

superyacht model making

Miniature replicas of yachts are works of art that can have both aesthetic and practical purposes – either as beautiful reminders of their full-size originals or as three-dimensional aids in the design and construction of a vessel. Michael and Frances Howorth enter the highly-skilled world of modelling, where hi-tech methods exist hand-in-hand with traditional craftsmanship

Right: Feadship's conceptual model X-stream was shown at the 2006 Monaco Yacht Show
Opposite, top left and right: models of Vripack's Stranger and a converted fishing cutter by Heliyachts



Scale models of superyachts are like family portraits, there to be admired when the original is absent or long gone. They are mementos that can outlive the owner and the real yacht, and many are works of art. With most owners seldom having as much time as they would like to spend on their yachts, a model can serve as a conversation piece or as a daydream that fondly anticipates future visits.

Owners are not alone in commissioning models, however. They are built and collected for many reasons, including the testing of a design without the expense of building a full-size prototype. Others are constructed for show, for use as remote-controlled vehicles, as toys or collectibles, or just for the pleasure of the construction process. People who love boats usually have an affinity with models. Indeed, few would disagree with the sentiments of the French model maker Yves Renouf when he says: 'I consider myself lucky that my job is my passion. Every model yacht I create is a pleasure for me.'

The first detailed scale models of boats were probably made in the 17th century as part of the normal process of commissioning a ship. In England between 1650 and 1800 there was a tradition of creating beautiful replicas of Royal Navy ships. Built in a distinctive and recognisable style, they are believed to have been commissioned by the Navy Board,

which administered the Royal Dockyards, so that its masters, the Lords of the Admiralty, could see the appearance of a proposed ship. The shape and decoration would be much clearer on a model than on any paper plan of that time. Generally known as Navy Board, Admiralty or Dockyard models in acknowledgement of their origins, they were not all intended for general design. Some were used for discussion of particular developments and changes, while others were commissioned for presentation to naval officers and dignitaries. They were mostly built to the scale of 1:48, without masts or rigging but showing the configuration of decks, gun ports, cabins and other parts. Beautifully constructed from fine-grained fruitwood, brass, ivory, ebony and gold leaf, and painted in the typical Navy colours of Prussian blue and Venetian red, they have been highly prized and collected since they were first made.

It's a small world

Builders of modern large yachts such as Perini Navi and Lürssen Yachts employ their own model makers, and recently the naval design company Nuvolari Lenard added a model maker to its team. While the names of most of the early model makers have been lost, those of their modern equivalents are no secret, and many companies and individuals around the world earn their living solely from making models. One of the oldest companies still in the business is Dubbelman Ridderkerk, of the Netherlands, which celebrated its centenary last year. The grandfather of today's managing director was famous for creating steering wheels for ships, but in 1912 was asked to make a ship model, and the company now produces several models of yachts every year. Some yacht model makers such as the

Yves Gaignet



Left to right:
wooden hull set in epoxy of a Peri Yacht 33;
a 62cm caferacer;
the synthetic superstructure for a 1:60 model of Vitruvius 200;

the finished model on a mirror base; a 1:33 ketch created using strip planking and cloth set in epoxy;
the same model finished shows off the yacht's lines





Above: a concept model for Abeking & Rasmussen, shown at the Monaco Yacht Show

British companies Aztec Model Makers and Amalgam Fine Model Cars Ltd extend their work to include architectural models, prototypes and artwork.

While plans are infinitely better than they were 200 years ago, and 3D computer models can certainly be extremely realistic, emotionally nothing can match a three-dimensional object that can be touched, and models are still made to explain to a potential owner, in a physical form, how a design will look. Shipyards, naval architects and designers commission models of their yachts to display at boat shows both before the build and during actual construction. Shipyards often have models built to assist in the design phase of production, and Gary Isaksen of Isaksen Scale Models in Everett, Washington, USA, has seen the benefits of this. He says: 'Many times, minor changes are made based on a review of the model. It's the best way to see what the yacht will really look like. In fact, I've often discovered design issues and made suggestions to resolve them when building the model. Changes have been made to the yacht after this information has been shared with the company.'

Scale models of planned constructions, generally consisting of just the hull and painted white or yellow, are made for designers whenever a custom-built large yacht is proposed, and long before the actual hull is constructed. These special models are tested in tanks where wave makers replicate sea conditions. The results are documented to show how the full-size vessel is likely to behave under way.

Models on display at boat shows not only depict yachts already built or under construction but also include concept



Left: a fully detailed show model from Franck Méplond of an 18m Hoek motor yacht
Bottom: basic hull models are used to tank test yacht designs for seaworthiness

yachts. These showcase the latest design ideas and always attract attention, as intended. Although the complete design may never be upscaled into a finished yacht, elements of it are often used.

Traditional style

Professional modelling to high standards requires years of experience and a range of skills. Some makers, like David Spy, of Helensburgh, Scotland, trained and qualified as naval architects, while a number of model companies, such as Seacraft Classics Inc, of Port Townsend, Washington, USA, have a naval architect as part of their team. Many of the finest model makers, for example Yves Gagnet, Robert Eddy and John Bertola, started when they were boys and carried on to make a career of the work. Twenty years ago every model was made by hand, probably in much the same way as Navy Board models, using different types of wood for the hull and superstructure. Over time, techniques have changed, but for some only the traditional ways will do, regardless of whether the model is of a motor yacht or a sailing yacht.

Juan Cadario, of the small family firm of Astillero de Modelos in Argentina, has been making models exclusively by hand for almost 25 years. He says: 'We use computers only to design and produce some fittings, and to scale and



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print drawings. I think that our models are appreciated because you can see, like in a painting, the handiwork of the artist. Every model we produce is a unique piece of art. The process is simple and similar to that of building a real boat. First we make a male mould in wood, then we produce a female mould in fibre glass, and from this we produce the model.'

John Bertola, of Basildon, Essex, UK, is another modeller still working in much the same way as when he began in the 1980s, although he has seen many improvements in the accuracy of the plans supplied to him since the advent of CAD (computer-aided design). Using original drawings scaled down to size – and, where the yacht is already built, hundreds of photographs – he constructs frames and lays plating one section at a time to give the effect of a yard-built vessel. The plates are cut from plywood, metal or plastic sheets and then painted to look like steel or faired in as required. Every plank for the decks is laid one by one, exactly as it would be in the shipyard. Items such as winches are made of aluminium and formed on a mini-lathe.

The latest techniques

To the combination of art, manual skills, dedication and perfection has been added modern technology, making some processes easier and faster and the models more

accurate. Many model makers have embraced CAD programs and CAM (computer-aided manufacturing) to cut out parts. Gary Isaksen and Sandy Copeman of Amalgam Fine Model Cars Ltd use CAD drawings with CNC (computer numerical control) machines that can cut curves as easily as straight lines to produce accurate shapes.

It is impossible to pigeonhole most model makers as either traditional or hi-tech exponents because many combine both disciplines. Susanne and Howard Learned, of Seacraft Classics, sum up the situation by saying: 'We combine high-end technology with CAD drawings and lasers, but many of our models are built traditionally, completely by hand and from scratch, using plank-on-frame construction. It depends on what kind of boat we are building. Using the best hardwoods, the hull is hand-formed and then sanded repeatedly to ensure that the lines are precisely finished according to the plans. Accurate deck and hull details are made with innovative materials that include custom brass, silver and chrome castings. Marine varnishes and polyurethane paint are used in the finishing process.'

David Spy also combines old and new. He uses CAD/CAM to cut out many parts, particularly brass, but prefers to build from a wooden hull and use traditional techniques so that the end product is largely hand finished. He avoids using castings as much as possible and fabricates parts in

Above: building the plank-on-frame hull for a model sailing boat at Seacraft Classics

Left: Robert Eddy works on a 147cm model of *Scheherezade*, which was intended to be mounted in the yacht's central hallway

Above far left: Juan Cadario of Astillero de Modelos has been making models exclusively by hand for 25 years
Top left: Seacraft Classics created this desk-sized Palmer Johnson 135 using laser/resin printing techniques and AutoCad drawings

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miniature, much as full-scale items are made. This ensures that the model does not 'lack character, avoiding the sterile appearance of some models, which can look manufactured and indeed soul-less'. He feels that it is quite difficult to catch the 'spirit' of a boat.

Robert Eddy of Robert H Eddy & Associates, Camden, Maine, USA, believes his company stays in business by embracing new technology as it comes along, but says: 'The hand and finish work remains the same – a labour of love.' Kevin Godfrey of Scale Model Weston Ltd in Braintree, Essex, UK, finds that it is more economical to make the hull and superstructure by hand, though it can be completed by CAD/CAM. He uses a computer to help turn out many small same-shaped objects quickly. David Fawcett, whose company David Fawcett Ltd, of Pwllheli, Gwynedd, North Wales, has been making models since 1981, has changed from using different types of wood for the hull and superstructure to building with fibre boards of different densities. This is easier to work with and, unlike many woods, will not dry out over the years.

To scale

A model's size and scale often depends on where the finished work will be placed. A scale of 1:50 is popular, while David Packer of Scale Models International, of Carshalton Beeches, Surrey, UK, often works at 1:75 or 1:100. However, as the real yacht grows in size, the scale of the model must be changed if it is not to become too big. David Fawcett Ltd is building a model of a motor yacht that will be more than 2.5 metres long – the company's largest ever – and Gary Isaksen used a scale of 1:24 for a 1.7 metre model built to divide the owner's dining and



Top: *Princess Mariana* gets a fleet of minatures courtesy of David Fawcett
Above: a 20m runabout to a design by Theo Werner, is a fine example of a model built by Henk Brandwijk to 1:20 scale
Left: this model of a Perini Navi was handcrafted by Seacraft Classics based on an AutoCad file



Above: an impressive mass-produced line-up from Franck Méplond of France

Left: two Princess 95 models from British company Amalgam Fine Models Cars Ltd

Below: one of the two versions of *Maltese Falcon* built by David Spy

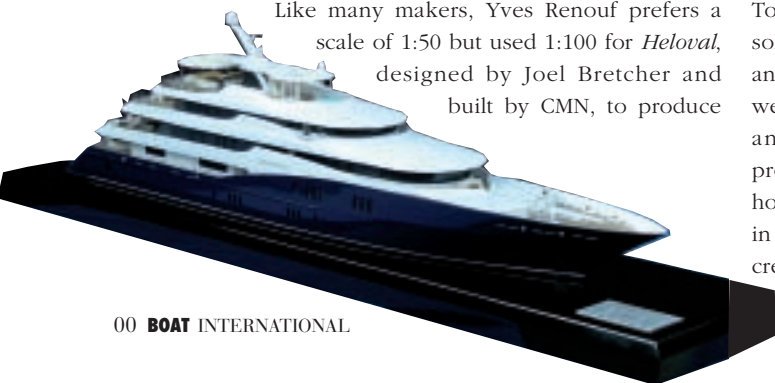
Below left: a model of *Excellence IV* by David Packer
Above, far left: John Bertola's 1:72 scale model of the J Class *Ranger*

The hull is hand-formed and then sanded repeatedly to ensure that the lines are precisely finished... deck and hull details are made with innovative materials that include brass, silver and chrome castings

living rooms. Astillero de Modelos makes models for Wally, with the largest to date being *WallyPower* for the movie *The Island*. Robert Eddy, who specialises in sailing yacht models, likes to work on replicas of 0.75 metres or less but can make larger sizes when requested. His biggest to date is a 1.47 metre model of the 49 metre ketch *Scheherezade*. The largest yacht model Yves Gagnet of Ship Shapes, Paris, has made tops everyone else at 4 metres. It is an Azimut 68 created on a scale of 1:10 and cut into two halves to show the complete interior, including the accommodation and engine room.

Finding the materials to make very small models at the correct scale can be challenging. For a 1:100 replica of a 7.2 metre yacht, Juan Cadario had the inspirational idea of using his four-year-old daughter's hair for the shrouds, and nearly 40 years later the model is still in perfect condition.

Like many makers, Yves Renouf prefers a scale of 1:50 but used 1:100 for *Heloval*, designed by Joel Bretcher and built by CMN, to produce



a 42 centimetre model. Recreating the curved thermoformed, Plexiglas superstructure and interior mirror effects of a 100 metre yacht created for Martin Francis was particularly demanding for Yves Gagnet, while the Dutch company Otter & De Roos finds that the most challenging models are those ordered by customers who are prepared to pay more than 75,000 for the best.

Same yacht, many model makers

More than one model may be made of a yacht, sometimes by different makers for different reasons. *Maltese Falcon* is an example. David Spy made two models of her while she was under construction in Turkey, using drawings from the design office and photographs taken on site. The first was for the designer Ken Freivokh and was exhibited at the 2005 Monaco Yacht Show; the second was for her owner, Tom Perkins. The hulls for these two models were made of solid timber, with the deck areas hollowed out by hand and deck planks laid individually, while the superstructures were built up using layers of brass sheet for the louvres and timber for the other layers. And while Spy was producing his models, Carmello Infanti, Perini Navi's in-house modeller, was making another one for the shipyard in Viareggio. The third model maker to create miniatures of *Maltese Falcon* is Robert Eddy, who





has also made models of *Andromeda La Dea*, *Mariette* and *Atlantide* for Tom Perkins.

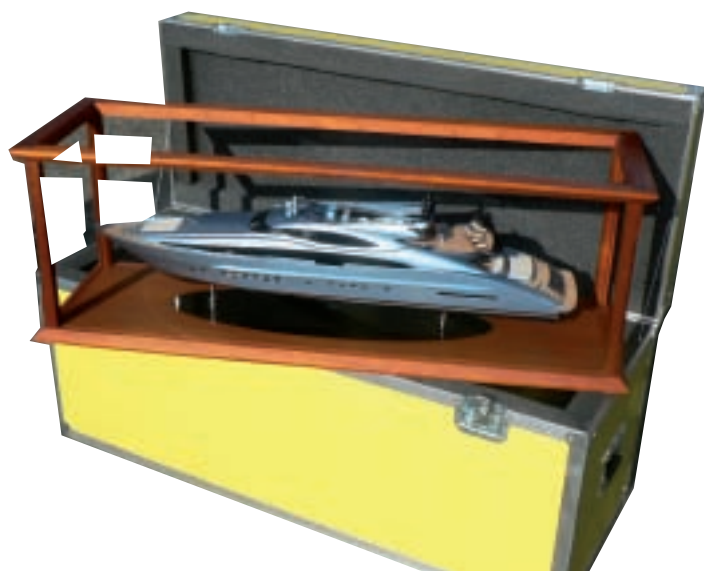
It's all in the detail

Making model yachts is expensive, rather like building the real thing. Wood, acrylic, brass and stainless steel are the most commonly used materials, with precious metals often used for fittings. Gary Isaksen makes railings from polished stainless steel and constructs decks and trim from real teak wood, as required by the design. He uses marine paints to match the exact colours of the full-size yacht. The cost of a model and how long it will take to build depends on the detail required and the finished size, but about three months or 1,000 hours are commonly quoted for a detailed model.

Models of 50 metre motor yachts made in the Far East can be purchased from BINA Scale Models of Malaysia for around 3,000, while the same sized replicas from Dubbelman Ridderkerk cost about 26,000 each. Robert H Eddy & Associates uses 14-carat white gold to create

chrome and stainless steel fittings, and yellow gold for bronze parts such as propellers. For this company, a visit to a finished yacht is essential to photograph, videotape and measure the boat to collect details and alterations missing from original design drawings. A typical project takes between 18 and 24 months to complete with costs ranging from \$100,000 to more than \$200,000. The old cliché fits – you get what you pay for. □

Above: John Bertola's 1.8 metre model of Kingdom 5KR is powered by two slow-revving car fan motors and two 12 volt batteries
Left: this Palmer Johnson 135 model from Seacraft Classics can be shipped and stored in its carrying case



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