The Hickman Sea Sled: The Best High-Speed Hull Ever?

Sadly, due to a combination of circumstances, the Hickman Sea Sled is only a memory today. It might, however, be time to revive the concept.

by Dave Gerr, N.A.

In his classic book, *Elements of Yacht Design,* Norman L. Skene said: "The Sea Sled...from a weight-speed basis, is one of the most efficient hulls ever built." Walter Bieling, of *Rudder* magazine, called the Sea Sled "the best sea boat I have ever been in." And Charles F. Chapman, editor of *Motor Boating,* wrote: "The Sea Sled in the war made a record unapproached by any other type of hull. But it should not be assumed for a moment that the Sea Sled is either strictly a war boat or only a rich man's toy, it is neither....We predict that this will be the beginning of a new era to motor boating.

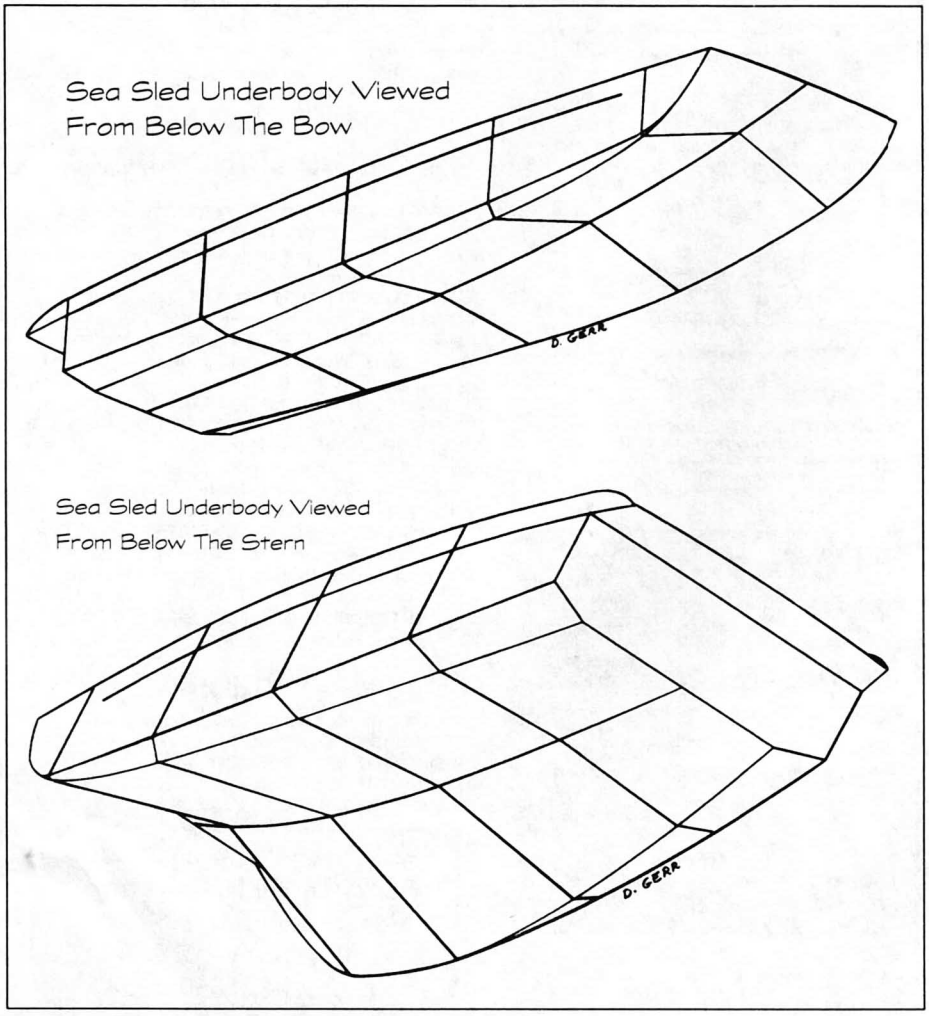
There are boats, and there are strange boats. There are boats that have fallen out of favor because there's no use for them any more. There are also boats that aren't all that good that are still being produced in quantities. (I'm sure you can think of a few.) But there's probably never been a boat that was odder, and more successful, and more completely forgotten than the Sea Sled—the Hickman Sea Sled to be precise.

What is a Hickman Sea Sled? Well, to understand this we have to go back a ways...quite a ways.

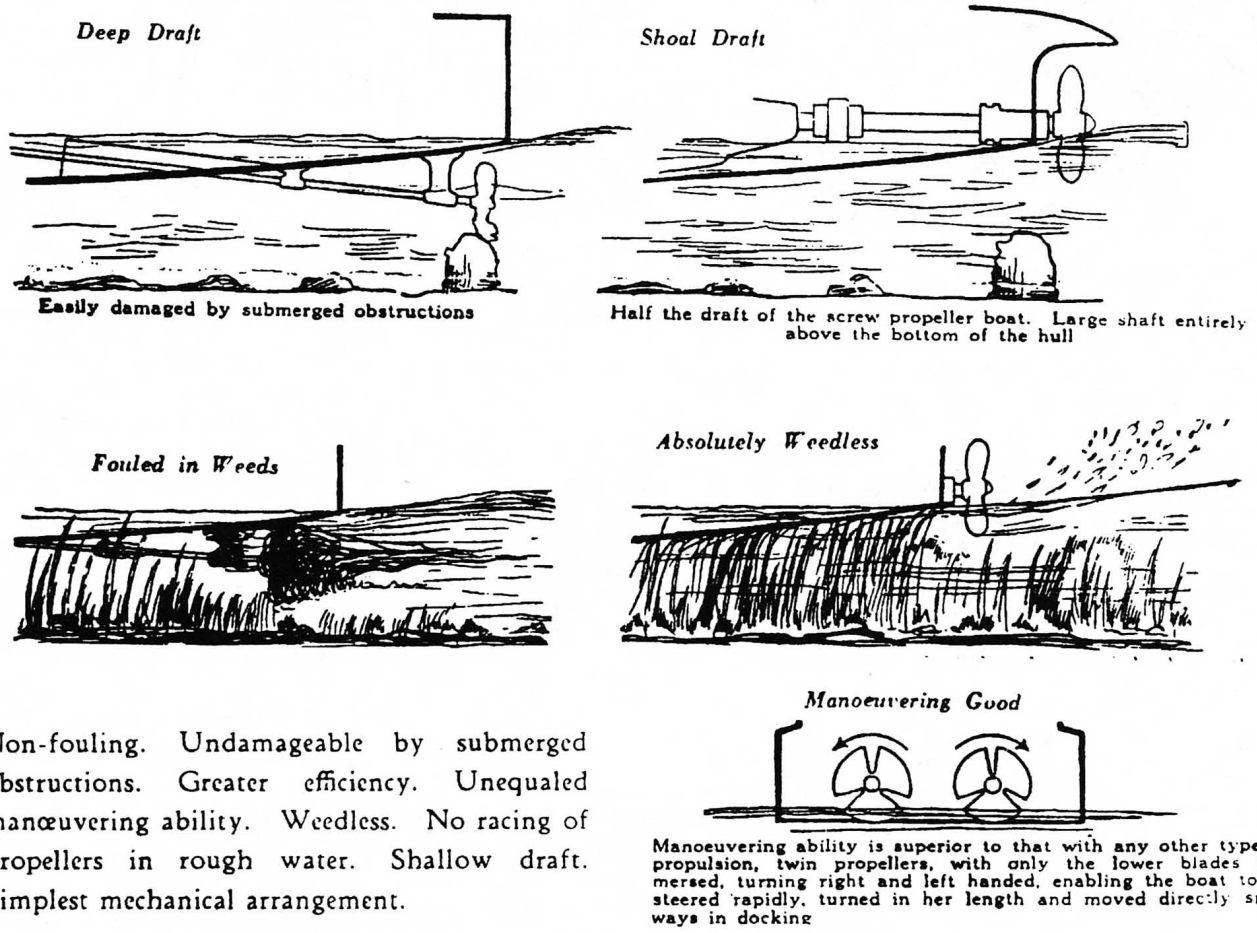
An Accidental Start

In 1907, a 30-year-old Canadian, an engineering graduate of Harvard University, decided to build a boat just for the fun of it. Powerboats in 1907—particularly high-speed powerboats—were brand spanking new. Heck, the light internal-combustion engine itself was brand spanking new. This Canadian, William Albert Hickman, was already well on the fast track. He was a Commissioner of New Brunswick, a Fellow of the Royal Colonial Institute, and—oddly—a successful author of adventure fiction to boot. All this was about to change. Hickman (who was known as Albert, not William) entered his new boat in a race against what he thought of as the real powerboats of the day. To his considerable surprise, he won!

This first boat, *Viper,* was little more than a flat-bottom skiff or sharpie with an engine in it. After being refitted with a larger 7-horsepower engine, *Viper* did 14.4 mph. This was fantastic speed back then (which shows just how far back "then" was). Hickman noted the spray thrown to the sides of his small boat, however,



An Original Hickman Sea Sled Ad Extolling The Virtues Of His New Surface Drive



and felt that this was wasted energy. If he could only trap this under the hull, he was sure his little boat would go faster. Sure enough, Hickman fastened plates along the side of his boat projecting down into the water. These trapped the spray and, indeed, his Viper went faster with the same engine.

Cheesy Water

At the same time, Hickman realized how much resistance water offered at high speed. He said: "The hardness of water at 50 miles per hour might compare with the hardness of cheese...at rest." He was one of the first to realize just how damaging appendage drag became as you drove boats over displacement speeds. This led Hickman to still another innovation, the surface drive. Yes, though there were some much earlier unworkable proposals for surface-like drives, Albert Hickman invented the first functional surface-propeller system and patented it.

Sea Sleds at Sea

Combine these two features, trapping water and air under a high-speed hull as it rushes forward, and a surface drive, and you describe the standard Hickman Sea Sled. In just a few short years (1914, to be precise), Hickman had submitted a patent application for his Sea Sled. It was officially awarded patent number 1,204,355 in November, 1916. In the meantime, Hickman was industriously building and promoting his boats.

The fact was, his Sea Sleds were unparalleled in both speed for horsepower and for comfort and safety at sea. The editor of *Motor Boating*, with five crew along, made the trip from Boston to Bar Harbor (about 260 miles) in an off-the-shelf Sea Sled runabout. This 26-footer—with six men and all their gear and claptrap aboard—ran at an average of 30 knots, and reached top speeds of nearly 40 knots. What's more, conditions were anything but ideal. The crew recounted large seas, gale-force winds, and fog. The year was 1914. This sort of performance in a 26-footer is still good going today. What a sensation it must have been 83 years ago!

Navy Rescue Sea Sleds

Things continued to get better for Hickman and his Sea Sleds. The U.S. Navy tested his boats in 1913, and were so impressed that both the Army and the Navy purchased Sea Sleds virtually exclusively for high-speed open-water service throughout the first World War. Murray & Tregurtha Company of Boston built most of these vessels in a successful joint venture with Hickman. →

Six Thousand Sleds

After the war, Sea Sleds continued in production, and eventually (under license) the Sea Sled company of West Mystic, Connecticut, produced over 6,000 boats ranging from 8 to 26 feet. In the period between the wars, other Sea Sled ventures included a 50-foot by 12-foot Sea Sled, the *Luz*, for passenger-ferry use in Columbia, South America; several large cabin cruisers; racing boats; and a Sea Sled aircraft carrier. Yes, that's right, an aircraft carrier!

The *Luz* was powered by four 225-horsepower Sterling gas engines that gave her the remarkable speed of 30 mph with 65 passengers on board. Once again, this is impressive some 70 years after the fact. Hickman also built 35-foot racing Sea Sleds that were clocked at 50 knots with marine engines, and 60 knots with marinized aircraft engines. Both of these were records in their day.

The Sea Sled Carrier

Probably Hickman's finest achievement was his 55-foot aircraft carrier. These boats were wood planked with steel framing. They were fitted with additional planing sponsons outboard, and with lifting strakes. Once more, the lifting strake and the sponson were Hickman inventions. Built by Murray & Tregurtha, the aircraft carrier ran 48 knots with 1,800 hp in 1918. Keep in mind that these were days of float-plane string-and-wire bombers, with quite limited range.

The idea was to mount one plane on each Sea Sled carrier, and run the Sea Sled at maximum speed into the wind. Then the plane, a Caprioni bomber, would rev its own engine which would pull the two (bomber and Sea Sled) even faster into the wind, at which point the plane could take off virtually standing still (relative to the Sea Sled, anyway). Incredibly, the scheme worked! But in 1918, we were at peace. The Navy and the Army (there was no Air Force yet) had no need for experimental aircraft carriers, and only the prototype was built.

How It Works

The Sea Sled hull form is remarkably simple in concept. You can see that the bow is an inverted "V." It looks

almost like a catamaran from the front. The odd thing is that the inverted "V" (which forms the catamaran-like bow) grows lower and lower (or shallower and shallower) until, at the transom, the Sea Sled is dead flat across the bottom like a scow.

In action, the air and water rushing under the hull is trapped and funneled between and under the hull, lifting the Sea Sled out of the water. Truly, the Sea Sled is the first surface-effect vehicle. Even better, the compressed air-water mixture under the hull forms a cushion that dampens pounding and slamming.

The semi-twin hulls effectively have nearly double keels, which give the Sea Sled great directional stability in rough weather, and the shape of the bows naturally resists broaching in following seas. This is partly due to the quick increase in buoyancy, partly due to the air cushion, and partly due to the asymmetrical waterlines in the bow. If one side digs in deeper than the other, the asymmetry tends to self-correct the steering. Add to this the reduced drag with the surface drive, and you have one fantastically efficient and seakindly package.

Non-Trip Chines

The only significant change Hickman introduced into his Sea Sleds was the non-trip chine. You can see this on the drawings as the shallow bevel cut out of the outboard edge of the chine. This keeps the Sea Sled from tripping over a wave in a tight turn in rough going. It's surprising to me how many of the occasional Sea Sled replicas I've learned of (built after Hickman died in 1957) omit these non-trip chines. They're essential to ultimate safety in choppy weather.

The Last Production Sea Sleds?

As far as I know. the last production Sea Sleds were made in fiberglass in 1988, by Sea Sled, Inc., of North Branford, Connecticut. The Valentijn-designed hulls are true to every principle of the original Sea Sled (including the clearly visible non-trip chines), except that Sea Sled, Inc.'s boats are outboard powered, not surface drive. (Many of Hickman's production Sea Sled runabouts were also outboard powered.) I haven't heard of Sea Sled,

Inc., since 1988, so I assume they're no longer in production (but I hope they're still around somewhere). Nevertheless, you can see what a fine running boat these craft make.

Where Did All the Sea Sleds Go?

Of course, you have to wonder: If Sea Sleds were (and are) so great, why aren't they everywhere? The answer is complex. First, when Hickman was alive, he guarded his patents jealously and viciously. This didn't win him any friends in the industry, and his competitors in the boatbuilding business justifiably felt threatened by his superior running boats. They did everything they could to run down the Sea Sled's reputation and to hamper sales. ELCO's president, for example, once prevented Hickman from showing his boats at the New York Boat Show. (The ELCO president, it happened, was also president of the Marine Manufacturer's Association, which ran the show.)

Later, prior to competitive bidding and testing for World War II torpedo and rescue boats, several builders managed to cajole and bamboozle the Navy into effectively banning Sea Sleds from being considered (in spite of the Sea Sled's superb record in World War I). Sea Sleds couldn't even be entered in the tests!

Further, in those days, wood was the only viable material for small craft (even if metal framed). The Sea Sled's unusual hull form required a complex and expensive structure to hold it together in standard wood construction. (This is no longer a drawback with modern FRP or cold-molded wood-epoxy construction.) On at least one occasion, the Navy passed over the Sea Sled for a less expensive conventional hull. When this low-bid conventional boat was finally delivered (and delivered late), it was a very poor performer and had structural problems as well.

Strange Steering

Hickman was also difficult in other ways. He was committed—among other things—to a unique steering system he'd developed. True to his dedication to reducing appendage drag, Hickman Sea Sleds had no rudders in the proper sense. (No rudders,

no rudder drag.) Instead, Hickman's Sea Sleds had plates on the outboard face of the stern of each hull. While running straight ahead, these steering-plate rudders were kept flush (in line) with the hull sides and generated virtually no appendage drag. If you wanted to turn, say, to starboard, you simply rotated the wheel to starboard which swung the starboard rudder flap out, causing more resistance on the starboard side, which made the hull turn.

This worked, and it worked particularly well at high speed in lowering resistance, but it wasn't as effective as a conventional rudder. On several occasions, Hickman's 35-foot racers clocked the hands-down fastest speeds on the straightaways (by substantial margins); but, on the race course, they turned in such a wide arc that the slower boats won the race itself. For some reason, Hickman never saw this as enough of a disadvantage, and wouldn't alter his steering system. Accordingly, Sea Sleds won no major races.

Add to this one more important factor: In the early 1900s, a Sea Sled just didn't look like a boat was supposed to look. Today, we're used to catamarans, gull wings, cathedral hulls, tri-hulls, hovercraft, pontoon boats, and such, so the Sea Sled doesn't appear any more peculiar than many other types. In fact, I think they look quite handsome. But way back when, the unconventional appearance made Sea Sleds just that much harder to sell. Gradually, the Sea Sled slipped into obscurity.

Time for a New Sea Sled?

To this day, however, the Hickman Sea Sled would make one of the finest possible cruising, fishing, or patrol/rescue boats (not to mention a high speed ferry). They are stable, soft riding, and very fast for their power. Indeed, the numbers still indicate that Sea Sleds are faster than anything other than three-point hydros and very high-strung stepped hydros. Neither of these is suitable for serious, everyday use. The Sea Sled is.

Built of FRP or wood-epoxy, the Sea Sled would be rugged and low maintenance. I'd stick with surface drives, but use the simple kind with standard rudders aft (rather than the more expensive universal-joint steerable Arneson type). A 28-footer would make the ideal fishing day boat. A 35- or 40-footer would make an economical high-speed cruiser that could take you anywhere in safety and comfort.

Did I say high speed? I should have said, *incredibly* high speed! Even better, with surface drives and the Sea Sled hull shape, you could run even the larger cruisers in just 24 inches of water and in weeds, with complete safety. I think the time has come. What the boating world needs is a new Sea Sled! ■

In between boat-design projects and writing articles for Boatbuilder, *New York City-based naval architect Dave Gerr is working on his fourth book for International Marine,* Boat Strength. *He is author of* Propeller Handbook, *and of* The Nature of Boats, *a collection of his earlier articles from this column.*