was complete and sitting in the water. I realized then that this was going to be my life-long career. I worked my way up the ladder a little bit and finally made it to finish woodworker and then I had wondered how I could be the creator of such a beautiful thing. Then one day I met a man named Dave Martin. Dave was a Westlawn Graduate from the 1950's. He told me about a school called Westlawn and



Mike Hartline, chief of design at Cabo Yachts (Right) with Westlawn student and Cabo's electrical designer Daniel Denis (left) in the Cabo plant

that that I could study at home and learn to design yachts. This was perfect for me because I already had a family to take care of. Dave told me that it was a great school and that I would need to work hard to complete the program, but it would be worth it. I listened to Dave because with his Westlawn education he designed boats for Ocean Yachts, Egg Harbor Yachts, Pace-maker Yachts, and the list goes on. I would like to add that Dave Martin became my mentor throughout my career. So I signed up for Westlawn.

The day I told my boss that I entered the Westlawn Institute program I got promoted. Westlawn was very much respected at Ocean Yachts. As I worked my way through the Westlawn course the promotions came with it. Finally I found my way into design and engineering at Ocean Yachts. By the time I was midway through the Westlawn course, I was in charge of research and development. When I completed the course and received my Westlawn diploma, it was not long before I was manager of design and engineering.

I worked in this capacity for several years when my family and I wanted to look for opportunities elsewhere. I sent out a couple of resumes to see what would happen. I received a great response from Bertram Yachts, in Miami.

Unfortunately, we had to pass; the kids just were not ready to move at that time. A few years later, my wife and I thought that we would look into new opportunities again and with a new company. I spotted a job ad for a tooling manager at Cabo Yachts. So I applied and received a good response. They flew me across the country for an interview. There were several applicants applying for the job but, I got it and I know it was because of my Westlawn diploma. My family and I moved across the country for the change we were looking for.

It wasn't long before I was part of the new product development team, and - right at the beginning - my Westlawn skills went to work. The thing about Westlawn is that when you graduate you are very confident about your designing skills. I became a major contributor at these new product development meetings. Within months I was promoted to manager of the lamination departments and the touch-up departments along with the tooling department. Then one day the president of the company said he wanted to see me in his office. He said that the position of head of design and engineering was open and that I would be the right choice to fill that position. I accepted the new post with confidence. Funny thing is the week after I accepted this position I received a phone call from a recruiter that a company in Florida would like to interview me for the same type of job. I had to decline that offer. But after I hung up the phone I remember telling myself, 'Who would have thought that a distance study program could provide so many opportunities.' Thanks to Westlawn and of course Dave Martin my boat design career has been the trip of a life time. "



*Ocean 37 designed by Mike Hartline*

*Mike Hartline*

*Just as at Ocean Yachts, Cabo has more than one Westlawn designer. The photo (above left) includes Daniel Denis, a current Westlawn student, who is also in engineering at Cabo.*

[Click Here](#) to visit the Cabo Yachts and take a virtual plant tour see how they design and build their boats.

[Click Here](#) to see more photos of the Ocean 37 at the Ocean Yachts website



## Know It All Contest Winner From the June 2008 Issue



Congratulations to Westlawn Student Chris O'Connor for his correct answer to the June 2008 Know It All question. He had the only correct entry submitted. For his brilliant and insightful answer, the estimable Mr. O'Connor has earned the distinguished title of **Know It All** and has won the coveted prizes of a Westlawn tee shirt and a Westlawn cap. He will also receive a certificate attesting to this great accomplishment.

### The question from last issue was:

You've been asked to inspect *TenderFoot*, a 38-foot production fiberglass sailboat. There's a problem with its chainplates. The owner likes to sail hard and races and cruises in all weather. He has been having trouble keeping the lower shrouds tensioned properly, and has had to recaulk around the lower-shroud chainplates repeatedly. Now, the deck seems a bit soft around the chainplates. Examining *TenderFoot*'s chainplates closely, you find that the lower shrouds are 3/8-inch, 1x19 stainless steel. The owner's manual confirms this and that they are of 316 stainless alloy. The cover plate around the chainplate has lifted a bit, and the recent caulking is already showing signs of separating from the deck. Below decks, you find the stainless chainplate is a flat plate penetrating a slot in the deck (made tight by the cover plate and caulking), with eight 3/4-in. stainless through bolts fastening it into a 3/4-in. plywood bulkhead. There's a solid 1/4-in. aluminum backing plate under the nuts on the opposite side of the of the bulkhead from the chainplate.

- 1) What is causing the problem?
- 2) How would you recommend correcting it?

### The answer (as O'Connor presented it) is:

We have a lower shroud of 3/8-in. 1x19 316 SS alloy. This has a breaking strength of 14,500 lbs.

The stainless steel chainplate is fastened to a 3/4-in. plywood bulkhead with (8) SS thru bolts, 3/4-in. dia. each, with a solid aluminum backing plate under the nuts on the opposite side. We'll assume an ultimate bearing strength of the plywood bulkhead to be 2,500 psi.

We'll assume this lower shroud is the only shroud attached to this chainplate.

The Chainplate Design Load (CDL) is:

CDL = 1.34 safety factor x shroud breaking strength

CDL = 1.34 x 14,500 lb.

CDL = 19,430 lb.

The required load bearing area for this CDL is:

Bearing area = CDL ÷ Plywood Ultimate Bearing Strength

Bearing area = 19,430 lb. ÷ 2,500 psi

Bearing area = 7.77 sq.in.

The actual load bearing area is:

Bearing area = bolt diameter x bolt bury length x number of bolts

Bearing area = bolt diameter x bulkhead thickness x number of bolts

Bearing area = 3/4" x 3/4" x 8 bolts

Bearing area = 4.5 square inches

This is less than the required load bearing area of 7.77 sq.in.

The problem is inadequate load bearing area of the chainplate bolting to this plywood bulkhead. This is causing the chainplate force on the eight thru-bolts to elongate the bolt holes in the plywood bulkhead.

This can be fixed by replacing this chainplate with a larger one holding more bolts. Another solution would be to install annuluses in the current bolt holes, assuming the elongation is not excessive and the bulkhead is not too

Continued on Pg. 11

**See Pg. 10 for the New September Know-It-All Question** 

## "Yacht Design Lite" is Changing to "Elements of Technical Boat Design"

For over a decade, Westlawn has offered the Yacht Design Lite course (YDL) for industry professionals who need to understand the basics of boat design but do not intend to become professional designers. To better reflect the actual course content, the name of the course is being changed to Elements of Technical Boat Design, or just "Elements" for short. Surveyors, production managers, marine managers, professional crew, marine investigators, insurance adjusters, technicians, and similar marine professionals will benefit greatly from the Elements course.

The name change is being phased in and will take full effect by January 1, 2009. Until then, you will see reference to both YDL and Elements on the Westlawn website and in our catalog. They are the same course and no matter which name you read about or sign up for you will be enrolling in Elements of Technical Boat Design.

[CLICK HERE](#) for more details and enrollment information on this and Westlawn's many continuing education courses.

[CLICK HERE](#) to learn about ABYC member and Corporate Multiple-Enrollment Discounts

## Tuition Assistance

**Westlawn's financial aid program** offers students two options for financing their tuition for the four-module professional Yacht & Boat Design Program and for the Yacht Design Lite course.

With interest rates from 3% to 9%, students now have the flexibility to choose the payment plan that best meets their needs. Students moving on from Module 1 to advanced modules can continue to finance their tuition by rolling over any balance due as they progress in their study.

This tuition-financing program is available through TFC Credit Corporation, which has been financing student tuition for over 35 years. In that time, TFC has financed over 250,000 students at over 1,500 schools. With full-service operation centers in both New York and San Francisco, TFC Credit Corporation is a leader in education-financing. TFC's web address is [www.tfccredit.com](http://www.tfccredit.com).

Download, Westlawn's catalog and enrollment forms, from the Westlawn website, to read complete details of the tuition financing through TFC Credit, at Westlawn. [Click here](#) for enrollment forms. [Click here](#) for the Westlawn catalog.

## ABYC Courses and Schedule for 2008-2009

The ABYC Education Department has been providing industry certifications, training, high school and college curriculum, and industry seminars for over fifteen years. They are providing the marine industry with the skilled workers required to build and maintain modern small craft of all types.

ABYC is currently scheduling on-site factory training for 2008-2009. Please call ABYC for custom tailored, flat rate, instruction by top industry trainers at your facility (410-990-4460, Ext. 31).

The Marine Technician Certification Program developed by ABYC with "NOCTI Certification\*" has proven to be the industry standard. We continue to provide the highest quality marine education and training throughout the country and throughout the year.

**For course dates and descriptions** [Click Here](#) or see listing on Masthead Page 15.

\*NOCTI (National Occupational Competency Testing Institute) is a regular provider of the assessments on which many certifying bodies depend for measures of applicants' standards-based knowledge and skills. Certificates benefit employers by showing that applicants have acquired specific skills. The status of having a certified staff can lead to higher sales and customer satisfaction.



All Westlawn Courses are nationally accredited by the Accrediting Commission of the DETC

## THE DISTANCE-LEARNING ADVANTAGE

Distance learning is *the* cost-effective way to advance your career or train your employees:

- no travel, little or no time lost from work
- no on-site or off-site set up and no facility rental
- no visiting instructors
- modest tuition costs
- start when you want
- study at your own pace





## News & Views

### President Bush Signs Clean Boating Act into Law

WASHINGTON, D.C., July 30, 2008—In a significant victory for the recreational marine industry and the American boating and angling public, President Bush on July 29th signed into law S. 2766, the Clean Boating Act of 2008, protecting the more than 17 million recreational boats throughout the U.S. from unprecedented and unnecessary federal regulations. Congress had passed the Clean Boating Act on July 22, 2008.

"The recreational marine industry and boaters throughout the U.S. can now rest easy and go boating without a federal or state permit, heavy penalties and absurd legal jeopardy," said Scott Gudes, NMMA vice president of Government Relations. "We applaud President Bush and Congress for their bipartisan efforts to reverse the unintended and potentially devastating consequences of an overbroad federal court decision."

Introduced by Senators Bill Nelson (D-Fla.) and Barbara Boxer (D-Calif.) and Representatives Steve LaTourette (R-Ohio) and Candice Miller (R-Mich.), the Clean Boating Act permanently and fully restores a commonsense regulation that excludes recreational boaters and anglers from the Clean Water Act federal and state permitting system designed for land-based industrial facilities, like sewage treatment plants. Without legislative relief, the Environmental Protection Agency (EPA) was set to implement new permitting regulations for boaters by October 1, 2008.

"This is welcome news for all recreational marine manufacturers across the country," said Thom Dammrich, NMMA president. "NMMA raised the alarm on this misguided court decision nearly two years ago, and we are thrilled that Congress and the President have prevented the bureaucratic nightmare that was set to become law."

"NMMA thanks all of its partners in the Boat Blue Coalition, including BoatU.S.," added Gudes. "Passage of this legisla-

tion is a testament to what is possible when our community joins forces and speaks with one voice before key decision-makers."

*Source: National Marine Manufacturers Press Release July 30, 2008*

Recreational boaters should always follow the **Best Practices** with respect to protecting the environment. Some of the required best practices included in the permit proposal included such items as:

- No visible garbage in effluents
- No discharge of visible living organisms (except bait), cleanup of any visible sheen originating from vessels, secure on board trash receptacles, no disposing of fish wastes in harbors of marinas, cleaning organisms from hulls if transporting boats to another state.
- The use of phosphate-free soap and cleaners
- Inspection of engines for loose seals, minimizing entry of oil into bilges, and minimizing gray water discharges in areas where vessel traffic is heavy.

*Source: Soundings Trade Only, August 2008*

### SNAME Group Issues Call For Papers on Sailboats

The Small Craft (Sailing) Technical Panel of the Society of Naval Architects and Marine Engineers issued its initial call for papers for the SNAME Journal of Sailboat Technology.

The new online, peer-reviewed journal will focus on research achievements and engineering practices, ranging from sailboat systems and sail design to materials and construction methods, weather routing and race simulation.

A detailed list of topics and guidelines for authors are posted at the journal's website at [www.journal.sailboat-technology.com](http://www.journal.sailboat-technology.com).

SNAME is a non-profit technical society of individual members serving the mari-

time industry. SNAME is dedicated to advancing the art, science, and practice of naval architecture, shipbuilding, ocean engineering and marine engineering.

*Source: Trade Only Today, 13 August 2008*

### ABYC Member First To Earn All 8 Certifications

The American Boat and Yacht Council has recognized Dwight Escalaera, of Wakefield, R.I., for having earned all eight ABYC marine technician certifications.



Dwight's passion for the marine industry can be seen in his roles as a marine surveyor, boat building instructor and industry compliance consultant through Executive Marine Services. Dwight is a member of the ABYC Galvanic Isolator Project Technical Committee (PTC) and takes a keen interest in the ABYC Hull Piping PTC.

"When I settled on boatbuilding as my career, I set a personal goal of earning all ABYC certifications to assure that I have an understanding of all facets of boatbuilding," Escalaera explained.

ABYC established its certification program more than 15 years ago to provide a measure of competence in the areas of: marine electrical, marine systems, diesel engines, gasoline engines, marine corrosion, ABYC standards certification, air conditioning and refrigeration, and composite boatbuilding.

*Source: American Boat & Yacht Council, Annapolis, MD August 12, 2008*



## News & Views Continued from Pg. 9

### New 'Houseboat Feature' Set to Launch at 2009 Louisville Show

Chicago, IL August 4, 2008 – The National Marine Manufacturers Association (NMMA) will unveil a new houseboat-specific feature at the 2009 Louisville Boat, RV & Sport Show, taking place January 24-February 1, 2009 at the Kentucky Exposition Center in Louisville.

The new section will feature the latest in houseboats and related gear, equipment and services. The houseboat-only area will have its own hours and entrance, and will open the second week-end of the Louisville show, from Thursday, January 29 through Saturday, January 31. Several of the industry's leading houseboat manufacturers—including Fantasy Custom Yachts, Somerset Houseboats & Cruisers, Stardust Cruisers and Thoroughbred Houseboats—have already committed to participating in the Louisville show's houseboat section.

### ABYC Continues Global Technical Training Expansion

**July 30, 2008, Annapolis, MD:** The American Boat & Yacht Council (ABYC) recently conducted two certification classes in Cape Town South Africa. After learning of ABYC's on-site technical training program, the Cape Town Boatbuilding and Technology Initiative (CBTI) contacted ABYC to provide two training sessions for their members. Fifteen South African students attended the ABYC Electrical Certification class and 11 were in the ABYC Diesel Engine Certification class, both of which were held at the Cape Town Boat Building Academy, a new education and training facility that the CTBI recently opened.

CBTI member companies export to the United States, and these classes were part of an educational push that they are kicking off to support the marine industry in South Africa.

### EPA sets new gas-engine emissions standards



On September 4th the Environmental Protection Agency announced a new strict set of standards for gasoline engines.

The rule which goes into effect in 2010 will cover a range of gas-powered personal watercraft and inboard and outboard engines. The regulation also includes the first national standards sterndrives and inboard engines. It also sets standards for carbon monoxide for gasoline engines.

According to the EPA in order to meet the new emission standards, manufacturers will probably employ catalytic converters for the first time in many boats.

Source: Soundings Trade only today  
05 September 2008

## Will You Be The September '08 Know It All?

Want to see how much you know? Want to show everyone else how much you know? The first three people to submit the correct answer to the following question will win a Westlawn tee shirt and cap, and will also receive a **Know It All** certificate. The answer and winners to be published in the next issue of *The Masthead*.

The owner of the 44-foot motoryacht, *Bone Dry* wants to ensure that she has adequate bilge pumping capacity installed. Her criteria is that the bilge pumps be capable of at least somewhat more capacity than needed to keep up with flooding from any one of *Bone Dry*'s seacocks should it fail. The largest seacocks are 1-1/2-inch diameter, and the lowest of these is located 33 inches below the waterline.

*Bone Dry* is fitted with two 12-volt, electric, submersible bilge pumps, each rated by the manufacturer at 1,500 gallons per hour. The pumps both lift about 46 inches using smooth hose, with minimal bends to their overboard-discharge thru-hulls, and the wiring is properly installed of sufficient gauge.

Is this enough pumping capacity to keep up with the flooding if the largest and deepest seacock fails? Why?



**J-35s designed by Westlawn alumnus Rod Johnstone racing off Alcatraz**

**Know It All Contest Winner** continued from page 7

damaged to permit this. The current elongated bolt holes would be drilled out to accept an annulus of twice the bolt diameter. These annuluses could be fabricated of G10, which is impervious to rot and will not induce galvanic corrosion in the bolts or chainplate. (They could also be high-density, epoxy-grout annuluses). This would double the actual load bearing area at the chainplate bolts:

The new actual load bearing area is:

Bearing area = annulus diameter x annulus bury length x number of bolts

Bearing area = annulus diameter x bulkhead thickness x number of bolts

Bearing area = 1.5" x 3/4" x 8 bolts

Bearing area = 9 square inches

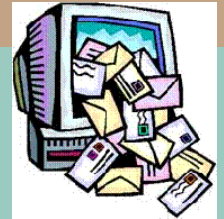
This is greater than the required load bearing area of 7.77 sq.in., and will solve the problem. Any wet or damaged plywood or deck-core material would need to be replaced and/or repaired.

## We Get Mail

### Erdevicki Opens Second Design Office

We recently received a copy of the August 08 e-newsletter from Ivan Erdevicki Naval Architects and Yacht Designers.

A graduate of Westlawn's Professional Boat & Yacht Design program Erdevicki wrote:



"I am excited sitting in our new office in the city of Herceg-Novi in Montenegro on the Mediterranean overseeing the entrance of the Kotor Bay, looking at the latest 200 ft Bennetti motor yacht entering the bay. Behind it is 500 ft. long square rigger with 5 masts. It is beautiful summer day. Wonderful setting and I feel inspired.

Looking back on the last couple of months, I realized how hectic it was for our offices, both in Vancouver and Montenegro. The 110 ft sailing yacht *Durabo* took an interesting turn, and became sloop. It is now under construction in

Vancouver, BC, Canada. The boat is a true performance-cruiser built in aluminum, with bulbous lifting keel, dual rudders and unique styling."



designed by: Ivan Erdevicki



KISS

250 ft motor yacht

[Click Here](#) for the Erdevicki e-newsletter

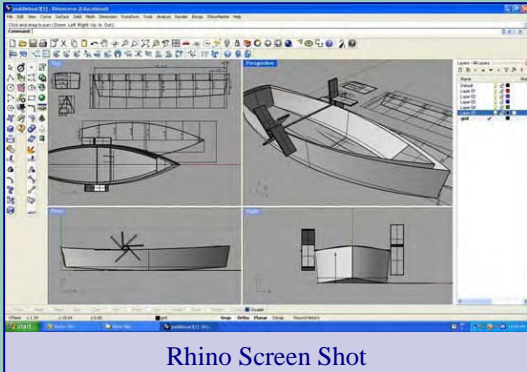
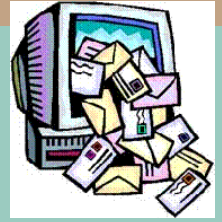
[Click Here](#) for the Erdevicki website to learn more about his company and his designs.



## We Get Mail continued from Pg 11

### Student and Kids Build a Side-Wheeler (Steam Engine Optional)

Module 2 student Jonathan Ames recently posted this story on the Westlawn Forum.



Rhino Screen Shot

"Just a little fun my boys and I have been having over the past few months.

This little boat was inspired by the scow in Dave Gerr's book *The Nature of Boats*, but my boys wanted a boat with a "pointy end" so I made her a dory.

She floats more or less on her waterline at a designed displacement of 96 lb. with two crew, but when I get my butt in there "pounds per inch immersion" has a whole new meaning.

Rhino was great for this project. I lofted the surfaces as developable and then just unrolled them. Real nice fit."



Hull Stitched



Hull Glued



Painting



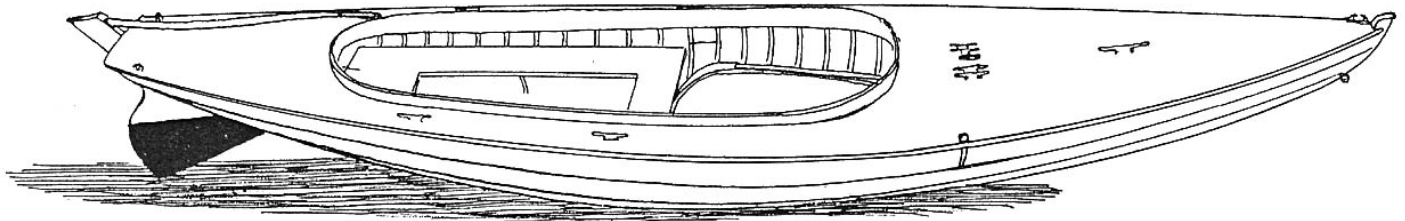
More Painting



Still More Painting



Afloat, Powered With Paddle Wheels



# Is a Little Knowledge Dangerous?

*By Jack Hornor*

Probably realizing that all of his baby boomer patients were getting of an age when they were going to need the service, my dentist recently informed me he was discontinuing his general practice in order to specialize in restorative dentistry. I wasn't surprised; it's just another reminder of the age of specialization we increasingly find ourselves living in.

With yacht surveyors, most still concentrate on pre-purchase, condition and value or claims survey assignments; there isn't much financial incentive yet to make a living specializing beyond these broad categories. For the near-term, yacht surveying remains a profession of general practitioners who, in order to be competent, must have a broad knowledge of all things related to a vessel's systems, construction, repair and service. Conscientious surveyors must study just to keep abreast of new technologies as they relate to these essentials.

So if you, as a surveyor, never intend to design a boat, why would you clutter your already chucked-full brain with more minutia about the sometimes art/sometimes science of naval architecture?

For many, it's simply that they can never get enough knowledge about a subject for which they are passionate. However, I believe a good case can be made that a program such as Westlawn's Yacht Design Lite (Elements of Technical Boat Design) can be a considerable asset to a marine

**"For the near-term, yacht surveying remains a profession of general practitioners who, in order to be competent, must have a broad knowledge of all things related to a vessel's systems, construction, repair and service."**

surveyor's career. First and foremost among the useful information to be gained is an understanding of the symbols, abbreviations and the lexicon of boat builders, designers and naval architects. Nearly all surveyors will at sometime in their career be called upon to understand or explain these to a client. No doubt just about any surveyor already knows simple basics such as LOA and LWL but how many know that (T) signifies draft, what is meant by the term Length Between Perpendiculars

(LBP) or that BM has nothing to do with the boat's sanitation system.

Wouldn't it be cool to explain to your friends why size really doesn't matter? Which is, by the way, the purpose and importance of dimensionless numbers such as the sail/area displacement and displacement/length ratios.

Most surveyors have a basic understanding of the importance of the vertical center of gravity, particularly as it relates to the stability of a sailboat. However, many could benefit from a better understanding of how the center of buoyancy and center of gravity relate to one another, how they change locations with speed and trim and how their positions may effect the operational characteristics of a boat.

Another example would be an understanding of how buoyant and non-buoyant volumes affect the trim of a partially submerged vessels, which is essential to surveyor who, as part of his or her practice, investigates the cause and origin of vessel sinkings.

So, is a little knowledge dangerous? Quite the contrary; when the limits are properly understood, I think Westlawn's Lite course (Elements of Technical Boat Design) helps the surveyor spot potential problems he or she might otherwise have missed. The surveyor can then advise their clients when it's time to call in the next level of expertise.

**Westlawn graduate Jack Hornor, NAMS, SAMS CMS, is the principal surveyor and senior designer for the Annapolis-based Marine Survey & Design Co. This article by Jack is reprinted from Boat US Technical Information Exchange July 2008 issue.**

**"Since I have added Yacht Design Lite [now called Elements of Technical Boat Design] to my resume I have had several job offers from different companies and even a promotion with the company I am employed with now. If any one is wondering if it would be beneficial to complete the program, I would say YES."**

Charles Bursk – November 2005  
Tiara Yachts  
Holland Michigan

## Practical Speed and Powering Calculations — Update

### Improving the Wyman Speed Formula

By Dave Gerr, © 2008 Dave Gerr

In the previous issue of *The Masthead*, we discussed two extremely useful speed-and-powering formulas, the incredibly versatile formula developed by naval architect David Wyman (the Wyman formula), and also the Gerr formula for boats operating at speed-length ratios under 2.0. We saw how the Wyman formula provided remarkably good results across the entire range of boat speeds (of SL ratios), and that the Gerr formula generally gave slightly better results at SL ratios under 2.0 (even though the Wyman formula was still quite close).

David Wyman has written me with improved calculations for determining the Wyman coefficient. These make his already excellent approach still more accurate. The overall Wyman speed-and-powering formula is unchanged; this is just tweaking the coefficient to get still more precise results. The updated Wyman formula is thus:

#### The Wyman Speed Formula

The Wyman speed formula requires two steps:

- 1) Determine the Wyman coefficient (Cw)
- 2) Calculate the boat speed in knots

Cw = 1.0, when SL ratio is less than or equal to 2.0  
 Cw = 1.0 + ((SL ratio - 2.0) x 0.19), when SL ratio is greater than 2.0

$$\text{Kts} = \text{Cw} \times \sqrt{\text{WL, ft.}} \times \sqrt[3]{\frac{\text{SHP}}{\text{Disp., lb.} \div 1,000}}$$

This can be rewritten to solve for required SHP as:

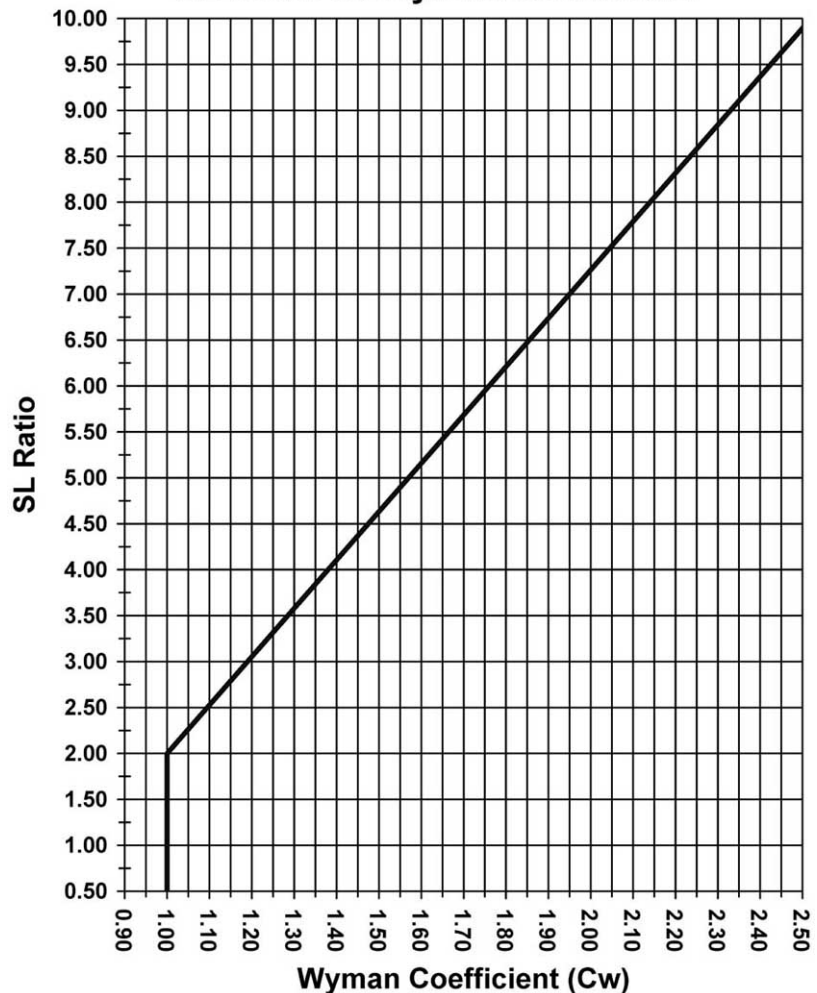
$$\text{SHP} = \left( \frac{\text{Disp., lb.}}{1,000} \right) \times \left( \frac{\text{Kts}}{\text{Cw} \times \sqrt{\text{WL, ft.}}} \right)^3$$

Divide SHP by 0.96 or 0.95 to find required engine BHP.

Where:

Cw = Wyman coefficient

#### SL Ratio vs Wyman Coefficient



SL ratio = Estimated SL ratio

Kts = Speed, knots

WL = Waterline, ft.

SHP = Total installed shaft horsepower (use 95% to 96% of brake horsepower, BHP)

Disp. = Displacement, lb.

The revised coefficient can also be read from the graph above. You will find the above adjustment to the Wyman coefficient puts your results even closer to dead on target than the version presented in the previous issue. For a complete understanding of these speed-and-powering methods, be sure to study the article on the Wyman and Gerr speed-and-powering formulas on [page 12, of the June, 2008 issue of \*The Masthead\*, Volume 2, Issue 2.](#)



## Speed Trials

### The Key to Evaluating Your Design's Performance

By Dave Gerr, © 2008 Dave Gerr

*Twice more the trial crew took Walrus out in the Sound, until the inspectors and supervisors were satisfied.*

*"Run Silent, Run Deep,"*  
Commander E. L. Beach

This probably won't surprise you: Boats are not cars. What is surprising to me, however, is just how many sailors seem to treat their own personal *Swift 'n Swanky*, much like a car. There's a tendency to simply fill 'er up, turn the key, and "drive" off. If a Navy or merchant skipper were to manage a command this way they'd—more than likely—be cashiered! The reason is that boats (like ships) are far more complex and differ far more from one another than do cars. In order to fully evaluate the performance of your *Swift 'n Swanky*—or any boat for that matter—you need to systematically test its performance and behavior; you have to run sea trials. Indeed, this is exactly what any commercial operator or naval crew does every single time they take delivery on a new vessel. Proper sea trials for a ship may take several weeks of careful and painstaking work. What's more many of these trials will be repeated again at regular intervals over the life of the vessel—after major overhauls and refits, or simply when a new captain takes charge. Sea trials are not just informative but provide critical information for evaluating your design, applying this data to future design work, and providing valuable information to the crew on performance and range.

#### Full Sea Trails

Now, proper and full sea trials are not just speed trials, but also a systematic evaluation of every item on board: from measuring exact flotation; to testing each item of machinery and equipment; to testing for watertightness of deck hardware, hatches, and windows; to inspecting hull fittings for leaks; seeing that valves function properly; that the electric system is working to spec; and more. All these tests should be planned out in advance, conducted systematically, and recorded in a notebook. The data is then neatly transcribed and recorded to your files, including a notes on all problems found, the corrective measures taken, and the subsequent corrected test results. It's a job of two or three days on an average boat, and several days to a few of weeks on a large complex yacht or small ship. Still, in many ways, the heart of sea trails are the speed trials and that's what we'll examine here.

#### Real-World Speed Trails Usage

A skipper I know ran his fishboat, *The Fisher King*, out to the Banks regularly, always keeping—as he should—a close eye on the weather. Nevertheless, one day he was caught out in a storm and had to motor all the way back in rough seas at low speed. He had less than one-third-full tanks and didn't know what speed would give him the required range under the circumstances. As *Fisher King's* captain put it, "I was

sure we were going to end up calling the Coast Guard. We were running on fumes, when we finally eased back through the inlet!" If he'd had speed-trials data with detailed performance information at hand, he would have had far less worry.

If this weren't enough, getting accurate speed numbers allows you to do basic things like calibrate the knotmeter. A fellow once paid me cash money to "fix" his boat which was "only doing 10 knots." In order to get an accurate handle on things, I ran a measured mile on the boat (this was in the days before GPS) and discovered it was going a full 14.1 knots, while the speedo—which the owner had believed unquestioningly—read 10.7!

#### Trials at Sea

The heart of the speed-trials process is simply taking the boat out and systematically recording its speeds at varying engine rpms. The critical thing is to find speed through the water. In the old days, there was just one way to do this: Running a measured distance at least twice—back and forth. You can usually find a measured mile laid out and surveyed, with range markers set up, within in easy sailing distance. If not, you can pick any two prominent points off the chart—say, between a bridge pier and a shore-based day marker. Run the distance between them and reduce the time to speed using:

$\text{Knots} = 3617.6 \times \text{Distance Sailed, in Nautical Miles} \div \text{Seconds}$

$\text{Knots} = 0.595 \times \text{Distance Sailed, in Feet} \div \text{Seconds}$

(Don't run between two buoys. They can drag and drift around just enough to throw calculations off.)

The ideal run is a good steady 3 minutes. Except on fast boats anything between 1 and 2 miles is about right. A 25-knot boat would then need a trial course of about 1.25 miles for the ideal 3 minutes, but a mile or a mile and a half would do fine. Be certain you've steadied down on course—at the rpm you're testing—before you pass abreast of the first marker, and that you don't alter course or speed until after you've passed the second mark.

#### Radio Days

In this modern, electronic/computer age, the simpler and standard method is GPS. In fact, handheld GPSs are becoming so inexpensive that the old measured mile may soon be a thing of the past. You can read speed directly without taking sights on ranges or checking time. Keep in mind, however, that speed on GPS (or from a radar gun shot from a dock, if you should happen to have access to one) is speed over the bottom, not speed through the water. Just as with running a measured mile, you have to run both ways—

reciprocal courses—and average the results to cancel out the effect of current.

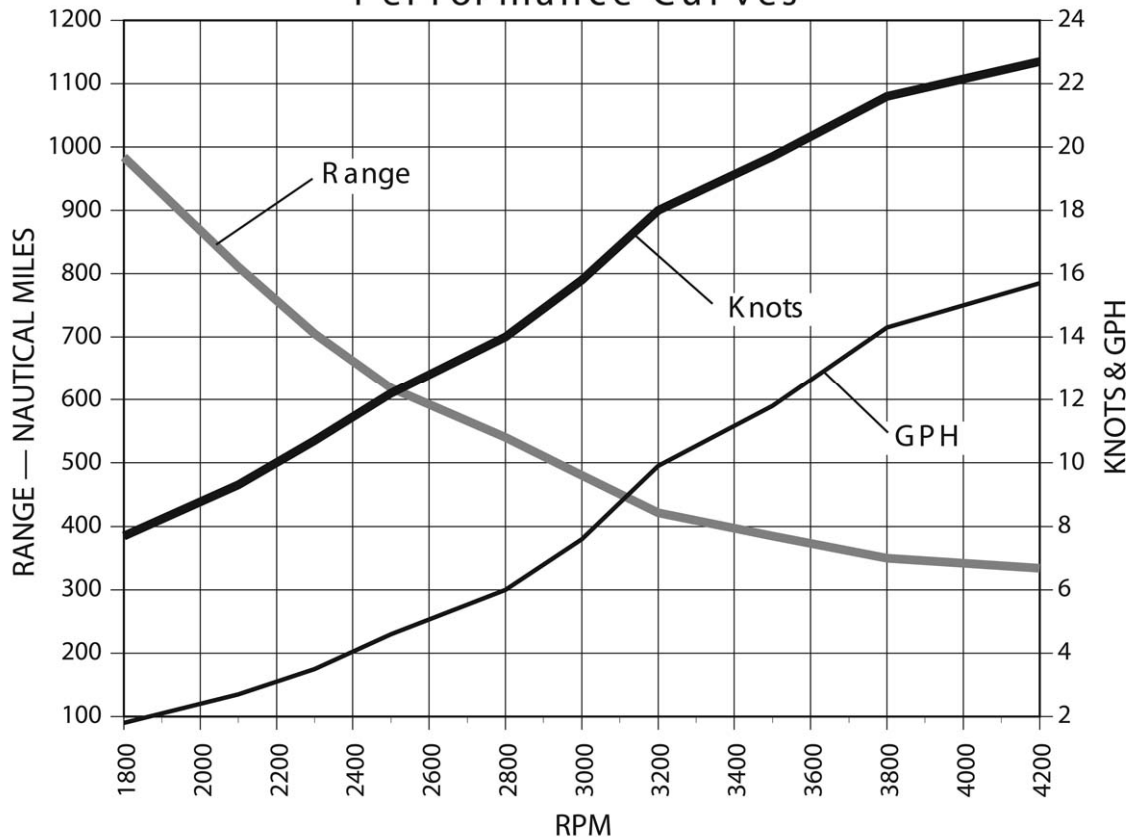
For instance, on one recent trial I ran, the GPS read 30.1 knots at 2,800 rpm, on 245° magnetic, but it only read 28.9 knots, at the same rpm, when we turned around and ran back on 65°. To find the real speed through the water simply average the two speeds (add them together and divide by two). In this case, you'd get 29.5 knots. The difference (between 29.5 and 28.9, or between 29.5 and 30.1 knots) is the effective current of 0.6 knots. Even 0.6 knots is significant, but it's not at all unusual to encounter currents of 1.5 or 2 knots, so running back and forth on reciprocal courses is vital.

The Navy runs boats back and forth 6 times (that's right *six!*), and they'll do it at each rpm being tested—every 200 or 300 rpm over the entire engine operating range. I usually run reciprocal courses at every 200 to 400 rpm one time each, and check to see the results make sense. If speed at one rpm or another seems out of kilter low or high, then I'll run at that rpm two more reciprocal runs to double check.

### The Sea Trials Form

Use the Sea Trials Form (next page) as a guide when you run your trials; it'll help you avoid confusion. Fill out all the relevant data, choose your location and make your runs. The minimum you'll want to do is a pair of back-and-forth (reciprocal-course) runs at: maximum speed, regular cruising speed, and slow cruising speed—six runs in all. Again, I usually do, run every 200 to 400 rpm. (Use 200-rpm increments on slower-speed diesels, and 400-rpm increments on high-speed gas engines.) You simply enter the time, in minutes and seconds, on the table, convert to total seconds (1 min. 26 sec. is 86 sec.) and multiply by distance, using the speed formulas given above. Or—if using GPS—just the course and speed for each run. Put an "M" after the course for magnetic headings or a "T" for true headings.

## "Swift 'n Swanky" Performance Curves



If you're running a twin-screw boat, it's worthwhile doing an additional series of runs, under one engine only. This will give you hard numbers on how the boat will perform if one engine goes down.

### Fuel Hog?

Fuel consumption's a bit more difficult to check. If you're set up for it, you can pipe in a temporary, graduated, clear-plastic fuel container, mounted where it can be read easily and—during each trial run—open and close appropriate valves so that the engine draws fuel only from this container. Clearly, you can read consumption directly, which gives the most precise results, but this is too much of an investment in time, effort, and set-up for many small-craft tests. The alternative is to check consumption just as you do in your car by filling up the tank, running a known distance at a fixed rpm, and then topping up the tank noting the amount needed to fill up. Since you're going to be running to and from the dock, it usually easiest to keep the fuel-consumption trials separate from the speed trials, even though—with proper equipment—it'd be best to do the two at the same time. On gas-engine boats, this is about all you can do; and it is reasonably accurate. On diesel vessels, though, you can take two steps to increase accuracy further.

- 1) Carry a plastic jerry can of diesel with external level graduations in the cockpit. (You'll probably need a

# Speed Trials Form

Boat Name:			Trial Date:		
Design Office			Design No:		
Trial Start Time:			Trial End Time:		
Location of Trial:					
LOA:		LWL:		Beam:	
Beam WL:		Draft:		Displacement:	
Description of Boat:					
Fuel Tanks at				% of Total Capacity:	
Water Tanks at				% of Total Capacity:	
Number of Crew on Board:					
Engine(s)—Model, Rated BHP, Max RPM:					
Reduction Gear—Model, Reduction Ratio:					
Propeller(s)—Diameter, Pitch, Number of Blades:					
Wind Direction:				Wind speed:	
Height of Seas:				Direction of Seas:	

Run	Course	RPM	Time		Distance	Knots
			Minutes	Seconds		
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

Notes:



large funnel and/or a screw-on pour-spout hose-and-nozzle as well). Top up from the pump at the fuel dock, and run out to the start of your measured run. Stop and—using the jerry can—retop the tank. Record the amount of fuel added. Now, make your trail run—back and forth. Using the jerry can or fill up, noting the amount. The amount of this fill-up is the total consumption over your measured trial run. (You can't use this trick on a gas boat because you don't want to take the chance of spilling gasoline underway.)

- 2) A diesel's return-fuel line gets pretty warm—warm enough to heat up your whole fuel tank. Make sure your *Swift 'n Swanky's* been running an hour or so before you start with your first fill-up at the dock—prior to your run. This'll prevent miscalculations caused by the fuel's expansion from heat.

### The Fuel-Flow Gauge Option

There's a third option on many modern boats, and on most of the boats I've designed. This is a built-in fuel-flow gauge. These are installed on the control panel and give the crew continuous, instant readout on fuel consumption. FlowScan is one manufacturer of these instruments. You can thus read fuel-flow rates directly, no measuring, filling, or other steps required. Most modern electronic engines have fuel consumption readouts built in as part of the instrumentation package and don't even need the FlowScan added.

For both gas and diesel—using the fuel-dock-fill-up method—longer trial runs help reduce errors by generating larger measurable quantities of fuel. A run of 20 minutes or so (10 minutes out, 10 back) should be suitable—longer still, though, helps accuracy. If you're going to be running a series of these trials, take pity on the poor fuel-dock attendants. Tell them what you're planing in advance; pick a day that won't be busy; and you might offer a few extra bucks for the privilege of pulling in and out several times and buying dinky quantities of fuel.

The most convenient way to evaluate fuel consumption is in gallons per hour (GPH):

$$\text{GPH} = 3,600 \times \text{Gal. Consumed} \div \text{Seconds}$$

$$\text{GPH} = 60 \times \text{Gal. Consumed} \div \text{Minutes}$$

If our *Swift 'n Swanky* burned 5.28 gallons at 2,600 rpm, over a 21-minute 20-second run, it was consuming at a rate of 14.85 gallons per hour. (20 sec.  $\div$  60 sec./min. = 0.33 min., 20 min. + 0.33 min. = 21.33 min., 60 x 5.28 gal. consumed  $\div$  21.33 min. = 14.85 GPH).

### Recording Your Performance Results

Once you've completed your trials, you need to neatly record your results for easy reference in your design office and for the vessel's crew's use underway. Simply making a table listing the numbers is better than nothing, but drawing a graph is—by far—the best. It takes little time and it allows you to quickly read off intermediate values and see trends.

In the old days, you'd purchase graph paper from your local stationary store and record the plot as described below. You could still do it this way, but today you've got it even easier. Almost any common spread-sheet program will have all graphing capability you'll ever need.

Say good-old *Swift 'n Swanky's* a 29-foot, single-screw, sterndrive, with a 170-hp gas engine, and 230 gallons of fuel tankage. Max rated rpm is 4,200. You've gotten the following trial results:

**Swift 'n Swanky Speed Trial Results**

RPM	KNOTS	GPH	RANGE Nautical Miles
4,200	22.7	15.7	334
3,800	21.6	14.3	350
3,500	19.7	11.8	385
3,200	18.0	9.9	421
3,000	15.8	7.6	480
2,800	14.0	6.0	540
2,500	12.2	4.6	619
2,300	10.7	3.5	705
2,100	9.3	2.7	811
1,800	7.7	1.8	984

To create *Swift 'n Swanky's* performance curves, make the bottom horizontal axis "rpm," and the left vertical axis "range." The right vertical axis will do double duty for "speed" and for "fuel consumption" (knots & GPH). Plug in *Swanky's* trial results and connect the dots. That's it! (This graph is on page 16.) You can smooth out the curves if you like, but it best to leave the performance curves a bit bumpy as your real-world results will probably work out. All this data should go in your design files on this boat. A neat set of the tabular results and charts should go to the boat's owner. I tell my clients to make a few copies at a local copy shop and store at least one with the ship's log or in the chart drawer. Even better, have a copy laminated in stiff, clear plastic. Not only does this protect the graph from the wet, but the crew can draw "figuring" lines on the plastic surface with a grease pencil and straightedge, erasing their work over and over with ease.

### The Get-Me-Home Calculation

Now, armed with *Swift 'n Swanky's* performance curves, the crew can easily find out what speed they need to run at to make it back to port—the information the skipper of *Fisher King* needed. Say *Swanky* is somehow caught out. Perhaps the inlet the crew usually takes is impassable and they have to run further to an entrance that's safer. How does the crew determine the safe speed to get home with a bit of fuel in reserve?

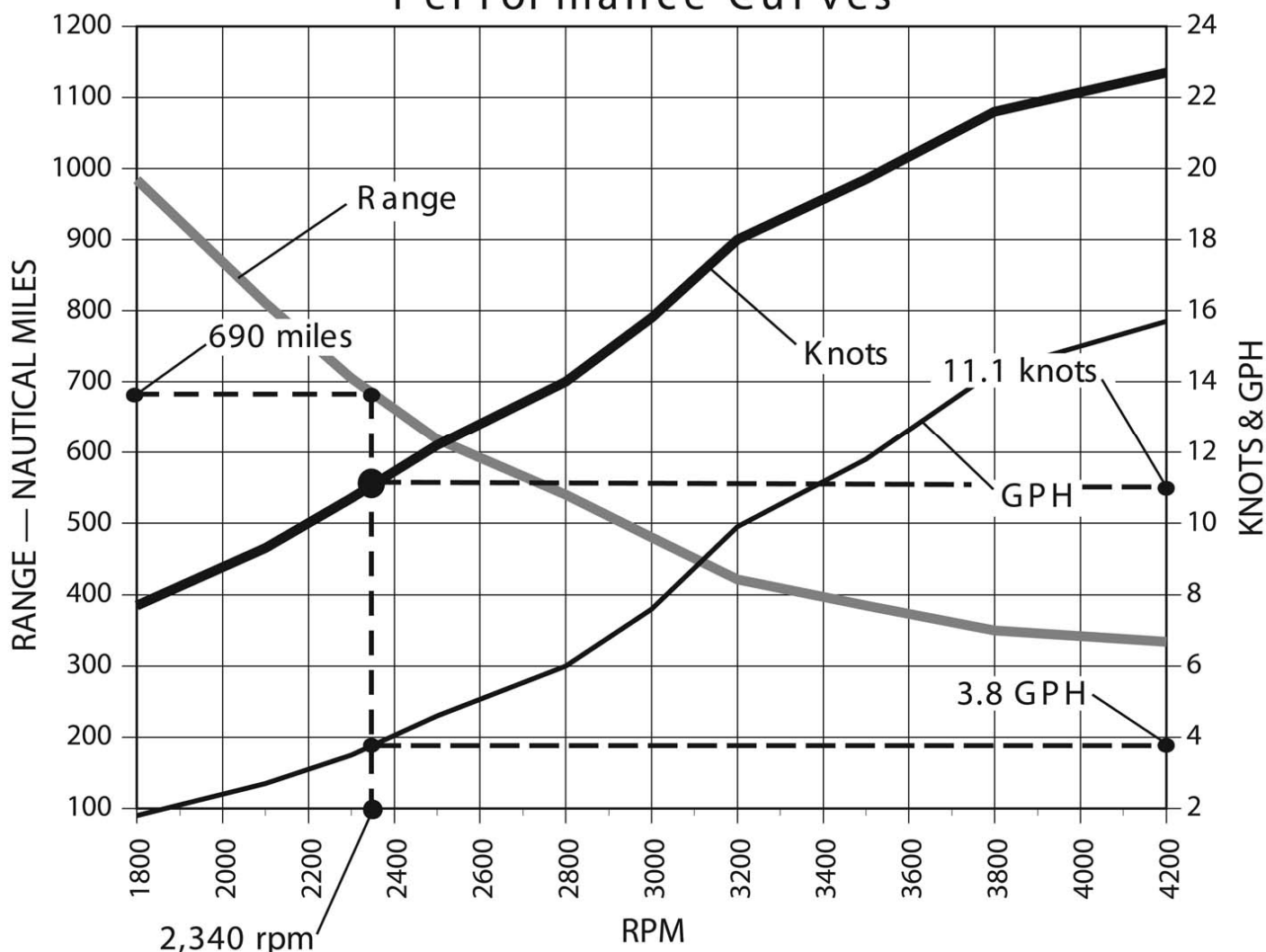
- 1) Check the remaining fuel. Let's, say, it's 75 gallons.

- Plot the distance back, say, as 190 miles.
- 2) Reduce the total fuel remaining by 10 percent to give a reserve. If the weather is bad, increase the distance back by 5%, or by 10% for really rough conditions where it's very hard to hold a steady course. In our example, the weather's bad but not awful, so we'll use a 67 gallons (75 gal. x 0.9 = 67.5 gal.), and we'll use 200 weather-corrected miles (190 mi. x 1.05 = 199.5 mi.).
  - 3) Divide the reserve gallons remaining by Swanky's 230-gallon total fuel capacity to get 29 percent. (67 gal. / 230 gal. = 0.29).
  - 4) Divide your weather-corrected miles by 29 percent to get the equivalent range with full tanks: 200 miles / 0.29 = 689.6 miles, say, 690 miles.

- 5) Read *Swift 'n Swanky's* performance curves, running across from 690-mile range to where this intersects with the "range" curve.
- 6) Dropping down, you'll see that you should run at 2,340 rpm, which should give you just about 11.1 knots, consuming 3.8 gallons per hour.

Since going slower increases range, you'd round down to an even 2,300 rpm—10.7 knots and 3.5 GPH. If—a sometime later—the crew is still worried about progress, they can repeat the get-me-home calculation using the remaining fuel and the remaining distance to go. Not, only is this above invaluable for working out of a long-range scrape, but it's also useful for planing cruises.

## "Swift 'n Swanky" Performance Curves



## Training Links & Events Schedules

### Training Links - For Current In-Class ABYC

To register for an ABYC Education Program,  
click on the event name you would like to attend.

DATE	EVENT NAME (CLICK FOR DETAILS)
Sep 09, 08 - Sep 10, 08	<a href="#">ACR400 - Refrigeration and AC Certification - Philadelphia, PA</a>
Sep 11, 08	<a href="#">EPA100 - EPA Coolant Certification Class, - Philadelphia, PA</a>
Sep 13, 08 - Sep 14, 08	<a href="#">Your Boat 101 - Marine Electrical Systems for the Boat Owner</a>
Sep 22, 08 - Sep 25, 08	<a href="#">ELC400 - Electrical Certification Course, - Somerset, KY</a>
Sep 23, 08 - Sep 26, 08	<a href="#">MCC400 - Marine Corrosion Certification, - Miami, FL</a>
Oct 01, 08 - Oct 03, 08	<a href="#">BEL200 - Basic Marine Electrical, - Jacksonville, FL</a>
Oct 21, 08 - Oct 24, 08	<a href="#">ELC400 - Electrical Certification Course, - Annapolis MD</a>
Nov 05, 08 - Nov 07, 08	<a href="#">BEL200 - Basic Marine Electrical - Portland, OR</a>
Nov 11, 08 - Nov 14, 08	<a href="#">MS400 - Marine Systems Certification, - Annapolis, MD</a>
Nov 18, 08 - Nov 21, 08	<a href="#">ELC400 - Electrical Certification Course, - Miami Beach FL</a>
Dec 02, 08 - Dec 05, 08	<a href="#">DENG400 - Diesel Engine &amp; Support Sys. Cert., - Mystic, CT</a>
Dec 10, 08 - Dec 12, 08	<a href="#">SC400 Standards Certification Course, - Mystic CT</a>
Jan 13, 09 - Jan 15, 09	<a href="#">BEL200 - Basic Marine Electrical - Annapolis, MD</a>
Jan 20, 09 - Jan 23, 09	<a href="#">ELC400 - Electrical Certification Course - Mystic, CT</a>
Jan 27, 09 - Jan 29, 09	<a href="#">BEL200 - Basic Marine Electrical - Seattle, WA</a>
Jan 27, 09 - Jan 30, 09	<a href="#">MS400 - Marine Systems Certification, - Orlando, FL</a>
Feb 03, 09 - Feb 04, 09	<a href="#">ACR400 - A/C and Refrigeration Certification, - Cleveland, OH</a>
Feb 03, 09 - Feb 06, 09	<a href="#">MS400 - Marine Systems Certification, - Portland ME</a>
Feb 05, 09	<a href="#">EPA100 - EPA Coolant Certification Class, - Cleveland, OH</a>
Feb 10, 09 - Feb 13, 09	<a href="#">MS400 - Marine Systems Certification, - Charleston SC</a>
Feb 17, 09 - Feb 19, 09	<a href="#">SC400 Standards Certification, - Portland, OR</a>
Feb 23, 09 - Feb 26, 09	<a href="#">ELC400 - Electrical Certification Course, - San Diego CA</a>
Feb 23, 09 - Feb 25, 09	<a href="#">SC400 Standards Certification Course, - Ft. Lauderdale FL</a>

### IBEX 2008

October 6-8 at the Miami Beach Convention Center



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- Attend FREE Exhibitor Workshops hosted by experts
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 Admission is FREE with valid student ID card or trade business card  
**Be sure to stop by the Westlawn/ABYC booths to meet with our staff.**

[Click Here](#) for more information on events and pre-registration.

### Training Links for Westlawn Distance Study

Click on Topic for more information:

[Professional Yacht & Boat Design,  
 4-Module Program](#)

[Elements of Technical Boat Design  
 \(Formerly Yacht Design Lite\)](#)

[Continuing Education](#)

[Applications & Enrollment](#)



All Westlawn  
 Courses are  
 nationally accredited  
 by the Accrediting  
 Commission of the  
 DETC

### 2008 NMMA Boat shows

#### **43rd Tampa Boat Show**

September 5 - 7, 2008

Tampa Convention Center  
 Tampa, Florida  
[www.tampaboatshow.com](http://www.tampaboatshow.com)

#### **Toronto In-Water Boat Show 2008**

September 11 - 14, 2008

Ontario Place Marina  
 Toronto, ON  
[www.torontoinwaterboatshow.com](http://www.torontoinwaterboatshow.com)

#### **Virginia In-Water Boat Expo & Sailfest**

September 12 - 14, 2008

Downtown Norfolk Waterfront  
 Norfolk, Virginia  
[www.virginiaboatexpo.com](http://www.virginiaboatexpo.com)

#### **33rd Norwalk International In-Water Boat Show**

September 18 - 21, 2008

Norwalk Cove Marina  
 Norwalk, Connecticut  
[www.boatshownorwalk.com](http://www.boatshownorwalk.com)

#### **104th New York National Boat Show**

December 13 - 21, 2008

Jacob Javits Convention Center  
 New York, New York  
[www.newyorkboatshow.com](http://www.newyorkboatshow.com)



## Training Links &amp; Event Schedules (continued)



# RINA

## Royal Institution of Naval Architects 2008 Conference & Training Programme

### SUPERYACHT UNDERWATER CORROSION SEMINAR

8 October, London, UK

<http://www.rina.org.uk/corrosionmanagementcourse>

### FUNDAMENTALS OF CONTRACT & CHANGE MANAGEMENT FOR SHIP CONSTRUCTION, REPAIR & DESIGN

29 - 31 October 2008, London, UK

<http://www.rina.org.uk/fundamentalsOct09>

### MARINE RENEWABLE ENERGY

19- 20 November 2008, UK

<http://www.rina.org.uk/marinerenewableenergy>

### PRESIDENT'S INVITATION LECTURE

5 November 2008, London, UK

<http://www.rina.org.uk/presidentsinvitationlecture2008>

### HIGH PERFORMANCE YACHT DESIGN

2 - 4 December 2008, Auckland, New Zealand.

<http://www.rina.org.uk/hpyd2008>

### WATERJET PROPULSION 5

11-12 December 2008, London, UK

<http://www.rina.org.uk/waterjet>

### INTERNATIONAL CONFERENCE ON INNOVATION IN HIGH SPEED MARINE VESSELS

28-29 January 2009, Fremantle, Australia

<http://www.rina.org.uk/hsmv2009>

### HUMAN FACTORS

25-26 February 2009, London, UK

<http://www.rina.org.uk/humanfactors09>

### FUNDAMENTALS OF CONTRACT & CHANGE MANAGEMENT FOR SHIP CONSTRUCTION, REPAIR & DESIGN

March 2009, London, UK

<http://www.rina.org.uk/fundamentalsmarch09>

### SUPER & MEGA YACHT DESIGN

April 2009, Genoa, Italy

<http://www.rina.org.uk/superandmegayachts>

### SAFEDOR CONFERENCE

27-28 April 2009, London, UK

<http://www.rina.org.uk/safedor2009>

### ANNUAL DINNER

30 April 2009, London, UK

<http://www.rina.org.uk/annualdinner2009>

### BASIC DRY DOCK TRAINING COURSE

11-14th May 2009, London, UK

<http://www.rina.org.uk/drydock2009>

### INTERNATIONAL CONFERENCE ON SHIP MANOEUVRING IN SHALLOW AND CONFINED WATER

13-15 May 2009, Antwerp, Belgium

<http://www.rina.org.uk/bankeffects>

### SURV 7 – SURVEILLANCE SEARCH AND RESCUE CRAFT.

27-28 May 2009, Poole UK

<http://www.rina.org.uk/SURV7>

### WARSHIP 2009

June 2009, London, UK

<http://www.rina.org.uk/warship2009>

### ICCAS: INTERNATIONAL CONFERENCE ON COMPUTER APPLICATIONS IN SHIPBUILDING

1-3 September 2009, Shanghai, China

<http://www.rina.org.uk/ICCAS>

### INTERNATIONAL SYMPOSIUM ON SHIPBUILDING TECHNOLOGY

September 2009, Osaka, Japan

<http://www.rina.org.uk/ISST2009>

### HISTORIC SHIPS

October 2009, London, UK

<http://www.rina.org.uk/historicships2009.html>

### ICSOT: ICE CLASS SHIPS

October 2009, Busan, Korea

<http://www.rina.org.uk/ICSOT2009>

### INTERNATIONAL CONFERENCE ON SHIP AND OFF-SHORE TECHNOLOGY

December 2009, Kharagpur, India

<http://www.rina.org.uk/icsotindia2009>

[www.rina.org.uk/events](http://www.rina.org.uk/events)

If you would like to receive any further information on any RINA event then please contact the events

department: 10 upper belgrave street, London, SW1X 8BQ

Tel: 44 (0)20 7235 4622,

Fax: 44 (0)207259 5912

Email: [conference@rina.org.uk](mailto:conference@rina.org.uk)

**Westlawn students are eligible for student membership and Westlawn graduates are eligible for graduate membership in RINA.**

## Back Issues of The Masthead

Click on the Back issue that you would like to read:

- **April 2007** Tech. Article: Passenger-Compartment Ventilation Fundamentals
- **June 2007** Tech. Article: Stability Is The Key – Part 1, Initial Stability
- **Sept. 2007** Tech. Article: Stability is the Key – Part 2, Reserve Stability
- **Dec. 2007** Tech. Article: Basic Criteria for Powerboat Stability
- **Mar. 2008** Tech. Article: The Concepts and Applications of Tons and Tonnage
- **June 2008** Tech Article: Practical Speed and Powering Calculations

## Ship's Store

[Click here](#) to visit our ship's store for Westlawn caps and tee-shirts, bronze spline weights (*see picture below*), and a selection of marine books.



## Drafting Table Size and Use continued from page 3

course to Module 2, your final work will largely be done in CAD, but your preliminary sketches and preliminary drawings will be done at the drafting table, and you need a table large enough to spread out your CAD plot drawings for review and to display to clients as well.

For example, my own drafting table is 3 ft. x 8 ft. (914 x 2438 mm). I made it over 30 years ago out of a sheet of 3/4-in. (19 mm) plywood and some home-made trestles. The table top is covered with vinyl board cover (which I've only needed to replace once over all these years). I set up the trestles so the table top is angled slightly at 5 degrees.

The entire set up cost me about \$90. Maybe it would be all of two or three times that today. Though most of my office's design work has been done in CAD over the last 10 years, that big drafting table is in heavy use, for:

- preliminary drawings
- spreading out and checking and referring to CAD plots
- reference material
- reference drawings
- 2nd computer

. . . . Dave Gerr

## The Masthead

News from Westlawn Institute of Marine Technology

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We're on the Web at  
[www.westlawn.edu](http://www.westlawn.edu)

## Who We Are

Westlawn is a not-for-profit educational affiliate of the American Boat and Yacht Council (ABYC). Our School is nationally accredited by the [Distance Education and Training Council](#) (DETC), and approved by the [Connecticut Department of Higher Education](#).

## Our Mission

Founded in 1930, the mission of the Westlawn Institute of Marine Technology is threefold:

- To provide our students with the skills and knowledge required to build a rewarding career in the profession of yacht and small-craft naval architecture.
- To support continued growth of the recreational and small-craft marine community through the development of well-trained, safety-oriented, boat designers developing better products for the benefit of the boating public.
- To provide continuing education to marine-industry professionals.



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