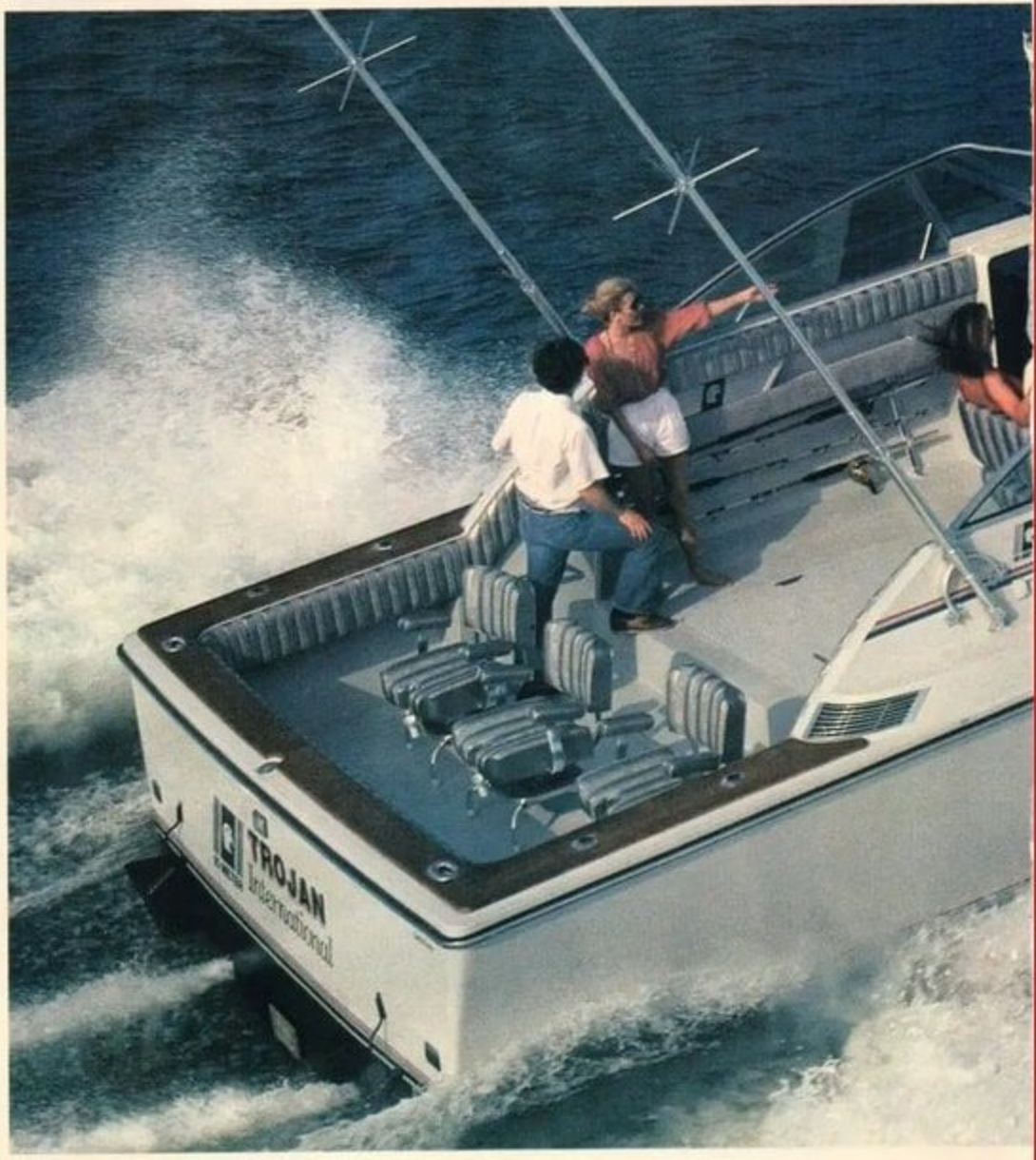
TROJAN'S NEW THOROUGHBRED

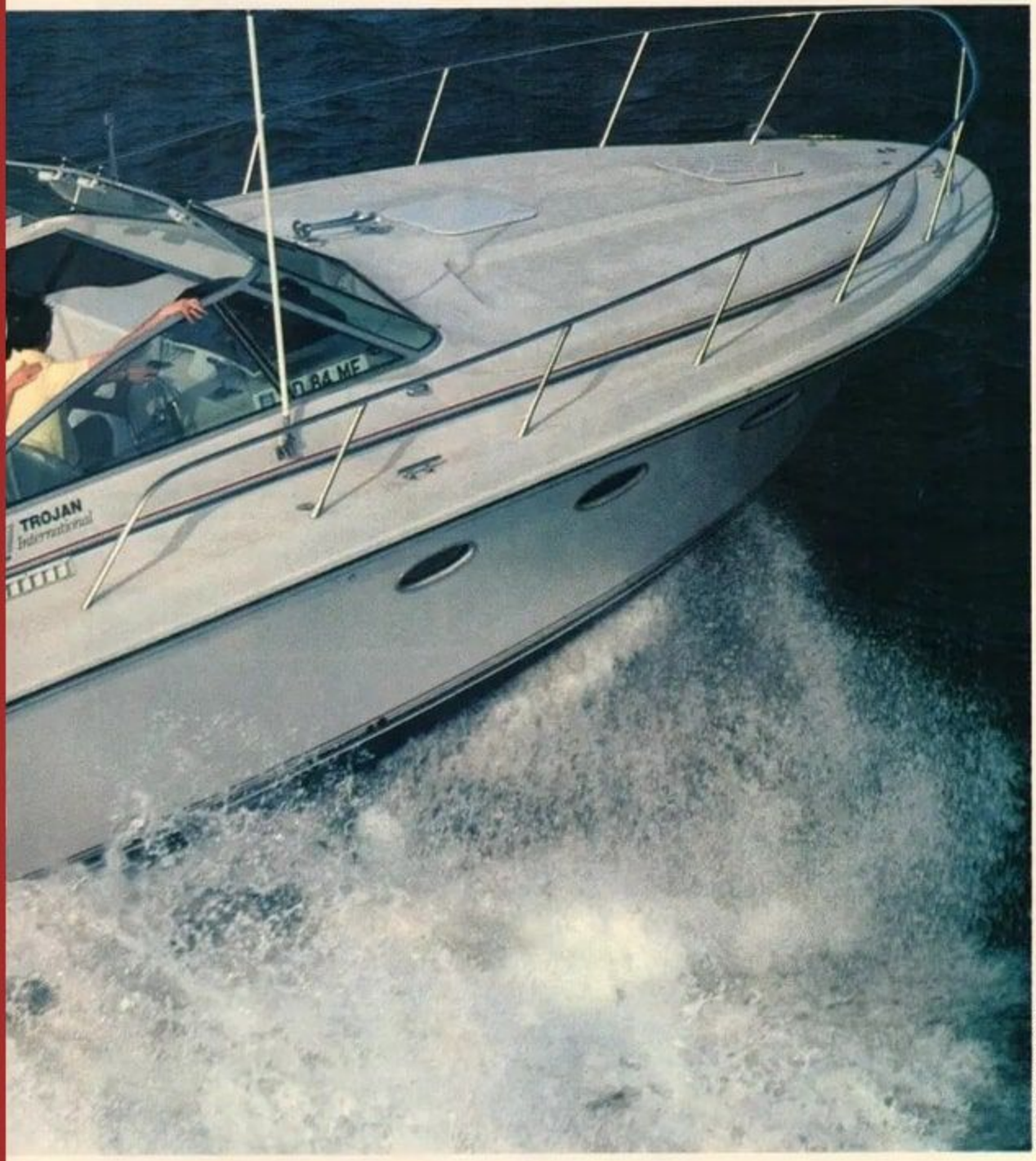
Style, Stability and Chic are modern Graces who ride Trojan's 10 Meter with its radical DeltaConic shape.

BY PETER SMYTH



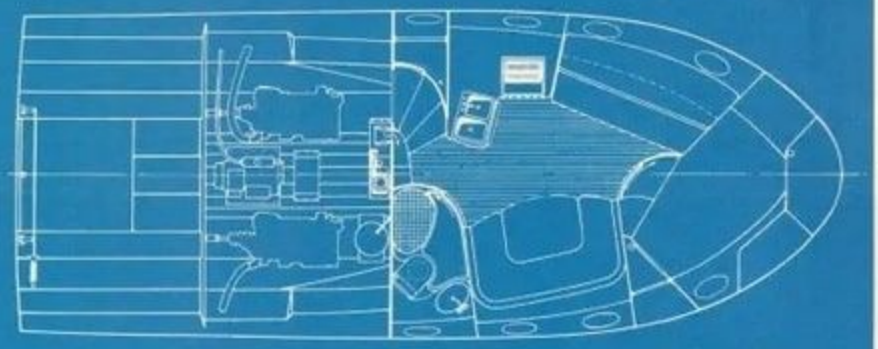
There isn't much question that the new Trojan International 10 Meter was the most talked about powerboat at the 1981 Miami Boat Show in February. Not only is she the most radical boat Trojan has ever produced, but she represents a whole new school of thinking in bottom design, and in structure. Her promoters bill her as the greatest gift to boating since the advent of fiberglass. Her detractors say other things: "She's so fat she's gotta be a pig"; "That bottom has got to pound"; "Those flat chines will slap you silly"; "There's nothing new about her."

Well, they are welcome to their opinions even if they couldn't be more wrong. While it can be truthfully said that no boat is perfect, I will also make the flat statement that the 10 Meter is the best riding, best handling, and most efficient planing hull to appear in many years. And the reason for this combination of qualities is called the DeltaConic—a bottom concept developed by Harry Schoell that was new and different enough a couple of years ago for the taste of the U.S. Patent



Photograph by Peter Smyth

With a length of 33 feet, this International 10 Meter carries a hefty width for her length. The beam of 13 feet is a combination of DeltaConic design plus chines. Note the engine room space in this floor plan, plus imaginative layout of the cabin.



Photographs by John Wisdom

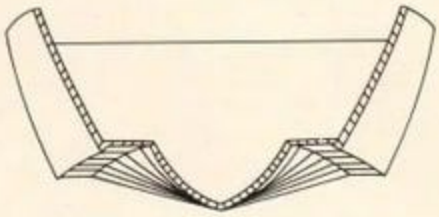
The integrated airplane-styled instrument panel is designed for easy scanning at high speed. The helm seat is of special design to accommodate pilot, plus friend.

Interior photos by Chris Cunningham

Below deck, the compact settee is ample for gourmet dining. Right of settee, the head door operates electronically with manual override. With microwave oven and electric/gas stove, the galley, upper right, works well. The main stateroom, far right, accommodates two with hanging locker at foot of bunk. The head, right, has a unique single-piece towel and grab rail.

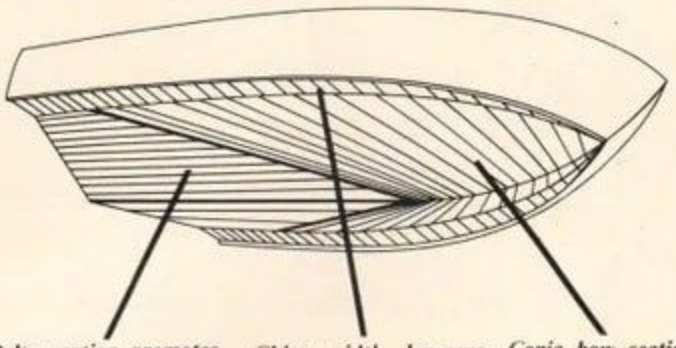
Trojan Fuel, Speed and Sound Facts

RPM	GPH	MPH	DECIBELS AT CONTROLS
1,000	3.2	6.6	67
1,500	5.6	9.3	72
2,000	10.4	11.6	77
2,500	16.0	16.0	80
3,000	24.8	23.5	81
3,500	30.0	28.3	84
4,000	44.4	32.8	85



This cross view shows Conic section and chine. Total chine width, from bow to stern, is approximately 20 percent of total hull width.

The conical surface has no compound curves. A straightedge laid on the section will be in line contact at all times. Delta sections are symmetrically disposed flat surfaces. Conical contour extends ½ hull length at the keel and about ⅔ the length at the chines. Except at tapered bow, chine width remains constant.



Delta section promotes low-speed plane with less wake-making.

Chine width dampens roll, while reverse angle drives spray from hull.

Conic bow section has deep entry with optimum water flow, low drag.

Office. USPO people don't normally issue patents for reworked or old ideas. They did issue one for Schoell's remarkable bottom design.

To understand why the DeltaConic performs so well, we need first to look at older hull forms and their deficiencies.

The place to start is with a plain Jane, flat bottom boat. Strangely enough, perhaps, the flat bottom is still the most efficient planing bottom ever devised. When the bow lifts, and the bottom develops an angle of attack with the water, all the planing forces react straight up and down. All of the boat's energy is converted into lift. Flat bottoms, however, will loosen the fillings in your teeth if you try to run on anything but smooth water.

The logical step was to sharpen up the boat forward so that it could bang into seas with some comfort. This worked well for riding comfort, and is often called a V or modified V bottom. To be absolutely correct, it's a warped plane bottom because of the twist between the relative flat after sections and the sharp forward sections. Today, this type bottom is still used by many builders, including Trojan.

The problem with the warped plane bottom is the difference in angle of attack between the portion of the hull nearest the centerline and the portion nearer the chine. A slice through the boat at each place will reveal that the fore and aft line of the bottom runs at a much lower angle of attack near the center than it does near the outer edges. Therefore, the boat must run at trim angle that is a compromise between the steepest and shallowest angles of attack. This, in turn, means that the outer part develops too much lift and the inner part develops too little. In fact, the inner portion of the hull usually develops a negative pressure. This creates a suction load that the boat must continually battle. Obviously, to win the battle it means a loss in efficiency and increased fuel use.

It was this characteristic of the warped plane bottom that led Hacker, then Lindsey Lord, and then Ray Hunt, to develop the constant deadrise hull, which is better known as the deep-V. This hull carries the high deadrise of the entry all the way to the transom, thus eliminating the warp and its suction load. The deep-V was a vast improvement in seakeeping characteristics, but carried with it a loss of lateral stability, and planing efficiency. The high angle of the deadrise pushes water sideways as well as down. Thus, a deep-V needs more power than other hulls with lower deadrises.

Harry Schoell was in the middle of this development. He cut his designing teeth on both modified and deep-Vs and was actually responsible for the development of a deep-V hull (the AlimV-20) coincidentally with Hunt's development of the form. The concept of running strakes was originally patented by Schoell about 1960. Self-trained and self-tutored, Schoell grew up in the ferment that was the South Florida boat building business, and learned what works and what doesn't work. Over his years in the business of designing and tooling boats, he developed a number of well-known boats, including the Sea Bird; all of Larson's and IMP's current production; the 23-foot Pantera; the 24-foot Donzi (that is now the Sonic), and the 28-foot Magnum (the design that spawned an incredible number of spin-off

Continued on page 102

TROJAN'S THOROUGHBRED

Continued from page 61

performance boats).

Other Schoell ideas include a patented system exhausting engine fumes out the side of the hull (this is aboard the 10-Meter); engines running athwartships to lower their height, simplify counter rotation, centralize their weight and lower their shaft angle (Trojan declined this one); tricky shaft bearings and rudder assemblies that extend the power train and lower the shaft angle for more efficiency (also declined); and some of the most advanced ways of integrating the structure and accommodations for extra strength and simplicity (the 10 Meter has taken full advantage of these).

But Harry Schoell's DeltaConic bottom is probably his most remarkable contribution to the marine world. Development was evolutionary and started in the early 70s. Toward the end of the 70s it was developed well enough to put under the entire North American line, all the IMP and Larson boats, and a group of 37-footers for Stapleton, a work boat builder in Perrine, Florida. It was one of these 37s that made believers of Trojan.

In form, the DeltaConic hull has three basic sections. The planing area is the Delta section and is composed of two triangular flat planes aft. The deadrise is between 12 and 18 degrees, with the 10-Meter's deadrise at 14 degrees. A straight edge ruler will lie flat in any direction on the Delta section. Therefore, it cannot form areas of unequal pressure.

Forward of the Delta, the boat begins to fair sweetly into a fine entry. Each side of the hull is developed geometrically in Conic sections. Once again, by using Conic sections, unequal pressure problems are totally avoided. The entry that results is finer and softer than that of a deep-V.

Together, the Delta and Conic sections form a relatively narrow hull. To increase it to a useful beam, a wide chine with a slight deadrise is added. This enhances stability in a turn, as well as avoiding wave slap under the chine. Casual viewers of the 10-Meter at the Miami Show stated flatly that the chines had to pound. My experience with the boat indicates that they do not.

Finally, the outer edge of the chine has a lip to knock spray down, which it effectively does, making the 10-Meter one of the driest high-performance boats in town.

While Schoell was learning his trade and developing this new and quite remarkable hull, things were going quite differently in other parts of the marine world. Ideas were developing in the traditional cruiser companies, and most specifically, at Trojan Yachts.

This part of the 10-Meter story starts a long time ago in a Lancaster, Pennsylvania, dairy. Two ex-Owens men, Jim McQueen and Harper Hull, armed with a GI loan and a rented truck, had bought the dubious assets of the Trojan Boat Company of Troy, New York, and set up shop in the dairy.

The original Trojan product line was a pair of 13 and 15-foot outboards. Modestly successful, Trojan's first real break was their introduction of the 20-foot Sea Breeze outboard cruiser, the first outboard cruiser that looked like a real boat. Instantly accepted, Trojan sold some 2,000 of them the first year, and in the process put themselves solidly into the cruiser business.

Soon the outboards were dropped and production of family cruisers became Trojan's whole *raison d'etre*—cruising boats for Ma and Pa and the kids; boats that were a good value at a good price so that the middle income fellow could buy

one and enjoy it; boats that were purposely unradical. If they were efficient, reliable, dependable and comfortable, they were also totally without surprises. "Stolid" is an adjective that comes to mind.

Trojan was also very conservative, taking to change slowly, and only after others had done the experimenting and had suffered the failures or savored the triumphs of such experimentation. Fiberglass came very nearly last to Trojan in the cruiser field. In fact, as Trojan's PR and advertising person during the mid-Sixties, I had the dubious honor of introducing the last wooden cruiser to appear in a Miami Show. The year was 1967.

In the 70s, the market began changing too, and changing at an ever increasing rate. Historically, there were outboard builders and cruiser builders. When it came time for an outboard skipper to move to a cruiser, he had to change brands. With the entry of Sea Ray, Bayliner, Wellcraft, and others in the cruiser field, this was no longer so. Too, the newer builders were less conservative, more in touch with the tastes of the times. Their cruisers tended toward the Neo-rocket style. Interiors were plush and more contemporary. Old line cruiser companies' sales sagged.

Adding to the woes of the old line builders as the diminishing ability of the middle class to buy boats of any type. Many families could no longer buy family cruisers.

By the late Seventies, the future of Trojan and other old line companies looked bleak indeed. Trojan president and long-time friend, Don Seith, shared his concerns with me at the Norwalk Boat Show in 1979. Being an avid student of the history of developments of the recreational marine business, I had been aware of the growing problems of the older cruiser companies and was convinced that the answer for them was revitalization via new boats that were a quantum jump over and beyond the offerings of the newer companies: boats that were full of pizzazz, and created for the new market of the well-heeled who could and would pay for luxury and excitement.

TROJAN 10 METER SPECIFICATIONS

LOA	33'
Beam	13'
Draft	24"
Dryweight (aprox)	10,000 lbs.
Horsepower	Twin gas to 540
Fuel	242 gal.
Water	40 gal.
Sleeps	4 to 6
Price per pound	$7.25
Price with twin 270 Crusaders	$72,490

Trojan Yachts Div of Whittaker, Dept. MB&S, P.O. Box 3571, Lancaster, PA 17603

So convinced, I told Seith about Schoell's work, and the rest is now history. After a day or two aboard Schoell's own 37-footer, Seith became a believer, and the planning for the new 10-Meter began. (Trojan also acquired all the North American boats and is now producing them as Trojan Americans).

In step with the basic designing and styling of the boat, planning for the radical structure went forward too. To keep costs and weight down, while enhancing strength and stiffness, the boat is built of five basic moldings: hull, deck, two hull liners and one deck liner. Most of the interior structure is molded into the liners. These are bonded under intense vacuum inside the hull and to the deck. Many of the interior surfaces are curved as well, to promote stiffness yet further. Building tooling of this much precision was involved and expensive, but it resulted in a very strong, but light hull. Liners have, of course, been used often in the past, but only rarely are they fully bonded, structural parts of the boat as well. The sheer on the 10-Meter, for example, is four moldings interlocked,

Continued

bonded, and bolted together.

Other engineering details include: access panels to every part of the boat's inner workings and hidden mechanisms; centralized and instantly accessible panels for the electrical systems; Schoell's patented exhaust system that puts the exhaust into the water along the sides of the boat where it will be carried away instead of blowing back into the cockpit; space age control console that hinges open quickly for access to the wiring; molded-in air conditioning ducts to provide even cooling throughout the boat; specially developed portlights that open with a quarter turn of the fasteners, yet are leakproof when closed, and push button interior doors for the head and forward stateroom.

These last were the favorite toy of the Miami Boat Show and the doors on the display boat were probably operated more than 10 years of normal service. The instant question about them was: What do you do when they won't work? The answer is just as quick: Push them open by hand. The electrical drive is designed to be over-ridden if needed.

They are the final fillip in luxury aboard a boat whose interior was created to be opulent and luxurious. In a total departure, Trojan abandoned the traditional and went to brushed aluminum, wine-red Formica, and silver-gray soft look fabrics throughout. Underneath the new look, however, lurks a standard six-berth arrangement with convertible dinette, a settee that converts into upper and lower berths, double berth stateroom forward, galley aft to port, with head to starboard.

The head is huge for a 33-foot boat, and is all molded for strength and to make it easy to keep clean. An outstanding feature is the stainless towel rack that doubles as handrail for use in a seaway.

The galley is also very complete for a small boat. A new idea is the alcohol stove with an electric cooktop. Also new is the trash container hidden under the center of the L-shaped counter. The remainder is given over to storage for dishes and bottles, toaster oven, optional microwave and under-counter refrigerator.

All in all, a very workable arrangement, as ought to be expected from a company that has been building cruisers for 30 years.

But the interior arrangement is about the only thing that betrays the boat's heritage of family cruiser building. Trojans historically have been commodious livable boats that ran with reasonable efficiency (in wooden boat days they were very efficient), and acceptable comfort in quiet waters. They were not designed, nor were they noted for handling the great, rough waters of a transatlantic crossing. To a boat, the hull was of the modified-V design, with definite compromises between accommodations and seakeeping ability.

The 10-Meter is a total departure, and is one fine Trojan with truly outstanding seakeeping ability. Consider this: We took her out the first Sunday after her arrival in Florida. It was only her fourth day in the water and the second time she'd been in the ocean. The wind was honking out of the northeast at 20 to 30 knots and the Gulf Stream was near its worst. Seas were eight feet or better, with the top two or three feet frequently falling off as breakers. It was a thoroughly mean and nasty day.

We went through the inlet at a conservative 2,700 rpm and then, as our courage stiffened, we winched the throttles up until we were highballing over, around and across the seas at 3,500 rpm or about

28 mph. We were airborne quite often.

At no time did I feel threatened by a loss of control. At no time did we take more than spray aboard (and not very much of that), and at no time did the boat smash into a wave with the teeth loosening jar one might expect. Nor, did the chines slap or pound.

Upwind or down, she handled positively. Her directional stability is uncanny. We let go of the wheel for periods that were quite extended under the circumstances and Schoell later reported running halfway to Miami (over 10 miles) without ever touching the wheel.

But, her most incredible quality is stability. Whereas deep-V will roll until you can barely stand up, the DeltaConic rolls hardly at all. To prove the point, we went dead in the water with the great rolling and breaking seas on the beam. I stood in the cockpit with my feet together expecting momentarily to be thrown for a loss. Several minutes later, as the boat went up one wave and down the next, I was still standing without once having to reach for support. Amazing, truly amazing.

This quality, according to Schoell, comes from the boat's forward end having a different rolling period than the stern. This transforms the desire to roll into a pitching motion. As the boat begins to roll, you can feel the stern lift, meet resistance and then give up the attempt. The result is a weirdly stable platform in the midsts of a heaving sea.

The role of the boat's incredibly wide beam of 13 feet in promoting stability is mixed. It plays a role, of course, but not as large as might be imagined. Wide boats with flat bottoms tend to have jerky rolls. Since much of the 10-Meter's beam is in the wide chines that are often above the water, this jerkiness or quick rolling is subdued, with most of the stability coming, as mentioned, from the double axis of the boat.

Critics also made the statement that a boat this fat would be hard to push, and that would be so if it were all in the water. Since the chines just kiss the water at rest and rise above it upon planing, the actual boat that runs in the water is much narrower and more easily driven. In fact, advancing the throttles and watching her slide up on a plane with hardly any hump is a joy.

And, once on a plane, the boat surely runs. Due partly to light weight of 12,000 pounds, and partly to the inherent efficiency of the DeltaConic, the boat topped out at 32.8mph, while 3,000 cruising rpms produced 23.5mph. This efficiency carries over to displacement speeds as well with the boat achieving 9.3mph at 1,500rpm using 5.6gph.

Power installed in the test boat was a pair of 270-hp Cursaders. Trojan also offers a bewildering array of options ranging upwards from a pair of MerCruiser 470's (140 hp each). Although no boat has yet been built with these tiny power plants, Schoell predicts a top speed of close to 26 mph with them.

If that speed is achieved, Schoell and Trojan have indeed scored an outstanding accomplishment. Even if that mark is missed, the boat, as it stands, is accomplishment enough.

Perhaps the largest accomplishment is Don Seith's, who somehow managed to convince the brass at Whittaker, the conglomerate of which Trojan is a division, that it was right and proper to abandon what they had been doing for thirty years and strike out boldly and expensively in a totally new direction.

The International 10-Meter is the first result of that new direction. Others will surely follow since, as of the close of the Miami Show, dealers had placed enough orders for every boat to be built this model year. $