

Get your kicks on *Route 66*

'A bold experiment in bluewater cruising design,' this American 68-footer is pushing back the frontiers in more ways than one. Matthew Sheahan reports

America's first coast to coast, trans-continental highway became a national icon for the technological age. It was seen as a far sighted and ambitious project. The same could be said of its namesake, the unorthodox new design, *Route 66*.

The first time you view the yacht from the dock, you will notice that she has a freeboard high enough to rest your chin on, a rig that towers 78ft (23.77m) above her deck, and a boom long enough to make your winch-grinding arms and Spectra-ripping palms wince.

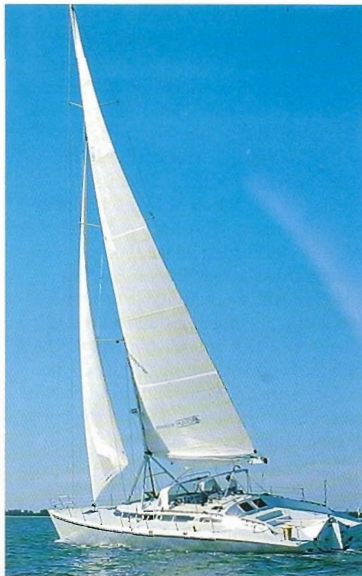
And yet *Route 66* has been conceived, built and delivered to a husband and wife team, to be handled with no additional manpower. She is no fancy, scorch-round-the-bay machine; she is their home, their transport and their ticket to a global cruise.

So don't be put off by her looks; *Route 66* is one of the most significant designs of her time and, even if you could never accept her appearance, the design philosophy is a rare example of unrestrained free thinking.

She was built by the Newport Rhode Island-based yard of Eric Goetz Custom Yachts, although she was sponsored by America's largest yacht builder, the Hunter Marine Corporation. Hunter describe her as: 'a bold experiment in bluewater cruising design' and she is the showcase for a new breed of cruising production boats, starting with a Finnish-built 45-footer to be launched in early 1995.

Route 66 bears no resemblance to any of Hunter's existing boats – they produce the well established Legend range. In fact, she resembles nothing else you may have seen on the water to date, with her razor-fine entry, high freeboard and a sheerline that slopes away to just above the waterline towards the stern.

The design was conceived by Sarasota-based Lars Bergstrom. The prolific design work from the Bergstrom & Ridder partnership is probably one of the best-kept secrets of the marine industry. Many will cast their minds back to the Bergstrom & Ridder (B&R) rigs of the 1970s, distinctive for their heavily swept-back spreaders and double-diagonal



Top, her hull sections are semi-circular to ensure that her underwater shape does not change with an increase in heel angle. **Above**, despite light winds, *Route 66* sailed well upwind with small fractional jib

rigging. But how many people realise that the same team designed the Windex wind indicator, or that they quietly worked behind the scenes as main consultants to such famous designers as Sparkman & Stephens, Ron Holland, Bruce Farr, German Frers and many more? This time around, it is not just the rig, but the whole design that has come from their drawing boards.

Yachting World were invited aboard *Route 66* by the owners, Bill Whitmore and Carol Hankins, for three days of sailing trials in the cool, bright sunshine of Florida's Tampa Bay.

THE DESIGN

One of the best known of the 60ft single-handers designed for globe trotting was *Hunter's Child* and B&R Designs spent many hours in the test tank at the Royal Institute of Technology in Stockholm developing her lines. Convinced that their fair hull design worked well aboard that boat, the designers used the same hull for *Route 66*, but this time the boat was slightly longer at 68ft LOA.

Broadly speaking, the aim was to produce a hull shape that did not alter below the waterline with an increase in heel angle. In this way the fore and aft balance of the hull remains the same, which eliminates the tendency for an increase in weatherhelm and dramatically reduces the chances of a broach.

Achieving these fair hull lines means that the underwater sections need to be semi-circular with the same radius centres. As the radius of the sections becomes larger towards the stern, so does the beam and to restrict this it is necessary to reduce the height of the sheerline in the after sections. Hence the sloping deck.

In keeping with her pedigree, *Route 66* is a high performance yacht which has already clocked up speeds of over 20 knots. Subtle design details such as the neatly concealed spray rails at the hull-to-deck join in her forward sections hint at this, but a less obvious feature is the faired-in, quarter-inch deep slot, that runs round her hull at maximum beam.

This is the venturi slot. Its purpose is to smooth the transition between displacement and planing speeds by feeding in air to the underside of the hull, reducing the resistance caused by the boundary layer being dragged along. The slot is connected to vents concealed in the cockpit.

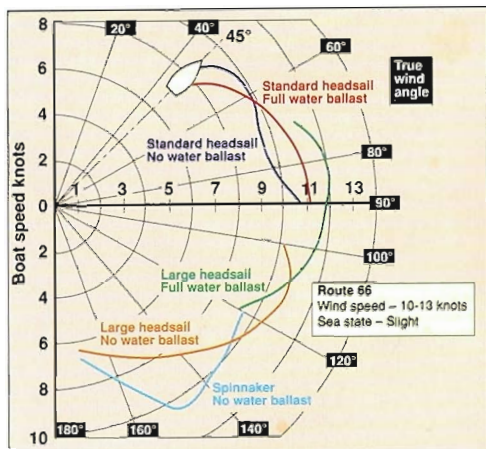
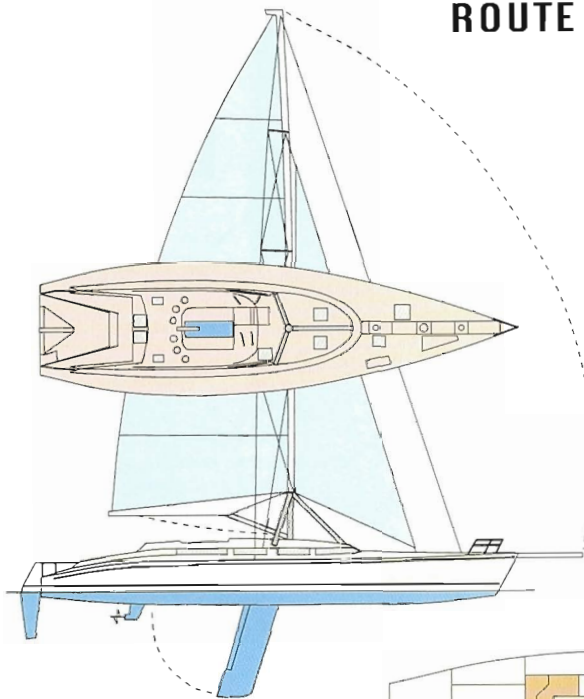
As well as acting as cockpit drains, the ▽



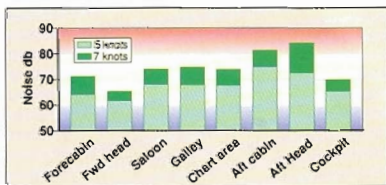
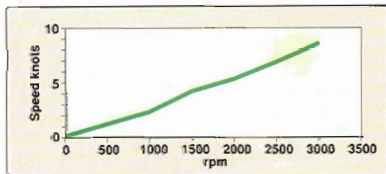
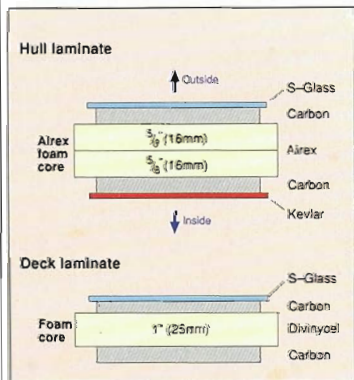
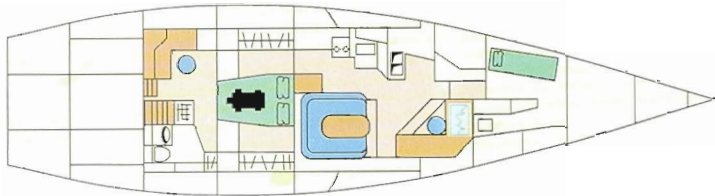
Main picture, in light airs with the asymmetric spinnaker set. Apparent wind angle was 90° , but the true wind angle was 160° . Top, with the rudder swung to port, launching a RIB which is cunningly stowed under the afterdeck, is a simple operation. Above right, a cradle system prevents the mainsail from falling onto the deck when lowered. Above, the overflow pipes from the water ballast show when the tanks are full



ROUTE 66



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 Built by: Eric Goetz Custom Yachts, Newport, Rhode Island, USA.
 Marketed by: Hunter Marine Corporation, PO Box 1030, Rt 441, Alachua, Florida 32615, USA.
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Polar diagram: Shows the optimum close-hauled angle to the true wind. Also shows speed attained on all courses. Important - consider in conjunction with the true wind speed during the test.

Sail area: displacement ratio: This ratio gives some indication of power available. Higher numbers = greater performance.

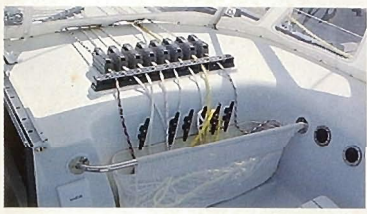
$$\frac{SA(ft^2)}{(\text{Displacement} (lb) \div 64)^{0.62}}$$

Ballast ratio: A comparison between displacement and the weight of the ballast.

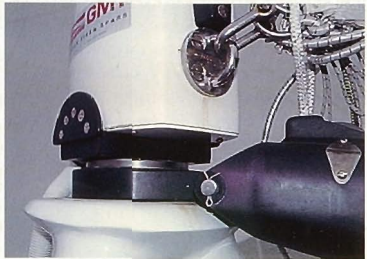
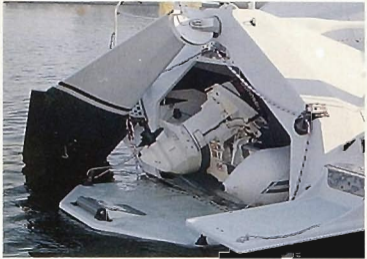
Displacement:waterline length: Performance indicator. Low numbers = higher performance. $(\text{Displacement} (lb) \div 2240) (0.01 \times \text{LWL} (ft))^{-1}$

COMPARABLE BOATS

	ROUTE 66		OPEN 60		WHITBREAD 60		SWAN 68	
LOA	68ft 0in	20.73m	60ft 0in	18.29m	64ft 10in	19.76m	67ft 9in	20.62m
LWL	66ft 6in	20.27m	56ft 9in	17.30m	60ft 3in	18.36m	54ft 9in	16.69m
Beam	1.8ft 0in	5.49m	19ft 0in	5.79m	17ft 3in	5.26m	17ft 9in	5.41m
Draught	15ft 6in	4.72m	13ft 0in	3.96m	12ft 4in	3.76m	11ft 8in	3.56m
Displacement	28,000lb	12,698kg	24,250lb	10,998kg	29,770lb	13,501kg	88,000lb	39,909kg
Sail area	1,800ft ²	167.4m ²	3,153ft ²	293.23m ²	643ft ²	59.80m ²	2,155ft ²	20.42m ²
Berths	4		1		8		12	
Sail area:disp	31.2		60.2		35.8		17.4	
Disp:LWL	42		59		60		239	



Top left, two telescopic poles are concealed by hinged bow section doors. This pole is extended to keep the anchor clear of the bow; the other is the asymmetric spinnaker pole. **Above**, venturi slots connected to the cockpit drains smooth the transition into higher speed ranges. **Left**, all rope clutches are backed up with horn cleats. **Below left**, the transom folds down to reveal a small RIB stowed under the after deck. **Below right**, the gooseneck arrangement



and control, but also prevents the bow from being pitched as the rudder is moved. Adjusting the angle of dangle can be achieved from the cockpit, with two control lines led onto self-tailing winches within reach of the helmsman.

Yet advanced though this is, B&R have taken the idea one stage further. By canting the rudder fully to port, the transom can be folded down to reveal a purpose-built garage for the rigid bottom inflatable tender. Rigged with its outboard engine, ready to go and resting on a set of free running rollers, the dinghy is simply pulled out by hand.

Storing the dinghy is equally simple. The painter is led round a block inside the garage and back to the step where a gentle tug eases the boat back into its housing. Even fuelling this tender has been thought of – it has a separate fuel storage tank and delivery hose.

ON DECK

Bill Whitmore has spent the best part of his sailing career with a tiller in his hand and he could not entertain the thought of giving it up aboard his dream boat. A Kevlar belt and twin control lines connect the tiller to the helm through a tube that runs back to the rudder stock. But with just two on board the autopilot is more frequently used and here the trim tab on the rudder blade steers the boat. This system means that there is less load on the autopilot as well as providing a back-up means of steering the boat in the event of the main linkage failing.

The small centre cockpit is set high in the boat giving excellent all-round visibility. Behind the helmsman, three pairs of Barient self-tailing winches control the mainsheet, genoa/spinnaker sheets and the rudder canting. All the control lines are led back to the cockpit through Lewmar Superlock clutches before reaching the dedicated horn cleats.

Once the control lines are set, the ▷

slot also provides a dumping vent for the 416gal (1892lt) of sea water ballast which can be carried on each side of the hull. Filling these tanks is achieved either by means of the engine-driven pumps, which takes four minutes, or via the forward-facing scoops under the hull.

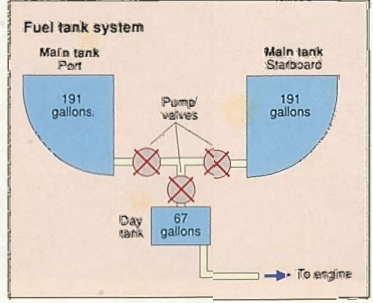
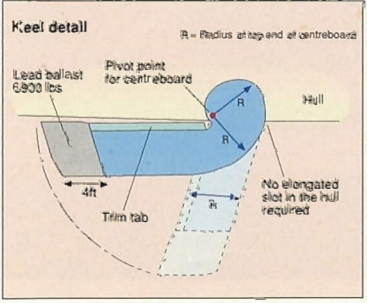
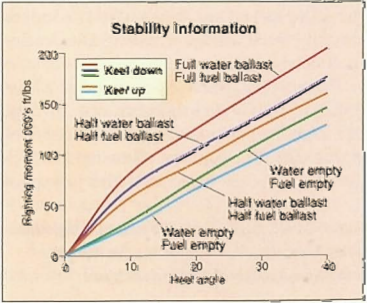
Speed enhancing though it is, taking on water ballast to achieve a greater righting moment also means taking on extra weight and this can mean a lower speed potential, especially in light winds. *Route 66* can carry a maximum of 191 gal (868lt) of fuel on each side of the boat (449gal in total, including the 67gal day tank) in symmetrically sized and positioned tanks. So on a passage this can be pumped to the weather side before the extra weight of sea water is taken on board (see diagram below). Filling both the water and fuel tanks achieves a maximum of 12° of heel.

In their quest to keep weight to a minimum and performance to a maximum, the designers

have opted for a deep 15ft 6in (4.72m) carbon fibre, lifting fin keel with 6,900lb (3,129kg) of lead occupying the bottom 4ft (1.22m). The configuration operates much like a dinghy centreboard, but in order to avoid the extra drag of a centreboard slot, the fin is cleverly hinged about a point on the trailing edge, just inside the hull (see diagram below centre). With the keel fully raised, she draws 5ft 6in (1.68m), but still maintains adequate stability, as well as providing enough steerage under power or sail.

As anybody who has witnessed the unnerving loss of grip on a rudder at speed will confirm, efficient foils are all important. Designers of the world-girdling Open 60s have spent much time developing this area and here *Route 66* has inherited the lessons learnt.

She has a single-blade, transom-hung rudder that can be canted from side to side to ensure that the blade is always perpendicular in the water. This not only ensures maximum lift





clutches are released to allow the horn cleats to take the full load – a seamanlike arrangement. Beneath these cleats, a large netting bag, suspended on a sturdy stainless steel, tubular frame, collects all the rope tails ensuring that they keep the cockpit clear.

Strolling down the wide side decks towards the bow, you will notice that the top of the triple guardwires comes to thigh height, the non-slip is excellent and this and the solid grabhandles make you feel secure.

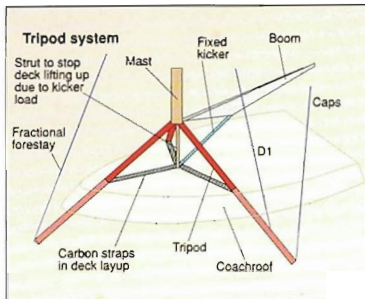
The foredeck is a wide open expanse of clear deck with flush locker lids concealing, for example, the dedicated anchor storage or the windlass housing. Despite being open, the deck feels safe to work on.

The headsail is a furling type, set roughly midway between the pulpit and the mast which means that, should you need to deal with the headsail, you are well back from the really wet bit. In fact, the only reason to go forward is to open the bow flaps concealing the retractable spinnaker pole on one side and the anchor pole on the other.

THE RIG

A large, white-painted, carbon fibre tripod spans the boat from gunwale to gunwale, supporting the base of the B&R rig some 7ft (2.13m) above the deck.

Producing a 68ft cruiser that is lighter than a Whitbread 60 owes a lot to this system – designing loads out of the boat is the key.

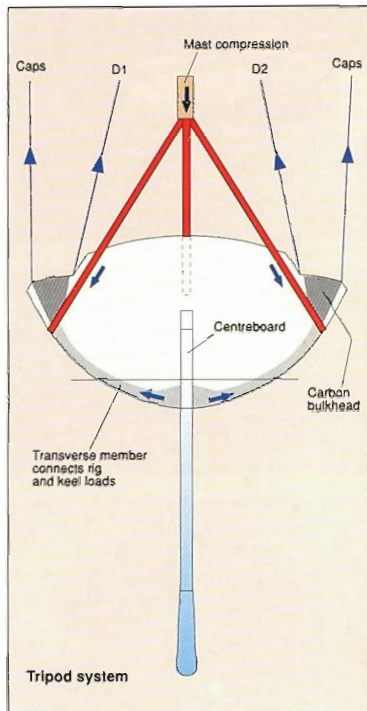


Diagrams above and right, show the tripod system designed to connect the rig loads to those exerted by the keel without using the hull or deck to link them. All load is taken by the robust tripod, rather than by the vulnerable mast

Conventionally rigged boats generally use the hull and deck structure to carry the high loads between rig and keel. Crudely put, the result is a hull and deck that is frequently overbuilt and overweight. The B&R rig system, with its tripod base, ensures that the rig and the keel are connected directly. The transfer of load between these two major components is best thought of as a closed loop of loads. The diagrams above best show how this is achieved, but a good analogy is a sailboard rig.

You sit on the beach, with your foot on the mast heel and sweat down the luff of your sail to get the required bend in the mast and an efficient shape to the sail. Once the downhaul is cleated, the sail is like the skin on a drum – taut and perfectly shaped. You then pick up the lightweight aerofoil section and fit it to your board. Despite the high load you have induced into the rig, the unit is easily handled.

Route 66's rig, from the tip of the mast to the top of the tripod, is the same as the sailboard sail. The mast is pre-bent by the tension in the diagonal stays and the only real difference is that it is held upright in the boat by a pair of cap



shrouds and lowers. The rig is so secure that not even a permanent backstay is required, let alone runners.

On designs gone by, the tripod was mounted below decks, but *Route 66* has a boom fixed by a solid, non-adjustable kicker, and mounting the boom gooseneck on the tripod means that all the load can be taken by the robust tripod and not by the vulnerable mast. To the crew, the net result is a fully battened mainsail that always maintains its shape, with a mainsheet that simply alters its angle of attack to the wind – just like a sailboard.

ACCOMMODATION

Route 66 is home to Bill and Carol, so you would expect her to be fully fitted out. Despite her clinical colour scheme of white and dark green, she is spacious, practical and homely – perhaps it's the oak trimmings and wicker-fronted lockers that add the domestic touches. And she is designed to household proportions.

Take the galley, for instance. Running a full 14ft (4.27m) along the port side of the cabin, the galley has no less than 17.8ft² (1.65m²) of worktop space, a fridge, a freezer and extensive food storage space.

The navigation station, too, has a vast 25.1ft² (2.3m²) of desktop space with storage to match. Its position follows the contour of the coachroof windows, allowing a superb panoramic view and, with the autopilot

Conventionally-rigged boats are subject to high loads on the bottom section of the mast. The A-frame arrangement reduces these to a minimum



repeater to hand from the swivelling office-type chair, venturing outside is rendered virtually unnecessary. Through much of the boat, the headroom is typically 6ft 9in (2.92m).

The after cabin spans the full width of the boat, with ensuite head, as well as a desk complete with a filing cabinet and a phone, to name but two of the household essentials. Removing the double-berth mattress reveals the engine and all the yacht's main services, with plenty of space to work on every item. There are even two hatches and companionways onto the after deck for that early morning swim.

The forecabin houses a pair of hinging pipecots, hanging space for wet oilskins as well as a workshop bench area. Again, the area surrounding these features is spacious.

UNDER SAIL

There are no bow thrusters or special techniques to get the yacht under way. Bill simply asks for the bow to be gently pushed out and, as he accelerates away from the dock, Carol steps aboard at the transom, the low point of the sheerline. A normally aspirated Yanmar 50hp diesel is all this boat needs to propel her at more than eight knots and, even with her keel up, she has surprisingly good manoeuvrability.

Once we are out of the harbour, the 3:1 main halyard is placed on the hydraulically powered primary winch. As the mainsail slowly creeps up the mast, the Harken batten cars carrying the luff of the sail are exposed. The operation may seem slow, but there is no noise from the sail as the full length battens damp the flogging motion – there are no running backstays whipping around the side decks, either.

Bearing away, the boat accelerates quickly in the light breeze. Bill cuts the engine. No sooner has the prop stopped spinning than the headsail is unfurled and, with a gentle tug at the cleated sheets, *Route 66* snaps into action. A quick glance at the log and we are reaching along at over seven knots in ten knots of true wind and yet from the cockpit I could have sworn that we were doing no more than four.

"Watch the transom," says Bill. "At the moment the keel is up, which trims the stern down; as soon as we lower the keel, the wake will turn flat and she will start to get going – then we'll put the ballast in!"

By now Bill has turned on the autopilot and Carol, having just flipped the switch to lower the keel, is showing one of their guests down below. There is a calm, confident atmosphere aboard as our speed climbs towards double figures – *Route 66* is certainly well suited to short-handed sailing.

Her normal sailplan uses a small fractional headsail, with virtually no overlap, but today we have the new masthead floater aboard, designed to be used in lighter winds. Our plan is to compare speeds and sailing angles for the two headsails as well as comparing her performance with and without water ballast.

As we vary the sailing angles and experiment with the water ballast, a pattern begins to



Photos: Matthew Sheahan



Above, looking aft at the galley, to port. Beyond lies the after cabin. **Left**, acres of space are available to the navigator in the nav station. **Below**, the after cabin has a split mattress and leecloths. The engine bay and ancillary equipment are beneath this berth. A lifting cover provides quick and open access to all equipment

emerge. On the polar plot, lines start to intersect each other, giving us a clearer picture of her optimum configurations. But it's not all plotting points and logging numbers.

At 80° to the true wind (11 knots), we hit 12 knots. She comes alive as the channel markers in Tampa Bay rush by. Yet as the excitement builds within the crew, the boat remains docile on the controls. The autopilot hardly moves as each gentle puff of wind has us heeling a little more, but accelerating at the same time.

On the previous day Bill and Carol demonstrated the ease with which a 3,000ft² (279m²) masthead asymmetric spinnaker can be handled by two. The wind then was only three knots less than today, but for a high performance boat, such light winds mean that you quickly exceed the speed of the wind.

With this configuration, the apparent wind was dragged so far forward that, at 160° true, the apparent wind was on the beam. Eventually, as the boat speed exceeded the wind speed, we could not sheet the sail any further and the sail collapsed until the boat slowed down. We had clocked 10.4 knots in 8-9 knots of wind!

CONCLUSIONS

Sophisticated she may be, but she has also been well conceived in a seamanlike manner that should perhaps embarrass some of today's conventional cruisers. Only if a system makes



life easier or safer is it incorporated into the layout. The pump panel for the water and fuel looks involved, because it is. And yet just three on-deck instrument repeaters are fitted to display her sailing performance, because they are all that is necessary.

You have to admire the way in which everything, from the bilges to the block and tackles, is easily accessible. Nowhere is there an item of equipment that is hidden or awkward to get at.

Perhaps most important is that she is a fully integrated modern design. The use of asymmetric sails, water and fuel ballast, a simple-to-handle rig, a centre cockpit, a transom-hung rudder, are all factors that complement each other to produce a yacht that is easy and exhilarating to sail – and comfortable as well.

Love her or loathe her, she may not be the final word in cruising designs of the future, but she's providing plenty of answers. □