

Building Christina Grant

A 38 ½ foot William Atkin Cutter

Wilson Fitt
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This is the story of how a desk jockey let his fantasy take over real life, built a 38' boat to sail to the Caribbean, and raced in the 2000 Antigua Classic Yacht Regatta.

My messing about with boats started at about 12 years of age when a friend and I built a little plywood dinghy that I don't think ever floated for more than a few minutes. My father had an L. Francis Herreshoff H-28 which I inherited at an unreasonably early age and by trial and error, learned to manage, maintain and repair. The H-28 needed a new dinghy, so I built a little plywood pram in my mother's dining room. In the mid 70's I sailed the H-28 to the Bahamas and back home to Nova Scotia, towing the dining room pram all the way.



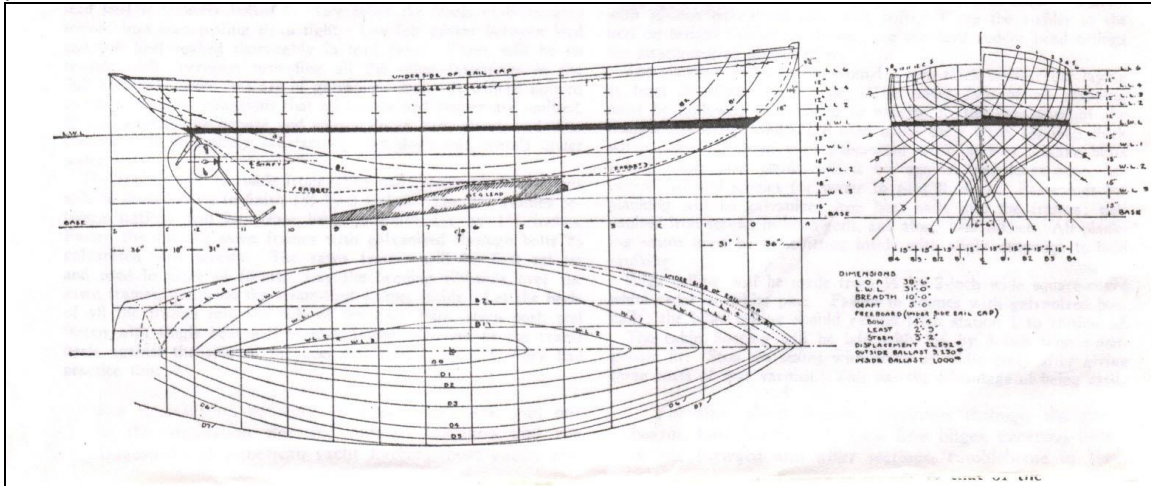
Eventually the H-28 was sold, and I started my first "real" project, a 14' Whitehall from plans in John Gardner's book, a graceful little boat that has given many hours of pleasure. Flush with success, I started talking big boat talk, but my more sensible wife diverted my attention to a cedar and canvas canoe. The canoe took us on several pleasant trips in the backwoods of Nova Scotia, but now languishes in a friend's barn alongside the Whitehall.

At some stage, before the canoe was finished I think, my wife's suspicions were aroused again when scrap lead started to appear in the back yard, to be joined by that most essential piece of boat building equipment, a cast iron tub in which to melt the lead.

Over the years, I had accumulated a large shelf of boat building books. The only one that seemed to make a big project do-able was Bud MacIntosh's "How to Build a Wooden Boat". With Sam Manning's drawings, MacIntosh cut through the mystique, dispensed with the fussiness of perfection, and made it all look like a straightforward piece of work that a normal person could accomplish. You don't start out on a project like this without a well-developed capacity for self-delusion about time, effort and cost. I am no exception, and MacIntosh's book was enough to push me over the edge.

After years of gazing at boat plans, I settled on a 38 ½' 1939 William Atkin design called 'Jerry Colemore'. A friend of my father's had owned one and I admired its robust unfussy look. Bill and John Atkin's writings influenced me with their plain spoken manner about boat building techniques and plans were available from Atkin & Co. at very modest cost.

The design is a very traditional, heavy displacement knockabout sloop that has proved to be an able performer, not particularly nimble, but happy to charge along in a straight line for hours or days at a time. The rig seemed small like many Bill Atkin designs but after some delightful correspondence, John Atkin referred me to Jay Benford who put together an 875 square foot cutter rig with a short bowsprit that is almost 50% larger than the original sail plan.



At that stage we lived in a modest house in central Halifax, Nova Scotia separated from our neighbours by an 8' driveway and hemmed in on all sides by zoning and land use restrictions that would clearly prohibit a big backyard boat. A friend was in the process of finishing out a fibreglass Rozinante hull in a warehouse with lots of extra space, so I started there with a loft floor consisting of ½" drywall sheets laid over very rough plywood salvaged from a construction site. The drywall gave a smooth clean surface and the plywood held the nails around which battens were sprung.

Text books and table of offsets in hand I spent a whole winter lofting and fairing the lines, making patterns for the backbone structure and other major pieces, the plug for the lead keel and the station moulds. I spent far more time on lofting than Bud MacIntosh would have, laying out and fairing every single line. The only thing not shown on the plan was the radius of the curved and raked transom, so I arbitrarily picked 10' which seems to look fine now that the boat is built.



I bought a large pile of wide, dirty spruce boards from a local demolition contractor and paid my young sons to fill most of the five-gallon pail with the bent nails that came along with the wood. These boards made the moulds and many other bits of temporary framing throughout the project.

The same contractor was tearing down a building that had douglas fir floor joists 1 ½" x 13" x 30' long. I bought a pile of them (also with nails included) with the keel and deadwood in mind.

Around this time my wife resigned herself to this scheme of mine and it became clear that the warehouse would not be available for the long term. We started scouting around for a house with enough room for a boat shed and ended up selling the place in town and buying an 1820 vintage fisherman's house near Peggy's Cove in dire need of renovation. We completed the renovation, including building an addition and moved household and the various bits and pieces of boat to the new site. My poor old utility trailer burned out a wheel bearing halfway there one day with a load of scrap lead. We had to abandon the lead by the side of the highway, returning weeks later to reclaim it.

I erected a 45' x 18' arch roof plastic shed attached to the existing workshop on the property. The sight of this apparently massive empty structure made me realize what a big undertaking this was and I thought seriously about whether this was just too much. However, having told too many people that I was building a boat, pride and stubbornness pushed me ahead. The neighbours, some of them old time fishermen, were certain (so they later said) that the plastic shed would blow down with the first fall gale but it stood with the strength of a reed for the next four winters.

For quite a while my lumber pile was an unprepossessing collection of salvaged boards and planks that inspired no confidence in the onlookers. Black locust trees grow commonly in southwestern Nova Scotia, not as native flora but as ornamentals by roadsides and houses. With the help of a bandsaw mill operator, I located a line of old locust trees that the owner wanted removed. On a cold, rainy March day we cut the trees, returning the next day to mill them up. I was armed with patterns for the major backbone pieces, and we managed to cut big chunks that approximated the required dimensions. The rest of the pile was reduced to 2" flitches or firewood. One of the problems with roadside trees is that the bottom 4 or 5 feet tends to have



embedded nails or fence wire and at the 15 or 20 foot mark we also found remains of old telephone wire hangars. This is hard on saw blades and millwright's nerves.

My bandsaw millwright friend also located a stand of nice white pine, cut and skidded out a pile of logs that ranged from 15 to 20 feet long. I joined him for two days of steady work, everything covered in snow and frozen solid.



He let me orient the logs on the bed of the mill to maximize the sweep in the life edge boards, apparently under the impression that I knew what I was doing. As each board came off, I could choose whether to throw it on the flat bed trailer, the discards being set aside to be resawn later for house lumber. As a result, I ended up with 2300 board fee of excellent quality pine for planking. The pile was stacked and stickered in our yard about a year before being used.



Between working on the house and keeping my employer happy, it took most of a winter to cut and finish the backbone pieces. The stem came from one nicely curved piece of black locust. The forefoot was a massive piece that could not possibly be created in one piece from anything I had access to, so I laminated it over a form in twelve layers with resorcinal glue, comforting myself with the knowledge that it would be full of bolts before I was finished.

The keel is unusually wide in this boat, almost 36" at its broadest. It was shown in the plans as three pieces of oak laid side by side with softwood splines in the joints. Despite John Atkin's reassurances, I was doubtful of this, and so laminated the keel using the salvaged douglas fir planks 4 layers thick and 3 wide, staggering the longitudinal joints in each layer. I used resorcinal glue and clamped the whole assembly as a huge slab 30' long, 37" wide and 5" thick using 2 x 4 stringers crosswise at one foot intervals and drilling holes vertically through the whole mess for threaded rods and nuts top and bottom. Gallons of sticky red glue, a bunch of young helpers to spread it, a plastic tent and heaters to make it cure finished the job. Offcuts that were subsequently left out in the weather for four winters showed no signs of delamination, so it seems to have worked out fine.



The deadwood was sandwiched together from more of the fir planks using asphalt roofing cement between layers and many long 5/8" bronze bolts. Stern post, horn timber, knees and transom frame all came from the pile of black locust.

The transom is a classic, steeply raked and curved specimen that intimidated me at the beginning. I built a large ladder form to the

inside radius and marked out the finished inside size using a plywood pattern taken from the lofting. I attempted, with pitiful results, to steam and bend two massive pieces of black locust around the form to make the outside edges of the transom frame. Finally that approach was abandoned in favour of laminating three layers that were induced to curve in advance by steaming and pre-bending over the form. Each half was bevelled according to the lofting, some of the bevels being well over 60 degrees, leaving a bit to spare for final adjustments. The two halves were assembled against the 4" x 6" centre post and with some smaller intermediate framing and temporary bracing, the whole assembly was complete.

The lead keel for this boat is not a simple slab-sided, flat-topped affair. Instead, it is all curves on the underside with a short flat top and a long taper aft that matches the wedge shaped deadwood. I made a wooden plug layer cake style from the same wood pile that made the moulds, fairing it up with a variety of power tools and drywall crack filling compound. The textbook amount for shrinkage was allowed fore and aft but not athwartship. The finished plug was about 14' long and needed several people just to move.

The next step was to build a big plywood box that looked like Frankenstein's coffin. The plug was suspended in the box and concrete poured around it to create a female mould. In hindsight, it was grossly overbuilt with almost a foot of concrete in places and rebar throughout. I didn't fancy the idea of 10,000 lbs. of molten lead running over my feet so stuck with the "more is better" theory.

The design weight of the keel was 9500 lbs. And I had about 11,000 lbs. of miscellaneous scrap on hand, including old sewer pipe, roof flashing, wheel weights and ballast pigs. I had intended to weigh and tally each piece as it went into the pot but forgot in the heat of the moment, so the best estimate of the final casting based on what was left over is 10,500 lbs. The plans called for 1,000 of inside ballast so the discrepancy seemed acceptable. Somewhere I read that most keels are overweight anyway.

I perched the fabled cast iron bathtub on 45-gallon drums, arranged a drain into the mould and put two big propane space heaters on end like rocket engines under the tub. Three large hand held "tiger" torches completed the heat generation equipment. A test run with a couple of hundred pounds of lead seemed to indicate that the rig would work and the tub would not split asunder when heat was applied. On the appointed day we loaded the tub with lead and fired up the torches.

My friends had divided themselves into two camps: those who wanted to see this happen and those who wanted to be in a different county. Some of the former group, equipped with heavy gloves and face masks, helped to slog lead up the ramp to the tub, held torches and watched as molten lead poured out in a clear silvery stream.

We burned about 400 lbs. of propane but didn't generate quite enough heat to create a steady flow of hot lead. The melt was done in batches of 2000 or 2500 lbs. each, resulting in a layer cake casting with imperfect bonds between the layers. As the lead keel was to be held on with 14 one inch diameter bronze through bolts, it seemed unlikely to fall apart and I did not spend much time worrying about it.

The keel casting lasted until midafternoon and ended with large quantities of cold beer for the crew, laughter and congratulations that no one was hurt.

The denouement, of course, was removing the keel from the mould. I rented a jackhammer and spent several days of hot, dirty and noisy labour reducing the concrete mould to a pile of rubble and annoying our neighbours. I don't recall reading about this part of the process in the "romance of wooden boat building" articles in WoodenBoat Magazine. Perhaps I missed that issue.

In hindsight I think that a keel of this size is at the outer limit for a backyard project. A 2 or 3 thousand pound casting should present no serious problems, but the set up cost and hazards of a 10,000 lb. casting are problematic. I could have hired a professional to do the job for 50 cents per pound, lead not included, which might have been money wisely spent.

At the risk of dwelling too long on one subject, I will refer to briefly to the bolt holes in the lead. I put wooden dowels in the keel mould in an attempt to create bolt holes but in practice it didn't work very well. The dowels were badly charred with flames from the torches as we tried to keep the lead moving, so the holes were either very rough or non-existent. Once the lead keel was manoeuvred into position (a temporary cradle, short pieces of pipe as rollers, two little hydraulic jacks: next project is to build a pyramid!) I bored up through the rough bolt holes into the wood keel and down through the wood and lead for the rest. I had a long extension welded to a 1" twist drill bit for these holes. My concern was that the bit would get hot, bind in the hole and freeze up forever. It did tend to clog and bind in spite of water or oil poured in the hole (both of which make a big mess as cuttings come up). Once it got away from me, the bit froze up in the hole and the drill started turning, stopping only when the power cord was sheared off, fortunately without breaking my wrist in the process. Make sure your finger stays away from that trigger lock button! Next time I'll try an auger bit instead of a regular twist bit as it might clear itself more easily.

In the end, 14 one-inch bolts were set, a row up the centre line matched pairs on each side of the centreline where the width of the keel permitted. The top washers tended to sink into the relatively soft douglas fir of the wood keel so I made 4" diameter washer shaped pads from black locust to spread out the compression load.

I waited until the backbone was assembled and set up before drilling the big holes for the propellor shaft and rudder stock. Each one was almost two feet long and about 2" in diameter to accommodate a bronze tube with a flange on the end. My reading of various instructions did not seem to clarify how I was going to make these big holes run straight and true, and subsequent experience did not cast much further light.

I had appropriate sized forstner bits welded to long extension rods and set up jigs to hold them in alignment. Entering in the proper spot was not a problem but maintaining alignment down the length of the hole proved to be nearly impossible. Finally, I got through, but the middle looked more like a cavern than a nice neat hole. To salvage the situation, I bored small diameter side holes intersecting my ugly efforts and inserted a lubricated steel tube of the same diameter as the real tubes in the propellor and rudder stock holes and squirted in thickened epoxy to take up the difference, extracting the steel tube before the epoxy set up hard. When the real tubes were installed, I again drilled some intersecting side holes and forced in warmed up asphalt roofing cement until it squeezed out at both ends. Not pretty, but it seemed to work.

Setting up the moulds presented no difficulty except for much awkward climbing up and down, which was to be the story of the next four years. Everything faired up quite well except for the last station which, following Bud MacIntosh's advice, I left sitting on the shop floor.

It might have been an excess of caution, but I didn't start cutting the rabbet for the sockets for frame heels until after the moulds were up, even though all the lines had been lofted and marked on the various timbers. It is one of those tasks that consumes hours of contemplation of books and arcane instructions, is quickly obvious when you are presented with the three dimensional reality and then takes forever to finish. Our boat has about 50' of rabbet per side. Maybe there's a quicker way to do it, but I just pounded away with a heavy hammer on a big framing chisel, smoothing with a rabbet plane and whatever other implements could be brought to bear. The frame sockets, described in a few short paragraphs in the books, also took a long time, mostly in below freezing temperatures. I started in the middle where the bevels were relatively simple and obvious and worked toward the ends where they became quite extreme.

Steaming and bending the frames is just as quick and easy as the books say. With two helpers we did the whole boat in a weekend. My steambox boiler was an old stainless steel beer keg fired by a big propane torch and feeding into a styrofoam wrapped box. I made a big plywood wrench to apply the twist and filled each heel socket with Sika 240 adhesive to take up any evil gaps that might cause trouble later. The frames were made in two layers (three right aft), which would later be fastened together with the copper rivet plank fastenings.

The floors were another "how could I possibly spend so much time on this?" problem. The original plans only called for a relatively shallow floor at each station, but not comfortable with that and having read the scantling rules, I made up a laminated floor at every frame with wings that reached up the planking 12 or 18" on each side. I know that in theory you can loft and build each of these with precision, but adopting my usual cut and fit approach, I did them in situ against the frames and ribbands. Laminating anything is very laborious compared to cutting it from solid timber; assembling, gluing, cleaning, bevelling and fitting these seemed to take forever.

Finally, I came to planking, in many respects the most satisfying part of the whole job. On the Whitehall project, I had followed the textbooks by starting from the top down then the bottom up, with a shutter plank in the middle. Fitting that shutter was such a task that I decided to line out this boat as best I could and plank straight from garboard to sheer, a process that worked out quite well.



In my relative inexperience, I struggled with the first few strakes, trying each one four, five or six times, again thinking that this could take a lifetime. After a while, though, a rhythm developed, clamping became easier, and the work went along quite quickly.

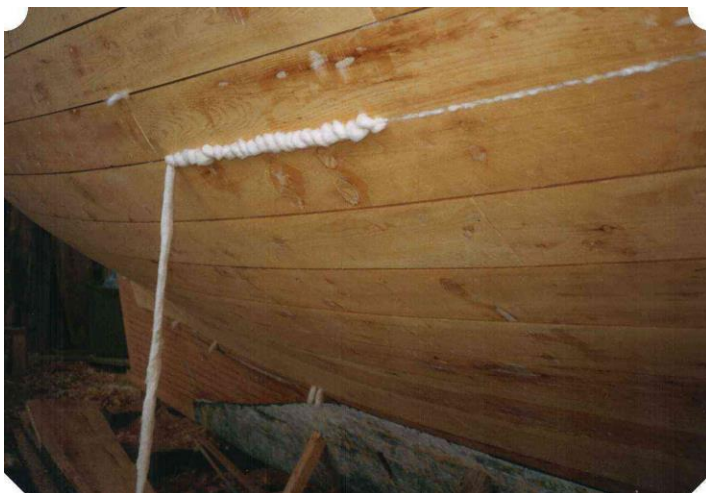
I had decided to fasten the planks with copper rivets and discovered early on that bucking and peening is a lot of work requiring a patient helper. With the assistance of a local blacksmith, a big C clamp was modified so it would clamp plank to frame, set and buck the rivet. This allowed me to nip and peen it all single handed. In another breakthrough of crude technology, after fiddling with wedges and similar things, I settled on several old car scissor jacks to edge set or squeeze each plank down against its neighbour, pushing against the ribband above. The plank to plank joists were all light tight, but since most of the work was done in winter, they opened up a bit when spring came and the sun shone into the plastic shed, converting it from an icebox to a sweatshop.

To push the schedule along, I hired two young men who had basic carpentry experience to work with me during their one-week spring break. With me spiling, cutting, beveling and fitting and them clamping, fastening and peening, we planked almost half the boat in a week. By then, I could get the plank right with just one try most of the time.

When the time came to fair up the hull, I was tempted with power tools but quickly realized that they are far too aggressive. The time-honoured hand tools did most of the job, the worst being in the reverse curves in the aft sections.



Caulking (“corking”, as it is pronounced locally) is not as mysterious as “they” make it out to be. For fun, I made a traditional caulker’s mallet on a friends’ lathe although any mallet would do the job. The blacksmith forged irons of several sizes and off I went, developing tendonitis before finishing. A friend who was later to do a long offshore passage with us came by and said, “Is a string of fake Santa Claus beard all that’ll be between us and a watery grave?”.



I ran a bead of Sika 240 over the Santa’s beard and created a cove with another highly specialized tool, the rounded end of a popsicle stick.

The molds came out of the finished hull, revealing a cavernous space to be filled up.



Next on the list was the 1 ½" x 6" sheer clamp. The last of my salvaged douglas fir had been earmarked for the job, but after cutting, tapering, scarphing and wedging, it exploded just as it was forced home. Too dry and brittle, and definitely time to quit for the day. Some relatively clear white spruce planks from the local lumberyard did the job in three lengths per side.

Deck beams and carlines were laminated of locust or oak over a form, centerline blocking installed, and the deck laid down with two thicknesses of marine plywood set in epoxy and sheathed with fibreglass in epoxy.



We had considered laying a teak deck over the plywood, but the cost of materials would have been astronomic to say nothing of the labour. Several people said it would

leak no matter how careful I was, so we are satisfied with our leak-free painted deck. I only wish that I had doubled up on the fibreglass on the foredeck and cockpit where heavy things with sharp edges seem to get dropped regularly.

With the deck complete, visible progress seemed to accelerate. Three days work with my young helpers finished the ceiling, fitted tight with a broad band double thick along the turn of the bilge as per Bud MacIntosh. The mast step, a massive piece of oak, was notched over a span of 5 floors. The engine beds were installed and engine manhandled into place, after which I was comforted by being able to see the coupling by peering through the shaft log. Maybe it was in the right place after all.

I was lucky to find several long, wide mahogany planks at our local hardwood supplier's warehouse and bought them at huge expense for the cabin trunk. With a beating heart, I bored them edgewise for 3/8" through bolts, without the bit appearing through the side to ruin an irreplaceable piece of wood. Having used mahogany for the cabin, I was now committed to buying more and more for rails, trim, hatches, etc. etc. and am now doing my best to keep varnish on all that bright work. It does look good, however, both inside and out.

Finishing the interior did not take as much time as feared. I had spent quite a few evenings painstakingly drawing layouts, none of which came close to working. When it came time to actually try to build it, we used thin plywood to try out several "innovative schemes", none of which really worked. Finally, we settled on the conventional layout for a traditional boat of this size - galley, chart table and wet locker at the base of the companionway, two settees with lockers and bookshelves in the middle, a head compartment to starboard, clothes locker to port and double berth forward. After living aboard for over a year, it seems to work quite well.

All of the interior bulkheads and furniture were built out of ordinary lumberyard narrow, v-groove tongue and groove pine, painted a pale cream and trimmed with varnished mahogany. The pine boards were run through the thickness planer to reduce the prominence of the "v" a bit, as it seemed too heavy for the small space in which we were working. The only complaint is that some of the knots, even though primed with two coats of sealer, are still burning through the paint finish. The cabin top was laid with the same pine, covered with a layer of marine plywood set in epoxy and glassed over.

By now, the boat was starting to be recognized as such by the visitors who happened by. We posted a list in our kitchen inviting everyone who came by to suggest a name with sometimes hilarious results. Finally, we settled on "Christina Grant" after my mother and rashly decided on a launch date of June 18, 1999 about 6 months in the future and within a few days of her 80th birthday. This was to be a major party and family reunion. We had decided to go on a cruise to the Caribbean in the winter of 1999/2000 with the new boat so the heat was really on. To add to the pressure, we had found a buyer for our house who wanted possession on June 30th, minus all the accumulated debris of 5 years of boat building. I wrapped up my day job and spent the last six months full time at boat construction.

Having bought all that mahogany, I now wanted to finish the boat with yacht style trimmings and bronze hardware, some of which took a lot of tracking down. I was lucky to be put in touch with Bill Page of Cushing, Maine who has a gold mine of old bronze hardware and could find most of what I needed for reasonable prices. The big fittings such as chainplates, gudgeons and pintles,

anchor rollers and crane iron all had to be custom made. I made wooden patterns and had them cast at Lunenburg foundry, less than an hour's drive away. The Foundry let me look at their old patterns to see how they were made and advised me how to get what I wanted. Grinding and polishing the rough castings was not difficult, once I figured out what tools to use (a 4" high speed grinder with various discs and pads from a welding supplier). I took the precaution of having pieces that would be highly loaded radiographed to check for internal flaws.

My young helpers were kept busy on their weekends all that spring sanding and painting the interior and other tedious jobs while I pushed along with the electrical, mechanical and plumbing (all simple because of decision to do without refrigeration and hot water). Hatches, rails, trim and hardware were installed. A sliding companionway hatch that would actually slide smoothly consumed the best part of a week's work.

Finally, with only a little more than a month to go before launch date, I started on spars. Long straight clear spruce boards do not come from the gnarly spruce forests of Nova Scotia, so through the good grace of a friend in the forestry business in British Columbia, I had a lift of 14' and 16' clear 2" x 10" spruce planks shipped east. Long lengths of sitka spruce would be nice but with the use of epoxy glue, the shorter lengths can be scarfed together to make a perfectly satisfactory box section mast.

I built the boom for practice because a mistake would only ruin a relatively small amount of wood. Completing that, I scarfed and glued four boards each 55 feet long and tapered according to the instructions in "Skene". Rabbits were cut on the fore and aft panels, blocking made and internal wires run (why didn't I think of spreader lights?). None of this was terribly difficult but success hinged entirely upon the final assembly. After a couple of dry runs, I armed a crowd of friends with gloves, pots and brushes and we were off! Two people mixed epoxy, one distributed it to the spreaders, eight people smeared it liberally on each joint and then set the long boards in place, one at a time. A 55' board is surprisingly flexible and difficult to handle, especially when well lubricated with epoxy resin. Most of the clamping force was supplied by a banding machine such as is used to strap big boxes or pallets. This seemed to work quite well when supplemented with clamps in strategic places and numerous small wooden wedges. Like the casting of the keel, this was an event that ended with much laughter and cold beer.

Stripping the clamps, planing, sanding, and varnishing the spars all took time but now we were on the home stretch. Tangs and mast hardware were made out of stainless-steel plate, rough cut by the metal supplier to cardboard patterns that I made, drilled with my little, overworked drill press, and bent by brute force.

Finally, the unveiling. After four years the plastic shed, now with many layers, was torn down in an afternoon and for the first time we could stand back and get a look at this thing! My secret fears about lumpy sheer, awkward cabin trunk or droopy bowsprit were all put to rest.



After a streak of beautiful weather, launch day dawned grey and raining but thankfully calm. A huge crowd of family and friends gathered, and incredible amounts of food materialized including a whole pig and a lamb roasting on spits. What seemed like the world's largest mobile crane lumbered around the corner and unfolded itself to amazing heights, delighting the children young and old. My mother broke the champagne bottle and the boat soared over the little workshop to be deposited ever so gently in the water. The mast followed, stepped over a gold coin, and there we were, floating just above our lines and only weeping a few litres of water.



In less than two weeks, we managed to finish the rigging, go for a test sail with the sail maker, empty our house, load an incredible amount of stuff aboard and watch most of the boot stripe disappear beneath the water.

We spent three weeks in Halifax at one of the yacht clubs, sorting out hardware and supplies then left for a one year cruise to the Caribbean. That is another story, but in broad outline we coasted down the eastern seaboard of the USA to Beaufort, North Carolina; had a fast, rough passage to the Virgin Islands (1200 miles in 9 days) arriving just in time to hide from Hurricane Lenny, spent most of the winter in Antigua, sailed in the Classic Yacht Regatta and won a first prize in the Concours d'Elegance, Spirit of Tradition Privately Maintained. We sailed back in the spring of 2000 via Bermuda, spending the last day of the trip hove to in a northeast gale off the Nova Scotia coast, and finished the season with a cruise to the Bras d'Or Lakes.



I did not start this project with any clear idea of how much time or money it would take, which is just as well in hindsight. No effort was made to keep track of hours during construction, but the whole project from lofting to launch extended over 5 ½ years, six months of which were full time. I worked on it almost every weekend all day and tried to put in two or three evenings a week, although between demands of work and home this did not usually prove possible. My wife insisted that we take a vacation each year that did not include boat building. Reconstructing this, and allowing for the labour of my young friends, I think there are about 7,500 hours in the job.

The cost of the project was spread over several years, and I'm not sure how relevant they would be to anyone else. In the end, it cost at least 50% more than my best estimate at the beginning. We took mounds of invoices with us when we moved aboard, intending to categorize and add them up but finally threw most of them away, not thinking that such a detailed answer would be of much value.

Broadly speaking, the materials for the hull, deck and topsides structure including the ballast and building shed came to around \$85,000 Cdn. The engine (a 27 hp. Yanmar diesel), controls, shaft, tanks, etc. were about \$10,000; deck hardware, winches, anchors and so on about \$20,000; mast and rigging, another \$10,000; and sails \$10,000. Plumbing and electrical materials were around \$5,000. We have no refrigeration, pressure water or other "modern conveniences". My theory was that we could spend a lot of money buying cold beer in bars for the price of a refrigeration system and all of its attendant complications.

At this stage we would have had a reasonably well equipped boat for day sailing or limited coastal cruising, but we continued to spend on a wind vane steering gear, life raft, EPIRB, charts, books, fancy foul weather gear and endlessly on and on...add to this, of course, the tools needed to build the boat (buy the best at the beginning or you'll pay twice), insurance, the crane for launch day and the price of the party!

There is a romantic aura associated with wooden boat building, but there is really no magic (and in fact very little romance) involved in any part of the work. Like most things close up, it is hard and often repetitive work that you need to force yourself to get at each day until it is complete. I have no training in carpentry or boat building, except that gained through experience. If you are handy with tools and want the considerable satisfaction of building a wooden boat there is nothing to stop you. Even the money will usually work itself out if you are not in too big a rush. There are quicker and less expensive ways of getting a boat, but none are more gratifying. Bud MacIntosh was absolutely right.