

BRITAIN'S BEST-SELLING BOATING MAGAZINE  
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# Practical Boat Owner®

GEAR REVIEWS · PROJECTS · SEAMANSHIP · CRUISING · MAINTENANCE

## POPULAR CLASSICS!



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& 1950s

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and what they cost today...

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**DIY**

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Lynx on a pontoon mooring on Lake Temagami, Ontario

# Design and build in steel

Mike Camp charts the trials and tribulations of designing and building his 26ft steel sloop

About 50 years ago I had the opportunity to work in the shop of Tom Colvin when he was at Chesapeake Bay. Tom was one of the first boatbuilders and designers to advocate the advantages of building cruising sailboats in the 30ft to 50ft range out of steel and aluminium. His book on building with these materials is considered the bible of construction manuals.

His designs were also known for being based on the wholesome and practical ideas of working boats of the past. Over the following 30 years I worked on and off in many shops building and doing repairs in wood, fibreglass, steel, and aluminium, mostly on the west coast of British

Columbia. Also during these years I owned two sailboats. The first was the 27ft Eventide design by Maurice Griffiths, my second favourite designer. The next was a factory fibreglass production boat called the Pacific 30. In addition I sailed on boats of friends whenever I could. This was all coastal sailing, never offshore.

Then about 20 years ago I decided it might be time to start thinking about building a boat myself. But which design? There are so many to choose from. I loved Tom Colvin's Chinese Junk designs. I actually purchased a set of plans for his 42ft Junk, but then wisely decided a 42ft heavy displacement boat was way bigger than I needed or could afford. The most common mistake of people buying or building a

Originally planned for a cat rig, Lynx wound up as a sloop



boat is deciding on one too large.

I also was attracted to the traditional 'Tahiti Ketch', as well as some of Maurice Griffiths' designs in the 30ft range.

After much consideration, and with all my boatbuilding and sailing experience, I decided, why not design my own boat? So work began, even though my wife is saying I'm always trying to reinvent the wheel. In reply I keep telling her the wheel is not necessarily perfect.

My first design was a 32ft cat schooner, double chine steel with bilge keels. A half-model was carved, the lines taken off it, and then these lines lofted full size.

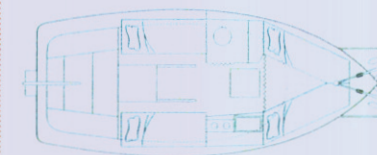
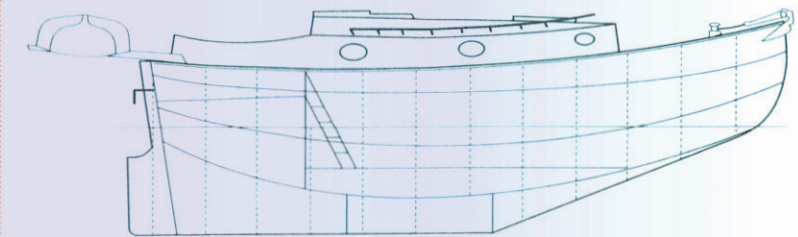
LOA (with davits)	9.14m	30ft
LWL	7.01m	23ft
Beam	3.04m	10ft
Hull weight	3,900kg	8,600lb
Sail area	35.5m <sup>2</sup>	382ft <sup>2</sup>
Headroom	1.70m	5ft 7in
Engine	9.9hp Honda OB	

Well, after I'd fabricated that long, steel keel I realized I didn't have the time or money to finish such a large boat. Tom's 42ft Junk displaced 35,000lb. This boat displaced about 18,000lb – still too big.

## The case for long-keelers

Let's first consider that damnable fin keel. Influenced by racing boat requirements to turn quickly, it is structurally weak, has no directional stability and shackles you with an unnecessarily deep draught.

If that wasn't bad enough, it is usually coupled with a skeg-hung rudder. So if you hit something big that doesn't knock off your fin keel, it will definitely take out your skeg-hung rudder. A serious degeneration in design by all accounts from the long, shallow keel from the past with its protected rudder.



ABOVE Mike Camp's design for his 26ft steel construction yacht Lynx

So... back to the drawing board. Time to make some hard decisions. How small could a steel boat be to carry a couple in safety and reasonable comfort... and cross an ocean? The design I came up with was double chine steel with bilge keels, sloop rigged, with the dinghy carried on davits off the stern, 26ft on deck with a displacement of 8,600lb.

### A perfect size?

A boat of about 26ft has many advantages. You can get by without an anchor winch, or any sail-tending winches. And for auxiliary power, an outboard works very well, thank you. Of my two previous boats one had outboard power, and one inboard. The outboard was a far better arrangement in every way – no through-hull fittings, which are always a source of leaks, no noise and smell in the interior, and all of that great storage area opened up in a small boat without an inboard. And today's 9.9hp 4-stroke outboards are rivalling small diesels in fuel economy and they are much quieter. Plus, for service or repairs the engine is taken to the mechanic, and not the other way around. Guess which is cheaper?

Also, when comparing different designs, the two most telling features of a boat's size are waterline length and displacement. ↻

Next, to go along with this deep fin keel, we now require a highly stressed tall mast with a puny main sail and a bewildering assortment of head sails. So the mainsail has become taller in the luff, shorter in the foot, and in essence has become secondary to the foresail. All these sins committed in the name of a fractionally better windward performance. I don't know about you, but I find it unpleasant to beat to windward, and would never own a boat whose main design consideration was going efficiently into the wind.

## Tom Colvin



Tom Colvin was a colourful non-conformist, professional sailor, boatbuilder, designer, writer, maritime

historian and polyglot, writes Graham Cox of the Junk Rig Association. He spoke five languages, including Mandarin.

He gained his Master under Sail aged 20, and Master under Steam at 23. In the 1930s he sailed aboard local trading junks in Southern China. He noted they carried stayed masts and small jibs, and had done so since Portuguese traders sailed these waters in the 15th century. This experience is reflected in the boats he later designed.

He built each of his designs for himself, and voyaged extensively before selling plans to others. He often sailed engineless, and raised three children aboard with his wife, Jean. His first ocean-going boat was the 42ft *Gazelle*, launched in 1967.

It is probably his most famous design, with more than 700 built. More than 10 are known to have circumnavigated, and others have made significant voyages. One *Gazelle*, *Migrant*, made daily runs in excess of 200 miles, running before the South Pacific tradewinds. They are slow to windward, but Tom did not consider this a disadvantage for ocean voyaging.

He passed away in Fort Meyers, Florida, in September 2014, aged 89.



Tom Colvin's most popular design, the 42ft *Gazelle* steel schooner

One of the most common tricks of the modern designer is to extend the bow and stern for no reason other than to make a boat seem bigger – to turn, say, a 30-footer into a 36ft boat so the designers and builders can charge more. In my opinion this arbitrary lengthening of a design adds nothing to seaworthiness, but it does make a big difference in docking fees. But, of course, most designers can't be concerned with anything so mundane as the cost of keeping one of their boats at a dock.

Then there is the thorny issue of the dinghy. Some sailors like to keep it overturned on deck, but then it constantly blocks your vision and is in the way when tending sails. The best route, I think, is to keep it on permanent davits, big-boat style. Mostly out of the way, but still readily accessible. The only downside is some marinas are going to charge you that extra 4ft boat length. In this case, you just have to bite the bullet and live with it. And as far as dinghy materials go, my first handmade one of fibreglass over plywood rotted out before I had a chance to use it. My next dinghy will be made either of solid fibreglass or will be an inflatable.

The last feature we will talk about is lifelines. On a wooden or fibreglass boat it's just about impossible to make them strong enough to withstand the force of a 200lb man (or woman) being thrown violently against them. On a boat made of aluminium or steel this is possible, but then they are usually made at just the right height to flip you overboard when thrown against it. To say nothing of the constant hassle getting over them while docked. No, for me, I much prefer a super solid toe rail, and cabin top handrails. If your feet stay on the deck, and your hand is tight on a deck rail, it's impossible to get tossed off the ship. Having said that, in rough weather an overboard line attached to



**ABOVE** Hull shape is established once keel, frames and chine are in place

**LEFT** Plating of the hull is under way

each crew member is always a good idea when leaving the cockpit.

So how did we arrive at the actual hull shape? Well, the aforementioned 32ft cat-rigged *Raven Lady* design was obtained by carving a half-model and taking the dimensions of the model. I felt too lazy to go through that exercise again, so I decided to cheat. The 26ft *Lynx* has the same keel shape, stern profile, transom lines, and midship frame design. So I fabricated the shortened keel, set up the stern and transom pieces, and welded the midship frame in place. Then I simply bent the shear bar, upper chine bar, and lower chine bar in place, and the hull shape was established. I call this process 'lofting-in-place' – although there may be a proper name for it. There were no real problems encountered in plating this framework.

So then there is the cabin and cockpit

design and construction materials. Where two different materials are joined together is always a source of future problems. I seriously considered an all-steel topside but concluded that would create too much weight aloft. So the decision was made to use laminated plywood covered with fibreglass cloth and resin. Overall it worked out well.

#### Choosing a rig

The original rig for *Lynx* was going to be a cat rig. That is, one mast stepped right close to the bow, one large sail usually gaff rigged, with no standing rigging. These boats were built by poor fishermen who designed out all unnecessary expensive fittings and gadgets – exactly opposite of the modern trend.

Anyway, I fabricated the mast step, and the boom. When I had a look at that huge

boom and imagined it sweeping across the cockpit in heavy weather, I chickened out. So I went with a traditional sloop rig with a large mainsail and a non-overlapping jib for easy tacking. I made a jib boom and boom track, but it was more trouble than it was worth, so I went back to a loose-footed jib. If the boat ever gets offshore, I would acquire a large, overlapping jib.

And a quick word on built-in tanks: don't have any! In my years doing boat repairs,

it wasn't a question of if they would be a problem, but when. Eventually both water and fuel tanks will become contaminated and will need to be cleaned out. And designers and builders never put large enough clean out openings. And then the lines and fittings always eventually leak. In the bilge under the floor of the *Lynx* I have enough room for at least 100 two-litre bottles of water, probably more. The gas cylinder for the outboard is on the same stern platform as the engine, and extra

gas cylinders are carried in the cockpit seat lockers, which are sealed off from the rest of the living area so there is never a smell of gas in the cabin.

Speaking of the cabin interior, the four berths of my original drawing were reduced to two, which gives way more storage capacity. There is a propane gas stove, and a permanent wood stove. Don't laugh until you've tried it. Propane heating stoves are great for creating moisture, something we are trying to avoid on a boat if at all possible. There is a toilet with a holding tank.

And a final word about overall boat aesthetics: everyone likes a boat with pleasing lines, but the shorter the overall length, the harder this is to do. It took a lot of extra work to attempt to get nice, flowing lines in the deck and hull, but I think it was worth it. Must be my artistic background. But then you can be the judge of that yourself. As far as the unusual shape of the bow is concerned, the best answer I can give is that it just turned out that way. I know it is usually long and narrow but as the beam still expands rapidly to 10 feet, it doesn't seem to have hurt the interior accommodation. It parts the seas wonderfully well and results in pretty much zero wake which adds to the overall efficiency of the design.

And the name *Lynx*? During my years as a professional trapper in northern Canada, it was my favourite wild animal. Actually, it still is.



Mike in full welding kit at work plating the bow of *Lynx*



Functional down below. Note woodburning stove and stainless steel compression post



Topsides are constructed from ply covered with glassfibre cloth and resin

**'My wife says I'm always trying to reinvent the wheel. I keep telling her the wheel is not necessarily perfect'**

#### ABOUT THE AUTHOR



**Mike Camp graduated from the University of Guelph in Ontario, Canada with a degree in Fine Art. After teaching for a few years he**

**decided to pursue working as a painter and sculptor full time. This work evolved into two separate but related fields. The first was as a wilderness landscape painter. To give authenticity to this work he spent over 25 years living and travelling in some of the most remote parts of Canada. The other aspect of his work was building monumental welded sculptures mostly of stainless steel. These works have become well known across Canada and can be seen on his website [mikecampdesigns.ca](http://mikecampdesigns.ca)**