

Project Amazon: An Open Class 60 Sailboat for Single-Handed Round-the-World Racing

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Project Amazon is a custom-designed Open Class 60 sailboat that began development in 1992. Detail design took place in 1995-96, and construction occurred in 1996-97. *Project Amazon* is an aluminum cat-ketch with two carbon fiber, free-standing, rotating wingmasts, an aluminum asymmetrical swinging keel, and twin carbon fiber, daggerboard-style rudders. Followers of the Around Alone and Vendée Globe single-handed, around-the-world races and developments of Open Class 60 sailboats may find these features unusual because collectively they do not fit mainstream racing sailboat design. None of *Project Amazon's* design features is totally new to sailboat naval architecture. These ideas have all been tried before, and all have been successful. But this is probably the first time that so many innovations have been combined into a single major racing sailboat design.

Introduction

ANY VESSEL DESIGN, whether a racing sailboat such as this, or a cargo ship, begins life from a list of owner's require-

ments. *Project Amazon's* owner, Sebastian Reidl (RI-dle, rhymes with bridle), had requirements much the same as all round-the-world single-handed racing skippers: the boat must be fast, strong, reliable, and easy to sail in a wide variety of conditions, from dead calm in the doldrums to gales with 100 ft (30 m) waves in the Southern Ocean. This sailboat is to be a machine, not a fancy yacht. It must be easy to fix should anything break, which is bound to happen somewhere, sometime. Everything in the boat is designed to mini-

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mize the chances of structural failure without sacrificing speed or the safety of the skipper and the sailboat.

Primary features

Hull design

- Dory-type hullform with an aft skeg
- Lifting strakes full length of hull
- Upper spray rail
- Air lubrication system
- Aluminum construction

Appendages

- Asymmetric keel shape with faired trim tab
- Aluminum keel construction
- Fuel tank inside keel
- Swinging keel
- Twin daggerboard rudders in turning cylinders
- Carbon fiber rudder construction

Rig

- High aspect ratio, elliptically-shaped mainsails in free-standing, cat-ketch arrangement
- Rotating wingmasts
- Carbon fiber mast construction

Hull design

General

Project Amazon has a considerably different hull shape from other Open Class 60 designs. It has a shallow, low-deadrise hull with a skeg fitted at the aft end (see Fig. 1). The stern is narrow aft rather than "aircraft carrier" wide as is typical of most Open Class 60 designs. Lifting strakes run full-length along both sides of the hull. A frigate-type spray rail is built into the upper topsides forward. Finally, the hull bottom has air-lubrication vents to minimize drag. Except for one other instance of air lubrication vents, none of these features are found on typical round-bottomed Open Class 60s, although they are not new to yacht design.

Project Amazon is built in aluminum. Open Class 60s have been built in aluminum before, notably Philippe Jeantot's first two *Credit Agricoles*, Jean Luc Van Den Heede's *36.15 MET*, and Alain Gautier's *Generali Concorde*. But in the last

few years, more and more very lightweight composite hulls are being built.

Dory-type hullform with an aft skeg

The low-deadrise bottom shape holds course better and is easier to steer than round-bottomed hulls. Round-bottomed hulls have minimal wetted surface which theoretically means less friction drag and faster speed. But their "skimming dish" shape makes them hard to control, particularly in large waves such as in the Southern Ocean. Hulls very wide aft have tremendous stability which makes them stand straighter to the wind, which is fine in relatively light conditions. In heavier conditions, however, as wide boats heel more, they become hard to control because the rig forces do not balance very well with the hull and keel forces.

Project Amazon's hull has minimally more wetted surface than its competitors, so friction drag may be a touch greater. This is compensated for by having much more sail area in the cat-ketch rig over the more common single-masted, stayed rig. Power-to-weight ratio is relatively high. Also, the hull is relatively wide, but only in the middle. The aft end of the hull is narrow so that it balances better with the shape of the bow. As the boat heels, the forces between the rig and hull balance better naturally. As a result, the hull is more easily driven, requires less effort to steer, and is much easier on the skipper and the autopilots. Also, it will not broach as readily, so it will be safer in heavy seas.

The aft skeg was incorporated into the hull shape to improve directional stability. It is plated on port and starboard sides and was built to be easily cut off should it be found unnecessary. Ultimately, the owner cut off the skeg prior to the boat being launched, for reasons of reducing weight and wetted surface, as it was becoming apparent that *Project Amazon* was getting heavier than expected during construction. Reports from the owner indicate that *Project Amazon* has more than adequate directional stability without the skeg.

Lifting strakes full length of hull

Although most Open Class 60s are able to plane like a powerboat, the common round-bottom hull is not a good planing shape. The bow buries into waves easily, and the boat is hard to control. At Sponberg Yacht Design Inc. (SYDI), we

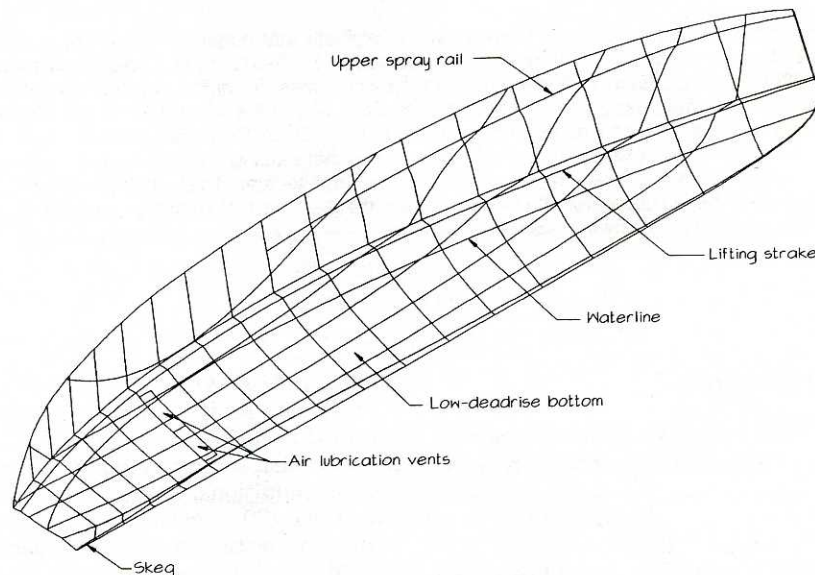


Fig. 1 Perspective of hull lines of *Project Amazon*

