



Originally called Varn's Infinity, the Merlin's Infinity has one of the most advanced hull designs and power packages in America powerboat racing—watch for it on this year's offshore circuit.

# Merlin's Infinity

## A Design for Tomorrow

BY JANA SOELDNER DANGER

**A**N EXCITING new ocean-racing powerboat designed by Harry Schoell of Fort Lauderdale, developer of the Delta-Conic hull and Infinity Yachts, will be a contender to watch in competition this spring.

The 49½-foot-long, supersleek, tear-drop-shaped *Merlin's Infinity* is the first diesel-powered U.S. boat to run in the American Power Boat Association's Open Class. It is also currently the longest open class boat in the world, according to owner-driver Barry Roth of Great Neck, N.Y. A 14-foot wing with a 15-degree dihedral gives 1,600 pounds of lift at racing speeds and adds to the dramatic, futuristic appearance of the boat.

The boat carries four crew members. Driven by Roth, the boat is throttled by Dick Schwartz of Fort Lauderdale. Bruce Kaplan of Manhattan serves as navigator, and Ben Ligeri of Port Washington is the boat's systems analyst, a new position created by the *Infinity* team. Ligeri's job, he explained, will be to

watch the dials and gauges and monitor the engines so the driver can give his full attention to steering, the throttleman can watch the waves and the navigator can concentrate on the charts and compass.

Other race team members, who work outside the cockpit, include marketing director Tom Robertson of Port Washington, NY, who is currently in negotiations with several sponsors, and rigger Frank Hample, known in the industry by his black cowboy hat logo.

Powered by three 650-hp twin-intercooled, triple-turbocharged 7.8 liter Ford Merlin diesels, the *Infinity* has a top speed of over 100 miles per hour. Based on Ford blocks, the high speed, lightweight Merlins were engineered by Bill Lawson and Mike Davis of Merlin Marine Engine Corporation in Fort Lauderdale. One engine is placed aft; the other two are forward of the cockpit, a feature unique to the *Infinity*, according to Schoell.

The location of the engines al-

lows zero shaft angle, eliminating slippage and increasing efficiency. Some resulting difficulties have been interestingly engineered: To overcome the fact that engine and shaft are at the same level, the port engine drives the starboard shaft and the starboard engine drives the port shaft, allowing the angle to remain at the desired level.

In lieu of transmissions, the engines are run by Gates Polychain kevlar cogbelts, which bring shaft revolutions to 4,200 per minute when the diesels peak at 2,800 rpm.

In early tests, the boat was clocked at its expected top speed of almost 100 mph, said Roth. "Once it gets up and gets going," he added, "it lays down level and flies straight."

Diesels were chosen for their reliability and longer lifespan as well as their lower maintenance cost, according to Ligeri. They are expected to outlast gas engines on the race course, and also to be cheaper to operate. Many gas-powered



American boats fail to finish races because of mechanical breakdowns, noted Ligeri. And, he added, 11 of 15 races in Europe last year were won by a single diesel-powered boat, M. Fabio Buzzi's *Gancia dei Gancia* (see January *Southern Boating*).

Using diesels was one of the first decisions about the racer made by Roth. "This boat was designed for the weight and mass of diesel engines," Ligeri explained. "Diesels are the future, and it's just a matter of getting the power to weight ratio correct."

The greater reliability of the diesels not only means fewer breakdowns on the race course, Ligeri said, it also means fewer costly repair bills. And the diesels use 30 percent less fuel than gas engines, which keeps both cost and weight down on a long race course. The *Infinity* carries 350 gallons of fuel and runs about a mile per gallon.

The team plans to replace the engines this spring with three 700-hp diesels which are expected to increase the boat's top speed.

The *Infinity* is built entirely of epoxy resins rather than with the usual polyester vinyl construction, according to its designer. Although epoxies are difficult to work with and only about three percent stronger than the latest vinylesters, a factor Schoell calls insignificant, the unique construction was done as an experiment. "We did it just to learn more," he said.

With a length under 50 feet and an eight foot beam, the *Infinity* was small enough to be suited to the experiment. The high viscosity of epoxy makes it difficult to use for larger projects, Schoell explained.

Schoell constructed the boat's stepped hull and side decks with end-grain Baltek balsa coring between skins of vacuum-bagged unidirectional glass and epoxy resin. Schoell is an adamant proponent of balsa cores, which he uses in all of his *Infinity* boats. He began using balsa when it was introduced 25 years ago and feels that it remains the best choice available. "Balsa still affords the strongest core material," said Schoell. "And I buy what works best."

The raised deck and cockpit are cored with Durakore, a strip com-

posite material with hardwood veneers glued and hot-pressed on both sides of Baltek polymer-coated AL-600 balsa. The wood veneers provide extra longitudinal strength, and the material is easy to work with. "It's very predictable," said Schoell. "And it's easy and quick to use."

The streamlined curves of the deck and cockpit were achieved by using Durakore strips laid edge to edge fore and aft in a temporary wooden jig, and then skinning the Durakore with vacuum-bagged knitted biaxial glass and high strength epoxy resin.

The deep-vee, stepped-hull design is built to handle rough water and keep the angle of attack at optimum level. "On the model tests we did, even in very rough water the boat still ran level," Schoell said.

A large overhang off the stern of the raceboat holds struts and rudders. The rear engine dumps cooling water through the struts, while the forward engines dump water through fittings attached to the hull step, eliminating the need to pipe exhaust all the way to the stern.

Unlike some racers that look as if they've been tacked together, the *Infinity* is finished and fair both inside and out. "The workmanship is airplane quality," Schoell said, and a look around shows he's right. The engine room is clean and neat. The cockpit is comfortably upholstered and semi-enclosed with a high-impact curved lexan canopy. Curved lexan, by the way, seems to be a kind of trademark of *Infinity* boats; Schoell's large, custom-built luxury yachts, which run up to 145 feet, make considerable use of it.

Inside the cockpit is a separate set of instruments for each of the four crew members. With an eye to safety, the crew also included scuba equipment in the cockpit in case of a turnover. "We don't expect anything to happen," said Roth. "But at speeds of over 100 miles an hour, you never know."

Future plans for the team include two more racers to be built by Schoell: a revolutionary 48-footer built to break existing speed records with a top speed of 150 mph; and a 105-foot *Infinity Challenger* powered by nine Ford Merlin diesels. 