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MANNERFELT
HANSE YACHTS
NDE FOR BUILDERS
END-SWAPPING ANALYSIS

DESIGNER PROFILE

TEAM MANNERFELT

Ocke and Ted Mannerfelt, a talented father-and-son design-and-engineering duo, have a diverse portfolio between them. Their Swedish studio specializes in fast, safe boats. And very forward thinking.

Text by Paul Lazarus

Graphics courtesy Mannerfelt Design Team

At the 53rd edition of the Miami Boat Show, in February 1994, Sweden-based propulsion-equipment manufacturer Volvo Penta was promoting a high-performance "concept boat." In Sweden, its designer (see below) called the boat, simply, *B-28*. With sponsorship, though, comes showtime branding rights: officially, the boat became the Volvo Penta B-28.

Yes, this was hype. And by now, old hype at that. But stay with me here, because the B-28 is well worth it.

First, consider the context of its rollout in the United States. In '94, *2 million square feet* (185,806m²) of exhibit space in and around the Miami Beach Convention Center alone were devoted to production powerboats, engines, and assorted accessories on static display. That massive venue was augmented by multiple in-water displays at marinas and at a separate sailboat show, all nearby in Miami Beach. It amounts to an incredible number of boats, many indistinguishable one from the next, with most of them wearing white gelcoat.

Into this crowded setting, in the water, Volvo Penta introduced a stunning platform for an advanced propulsion system: an inboard-powered, water-ballasted 28′ (8.5m) composite raceboat. Dockside, the first thing you'd notice about it was a shapely midnight-blue delta-wing deck, topping a narrow (less than 6′/1.8m beam) multi-stepped hull. A band of purple colored the deck's centerline, widening as it ran aft from stem to amidships. Seating for a crew of two in the open cockpit was configured fighter jet–style, with the headrest

Above—*A V-40R ("R" signifies racer) flashes the sophisticated running surfaces that Mannerfelt Design Team (MDT) founder Ocke Mannerfelt has been refining since the late 1980s. Measuring 41.9' x 10.2' (12.8m x 3.1m) and weighing 5 tons, the composite boat—created with son Ted in 2010 for Canadian builder Vector Powerboats—achieves 95 knots with 700 hp (522 kW). Vector also produces a fast-cruiser civilian version of this craft.*

behind the rear-seat position fairing into the stern.

Writers for various American and Canadian consumer boating magazines were invited to take a ride, out through Government Cut into open water; however, none were permitted to drive—as they normally might for a review of a conventional production powerboat. At the B-28's helm was Captain Ed Szilagyi, a professional driver (and still a Volvo Penta employee; these days Szilagyi is a regional and government sales manager for the Americas).

The half-dozen reports of the B-28 that reached print describing those demo rides convey a level of honesty not often associated with boat tests in the consumer press. In each case, Szilagyi gave the author the ride of his or her life—at speeds up to 72 knots (82 mph/132 kmh)—without endangering, or even scaring, the rider strapped into the rear seat. Moreover, I've never heard a cynical hint in the trade that anyone's published comments (they *all* raved about the boat) were connected to a Volvo Penta "ad buy" for the periodical their article appeared in.

Okay, let's take our own quick look at the B-28 from the vantage of 22 years after its American introduction. Dimensions: 28.4′ (8.6m) LOA by 9.8′ (3m) max beam; weight, 1,600 kg (3,527 lbs). Builder was Batbyggarna, a Swedish shop. Installed power was Volvo Penta's nominal 385-hp (287 kW) 7.4-liter electronically fuel-injected V-8 engine, mated to the company's DPX sterndrive fitted with counter-rotating propellers and integrated hydraulic steering. The power plant included an onboard electronic control module and automatic overspeed protection. This propulsion package was state-of-the-art at the time, spec'd for the B-28 long before Volvo Penta placed the engine in its product line. (By way of wider reference, in November 1994 Honda Marine would win an award at the now-defunct IMTEC marine trade show in Chicago for its prototype of a 4-cylinder 90-hp [67-kW] motor—the industry's first "big" four-stroke outboard.)

The B-28's distinctive deck delivered a wing-in-ground effect, improving speed, softening landings, and enabling the boat to "fly from wave crest to wave crest," to quote a Volvo Penta fact sheet. The Kevlar-reinforced laminate schedule incorporated Divinycell, a linear PVC foam made by DIAB, another Sweden-based manufacturer. Deep into the 1990s, DIAB, along with every other structural-core supplier, was trying hard to convince the recreational marine industry's production builders to move from single-skin layups to light-but-strong sandwich construction.

Press coverage of the Volvo Penta–powered and –sponsored B-28 made this 28.4′ (8.6m) racing machine—with its narrow hullform and winged deck—the talk of the 1994 Miami Boat Show. While in the U.S. that year, the B-28 successfully competed against APBA-classed American raceboats, thereby enhancing Ocke Mannerfelt's design and engineering reputation well beyond northern Europe and his native Sweden.

MAKING FAST

In the conference room at Mannerfelt Design Team's offices near Stockholm, Sweden, MDT founder Ocke Mannerfelt is sorting through an in-house archive of large color prints; they're all running shots of raceboats created by the firm. If the boat was built after 2006, then Ocke's son Ted gets design credit; otherwise, Ocke did the design *and* the engineering.

What follows, in italics, are pertinent comments of Ocke's as he perused pictures laid out on the conference room table, about whether it's even possible to make fast boats truly safe.

Of course, that's a contradiction: very fast boats, and safety. Because the faster you're going, the more unsafe you definitely are. Over the years we have learned a lot from racing. Racing is not only to make a boat go fast. To make a boat go fast, that's not complicated. Not at all. People don't understand the difference: racing the race course, different waters, different sea states, holding the boat together, holding the crew together, being prepared for everything—and still arrive first, and be able to walk away with a clear head. That *is complicated. Much more complicated.…*

The most dangerous part of going fast is when you feel comfortable, and then—suddenly—you stuff into the water. Just like that. Once you've started to stop like this [Ocke brings out photos of one of his raceboats stuffing its entire forebody] *… This boat is going about 80 mph [129 kmh], a 24' [7.3m] boat. Starting to stuff here, coming up here, and continuing.* That *is safety. To make the boat not dig in like a canoe, not submarine, to recover upward again, that's one thing you have to think of when designing a fast boat.*

A V-40R shown stuffing, and quickly recovering, in choppy seas during an offshore race. The Mannerfelt office owns, to date, 25 UIM world championships—along with an enviable safety record, thanks to assiduous testing before committing a high-performance design to construction.

While hull steps as a discrete technology date to the early 20th century, *multiple* steps on a relatively short, very narrow, deep-V hullform like the B-28's were both novel *and* successful—a difficult feat to pull off. Adding to the boat's bottom complexity was a patented aftermarket product called Speed Rails, whose distribution Volvo Penta assumed via its North American dealership network. These aluminum extrusions, affixed to the strakes on the B-28 brought to Miami, won an innovation award at IMTEC that November. Tellingly, in 2015 a group of Swedish naval architects and marine engineers coauthored a technical monograph describing their numerical modeling studies of "spray sheet deflection on planing hulls"—precisely the result achieved by the B-28's Speed Rails to further enhance its performance and fuel efficiency.

Finally, I'll note that a four-person fast-cruiser version of the B-28, though not displayed or demo'd in Miami, was also announced. It featured side-by-side cockpit seating, a sofa-style bench seat aft, and a bunk beneath the foredeck. Another alternate version of the UIM- and APBA-classed B-28 in Miami (UIM and APBA are initialisms for major governing bodies in powerboat racing) was likewise absent: it had twin outboards. *That* boat, designed to race in the UIM 6-liter outboard class, won UIM Worlds its first year out.

In sum, the B-28 was not merely unique to the '94 Miami Boat Show. There has really been nothing like it at any U.S. boat show I'm aware of in the years since.

Credit for the B-28's design and engineering, as well as for a series of

BOATS SAFE

An outboard-powered XB-23, a test boat, launches off a wave in 2004. Note the winglets, and a canopy that safeguards life and limb. Racing in the UIM 2-Liter class, the 24.3' x 9.8' (7.4m x 3m) boat did 75 knots with 220 hp (164 kW).

The second thing is the canopy. Without the canopy you're just sitting in an open boat. You won't survive, because of the water pressure. And this happens in an instant. Bam! [Slams his hand on the table.] *Just like that.*

All of our current raceboats that are designed to go over 80 mph have a canopy. Shoebox design. Extremely strong. With stringers inside, and a pushbar. Much like a NASCAR racer. We are a small community of designers around the world working together on these things. We buy know-how from each other. If you're strapped in, just like a NASCAR racer, you will survive that one. [Points to another photo of a boat, stuffing.] *And you can continue.*

Totally closed canopy. You have an air intake, which means if you stop the boat [due to a wave impact], water will come in, but you have a large water trap inside. Thanks to that trap you can continue even if you stuff it hard; the water drains, it gets pumped out, and the engine is not affected.…

That, in short, is what a fast safe boat is. Our boats are designed unlike most American boats: at full speed we can turn very hard without the boat shifting; it's tracking all the way. We are designing from experience, with CAD, from knowing what we're doing. And not taking risks.…

With many fast boats today, you can easily buy horsepower that you couldn't get 20 years ago. Inboards or outboards. Put them in or on an open boat, and it becomes for me a spinning wreck. If something happens, it happens so fast you cannot hold on. The risk of hurting yourself, or hurting others, is huge. And people do have accidents. It takes a lot of accidents before normal people understand how dangerous it is.…

Modern offshore sailing raceboats are designed to be self-bailing, self-righting; there is a great deal of new technology. But not in fast powerboats. It has yet to come. If you fall overboard at 65 mph [105 kmh], I think you will survive. Maybe break an arm, but you'll survive. At 70 mph, 75 mph [113, 121 kmh], jumping into the water—I don't think you will survive. You must have luck on your side just to survive. Today boats are doing 90, 100, 120 mph [145, 161, 193 kmh]. When they take off at those speeds, you're lost. Sometimes I feel I'm even a bit too old, because I realize how dangerous it is. Younger people don't understand it. They haven't seen it, as we have.…

One of those to understand is the military. They need to go from point A to point B, and be fit when they arrive. We've done a lot of research for the U.S. Navy. They bought a canopy from us. For testing.…

The best testing is actually through racing. With raceboats, if you're lucky enough to win one world championship, it's difficult, but you have done something good. Win a couple of them, and you think you know a little bit more. Well, we have won quite a number of world championships and still, I'm very careful about what we're doing.…

We'll continue to design raceboats—for our own education. And then we'll make boats like the one you were in this morning, the Dahl commuter—a private boat, a very good boat [see main text]. *Nothing strange. I know that you could go wherever you want with it. It's strong. It won't fail. What you get is…a good fast boat.*

—Paul Lazarus

smaller, evolutionary raceboats that preceded it, belongs to Ocke (pronounced AH-kee) Mannerfelt of Sweden. *Professional BoatBuilder* published a small item on Mannerfelt's Speed Rails in our February/March 1995 issue; and in the February/March 1999 issue we ran a Rovings entry on "a very fast hardtop commuter" rendition of the B-28, briefly produced by a Kentucky builder. That was the last mention of Mannerfelt in the magazine.

So, given a separate reporting assignment in Sweden in May of this year, I arranged a side trip for an article on Ocke Mannerfelt, now working closely with son Ted.

"No one in America had seen multiple steps on a midsize hull before that boat [the B-28] appeared in Miami," Ocke told me, in May. "Later, Ed Szilagyi raced it in Class A, a major class you had for single-engine power; I think our B-28 was 16 mph [26 kmh] faster than the American world champion in that class. After three races, all the American racers were complaining. They said: If that damn Swedish boat competes as a midsize, then they won't race. So the Americans changed the rule in the middle of the season. It was the best advertising I've had in all my life. It meant the American racers knew, *they knew*, our boat was faster. Today, you find plenty of steps in the market. But I believe we spurred it."

Ocke, for whom English is a second language, is speaking to me in a conference room at Mannerfelt Design Team, which occupies a good portion of a glass-walled, curved-roof, penthouse structure. It's a third-floor walkup, built directly above the

The glass-sided Mannerfelt studio, designed by Ocke, sits atop a chandlery and administrative building at a boatyard-and-marina operation in Hamnvägen, near Stockholm. Stored boats in their winter covers appear in the foreground; a small portion of the vast Stockholm Archipelago is visible in the distance.

ground-level chandlery and second-floor admin offices of a boatyard/marina/brokerage/boat-and-motor sales operation situated on Sweden's east coast. From the deck of MDT's greenhouse-like studio space, a visitor can view a tiny fraction of the largest collection of islands in Sweden (and the second largest in the Baltic Sea), known as the Stockholm Archipelago. Ocke designed this skybox where MDT works. We're in Hamnvägen, some 20 minutes north of the smaller of two airports serving Stockholm's metropolitan area. The yard's expansive outside-storage lot is located in a tree-rich residential neighborhood. Stables and paddocks flank the first part of a long driveway that runs past orderly rows of still-covered boats (at this latitude, prime boating season was not yet under way) to the waterfront. A riding school commands the road frontage.

Today, MDT is a three-person practice. Ocke's business card reads "founder and chairman"; Ted's, "CEO and design director." Viktor Nilsson, MDT's young hire as a computer-draftsman and IT guy, assists both

principals but Ted in particular. All the firm's new-builds in the past 10 years have been Ted's design ideas, and we'll discuss MDT's design-and-engineering process in a moment. But let's begin where I did on the day of my site visit: with the founder.

Now in his sixties—slim, fit, soft-spoken—Ocke said his formal education was in mechanical engineering, a versatile discipline. Initially he applied it as an engineer and designer at a Swedish company producing furniture, a five-year stint that taught him valuable lessons in ergonomics and further developed his native sense of the clean, spare, functional lines that define the aesthetic movement known as Scandinavian modern.

On the water, he started in sail, not power. "I sailed a lot as a kid. Raced Snipes, then Lasers, in competition all over Europe. And then moved up to Tornado catamarans, an Olympic class; I had three of those. After a while I decided to design and build my own sailboat—42′ [12.8m], glass fiber, fin keel with a spade rudder, reverse transom, fairly basic boat with a self-tacking fractional sloop rig. A one-off contemporary family-sailer; I think of it as *normal*. People asked me, 'What *is* that boat?' When I told them it's mine and how it came to be, they said, 'I want one.' I took that as a sign and in 1978 put together a boat company to do series production. We sold 58 of those 42-footers in two-and-a-half years. After that I was hooked: my professional life shifted primarily to *boats*."

Primarily but not entirely. What Ocke refers to as "architectural projects" commenced as a spinoff similar to the sailboat venture. "It started with friends asking me to do interesting jobs for them—a barn, a restaurant, a summer house, things like that." Over the years, the portfolio of architectural projects grew. "Today we're doing some private development—exteriors, interiors, furniture, *everything*. I've always been extremely interested in good design. Made myself into a *designer*. When we do a house, I buy the engineering but manage the construction."

His design range, that of a gifted generalist, expanded as the client list grew. Though the 42′ sloop turned into a commercial success, Ocke was sure that "succeeding as a sailboat designer would not be easy, because there are so many good sailboat designers around the world." He decided to enter the domain of powerboats instead, with an eye toward raceboats, where he would rely on this subset of the recreational marine universe as a test bed, a way to increase his understanding of hydro- and aerodynamics, structure, propulsion technology, and boat behavior at speed—even extreme speed—in a seaway. Not incidentally, powerboat racing seemed to be populated with fewer designers.

Another reason soon gave him greater incentive to learn as much as he could about raceboats, especially factors of safety: at age 12 Ted took

Built by Florida-based Mystic Powerboats in 2011, SilverHook is a Ted-and-Ocke collaborative design project. The 46.6' x 8.2' (14.2m x 2.5m) does 100 knots with twin 730-hp (545-kW) engines; 930-hp (695-kW) inboards push the top speed to 110 knots.

up racing—*motorized* racing, much as Ocke himself had pursued sailboat racing at a young age in performance one-designs.

I'd prepared for meeting both Mannerfelts by familiarizing myself with MDT's website, itself an exercise in Scandinavian modern. Meaning, the website deliberately understates the firm's history, research, clients, and accomplishments, but provided me with sufficient background to ask Ocke and Ted questions for further information.

Powerboat racing, for example. Mannerfelt-designed raceboats have won 25 UIM World offshore championships. There are also numerous Swedish and European titles to their credit, as well as recent back-to-back wins in the Cowes–Torquay–Cowes event in the south of England, a punishing endurance race PBB covered not long ago in connection with articles about Sonny Levi and Fabio Buzzi, the British and Italian designer/builder/racers, respectively. Mannerfelt-designed boats finished first overall in the 2014 and 2015 editions of the race, setting a new average-speed record of 96 mph (154.5 kmh) in 2015. Ted did not race that event, but

he *has* driven Mannerfelt boats to Swedish and world championships.

A lengthy list of first-place finishes to date, going back to 1995 involving Mannerfelt-designed boats, is posted on the MDT website, but it gives only the essential facts: name of race, class of boat, record time if appropriate, country where event was held. No mention of the driver. Or race team or builder, for that matter.

Likewise, the client list is less than complete, containing the names of approximately 40 business or government entities, listed alphabetically (A is for Autodesk, U for United States Navy), which commissioned one or more Mannerfelt projects—but with zero explication of the nature or date of the job. Same is true for awards: a baker's dozen are posted, an international medley honoring the Mannerfelt office either for design, innovation, entrepreneurship, engineering, or a combination thereof, dating to 1992.

Although MDT has concentrated mainly on power craft, the occasional sailboat commission comes in. Notable among them: a custom 75.5′ (23m) traditional sloop built by Maine's Hinckley Company (1992), and a redesigned interior (2004) for a 19m (62.3′) classic yacht built in Sweden in 1937. Mannerfelt powerboats, Ocke said, "helped bring in demanding sailboat clients who wanted me to do the details. Or everything." More recently (2006), a Chinese production builder commissioned MDT to design an 8m (26.2′) modern daysailer, a job handled by Ted.

Though Ocke was the competitive sailor in the Mannerfelt family, Ted (a former powerboat racer) gets the design credit for this 26.2' (8m) performance sloop. It's a capacious resin-infused composite production daysailer for Leading Yacht International in Yantai, China. Spars and appendages are carbon fiber.

In 2007 Ted designed the Pirelli PZero 1400, built by Italy's TecnoRIB. The stylish 45.9' (14m) runabout/tender delivers 48 knots with twin Volvo Penta D6 diesels, or 80 knots with a pair of MerCruiser V-8 gas engines. This model was a first-place winner in the prestigious Red Dot Design Award, an international competition.

The diverse Mannerfelt portfolio also offers examples of "product" projects: a proposed floating, hexagon-shaped, wind-turbine farm (2009); a complete surface-drive system for manufacturer Ibis Marine (1992); and a cockpit dashboard array of flush VDO analog instrumentation for manufacturer KG Knutsson (1978), followed by then-new *digital* instrumentation for VDO (1980). The latter two projects speak to Ocke's skill at industrial design.

Regarding MDT's website, Ocke said, "It's solid. We don't show off. Altogether, there may be 30 boats posted there." They're thumbnails, a digital contact sheet. The viewer must click on individual images to see more of that boat (or any of the projects on the site). Representative boats are grouped as concept, one-offs, production, raceboats, or sailboats. The production group contains the most of any on that web page: inboard and outboard runabouts, RIBs of varying size (open and cabin models), sedan cruisers, center-consoles—in effect, a cross-section of the Mannerfelts' contribution to the production powerboat marketplace over the last 21 years. The earliest entry? Nine slides of "daycruiser" versions of the B-28, as built by Batbyggarna. "Overall," said Ocke, "I've designed more than 90 vessels that went in the water. Yes, we are out fishing with the website, which indicates some of

what we've done. To learn more, people have to come to us and ask."

Virtually none of the photos or drawings on the MDT website are displayed at the studio; most of this material is filed away. I don't recall seeing a single racing trophy or similar hardware on display either, or any professional awards, framed under glass and hung. A select few tow-tank and wind-tunnel models, including a sawed-off forebody, are suspended or otherwise exhibited here and there at the studio—strictly for their sculptural appeal, and as bona fide technical artifacts emphasizing the firm's fundamental interest in research.

Now let's look at—up close and personal—the newest boat pictured in the production-projects lineup on the website. It's the Dahl P10 island commuter, a design conceived by Ted. There was one nearby, owned by a family with a cottage in the Archipelago. Prior to my arrival at the MDT studio, Ocke had arranged for the boat's skipper to bring it to the marina.

At the dock, we watched the Dahl P10 approach from far across the bay. It runs level, with little wake. Boarding over the bow, a move facilitated by a pair of tall, freestanding grabrails mounted on the foredeck, we proceeded along the side deck to molded-in steps leading down to the aft cockpit. In the cabin, I took the seat next to the helmsman; Ocke remained standing, behind us.

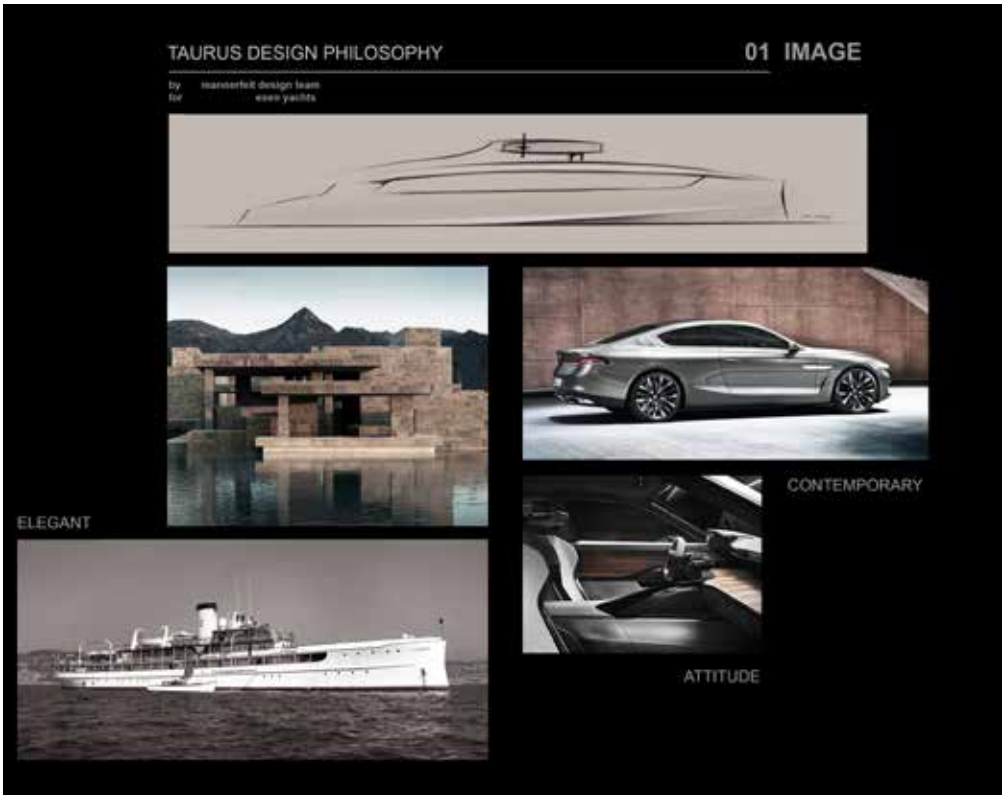
The Dahl P10 is 10.9m by 3.1m (35.8′ by 10.2′), weighs 4.7 tons, and, according to Ocke, will do "around 50 knots," powered by twin Volvo Penta D4-300 diesel engines. It's a

Ted's 2015 design of the Dahl P10 commuter demonstrates how MDT routinely applies racing-derived knowledge to other boat projects. The stepped-hull P10 (35.8'/ 10.9m) is fast (50+ knots), fuel-efficient, and easily handled. A commercial variant is marketed as a multi-mission patrol craft; both versions are available in carbon or fiberglass. The series' build is outsourced to Estonia by the Swedish company Dahl Naval.

cored-carbon boat with a stepped hull, manufactured in Estonia. The Dahl's governing interior-and-exterior aesthetic is unembellished functionality. A small galley and lounge area are to port in a superstructure that features excellent sight lines at the helm and good visibility all around for passengers.

Once we'd picked up speed, the driver put the boat through its paces—a few wide turns, a fast tight turn; ours was the only wake on this wide body of water—before throttling back. We then motored around the bay for a while at cruise. Noise levels were low, inside and out; Ocke could speak to the driver, or me, without really raising his voice. Returning to the marina dock, we disembarked and continued our conversation in the MDT studio.

Ocke: "That boat you just experienced has sold several other boats exactly like it. You noticed with our ride today how easy it was to drive. The helmsman didn't have to touch anything—no flaps, no trim, nothing.



Above—*A 164' (50m) motoryacht by MDT for Esen Yacht, a Turkish yard. Hybrid power gives the model, called Taurus, a top speed of 35 knots. For this concept project, Ted Mannerfelt turned to different sources for design cues,* ***facing page****. Before joining with Ocke 10 years ago to help establish MDT, Ted attended university in England, attained a master's from the Royal College of Art, and worked in Jaguar's advanced-design department.*

It just comes. And *that* is what an inexperienced boat driver wants. Like when you rent a Hertz car nowadays, they let you drive anything on the lot, because with a good rental car today, everybody knows how to drive one, it works well, you don't have to teach people how to drive it.

"Twenty-five years ago, all cars had different . . . operating systems. You didn't know what would happen in wet weather, or snow. Today, even economy cars have antiskid and other safety features. You take it out, and it works. That's where *we* want boats to go: safe to operate, large enough to be comfortable, and yet fuel-efficient. Most of the pleasure boats we—MDT—are designing today have these features built in. That comes from racing boats. We learn a lot from racing boats. The main reason for racing *is* to learn. Learn fuel economy. Learn safety. Learn easy-to-drive. Because that will be the future of boating: jump into the boat, start it, drive. Next, you activate the map, the C-map, point on it where you want to go, and the boat will *almost* guide you there. You have to help it of course, the boat is not entirely autonomous, not self-driving, but that day is not far off. Those computer programs are aids; they aid you. And good structure keeps a safety cell around you, though you don't notice."

Ocke paused. "Early stepped hulls

were dangerous. They could roll over. We have done lots of trial-and-error with models: trial and error, computer, computer, trial and error. I think we now know pretty well at least *what* we're doing. Maybe it could be done better, but we know what we're doing. The Dahl commuter *behaves*. It behaves predictably. And if you check the numbers, you'll be amazed at the speed and performance we're getting: about 20% faster than it theoretically should be, with 20% better fuel economy. It's a good boat. For me, the decisive factors are: fast, safe, fuel-efficient. Fine. I like that."

As mentioned previously, Ted Mannerfelt began racing boats at an early age. But he didn't start *designing* them, with Ocke, until 10 years ago. Before that, Ted was with Jaguar, in the British automobile manufacturer's advanced-design department. I'll put his place in that company in perspective: Ted estimates there were 2,000 people in research-and-development at Jaguar during the four years he worked there. Within R&D, Jaguar's design office had a roster of about 100. "That includes modelers," he said. "In advanced design, where I was: *four*."

How did he land an elite role at Jaguar? Nearing the end of his undergraduate studies in transportation design, in England, Ted circulated his portfolio of conceptual automotive designs among various car manufacturers. Invited to interview with several of the companies he'd submitted work to, Ted chose Jaguar. "I liked the people there. Open-minded. Making modern cars." And Jaguar apparently liked Ted, because the company not only hired him, it put him on the payroll while he studied for a master's at Britain's Royal College of Art, and paid his bill there as well. "When I was with Jaguar [during the early 2000s]," he said, "we were thinking about 15 years ahead, in terms of the product lineup."

MDT's website offers a chronological sampling of Ted's automotive projects. "In all my projects," he said, "I was trying to take inspiration from the past, see what the image of the car company really stands for; it should reflect the new design." He believes he's brought that kind of thinking to *boats* at MDT. "Our computer program here is not like an engineer's straightedge design. You can have free-flowing surfaces. You can experiment much more with a design surface. It's inspiration taken from . . . cars. About 10 years ago, that's when I saw an opportunity in the marine industry. It has started to happen, in some companies, particularly motoryachts: to actually step outside traditional boats into more daring design. I want to be part of that moment, to change some of the thinking about pleasure boats. You don't have to take a huge step. But, step by step, make boat design a little more modern, using fresh thinking each time." A few builders of very large motoryachts have indicated interest in exploring Ted's way of thinking, including an appropriate limousine tender to accompany such a superyacht.

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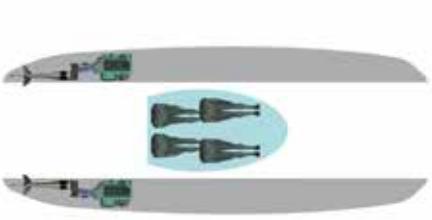

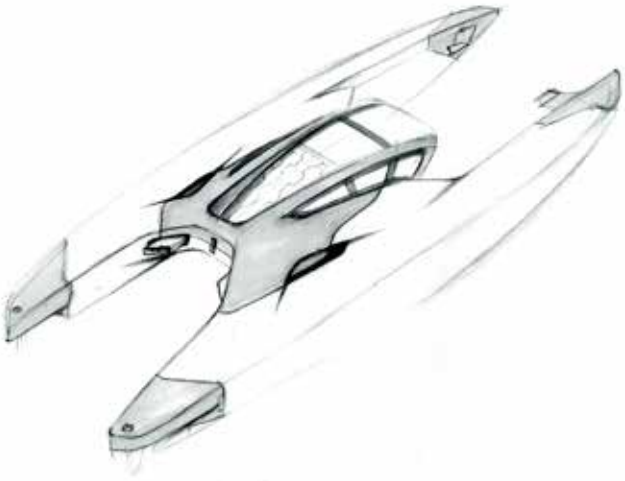

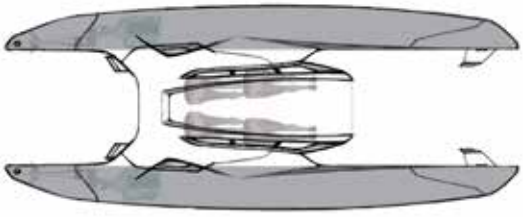

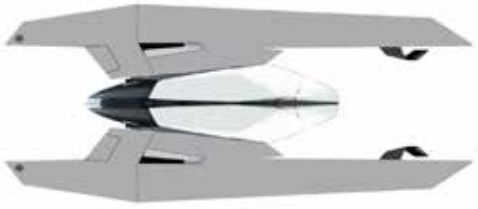

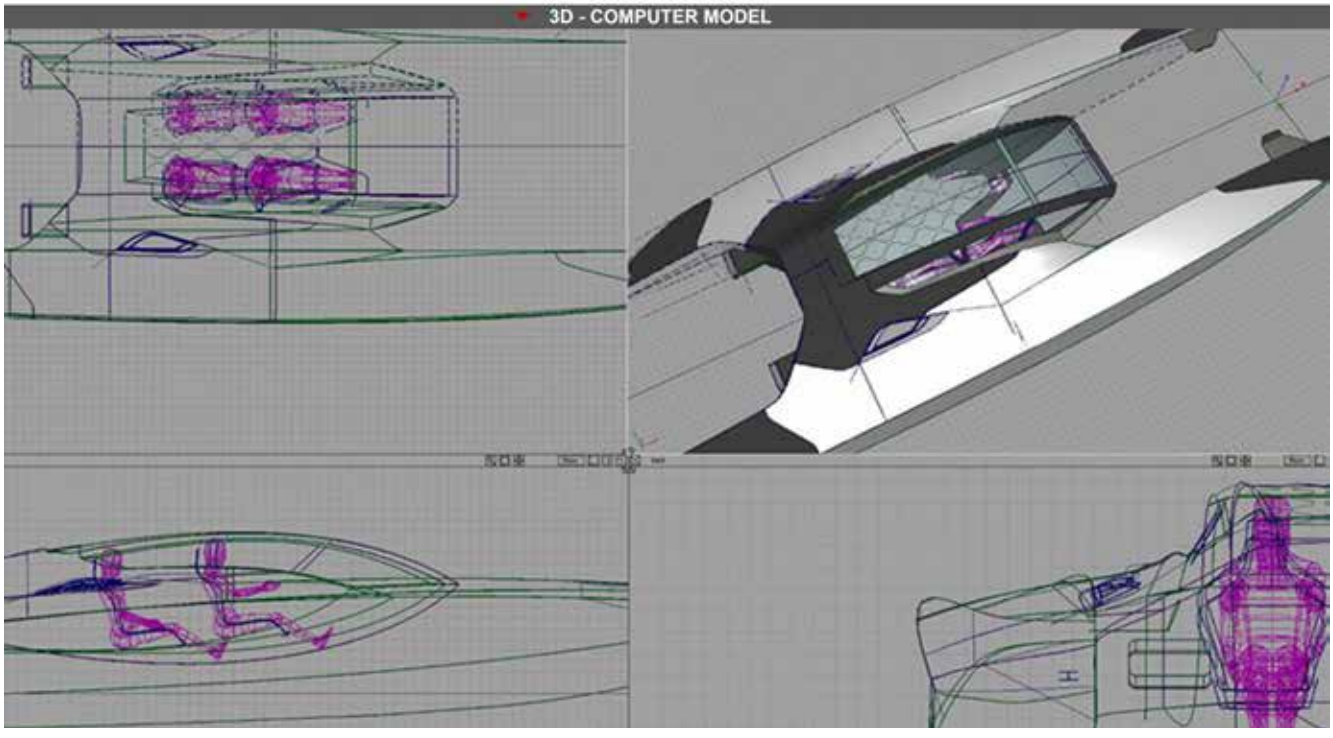
3D - COMPUTER MODEL

Facing page—*Nero is another Mannerfelt concept project. Ted began with a proven MDT hullform: the 105-knot outboard-powered cat, upper left, designed in 2007 for Victory Racing Team. He then considered a clear-plastic cockpit surround, similar to a basic helicopter's, for visibility and the heightened sensation of speed. Additional prompts came from iconic Star Wars imagery. Beneath those, we see Ted's freehand sketches above a batch of computer-aided drawings—en route to the rendering,* ***above,*** *of the finished product. MDT is currently negotiating with a yard to build Nero; the 31.8' x 13.1' (9.7m x 4m) hybrid-power cat will be an 80-knot ride with twin Volvo Penta D3 220-hp diesels.*

Ocke and Ted maintain separate spaces in the studio, but their computers are linked, and they communicate with each other verbally, in low tones, with evident ease. Ocke handles engineering problems and solutions as well as the firm's paperwork; Ted manages MDT's design work. "I have the tiller," Ocke said. "The tillerman can always override any trouble. We work well together. Ted has learned so much. He knows what to do. And I feel very happy with that. If I weren't sitting here in this office, I'd be at home doing the same things there. It's better to have an office. We help each other. We both need each other. Ours is a small company. You see that we keep an open office. We're two employees. It's extremely good to be just a few; allows us to be quick. All decisions are bam bam bam. Being quick—that's important."

Ted wants to show me how a new design takes shape at MDT. He's replicating the process for my benefit, much as cooking programs on television pre-prepare different phases of the featured dish. In the hallway outside his office he opens a drawer in a low cabinet and pulls out a flat file containing manually drawn sketches stacked neatly in a manila folder. Ted leafs through the drawings—it's a concept powerboat, based on a successful Mannerfelt catamaran racing hull—and hands several sheets to Viktor Nilsson, who will enter the drawings into a computer-aided 3D design program. Once digitized, the images can be progressively altered to suit as Ted develops a working file of the boat. The file gradually assumes the appearance of customary elevations, profile, sections, details, and perspective views as Ted "red marks"—with a digital pencil—the iterations Nilsson produces when following Ted's jotted notes and corrections. Both men can pull up earlier iterations and the latest one on their computer monitors and work on the file interactively. Ocke too can be readily prompted to take a look or make changes on his computer screen, at any time.

For this article, we've compressed the key elements of this creative process into a graphic, at left.

The following is Ted's narration: "We begin with a few lines in 3D, starting with the central cockpit. Here, after two days' work you see the design coming through. And then, what different color combinations do to the image; we go from black-and-white to modern graphics. Here is the final boat; it's about two weeks' worth of work. Here's the floating display [by which Ted means the drawn boat, controlled in virtual space with joysticks]. Here are some renderings of the boat in the water.

"If we were to design a production boat," he continued, "we would probably start from Ocke's side with a suitable hull, and I start from my side using free-flowing sketches. Then we marry them. So we're taking the engineering side and the design, and putting them together.

"Viktor comes in when I've done my crazy-idea design; maybe I've done some basic lines in 3D. Viktor fine-tunes my drawings. We can save the file, work at the same time on the model, then I can just paste it here, save that, and it pops up at this monitor. We go back and forth. That is what makes us efficient: we work in the same virtual room. All our computers link together; our programs can speak to each other.

"We work as a team." PBB

About the Author: *Senior editor Paul Lazarus has been writing and editing for* Professional BoatBuilder *since its launch in October 1989.*