JUNE 1985

POWER AND MOTORYACHT

A Magazine Exclusively for Owners of Large Powerboats.

THE HOT NEW PERFORMANCE B
BIRTH OF A NEW BERT

INSIDE: POWER AND MOTORYACHT REVIEWS THE TEMPEST 38

TEMPEST FUGIT

Some lessons in what makes a performance boat tick. Our example, class, is the newest Tempest.

BY CAPT. BOB ARMSTRONG

Ideally, when considering people or boats, each should be taken as an *individual*. Forget siblings. Never mind heritage. That's easy to say. But when discussing a boat like the Tempest 38 Sport, "family" is very important—parentage and other "offspring" alike. The 38, coming as she does from the same "stable" that previously produced the exciting Tempest 44, proves the point.

Sexy? Ummm. Classy? Indeed. Sporty? You bet. A performer? Wow! And built with the kind of solid engineering that means *continued* sexy, classy, sporty performance for a long time to come. And that, in a boat of this type, is perhaps even more important than what she'll do at the moment.

The truth is, any boat based on a proven racing hull will move, given enough horsepower and the right props. At least it will perform well long enough to give a good show for either a "press ride" or a "sales demo." The big question should be: Will she perform the same way trip after trip after trip?

The 38 Sport's console with a "talking" computer (below).

The 38 Sport, like her bigger sister, was engineered by Tempest's President, Adam Erdberg. Erdberg was recruited by Tempest's chairman, businessman Dick Simon, to ensure production of exactly the kind of boat Simon had been looking for when he decided to form Tempest and build it himself. Erdberg's strong engineering background includes: study and teaching at

PHOTOGRAPHS BY JOHN WISDOM

Israel's Technion Institute of Technology, design of high-speed missile boats for the Israeli Navy, and both production and design work at Bertram. With this sort of background, it's reasonable to expect that the Tempest 38 would be well put together. But what *might be* and what *is* can still be worlds apart.

The Heart Of The Tempest

Stepping into the spacious cockpit, let's, for the moment, ignore the convenient layout with its comfortable full-beam bench aft and side-by-side bolsters forward. We'll also overlook the careful detailing of the upholstery (with color accents that tie into the boat's overall hull graphics), and go straight to the console. Again, we'll temporarily disregard the console's fine ergonomic arrangement and simply hit the switch that opens the engine compartment hatch. The hatch, also upholstered in the customary "playpen" fashion of performance boats, lifts smoothly via its electro-hydraulic ram (it can be lifted manually, if need be) to reveal the first true signs of the difference between this boat and others of similar outward appearance.

The first thing you notice is that the engines are mounted farther forward than you'd expect. This is because of the T-Torque drive system Tempest employs (see the technical evaluation by Don Sharp). Unlike sterndrives, which are common on performance boats and usually require the engines to be mounted directly on the inside of the transom, the T-Torque drive requires that the engines be moved forward to make room for the shaft log and reduction gear as well as provide the proper shaft *angle* for the surface piercing props. The result is some unusual (in performance boats) space abaft the engines and a need, due to the forward shift in center of gravity, to put some weight in that space.

Hence, the next thing you'll probably notice is a unique mount for the batteries. They sit "up in the air," securely clamped to a plate atop a stainless "post," immediately abaft the engines and directly over the keel, one battery on either side of the centerline. This location of the batteries, when coupled with the weight of the drive system itself and other gear aft, nicely balances the forward shift in CG. Elevating the batteries also allows the raw-water intakes for the engines, along with their seacocks and strainers, to occupy the same hull area (below the batteries), a location which is ideal for efficiency of both cooling and maintenance.

Then look closely at the intake plumbing itself. Each water line has been fitted with a tee, secondary valve and hose connection—not your usual arrangement. The Tempest 38's gas engines are raw-water cooled. Those unusual "extras" on the strainers allow you to flush your engines with clean, fresh water at the end of the day's run, a practice which can add years to their useful life.

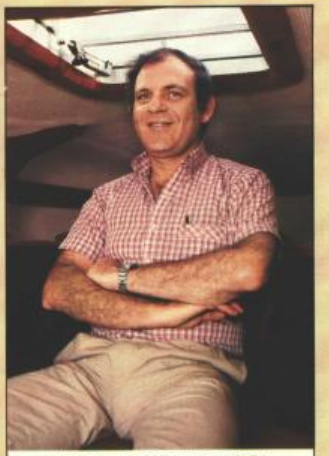
The custom-designed stainless steel exhaust system is also raw-water cooled as are the shaft logs. Water cooling and a special Teflon packing enable the logs to better handle high shaft speeds. Also, in a concession to the demands of performance, there are special hard plastic discs in the coupling between gear and shaft, to absorb much of the torsional shock that occurs when the propellers "bite" again on re-entry. Absorbing the shock here keeps it out of the rest of the drive train.

The engines themselves, one of several "packages" offered for the 38 Sport, are the first gas engines to be used in a Tempest (the 44 is diesel only). A pair of 511 Hawks with P-1000 headers, they're capable of putting out about 540 horses each.

The rest of the mechanical installation is impressive. Halon system. Standard. Power steering pumps on both engines. Standard redundancy. Wiring. Armored cables, all neatly loomed, run and securely mounted in, well, *milspec* (military specification) fashion. Two bilge blowers. Standard. Three bilge pumps. Standard. Trim tabs. Standard. Electric fuel pumps for each engine wired to pressure switches so they can only pump fuel if the engine is running (with sufficient oil pressure). In fact, the Tempest's engineering standards exceed not only all the current Coast Guard requirements for pleasure boats, but some of those for boats in commercial service, too.

Why Kevlar Costs More

And what about the hull itself? The boat I boarded was Hull Number One



THE ROAD TO THE T-TORQUE

BY DON SHARP

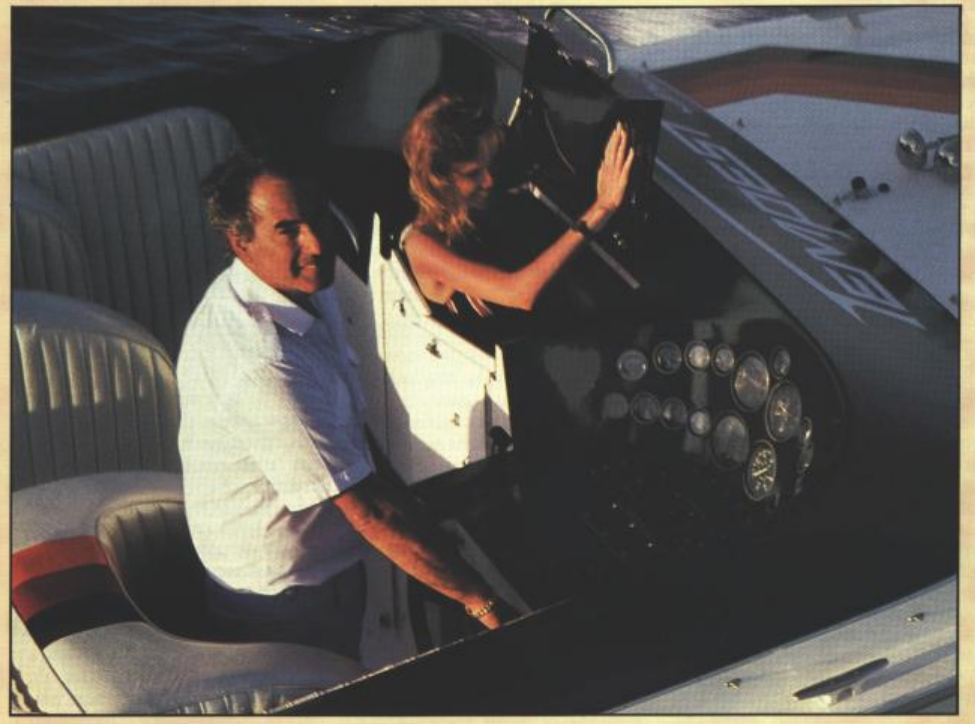
Just as the medieval alchemists sought the philosopher's stone that would transmute base metals into gold, so have modern marine "philosophers" sought the optimum propulsion system. The search has long been hampered by a common-sense necessity: the system that is best in theory must also work in practice.

The search began with the advent of steam power and became more vigorous around 1900 with the availability of "lightweight" internal-combustion power, meaning about 50 hp and 500 pounds, in those days. The early engineers quickly came to appreciate two phenomena associated with propellers: first, that friction (of the water) on the shaft, strut, and propeller hub consumed a lot of the power that was supplied to the shaft. And, second, that a propeller did not develop uniform thrust throughout its 360° rotation; rather, it develops the most thrust in the 30° to 150° portion of its rotation, and very little anywhere else.

William Albert Hickman, of South Boston, Massachusetts, was more interested in hull forms than in propulsion systems, but in seeking

(Please turn the page.)

Above, inventor Adam Erdberg.



Dick Simon (above—our model wasn't supposed to be there!) hired Erdberg who came up with the T-Torque (right).

and had been built of Kevlar and Vinylester resin, as opposed to the glass/polyester "standard" version. No doubt this lighter model was built first to thoroughly establish the 38's performance capabilities. To the ultimate consumer, however, the Kevlar hull, deck, and liner are an option. A $15,000 option. But that's only about 10% of the base price (as powered). And, considering what it costs to build with Kevlar and Vinylester, it's not a bad "deal", either. Interestingly, the increase is less due to a higher material cost than it is to the added labor required. One reason for this is that Kevlar is not easily cut with conventional instruments—knife or scissors. Instead, special tools must be used. This, in turn, means that each piece of fabric must be pre-cut to fit, using pattterns at a cutting table.

Specific details of layup, etc., are not readily available. Erdberg says, with a pleasant smile, but nonetheless obvious sincerity, "I don't want to give away all our secrets." He laughs and continues, "But I will tell you that the bottom is not a uniform thickness. In the aft areas, where you plane and re-enter, it's thicker than forward. Stringers in the engine room are plywood, covered with Kevlar. Forward of the engine room, they are not plywood, because there is no need to go

tions" are we talking about? The day I ran her, top speed was approaching 70. We had four people aboard and the seas were a gently rolling three feet. Wakes made no difference, and I dare say a greater load and moderately rougher seas wouldn't have either. However, one important factor that could make a big difference, and one that is still held in at least a bit of secrecy, is the way the drives are propped.

Erdberg admits that since the boat is brand new, he is still "experimenting" to find the best all around compromise. He is also, as with layup details, less than anxious to publicly announce technical information which could be helpful to potential competition. He does offer that the props used for our runs were "stainless steel, four-bladed, not a cleaver, but especially designed for surface piercing applications, and called a 'chopper'."

He also allows that he tried six-bladed props that had only 8% slip, which is phenomenal, but that they loaded the engines too much and wouldn't let them turn over 3,000 rpm. That gave a speed of about 52 miles per hour, but that's far short of the boat's capabilities and the engines' potential 5,400 turns. During our runs in the high 60s, the engines were only running around 4,900-5,000 rpm, so perhaps later propeller "experiments" will show even higher top speeds. The trade off is that with the props that only allowed 3,000 turns, the low end "bite" was sufficient to get the boat on plane without tabs. The props we used took about ten seconds or so to get on plane *with tabs* and perhaps yet more top speed, if it is possible, will call for too much of a low end loss for practicality. Afterall, they only let us do 55 on the highway.

Add all the options and the boat I ran would carry a price tag in excess of $170 thousand. No small tab for "a simple dayboat." But the quality of materials, engineering and workmanship, indicate that she will perform as well several years from now as she does today. And you can't put a price tag on reliability of that order. □

For more information, contact Tempest Marine, Dept. P&M, 4600 S.W. 44th Ave., Fort Lauderdale, FL 33314

Reprinted by permission from the June 1985 issue of POWER & MOTORYACHT MAGAZINE