

Q & A with Jim Bohart, Hunter Marine

The following is a series of questions posed to Hunter Marine by Jeff Halpern, collected from users of the Cruising World bulletin board during the week of April 12, 1999. The answers are provided by Jim Bohart, Hunter Marine.

CWBB There has been a lot of discussion about Hunter's slogan and seeming mission statement "We go the distance." Some of us wonder whether this is meant to imply that Hunters are built to be oceanic distance cruisers. In other words, does Hunter view their boats as blue water boats?

JB The slogan "We Go The Distance" is the result of a program that indicated a change in philosophy. Hunter became involved in 1988 with the Demming manufacturing philosophy and the resultant Total Quality Management programs. We embraced then, as now, applicable techniques in manufacturing to enhance our quality and overall customer satisfaction. We believe that if we can measure customer satisfaction we can continually improve quality. We do measure these areas religiously and apply the results. We know our customer and our product better because of this. Our customer satisfaction program is an integral part of ongoing quality improvement and design. "We Go The Distance" was a way of announcing to the public those ongoing changes. Its relationship to blue water ability is coincidental. Yes today, we view our boats larger than 33 ft. as blue water capable.

CWBB It has been pointed out that Hunter has received the highest level of the EU's new seaworthiness ratings. This rating category indicates that the vessel is designed to withstand conditions of approximately 40 knot. winds and 12-foot seas. Hunter's ads, however seem to suggest that the rating implies that the boats are designed to take anything that they might encounter in open ocean cruising. Are Hunters designed for the kind of conditions they might encounter in some of the nastier areas of the world, such as the major Capes or a North Atlantic passage?

JB All current Hunter boats 34' and larger built for European delivery are certified by IMCI to be in compliance with the relevant parts of the Recreational Craft Directive 94/25/CE. The CE mark means that the craft meets or exceeds all current standards and directives of the International Organization for Standardization in effect at the time of construction. All Hunters 34' and larger comply with the CE A design category. Those built for US delivery would have to have a serial number change that is not accepted by the US Coast Guard documentation service and lack various safety placards, stove shielding, and VHF radio specs required by the IMCI. Otherwise the construction is identical. The specific language used by the IMCI is: "Category A Ocean: Craft designed for extended voyages where conditions experienced may exceed wind force 8 and include significant wave heights of 4m, for vessels that are largely self sufficient." The key you're missing is the word "exceed." Yes, we believe the boats capable of rounding the major capes and of North Atlantic passage; several have. All our boats delivered over the past 5-6 years to our Cape Town South Africa dealer have been on their own bottoms. The skill of the captain and crew, proper preparation, appropriate safety equipment are of course essential to safe sailing and are not included when the boat leaves our plant but can be added.

CWBB There has been a lot of discussion about motion in a sea way on this BB. Is comfortable motion in a sea way something that Hunter considers into the design process?

JB Yes, to the extent that we try to keep weight as low as possible and toward the center of the boat to prevent hobby horsing. Our experience and others who have been offshore for extended periods also indicate that. Most of the boats built today also have options available for inner forestays, stay sails, crash bulkheads, deep fin keels, spinnaker gear, extra winches etc. During the 1998 Carribean 1500, the crew of Passage 450 *Eau-De-Vie* was well rested and reportedly able to cook and even take a tub bath during some of the worst of the weather in route to Bermuda. They were also a largely inexperienced crew who arrived ready to go when they reached Hamilton.

CWBB The EU standards only examine the potential of a boat to sustain a knockdown, and the likelihood that a boat will survive a knockdown should one occur in the conditions included in its rating range. It really does not address construction standards or the type of structural requirements that would be necessary to survive a major knock down. This question is aimed at such items as the large Plexiglass panels used in late model Hunters and the resultant large cut outs in the deck and house these require. This question is aimed at such vulnerable areas as the hull to deck joint, cockpit and deck areas, as well as the general hull design standards. There has been a lot of new

data gathered on the real loads encountered at sea. Does Hunter feel they have designed the structure of their boats to withstand the kind of massive loads implied in the kind of pounding a boat can take in a storm?

JB We feel that the design and construction of more than 27,000 boats has given us experience and knowledge that is incomparable. The severity of a storm is of course somewhat subjective and varies from observer to observer. We design and test our boats to be safe at any time. I am sure that those who have survived the sinking of a craft thought their vessel was the safest thing afloat...then it sunk. We do test for this. Steve Pettengill's job title is: Director of Offshore Testing. He does sail in offshore conditions for extended periods. I know of no better person to do so. Remember he spent one Thanksgiving upside down in Great American off Cape Horn in 100kt winds and 75' seas and has more offshore experience in very light weight boats than most. We will discuss construction further when we get to those specific questions.

CWBB Since a great deal of the Hunter talk on the Cruising World Bulletin Board revolved around the suitability of a Hunter for offshore cruising, it would interest me to find out from the horse's mouth, so to speak, which Hunters in the 35 to 45 ft. length, from, say, 1980 to the present, are especially recommended offshore. Since Hunter has made many models, it is of interest which are preferable for offshore use?

JB Twenty years ago the average offshore cruiser was 30' or so. Today it's evolved to be 40' or larger. Without opening a very big can of worms folks seem to be more comfortable in the larger boats. We have always built good boats. Certainly the larger models have more features conducive to offshore passage making: tankage, stowage, and accommodations.

CWBB Who does Hunter see as its target market? Many think it is relatively new sailors. Is this a fair assessment? Whatever Hunter sees as its target market, does Hunter have some sense of the actual experience level of those who buy their boats?

JB We see the world as our target market and anyone who seeks a comfortable cruising boat. We have dealerships in 43 countries worldwide and boats in about 100 charter fleets. We build boats from 9' to 46' and are finishing the tooling for a new 50 footer that we designed capable of being cruised by a couple and attaining 26 knots. We plan it's introduction at Annapolis in October of this year. We also know our customer very well. In order to build and sell boats we have to grow our customer base, that means living with them and helping them realize the dreams and goals they have set for their sailing lives. Quite a few of our owners are now on their 4th or 5th Hunter and have purchases that come close, if not exceed, \$1,000,000. We survey each customer two times. The data obtained from those surveys has to remain proprietary but suffice it to say that customer loyalty accounts for more than 30% of sales in boats over 40' while the remaining 60% is composed of owners of other boats, about 5% of whom are new to boating. Yes, we need to capture new sailors and we probably try harder than any other manufacturer to introduce people to our sport.

CWBB Does Hunter consider taking all of its knowledge and experience and producing more traditional boats in the future? A product aimed more for the offshore cruiser? By that I'm talking about the 35-40 foot range; making a lower profile hull, with way less windows/windshields, no arches, traveler/main sheeting systems on the deck in reach of the helms person, more square/less round cockpits.

JB Yes and no. We do not see "traditional" as being the market for us. Since 1986 everything we've done has moved us farther away from anything anyone could imagine as traditional other than teak interiors. For the past four years we have been developing an offshore cruiser in the vein of boats like *Route 66* (which we partially sponsored) which used a lot of the technology that was developed on *Hunters Child* and *Tuesdays Child*. The boat (the HC50) is planned for introduction this October. Nothing about this boat says anything about tradition. It is about fast passage making, comfort, and rule breaking. It retains a lot of windows, deadlights and hatches. It has a designed displacement of 18,000 lbs.; transferable water ballast tanks (ala R66, HC, and TC) and incorporates air injection to reduce an already low wetted surface area. Air induction does not work below 16kts and we hope she tops out closer to 25. It's not traditional to place thousands of small holes in your hull below the water line. The interior will be close to the interior size of most modern 40's. The cockpit is sizeable and open, and the nav station might end up being gimballed. It has good offshore berthing and an in-port cabin. It's designed for a couple to go cruising. It won't

be cheap but it will be affordable and available. I'm sure it'll have an arch. Currently production is at Hunter but might be moved later to our custom yard in St. Augustine.

CWBBThis is one of those items that seems to act as a real lightning rod. To traditional sailors, it seems like an affectation. There has been a lot of discussion questioning its purpose, windage, structural design and aesthetics. What is the arch intended to do?

JB The arch is intended to open up space in the cockpit that would be taken up by the traveler and main sheet while still providing for end-boom sheeting. We do feel that end-boom sheeting is more efficient and takes less effort, resulting in lower stress on all components involved (mainsheet, traveler, and deck). We wanted to get the traveler out of the cockpit at the same time. The arch provides an attachment point for a bimini and a location for lights and speakers.

CWBBWhat made Hunter think the arch was a good idea? Before Hunter started using them, arches existed to support radar domes and antennae and misc. equipment but the Hunter arch is pretty unique in that it can't do any of these things. What made Hunter think there was a problem that the arch actually solved?

JBSee above answer. We started using the arch in 1989 to provide a place for the mainsheet and traveler on a center cockpit 42. It worked and the owners of those boats were (and still are) in total agreement with its use. It worked its way into the rest of the line over time. If we thought it wouldn't be accepted in the market we would not have carried it through the line. We like working and have families to support.

CWBBAs someone who has fouled a mainsheet turning block more times than I can count, most times in heavy air, it seems like placing the traveler 6'0" above the deck is a dangerous idea.

JBLast year we moved the traveler control lines down the inside of the arch and exited them right next to the hands of the helmsman. This means you do not have to access the top of the arch to adjust the traveler. Yes I agree it is still possible to foul the mainsheet turning block. We have been using Harken travelers with spring loaded standing blocks that foul less. Still if you stand on the seating the arch is only about 4 ft. away. It's about as difficult as accessing a mid-boom traveler in front of your dodger from the companionway.

CWBBWith all of the skepticism about the arch found on this BB, if they really did not work, you would think that some owners would ask to have their arches removed. Has Hunter had requests to leave them off of a new boat or more significantly, have one removed from a boat after someone has lived with the arch? Any grief from the charter fleets where anything is bound to be abused.

JB Remember the skepticism on this BB is mostly if not exclusively from folks that don't own a boat with an arch. We also know that we can't be everything to everybody and don't expect to cover the entire population and sell everyone a Hunter; competition is a good and healthy thing. All of the current production models offer an option to the arch... with mid-boom sheeting. We have had some takers, but very few. Out of approximately 3500 boats produced with the arch less than 20 have been built without it. It's funny but we have more requests to modify older models to add an arch. I have never known of anyone to ask for the arch to be removed after purchase. Initially some of the boats in charter reported some gel-coat crazing on the inside radius of the upper corners of the arch we warranted the repairs and rethought some of the structure and eliminated that problem.

CWBB It (the arch) is one of those things where, I think, style wins out over function. Style will in time become dated whereas functional designs will live on and retain their value over a long time. Since it is style and not function, it will need to change over time (that's what style is for). At that point, the dated design will need to become a collector's item to retain its value. The Hunter arch, when carrying the mainsheet and traveler, takes on a pretty heavy load. The vertical components and turn to the arch will be taking a lot of flexing stress. How will this and its hull attachments stand up over time.

JBIt's not difficult to argue style. It is important to modify style over time. I agree with you in that the style of some of the arches is a bit extreme. I look for it to be modified over time. It's important to note that style is one of those intangibles that sell or prohibit the sale of a product. We have been running at full capacity production for at least the past 3 years so that style hasn't hurt. I don't agree with the collectors item view of resale. Good market research

indicates that our boats retain strong resale value and this is born out again by owners. (Despite what is reported from some of the den) of course you can always point out an exception but you need to pay attention to the rule. You have of course to compare the original sale price to the boat in question not to the same model in a different year. New boat prices have been escalating at rates of around 5-6% per year or greater. This and an aging used boat market has helped hold used boat values especially for the 3-7 year old boat. There will always be a strong market for used product. If the design is acceptable now it will and has proven to be acceptable in the used boat market later. The arch does take a good deal of loading. Some of the issues with composite engineering are learned with experience. Initially as I noted above we had some problems with flexure in the inside radius that caused gel coat to craze there. We also had to modify the footprint on the deck and the feet of the arch. There are an average of 8 -1/2" to 3/4" SS. bolts (depends on the model) though bolted anchoring the Arch to the cockpit coaming. The bolts would work loose and elongate the holes they passed through. We had to make this a tighter fit and added 3/8" aircraft aluminum plate encapsulated in the feet and deck footprint. We have never had an arch failure.

CWBB What are the rollbars for? - besides main sheet traveler and cockpit speakers.

JB See all the above. It's not to make McDonalds jealous. Your dad must have forgotten the topping lift and dropped the boom on your head when you were young.too bad you didn't have an arch on the boat. :-)

CWBBTraditionally bulkheads have played an important role in structure of the boat. At one time, there was a perception that a mark of the quality of the boat was the spacing of bulkheads and the amount of tabbing tying the bulkheads to the hull and deck. Hunter (and other manufacturers) have gone to open plans down below. How does Hunter deal with the longer spans in the structure in the absence of (or at least minimized number of) bulkheads and glassed in athwartship components?

CWBB Some manufacturers use name designers, such as Farr, Groupe Finot, German Frers and the like. Others like Hunter have an anonymous in house design team. There is an advantage to both approaches. Outside designers often have access to leading edge test data and design facilities and can bring in knowledge and equipment gained on the racecourse and from high budget programs. Having an in house design team allows for an consistency of design approach and building method which in theory helps with quality control during construction. Besides that some of these companies that do use outside 'name' designers still use anonymous in house engineering and detailing teams. My questions here are;

- Who are these people who actually design the Hunters? (By that I mean what are their credentials? Do they come from other design firms? In other words what is their background)
- How sophisticated is Hunter's design process?
- Are you running computer VPP's on alternative designs and weight distributions, for example?
- How about the structural design? Is this done on computers with some of the newer finite energy analysis techniques? Simple empirical static calcs or some of the dynamic loading calcs that have recently become available?
- Do you do any tank testing? Panel and other mock- up destruction tests?
- Is it done the old fashion way (which has worked pretty well for a few millennia) except perhaps for a few calculators.

CWBBHull/deck joint- (This is my question) A number of the bigger Hunters now have outward flange type hull deck joints. In my opinion I believe these are more exposed and vulnerable to damage and harder to repair. I have a series of questions on these:

- How are they built? Are they bolted and glassed or are the glued with a flexible adhesive?
- They are less expensive to build since you do not have to have removable flaps in the mold to form the inward facing flange and it is easier to gelcoat and glass an outward rolling corner than an inside corner. Why does Hunter use outward flange joints? Are there advantages besides cost in the finished boat?
- This technique has been around for decades. I remember hearing about and seeing an older Morgan that had hull deck problems. Have you had any problems with these joints as they get to be ten to twelve years old?

CWBB Different manufacturers handle structure in different manners. Some as mentioned above use bulkheads and furnishings as a part of the structure. Others use molded frames and still others just design the skin to take the loadings. How are Hunters structured?

CWBB What does Hunter use for coring?

CWBB There was a really interesting discussion about Hunters being used in charter boat fleets. In essence, someone pointed out that few things are tougher on a boat than being in charter. A lot of Hunters were (and I assume still are) used in the charter trade which was cited as an endorsement of Hunter's build quality. Has Hunter had any special problems with the boats that have gone into charter? Are the boats built differently if you know in advance that they are going into the charter trade? Similarly, are owners able to order beefed up versions of the stock designs?

JB Ok, an overview of construction.

This does not answer any of your questions in order but I intend it to be a framework to answer those that have been presented. I will of course at times refer back to this answer in the remaining questions you have posed.

The "Hunter Design Team" is no different than, "Group Finot, Bruce Farr, Frer's and the like", (other than that, we are also a manufacturer not just a design team) You want to call it the "Warren Luhrs design team" it's up to you. Warren just doesn't enjoy the limelight. It took a lot of coaxing to get him to present his name on any advertising. He is a great man to work with.

We build our tooling "in house" we have farmed (not a joke please don't take this wrong) out some in the past, but since 1992 our capability has grown, all tooling now is produced on site. The engineering dept. consists of a graduate engineer who has worked for the past 6 years in sail and rigging design (Keith Carew), a senior naval architect (Chuck Burns), an industrial designer, an interior designer, and 3-4 supporting field engineers, computer experts, and an R&D team of 20-year experienced tooling construction technicians. Add the consultation of B&R designs, Harken, Edson, UK, Yanmar, Selden, The NMMA (not to offend many others). Then you have to consider the work that's accomplished by dealers, focus groups, and owners through the CSS programs who direct what has gone right and what has gone wrong. Info input from the owners tabulates what features they expect and which they do not like. Warren calls the compromises and sets direction in meetings with engineering, production marking and the like. It goes on from there and changes are common from day to day. Steve Pettengill who is empowered to call changes as he sees them accomplishes prototype development and testing.

The engineering dept. is directly connected to manufacturing and uses "PRO E" software and state of the art computer systems. VPP's and test programs have been routine since the early to mid 90's. 3 axis and 5 axis routers are used to produce exact plugs, fast. We do test all structures, laminates, resins, coring, chain plate pulls, burn test, barcol hardness, rudder and other destructive testing on site and in other labs by independents in the industry.

Hull Lamination begins with 3-10 mil wet passes of ISO-NPG Gel coat, stick metered in 47 places mapped in the mold. After curing we follow with a skin coat of chopped strand built up to 1.5 oz. impregnated with 100% vinyl-ester resin. We use chop to eliminate starch binders found in mat this is the only place in the hull where it is used. The rest of the hull is hand laid 24oz. Woven roving, mat, by-ply, and 2808 stitched glass oriented on stress axis at 045 and 090. impregnated with dicyclopentadien resins for lower emissions. All glass is cut by a computer controlled laser directed cutter and numbered and inventoried prior to installation. This method gives precise overlap of glass panels and insures consistency. Lamination schedules remain proprietary. The hulls of all boats larger than 28' are cored from the water line to the sheer with Baltec Al 600-10 contour core. Baltec taper core wraps the coring to prevent any hinging with the laminate. The keel embossment, center line, waterline, areas of the bow and transom, rudder tube, and chain plate bonding areas are then massively reinforced. The chain plate areas in a 430 by way of example are composed of 28 layers of by-ply and 2808 stitched glass. A series of solid glass top hat beams and stringers are 100% over bonded to the hull bottom using 24oz roving in 12-16" widths and polyester bonding putty where inaccessible areas are joined. The beams forward of the sump work with the chain plate bonding area to form a ring beam and carry the mast and rigging loads once the deck and liner are joined; the bulkheads are then filleted, bonded fore and aft 100% to hull sides and deck receivers. The entire inner surface is ground smooth and accessible areas gel-coated and finished to prevent splintering.

Decks are coated with Neste's MaxGuard UV Stabilized gel-coat. This prevents chalking and retains a luster that does not need waxing. The deck is FRP same as the hull but cored with 4"x4" bricked marine plywood and wrapped in taper core. Wet out on all six sides this gives a cellular effect to the deck and prevents water migration through the core should it ever be penetrated. 1/8" and 3/8" aircraft aluminum is encapsulated to isolate and provide backing plate for hardware installation. All load bearing hardware is bolted through this plate, nutted and fender washers added. Other non-load bearing hardware is drilled and tapped into the plate for deck access. The liner is pre-wired and access conduit with chase lines to connect accessories is installed from the mast step to the chart table and from the transom to the main saloon and helm. All wiring is marine grade boat cabling tinned and annealed. A/C wiring is rated at 600v. The chain plates and compression post are bonded to the keel. All FRP components are sounded with phenolic hammers and inspected for voids.

We make our rudders and rudderposts on site. The rudder skins are made with bi-axial stitched glass and vinyl ester resin. The tubes are made of a series of uni-directionals wrapped around a Mylar skinned balloon bolted into a mold and compressed with low pressure air till cured, (the Mylar wrap eases removal of the balloon). The post is then glassed into the rudder to a depth of 3/4s of the depth of the blade and all voids are filled with urethane foam. Destructive testing on a 40.5 rudder and compared to a 1/4" dia. 4" stainless post and ss webbed blade accomplished some interesting results. The blades were placed in a jig bolted to the floor and brought under strain with a winch connected through a 4" hole in the lower part of the blades, a load cell placed in line recorded the results: at around 6000psi the FRP and stainless structure collapsed. At over 9000 psi the jig containing the composite structure collapsed, The composite structure survived the test. We've been using this system for the past 5 years and the rudders have proven to be lighter stronger and non-corrosive. We tested them in Charter fleets prior to introduction in the general market.

Hunter Mills all its teak from rough-cut stock in a computer assisted mill. All flat stock is A/A grade marine ply and we mill solid Corian for counter tops, Starboard for seating and wood replacement on deck, and also mill Lexan and acrylics. The cabinetry is assembled in modules and incorporates glass from the small parts mold room for reefer's and heads etc. The woodwork is finished with Daly's Seafin and Profin. All the cabinetry is either glassed to the hull or screwed into cleats and bulk-heading using SS fasteners.

Hull/Deck joints are outward lapped flanges. The joint is prepped and then filled with 3M 5200 and bolted on 6" and 8" centers (depends on the size of the boat) using 1/4" SS aircraft style nuts and bolts 360 degrees around the perimeter of the hull. It is then capped with a heavy-duty vinyl rub rail. No it might not be the best hull/deck joint but it ranks right up there with them and provides some unseen benefits. It does provide a strake for protection of the hull side and it does place hundreds of potential leak points outside the hull. This joint has been in use for 20 years and has stood the test of time. Surveys of damaged boats from Hurricanes and collisions indicate the strength is substantial, durable, and easily repaired. We do two leak tests of the boat one is done in an enclosed spray room for 4 hrs and the other is a pressure test and soap spray to pinpoint the leak prior to shipping.

Keels are through bolted into a solid keel embossment. The keels are solid lead hardened with 3% antimony. The bolts are j-hooked 316 SS and drawn down to appropriate cataloged torque setting sealed with epoxy bonding compd., and the joint glassed and faired.

All hull port lights are 7/16" thick polycarbonate sealed in place with Dow Corning 795. Deck hatches and opening ports Lewmar aluminum framed ocean series polycarbonate (lexan). Deck port lights are acrylic and also sealed into a 4" wide embossed flange set in 1" of DC795. Note: the use of acrylic in the larger deck ports is safer than the use of polycarbonate. They both are good materials and have similar strengths. The point impact strength of Lexan (polycarbonate) is 200 times greater than acrylic. While this is good for bullet proofing it does not indicate the best loading strengths. The tensile strength of Acrylic is 10,000psi and for Lexan is 9,000psi. The tensile modulus for acrylic is 400,000psi and Lexan is 345,000psi. Flexural strength of acrylic Vs Lexan is 15,000psi Vs 13,500psi while the flexural modulus for acrylic Vs Lexan is 450,000psi Vs 340,000psi. These are results from G.E. on 1/4" thick material and using the various cataloged test methods. ASTM D-638 and 790. The thermal coefficient of expansion for both materials is the same.

All masts are provided by Selden the anodizing is twice the thickness of any other spar at 20 microns. All stainless fasteners are isolated from contact with the aluminum and the fittings are premium. All hull through-hulls are silicone bronze backed with 1/4" to 1/8" treated marine plywood and topped with silicone bronze seacocks. All

hoses are double clamped with marine-grade Stainless Steel hose clamps. Martec makes the props and shafts are all aquamet Stainless Steel.

CWBB Building boats involves a lot of hazardous materials and potentially hazardous procedures. Bigger boat building companies have traditionally had a large turn over as workers become sensitized to materials. How does Hunter address this? Boatbuilding has often employed minimum wage workers who were treated as expendable. What is Hunter's policy on this issue?

JB If you ever get a chance to visit Hunter we invite you to anytime. We give tours daily at 9am, 11am, and 1pm. or on an appointment basis at other times. The tours are conducted by the line employees not the Marketing dept. They are proud of their jobs and take time out of production to show you around; nothing, other than engineering and R&D is off limits and photos are allowed. The average employee has been with the company over 8 years and there are quite a few who started with us 20 years ago. Hunter is one part of a larger Corp., The Luhrs Marine Group headquartered in St. Augustine, Fl. with production facilities there for Luhrs Sport Fishing Boats, Alachua Fl. for Hunter production, a new plant just outside Savanna for the production of Mainship Trawlers, and a Production facility in Southern New Jersey for the production of Silverton Yachts. There are around 1200 or so employees total with about 400 at Hunter. Alachua is a small farming community located in North Central Fl. just minutes North of the campus of the University of Florida in Gainesville. Most of our employees and their families have lived there all their lives. There is a strong work ethic among us. Styrene levels are kept way below minimum acceptable levels. Many substitutes for VOC's are employed to keep the environment in and around the plant far below acceptable levels. Boat building can be and is enjoyable work. In every possible way employees are motivated to stay and grow. The former (now retired) President of The Luhrs Marine Group started out as a laminator 25 years ago. The current president of Hunter has been with the company for 20 years and worked up through the ranks. As well as complete medical and dental insurance, a matched 401K program, wages that for the community are stronger than other manufacturing facilities in the area, we own 30% of the company and are on track to buy the entire operation through our ESOP program over time. Stop by next time your traveling through I know you will be impressed.

CWBB Why does Hunter use an outward facing flange hull deck joint?

JB We do use outboard lapped flanges because they are easier to construct than inboard flanges. We cycle tooling at a rather high rate and to obtain that rate sometimes we need two to four sets of identical tooling. That adds up fast because tooling is the major investment in FRP construction. I don't argue that an inboard lapped flange is better. But I will argue that an outboard flange for the reasons mentioned earlier is more than adequate and is construction friendly. It is certainly better than a shoebox joint that provides none of the benefits of either and is more prone to leaking and harder to repair if damaged. But then so would an inboard lapped one be even harder to repair and harder to access it's fasteners.

CWBB Does Hunter manufacture their boats in accordance with the current ABYC standards? If yes, why? If not, why not? If partially, why the areas they do and why not for the areas they do not?

JB Yes the boats are built to ABYC standards. Why? Well when we introduced the 29.5 in 1992 it was a radical departure from what we had in the past been doing. The look, the absence of a backstay, tooling being done from foam cut by 3 and 5 axis routers. It was all a kind of heady experience. We needed to be able to say that these new series were being built according to the highest standards a manufacturer could voluntarily accomplish. So we used A.B.S. and received inspection and guideline for construction, and final approval. The 29.5 were ABS approved, That is why dealers in Southern Cal advertise it as ocean capable and elsewhere it does carry an ABS certificate. ABS did away with its small boat program (I think by 1994) because of some highly published incidents, lack of manpower, and revenue from the program. (This is my understanding but may not be entirely accurate) ABYC then became the best standard we could build too and we never abandoned it. Not everything you do in Marketing is hype.

CWBB I think this is partially related to Hunter's marketing as passagemakers and world cruisers: Looking at a Hunter 43 or 45 interior layout, there is not a single berth that can be classified as a genuine sea-berth. Where is someone supposed to sleep on a thrash to weather in 35 or 40 knots of wind?

JB The interior layouts are designed primarily for families that do not do much extended offshore cruising other than, week ending, a hop to the Bahamas, out to Catalina, or down to the VI. Mostly the folks buying new boats today are not in the 3% or less category that will ever cross an ocean. Boat buyers 25-30 years ago were a somewhat

different breed, they bought the boat from the outside in and the interior space and livability were of secondary concern. That is not true today, customers (want, desire) demand roomy comfortable interiors. Owners want a big comfortable center line or athwartship berth that they can lounge around in at anchor and at the dock get a good nap, sleep at night, or entertain friends and family. That's maybe not what you want and you're correct; there are few if any good sea berths in these configurations. And the fact is, that dealers know all this and aren't going to take an interior designed for that 3% or less crowd. They making a living selling boats (not paying the floor plan company). So when you go through a boat show or visit the dealer or go aboard Mr. and Mrs. X's boat in your marina the interior you're most likely to see is the one just described. We do have several interior options available in every model from the 38 to the 50 that have good sea berths for a crew to go offshore in. By dividing the aft cabins in each, including the 450 and 420 CC., this actually provides 3-4 secure berths. You will, with this arrangement, have 2 aft quarter berths, low down and near the center of gravity. There is a small pilot berth in main saloon with 6'4" length that can be lee-clothed and you can do likewise at the settee as it easily converts to a double.

CWBB There was a discussion about the current trend (not just with Hunter) toward stuffing a head right up in the bow of the boat. Key points were:

- With the head in the bow freeboard appeared to be forced up (and the forefoot forced down) to get headroom this far forward in the boat.
- Placing the head in the bow means that seacocks are also located in this very vulnerable zone.
- Placing a head this far forward would make the head hard to use underway (but as someone pointed out in this discussion, its easier to use a head this far forward, or just use the aft most head) than to try to sleep up in the eyes of the boat.)

JB Yes we forced the free board up in the 450. This wasn't done in the 430 or 410. The seacocks are placed aft of the transducers and are located in a safe zone. This had to be, because the holding tanks are moved aft closer to the center of gravity. As a side note, all through-hulls are silicone bronze with silicone bronze seacocks and all are labeled, the hoses double clamped with quality marine grade SS hose clamps. Having spent over 5,000 NM in transits between Fla., the Dominican Republic, P.R., V.I., the Windward's and Leeward and Bermuda in a 430, I agree that the forward head (unless it's calm or you're downwind) is impossible to use. But the boat has an amidships head and it's useable, or, for that matter so is a bucket and the stern rail.

CWBB There were also some questions about the lack of general storage. In essence this discussion centered on the "price" of the open feel on most modern boats, but especially on Hunters. The feeling was that much of the furnishings were pushed to the edges of the boat, thereby creating a minimum amount of usable storage area. This was further complicated by volume taken up by something that Hunter did very well, which is supply lots of tankage. Where on board are supplies and spares supposed to be stowed? The boat in this discussion was a 45 or 450 I believe.

JBA simple answer here is that sailors have always had to be creative about storage. The grain carrying capacity of one hull (.5 xLxBxD/100), is the same for another except for the amount of furnishings and cabinets installed. We can and will do additional lockers and there are usually five lockers in the cockpit and transom that can carry a good amount of spares. We also finish areas under the floor board that can be used to store items that you do not need to access but rarely (like props, chain, anchors, and line). The 410 has a tool or can storage area with good volume next to the engine room. The 430 has a large reefer and freezer. Storage under the main saloon aft cabins and Pullman as well as 9 small lockers, 2 hanging lockers and one ample wet locker. If you need more locker space we have been known to put it in on request.

CWBB In a related discussion, there are the big open spaces down below found on Hunters which work great at anchor or at the dock, but which are treacherous when heeled over in a seaway. The question here seemed to be, "Why has Hunter (and other manufacturers for that matter) gone to so much deck area down below at the expense of sea berths and storage and ease of movement when heeled hard over?"

JB That is a tough one. We did install more hand holds down below on the 430 Pleiades (the boat that I sail) for that reason. The other thing about an IMS (non-rule driven) hull form is that the flatter you sail them the faster they are and there really is no need to drive them at angles of heel greater than 15 degrees because it just slows them down and increases weather helm. I have sailed on a 77' World Cruiser that had more open space in the main saloon than my living room. I didn't get to make any long passages in rough weather, but I wonder how they see it? I was aboard

"Shaman" in Bermuda; she's pretty open and they've been to some pretty tough places. But then those are modern yachts and more modern designs.

CWBB About the huge centerline aft berths with no sides; are you to wedge yourself in the spaces on the floor when offshore, or rig lee cloths all around the berth like mosquito netting and roll back and forth, back and forth in your off-watch. Also, I would like to know some of the documented "passages" the boats have made and some of the offshore races they have been in, or other proving grounds I can "take to the bank".

JB See above answer: I would install lee cloths!

Taking it to the bank: In 1991, 11 matched Legend 35.5's were sailed from New York to Bermuda with two crew per boat, then used for 15 days of match racing in the Omega Gold Cup. All this in extreme conditions -- some it during the time Hurricane Grace approached the island, and after being trashed by the most competitive skippers in the world at that time (some still are: Paul Cayard, Chris Dixon, Magnus Holberg, Marc Boet, Peter Isler and others). After the competition they were sailed back to St. Augustine by a crew of just two.

In 1990, Jim Bankson and Gary Baillargeon sailed the Legend 35.5 *Another Child* from Seattle to Hawaii and captured a first place finish in the double-handed Pacific Cup, beating several noted Cal 40's.

The 1989 single-handed Trans-Atlantic saw Courtney Hazelton on the modified Legend 45 *Marico* capture a first place finish in the fifty-foot class while recording a record run.

This same boat renamed (Sky Catcher) sailed in the '94 BOC captained by Nigel Rowe, the former Director of the BOC.

During some of the worst weather ever for the St. Pete to Isla Mujeres race in 1996, Steve Curran piloted a Hunter 336 to a first place overall. Most of the fleet was badly mauled and more than half never finished the race.

In the 1998 Trans-Atlantic (Dayton to Bermuda) Gus Williams finished third in his class, sailing a Legend 35.5 with his family aboard. The weather was so bad that only 40% of the fleet finished.

Brad Newell aboard *Wendigo* a Legend 43, departed California the Summer of 1994 arriving in Auckland NZ, Dec 1, 1995. We received a letter from them indicating they had no problems and praising the boat for both it's comfort and sea keeping ability. They might have since finished their circumnavigation.

One has only to contact. Bill O'Reilly, owner of Trident Yacht Sales in Darling, South Africa, to ask about the experiences of the delivery crew that brings him his boats from our yard and delivers them on their own bottoms, 9,200 miles through some of the roughest waters on the planet. I had the opportunity to hear Malcolm Meyers, a delivery skipper and veteran of 19 Atlantic crossings, tell of his 57 day nonstop delivery from St. Martin to Cape Town. During those 57 days he endured three storms, the worst a reported force 10 with seas to 35'. He did endure one knockdown, but nothing major broke and the rig held. His words, "I was impressed." Strike up a

conversation with Chris Oldham who has sailed his three Hunters from Seattle, to San Diego, to the VI, Bermuda, the Mediterranean and twice across the Atlantic. For personal family reasons Chris has withdrawn from the Round World Rally. Two Hunters (another 450 and a 40.5) remain committed.

Pauline and Voytec Dolinski left California and cruised Mexico for months before striking out for Polynesia aboard their Legend 37.5 in March of 1996. We still hear from them they as they continue cruising the world.

Over the years we have commissioned at our Yard in St. Augustine many boats scheduled for delivery in Europe, the Med, Africa, South America, and to charter companies who place them worldwide into demanding service. I could go on, but I think this illustrates the point.