

The Designer Designs One For Himself

By

Robert H. Perry

Naval architect Robert H. Perry lays down the lines and the logic for his ultimate cruiser

This is fun. I am the client. There are no mundane restrictions like cost or resale value, just, “What would you design for yourself?” I am very happy with my present yacht, *Ricky Nelson*, but it is the nature of the designer to always look for new solutions to old problems. This new design, *Eye Of Knute*, represents my ultimate solution for my own needs to date.

My needs are simple. I want a very fast yacht that can cruise four and be singlehanded with ease. I feel the ability to singlehand is the most important criterion for any cruising yacht design. I do not need a yacht capable of sustaining life for months since my cruising will be done in the archipelagoes of the Pacific Northwest and Alaska. Overnight passages will be rare as there are beautiful, secluded anchorages in abundance in this cruising ground. Actually, there is nothing in this design that precludes it from being a passagemaker; that simply is not my style or desire.

I chose 52' as the length overall mainly to ensure speed while providing enough length to treat the overhangs aesthetically. As you study the profile you should remember that there are many ways that I could have made this design faster, but only at the expense of aesthetics. I chose graceful overhangs to give this design a classic look. The tumblehome canoe stern and the slightly reversed bow are stylish treatments that also have positive side effects. The slight hollow in the bow profile allows me to develop some flair in the forward sections which will deflect spray and keep the foredeck dry. The tumble-home canoe stern provides a natural termination to the yacht's shape and helps balance the heeled waterlines. The result is a yacht with a stable, yet responsive, helm. Finally, this profile was chosen to impart an impression of grace and speed.

Fifty-two feet of overall length minus enough overhangs to prevent a snubbed-off look left me with a waterline length of 42'. This should give me a comfortable 8½-kt. cruising speed under power. Keep in mind that the prevailing winds in the northwest are light, hence a powerful auxiliary is desirable.

Utilizing foam sandwich fiberglass for the hull, balsa core fiberglass on deck and frugal use of superfluous interior joiner work, I am quite confident that *Eye Of Knute* could be built to a 17,500 lbs. displacement which is very light, but not nearly as light as many of the new ultra light displacement boats. The result is a displacement to length ratio of 105. Yes, indeed this is light. With the displacement at 17,500 lbs. I can comfortably achieve the interior drawn and

include tankage for 40 gals. of fuel and 100 gals. of water. *Eye Of Knute* is very long and light and will be exceptionally fast.

Beam has been designed to a minimum figure of 11'. The two things that really slow yachts down are beam and displacement. Of course it could be beamier, 11'6" or 12', but that would also make the yacht heavier, slower and more expensive. Cost, remember, is a function of displacement, not length.

One of the problems associated with such a lean hull shape is the inherent lack of stability. To help offset this the keel is designed with a large tank-carrying sump on top, with the lead located in the bottom half. I have done this on a number of new designs and have had excellent results. As long as I do not have to worry about any CGF or other rule affectations I will always try to produce as stiff a design as possible. With tanks and lead located thusly and the hull sections massaged into a stable shape, I think *Eye Of Knute* will be a yacht of more than adequate stability. I do not enjoy sailing on my side anymore than most of you. Considerations in the sailplan will further enhance the stability characteristics of this design.

There was no question in my mind regarding the configuration of the appendages. I chose a moderate-aspect ratio fin keel and a high-aspect ratio rudder set on a full skeg. I'm sure there are few of you left that think full length keels are the best for "tracking." In truth, I have had consistently better results with fin keels of varying aspect ratios than I have had with full-length keels. The key to achieving maximum control with this type of yacht is the separation between the control plane, e.g. the rudder, and the center of the yacht's mass. This is rather a simplistic explanation, but I think the picture it creates is quite accurate. The cleanest example of this feature is the arrow. After all, arrows don't have full-length feathers. The skeg forward of the rudder does tend to reduce the effectiveness of the rudder somewhat, but that is exactly the intention. A pure spade rudder would be more efficient, but it would require more attention to steering. The skeg sets up a flow stream for the rudder to follow and thus produces a yacht with a more forgiving feel. I fully expect *Eye Of Knute* to steer itself equally well as my present *Ricky Nelson*.

Self-steering is one of my prime requirements and I would not desecrate one of my beautiful canoe sterns with a mechanical self-steering device. It is not difficult for the modern designer to impart selfsteering characteristics into a design by manipulating the distributions of lateral plane and hull volume. Note that I have chosen a draft of 7'3". This is no problem in my area. Most of our coves are rocky and quite deep. Nothing helps a boat go to weather more than a big, deep keel. The draft also maximizes the stability of the design. If you cruise in shoal waters there are other possibilities, but they would compromise the yacht's performance.

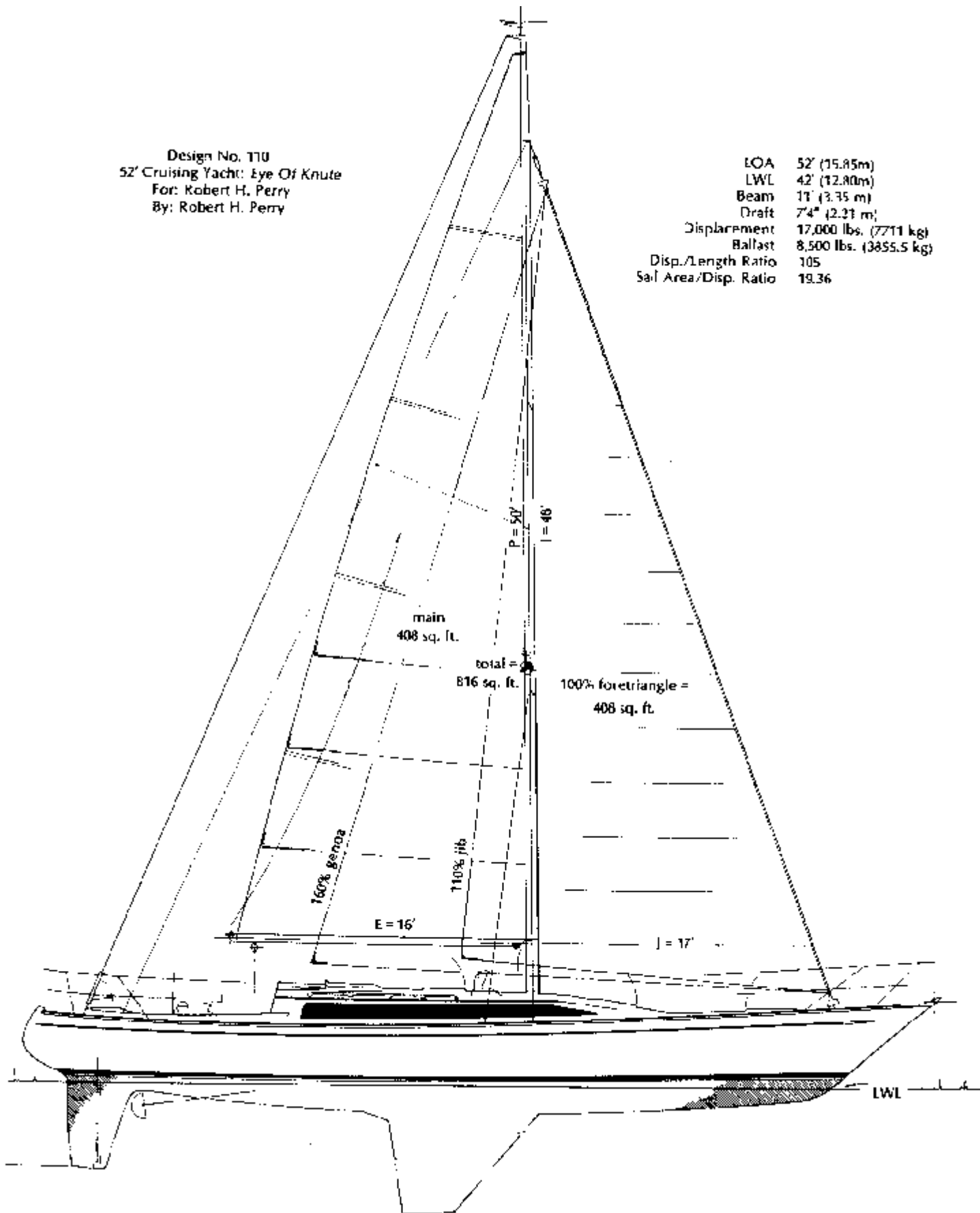
As long as we are talking about the performance, we should go directly to a discussion of the rig. I spent a good deal of time arriving at this rig configuration. The prime parameter was ease of singlehanding. I also needed a rig that enhanced the stability I was seeking. To this end I chose the fractional rig, 7/8 if you like, a rather low-aspect ratio plan. Curiously, and not by intention, the areas of the main and the foretriangle are identical at 408 sq. ft. each. The total sail area is 816 sq. ft. which gives the design a sail area to displacement ratio of 19.36. This is quite high and should indeed ensure excellent light air performance.

I chose the fractional foretriangle in an effort to cut down the size of the jibs. By putting more area into the main and utilizing a bendy spar with a hydraulic backstay adjuster, I end up with a more versatile rig that can be depowered by bending the mast and flattening the main rather than changing jibs. The large main will also enhance the yacht's reaching and running performance and eliminate the struggle of flying a spinnaker when shorthanded. I have drawn two jibs on the sailplan. One is a small lapper, the working jib, that will be used on most occasions. The second jib is a 160% genoa that could be resorted to if I had a mind to do a little friendly racing or just to further enjoy light air sailing. It would not be impossible to rig the design with a Star-type or Etchells-type self-tacking jib. In spite of the relatively small sail area, a yacht of these proportions will still be able to smoke past almost any other sailing yacht on most occasions. I realize that this is a strange attitude for a cruising yacht designer, but my pride gets wounded when one of my designs gets passed by anything.

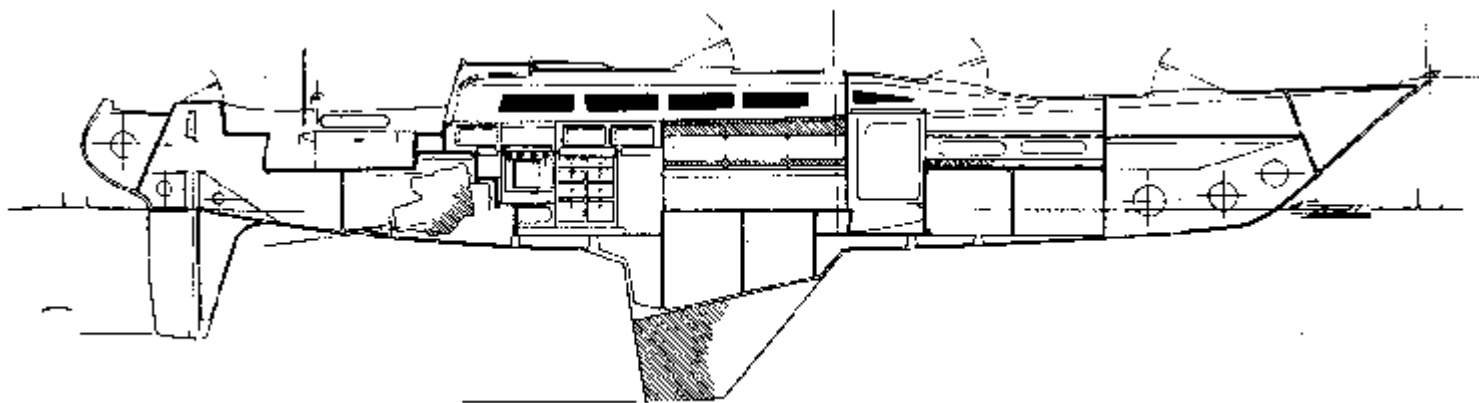
One of the side benefits of the narrow yacht is that the chain plates can be attached to the hull without resulting in a wide sheeting base. On a beamier design, if the chain plates are mounted on the hull, the resulting angle to the tack fitting can be well over 15g. This will never do if you expect to point well. Of course you can move the chain plates inboard on the beamy yacht, but this will most probably interfere with the pilot berths or head compartment. On *Eye Of Knute* the

Design No. 110
 52' Cruising Yacht: *Eye Of Knute*
 For: Robert H. Perry
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LOA 52' (15.85m)
 LWL 42' (12.80m)
 Beam 11' (3.35 m)
 Draft 7'4" (2.21 m)
 Displacement 17,000 lbs. (7711 kg)
 Ballast 8,500 lbs. (3855.5 kg)
 Disp./Length Ratio 105
 Sail Area/Disp. Ratio 19.36



angle from the tack fitting to the chainplates is $13\frac{1}{2}^{\circ}$. While this would not suffice for an Admiral's Cup contender, I think it will be just fine on this cruising design.



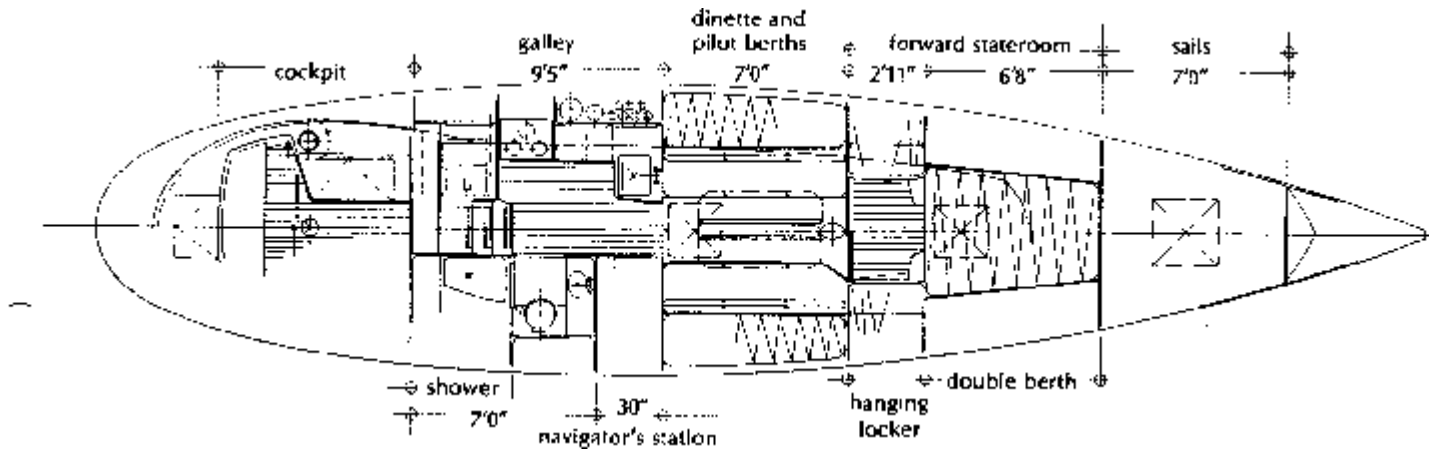
Another point of interest is the placement of the tack fitting. It could move forward to the stem, but I have always liked the look of a rig with the tack fitting moved aft. I think it conjures up images of meter boats. There is a practical side to this placement as well — no one has to work on the bow of the boat. Why get pitched around and soaked with spray if you don't have to? Note that the forward bulkhead is placed to allow efficient fitting of the forward chain-plate. Again, for purely aesthetic reasons I have moved the backstay chain plate forward to balance visually with the headstay. This also puts the self-contained hydraulic adjuster handle within easy reach of the helmsman.

For ease of singlehanding, all halyards lead aft to the cockpit. Jiffy reefing gear for the first reef also leads aft. This adds some friction on lines, but remember cost is no object on my *ideal* yacht. I would settle for nothing less than *all* self-tailing winches.

I have discovered that there is one job I cannot do effectively by myself on my current *Ricky Nelson*. It is very difficult to fold a large jib into a sausage bag alone. This bothers me. I take pride in my ability to handle *Ricky Nelson* without assistance and I regret the need to ask for help when it comes to folding my sails. (Of course I could stuff them into bags, but that is bad form.) The new *Eye Of Knute* will have a luff foil, as does *Ricky Nelson*, but with the addition of a roller furling system. This will allow both jibs to be roller furled, and will still give me a clean leading edge on the sail. The beauty of these new luff foil systems over older roller furling methods is their ability to allow the headstay to be set up tight and the fact that the jibs do not require heavy wire luffs. I have never been a roller furling advocate, but I think that technology has finally produced a system that will satisfy the most demanding sailor. It has to be better than crawling around on the dock trying to fold a sail by yourself.

That brings us to the predicted performance. *Eye Of Knute* will be very fast on the wind and will retain impeccable helm balance as a function of her heeled waterlines and narrow beam. The helm will be feather-light and will not be appreciably changed by the angle of heel. At times the yacht will be a trifle wet as it digs through a sea or two, but, you can't have everything. Reaching and running this design will be untouchable.

Free of measurement rule restraints, the modern Renaissance designer can address himself to clean and efficient hydrodynamics. *Eye Of Knute*, with its beam pushed into the ends, gentle entry and beautifully faired run is an otter among IOR hippopotamuses. A recent sail aboard Bill Lee's *Merlin* proved to me the validity of this approach and I adapted it to the cruising yacht. Fast is fun and when fast is also comfortable, you have an unbeatable combination. Some of you are undoubtedly saying that this is all fine, but what about comfort and cruising amenities? I have no intention of roughing it on my ideal yacht. I want accommodations that are capable of cruising four for extended periods, and have no intention of giving up the comforts I enjoy on my present yacht.



My requirements are as follows: a large galley, a separate shower stall, large chart table, two pilot berths, *high visibility dinette*, a large double berth and a sail locker. I have found these items to be desirable for cruising by myself or with a party of four. Obviously, the interior drawn will sleep six, but I do not intend to cruise with more than four.

We will start aft and work our way forward. To port is the galley with one large sink. There are two banks of drawers adjacent to the sink. I would use a propane stove for the convenience. Aft of the stove is the large icebox. Note that the overall length of the galley, bulkhead to bulkhead, is 9'5". Preparation of food is important to any cruise, and like most sailors my appetite soars when I am on the water.

To starboard of the galley is the head. Adjoining the actual head area is an enclosed shower stall that includes the wet hanging locker. I have difficulty starting the day without a shower and I like to do so without drenching the entire head.

Forward of the galley and the head is the raised, *high visibility dinette* and navigation station. This is a tricky area so we'll go slowly. There is a 10" step in the cabin sole at the start of the dinette area. That's right, there is no headroom in the dinette. But believe me this is no problem. I stole this idea from Bill Lee's *Merlin* and it is perfect. You are hardly aware of the loss of headroom because you are sitting down. The benefit is that you are sitting at the table with a great view out the ports so you don't have to stand up every time that you hear a boat go by. If you are moving forward from the galley, you simply sit on a dinette seat and scoot along in a sitting position until you reach the headroom area forward. I do like to relax and read below while being able to keep tabs on my surroundings. The seat backs are removable, so what before was a settee with a pilot berth outboard become a large double berth. This dinette arrangement is great and very versatile. Thanks, Bill Lee.

The chart table is just aft of the dinette on the starboard side where you can sit on the starboard settee facing aft and navigate comfortably. There still is excellent visibility out the ports due to the elevated location of the navigation station. The top of the chart table is of the same height as the galley counters.

Forward of the raised dinette you go through a sliding door into the forward stateroom. Headroom forward is 6'3" and there is enough space to comfortably pull your pants on. To port and starboard are large hanging lockers and steps to aid climbing up into the double berth. Lockers and shelves are built in outboard of the double berth. Note the hatch for stargazing over the head of the double berth.

Forward of this stateroom is the sail locker. I intend to carry one spinnaker and two jibs, all of which will easily fit into this space. In fact there is enough room here to convert this area into another sleeping space with two pipe berths. All hatches would be high quality alloy frame hatches.

True, this is not much of an interior for a 52' yacht. In fact it is smaller in some respects than the interior of my present *Ricky Nelson* at 37'. But I have achieved a layout that best suits my needs. The priorities have been equally well accommodated in an uncompromising manner. I'm sure that there will be some of you who doubt the workability of the raised dinette. But take my word for it, this does work remarkably well. You no longer have to sit in a small, cavelike area under the deck only to jump up and down with the sound of every wake that goes by.

For auxiliary power, I would use a 30-hp diesel engine located under the companionway steps. This would give me enough power to cruise at hull speed. I do not like to motor so when I have to motor, I prefer to do it quickly and at smooth and quiet RPMs. Notice the generous Iazarette space aft of the engine. I have always favored aft cockpit designs if only for the resulting extra storage space.

It has been a long time since I last sat down and drew a design for myself. Working up these sketches for *Eye Of Knute* has been a very enjoyable experience. All that is left now is to find a builder who is interested in this cruising yacht of the future.

Robert H. Perry, N.A. is a resident of Seattle, Washington, where he has his design firm. Among the many designs from his board are the Valiant 32 and 40, the Esprit 37, the CT 37 and the Lafitte 44. Immodestly billing himself as a Renaissance designer, Perry has drawn upon classic cruising lines and modern sailplans and underbodies to produce boats dedicated to the fine art of cruising comfortably and quickly under sail. The tumblehome canoe stern and cutter rig have become the hallmarks of his designs.