

## Chapter 1 : Do-It-Yourself/Wooden boat - Wikibooks, open books for an open world

*Comment: This book is a little beat up, but will work fine as a reading copy as all of the pages are unmarked. There is a vertical crease/wrinkle mark from use on the outside of the spine, but the binding is still sound.*

Being aware of these things should help to eliminate some frustration and expense. My list loosely follows the common order of seasonal work, from springtime commissioning to autumn haulout. Sanding and painting when the hull is dry Jan Adkins Sanding and painting a dry hull invites dust and debris to accumulate in open seams, potentially restricting the ability of those seams to swell. At some point, our boats spend time out of water. Is the paint cracking at the seams? Can you see through the seams? Why do this before sanding? Painting then traps this debris in the seams. As the planks then swell after launching, their edges will encounter that accumulated crud. Resist the temptation to put more than a few inches of water in your bilge: Many boats have their planking screwed directly to the transom edges. But after several years of sanding plank ends flush with a dried-out transom face, critical planking material is eliminated, and splits develop at the fastening holes. Rot may soon follow. Leave those projecting plank ends alone. After the transom swells back up, everything will align. If you can see light through your seams, my first advice would be to wait. Slick Seam, a soft, waxy product made by Davis Industries, is the standard for this treatment. It is effective, but rather messy when it squeezes out. It also has a reputation for clogging sandpaper. Dried-out topsides that have been given a fresh treatment of seam compound will likely end up with a bunch of seams emphasized by proud beads of squeeze-out after a boat is launched the planks have swelled up. These beads might look bad, but their presence indicates a healthy boat because the seams have closed up naturally upon swelling. This is an extension of the previous item. I have pulled enough caulking out of boatsâ€™ layers and layers of strata, caulking on top of caulkingâ€™ that I start to feel like a geologist. Before driving in new caulking, you must first take out the old stuff. If your boat is leaking, the caulking might be bad; it is, after all, a natural fiber, and it can rot. It can increase the shear, or lateral load, on your plank fastenings as well as increase the width of the caulking seam. As the planks swell with moisture after the boat is relaunched, the pressure that builds up between the plank edges can actually put tension in the frames and tear them apart, like a rope snapping in two. The effect is especially bad with dense mahogany planking; cedar is more resilient and forgiving. A Shop-made Reefing Hook The tool of choice for cleaning out old seams is a reefing hook made from the tang of an old file or a flat-head screwdriver. Using a propane torch, heat the tang or the screwdriver tip to red-hot. Then, bend the handle or tip a little past 90 degrees and quench the hot metal in water. File the business end of the tool to the sectional shape of the seam. Judiciously placed in the seam and dragged along, such a tool is very effective at removing old cotton and compound. A properly drilled screw hole includes these three elements: You remove a piece of varnished wood every year for 20 years so its finish will remain perfect. The screw holes become fatigued. Or imagine a badly corroded screw holding a plank to a frame; its threads have weakened and lost their grip, and the wood surrounding the screw hole has deteriorated to the point that it will no longer hold a fastening of this size. In either case, the screws spin uselessly in their holes, and the most convenient remedy is to replace them with larger or longer ones. This tactic only works with proper preparation. If you simply jam a larger screw into an existing hole, the new screw will likely be too big for the original hole, and the countersink not deep or wide enough; the screw may also be too long. The result can be disastrous, with one or more pieces split. In my experience, a boat is not going to take the all-day, every-day abuse of the summer sun without a minimum of six coatsâ€™ and afterwards at least one, but preferably two, maintenance coats per year. Anything less than that invites deterioration, which will require scraping back peeled or yellowing varnish to fresh wood and rebuilding the finish in that area. You might also end up sanding back graying wood to a fresh surface, and in the process lose some critical wood thickness. Boiled linseed see WB No. While oil is the easiest finish to apply, it does not give the same protection as a coat of paint, and it tends to blacken as it ages. It also is not as effective a moisture barrier as paint or varnish. However, when kept up, it makes a perfectly fine and time-proven finish, and it can keep rot at bay. Inadequate preparation for paint Kate McMillan Hasty preparation for painting can lead to trouble. All loose

and flaking paint should be scraped away; surfaces should be sanded; and hidden areas, such as the undersides of thwarts, should be coated. If you are going to paint, prepare your surfaces properly. Sand off all the gloss of the previous coat. For bare wood, rough up the surface adequately; too fine a sanding can burnish the wood, making it more challenging for paint to stick. Also, if you can, paint the whole piece. I often see thwarts with only their tops and edges painted, and the bottoms left bare. If moisture can get into one side easier than the other, it can ruin the finish and possibly warp the board. This will save wear on the bilge pump and potential clogging and it will allow water to flow freely through limber holes. Before you launch for the season, make sure your boat is clean. Get as much crud off as you can while the bilges are dry and you have access to a vacuum cleaner. Sanding dust accumulates everywhere. Sanding dust finds homes in plank seams and at the junction of your keel and floor timbers; vacuum these areas using a crevice tool and a brush attachment. A clean bilge will also help keep the pump from clogging. After the boat is launched, keep her clean. If I had my way, we would cruise barefoot and eat out of feedbags. And really watch out for stray potato chips: Freshwater washdowns Jan Adkins Regular freshwater wash-downs can promote rot in decks and top timbers. A clean boat is super important. When dirt accumulates in a crevice, it holds moisture, and the next thing you know you have rot. You need to wash that dirt off but not with fresh water. A regular freshwater wash-down with a dock hose is fine for fiberglass boats, but not wooden ones. The fungus that causes wood rot requires warmth, wood, and water fresh water, to be exact. Salt water is the answer. Old-timers sluiced their decks with salt water regularly, to keep planks swelled and rot at bay, and you should, too especially after a rainfall. Salty water prevents rot fungus from growing and it also keeps deck planking nice and tight. Afterward, of course, bail out the salt water. Having a squeegee or chamois to wipe standing water from seats and other horizontal surfaces prevents your own bottom from getting wet. It also prevents wear and tear from the salt left on that finish you worked so hard to apply. In addition to salting, you might consider a canvas cockpit cover to prevent large amounts of rainwater from finding its way into the boat. A cover can virtually eliminate pumping on a boat that is otherwise tight. It also eliminates bird guano, which fouls finishes and bilge pumps. First, make sure the weight of the boat is distributed evenly along the length of the keel. If your trailer has bunks or stands, think of them as kickstands only. They are there to prevent the boat from falling over, but they should not hold the entire weight of the boat. You should be able to loosen one whole side and careen the boat over. Rollers are generally bad for planked wooden hulls: If the centerline structure is not supported, bunks or stands can press themselves into the sides and bottom of the boat. The hull was built to have uniform pressure all over, not in a few localized places. The problems caused by improper trailer arrangements can be magnified when coupled with ratchet straps. These straps are convenient and easy, but also powerful enough to split a plank. Use them with caution. With the weight centered on the trailer, and with the trailer winch holding your boat forward, your strap should be tightened only enough to keep the boat and trailer together, to prevent bumps in the road from doing any harm. If your boat has a drain plug and is stored outdoors on a trailer, pitch the hull so the plug is at the low point and any water will run out if your cover leaks. Improper storage Kate McMillan Proper on-land storage includes adequate support, shelter, ventilation, and humidity. Before the boat is put away for the winter, it should be thoroughly hosed off with fresh water and all surfaces allowed to dry. Salt draws moisture which, due to decreased airflow and sunlight, invariably grows mildew during storage. Also, I have seen a fair bit of animal damage to wooden boats by porcupines and squirrels attracted to a salt lick. Ignoring any of these items can lead to damage. If it has long overhangs, gravity will attack those first. Jackstands, shores, or some other sort of prop underneath the bow and stern will minimize their tendency to droop.

## Chapter 2 : How to Build a Boat (with Pictures) - wikiHow

*Wooden Boats To Build & Use by John Gardner Background essays and complete building plans for 16 boats. Also included are discussions of half models, taking off lines, building techniques, and an essay on the future of wooden boats.*

Your first boatbuilding project should be simple and inexpensive, yet the boat needs to be useful when it is finished. The balance between these criteria is an individual decision. The Internet is a great place to start when looking for a design. A site I found useful for free design information was <http://www.dugboat.com>. In my case I chose the "Dug", designed by Hannu Vartiala. I chose the Dug because I wanted something simple and inexpensive as my first boatbuilding project. I modified the design to use 3mm plywood rather than 6mm. Not only was the thinner ply cheaper, but it was much lighter. It also gave me the opportunity to experiment with fitting gunwales. The finished product was a one person canoe. I can pick up and carry this boat easily by myself and it practically floats on wet grass. It is perfect for fishing in the shallow rivers around the headwaters of the Murray Darling system in Queensland, Australia. The Dug was my choice, though. Your own choice of design for your first boatbuilding project may well be different.

**Plywood** [ edit ] Plywood is a man made construction material. The outermost layers are termed the faces. Since these are the only visible layers, the appearance of each face is subject to standard specification. In Australia each face of a plywood sheet is described by a code letter: A " a high quality appearance grade veneer suitable for clear finishing. S " an appearance grade veneer which permits natural characteristics such as knots as a decorative feature subject to agreement. B " an appearance grade suitable for high quality paint finishing. C " a non-appearance grade with a solid surface. All open defects such as knot holes or splits are filled. D " a non-appearance grade with permitted open imperfections. Limited numbers of knots and knot holes up to 75 mm wide are permitted. In the USA some manufacturers use a letter code for the "front" face and a corresponding number for the "back" face, i. Typical applications using this grading standard are AA for marine plywood, AD for a wall cladding where only the front face of the plywood is visible, CD for structural plywood flooring and DD for structural bracing. The adhesive used to bond together the laminations in the ply is of paramount importance to boatbuilders. There are four standard glue ratings: Type A bond is produced from a phenol-formaldehyde resin [PF] which sets permanently under controlled heat and pressure. It forms a permanent bond that will not deteriorate under wet conditions, heat or cold. It is readily recognisable by its black colour. Type B bond is produced from melamine fortified urea-formaldehyde resin [MF] which sets under controlled heat and pressure. Type C and Type D bonds are interior use bonds produced from urea-formaldehyde resin [UF] and should not be used in boatbuilding. Plywood for boatbuilding is traditionally purchased in 8 foot x 4 foot sheets. In metric this rounds out to mm x mm. It is apparent from these dimensions that it is necessary to join plywood sheets together to build even the simplest of boats. It is not manufactured to the same engineering standards as marine ply but is often quite suitable for a first boatbuilding project. The glues used between the layers are the same as those used in marine ply so delamination should not be a problem Exterior grade ply may have one "good" face and the other of lesser grade, for example AB. The "Dug", my first boat, was constructed using exterior grade ply in pacific maple.

**Marine ply** [ edit ] Marine ply is an engineering product that must comply with published standards. These standards detail practically every aspect of the composition and performance of marine ply. If you are going to build a seaworthy boat, or a boat that must meet survey standards, use of a certified marine ply is essential. If it is not stamped then it is likely to be material which has not passed final inspection. Some examples of marine ply available in Australia are: AS Standard, Australian made premium plywood. BS Standard, premium plywood Pacific Maple: BS Standard, the most economical but slightly heavier plywood. Balsa-cored plywood, has a very high stiffness to weight and strength to weight ratio. For use in boat hulls, decks etc. Waterproof plywood with teak, ash and sapele decorative veneer.

**Joining Plywood sheets** [ edit ] Plywood for boatbuilding is traditionally purchased in 8 foot x 4 foot sheets. Two methods are commonly used to join plywood sheets together: The butt joint The scarf joint The butt joint is by far the easiest to make. It is formed by applying liquid epoxy to the edges of the sheets to be joined, pushing them

together and gluing a strip of ply to one or both sides of the seam. A variation is to use fibreglass tape instead of the strip of ply. Once the epoxy has cured the join is stronger than the plywood sheets themselves and the wood will fail under stress before the epoxy of the joint. Epoxy does not stick to polyethylene. Laying down a sheet of polyethylene film, such as a disposable painters drop sheet, can save the embarrassment of gluing your work to the floor when joining sheets. You can also use baking paper for this purpose if polyethylene is not available. Lofting[ edit ] Lofting is the process of taking the dimensions from a plan and drawing full size components on the construction materials. Using the lofting batten Sometimes the designer provides the necessary measurements in the form of a table, but sometimes it is necessary to take the measurements directly from the drawing and scale them up to life size. Station lines may be drawn every 10cm for example. The distances either side of the centre line at each station line are determined from the plans and marked on the ply as reference marks. Finally smooth lofting lines are drawn through the reference marks. A straight edge such as a steel ruler may be used for straight lines and the lofting batten is used for smooth curves. It is helpful to temporarily drive panel pins into some of the reference marks to ensure the lofting batten follows the correct curve. Once the lofting process is complete the lofting lines are used as cutting guides when the components are cut from the sheet. Epoxy[ edit ] Epoxy is the material that makes wooden boatbuilding possible for the average person. It is used as an adhesive, a structural component, and to seal the wood to stop it absorbing water. Wikipedia has an article about epoxy at <http://> A thin layer of liquid epoxy is applied to the wood like paint. Some of the epoxy is absorbed into the grain and the pore structure of the wood while the epoxy is a liquid and when it hardens the wood is effectively protected by a moisture proof barrier. The WEST System is a generic boatbuilding technique, but also a registered trade name for a brand of epoxy products manufactured under license from Gougeon Brothers, Inc. Since that time epoxy systems, including the WEST System brand, have undergone significant development. Today there is a wide range of manufacturers offering epoxy systems for wooden boatbuilding. A web search using the term boat building epoxy will return thousands of references, tailoring the search for your own location should return more than enough local epoxy manufacturers to choose from. A word of warning however. Not all epoxy formulations are suitable for sealing a wooden boat against moisture. Marine coating epoxies generally do not include organic solvents or thinners. They may be described as high solids epoxies. The reason is that organic molecules are much larger than water molecules. When organic solvents evaporate from the liquid epoxy during curing the departing molecules may leave microscopic tunnels that allow much smaller water molecules to enter. This reduces their effectiveness as a moisture barrier and makes them unsuitable for use as a marine coating. When building my first wooden boat I chose Bote Cote , a high solids epoxy produced by a company in Brisbane, the closest major city to my residence. My choice was mostly influenced by convenience, reputation for quality, and the desire to support a local business. Your choice of an epoxy system may be influenced by similar considerations but so long as you choose a high quality epoxy suitable as a marine coating, the choice is yours. Mixing Epoxy[ edit ] The most critical part of the epoxy process is mixing the correct amount of hardener with the epoxy resin. Stored separately the hardener and the resin will stay in liquid form. When mixed together the hardener acts as a catalyst and induces the resin to polymerise, or form cross linkages between its molecules. As these bonds between the molecules form the viscosity of the mixture increases and eventually, after a few hours, it solidifies. The reaction continues for several days afterward so it is important not to apply excessive stress to the material for at least 24 hours after application. The rate at which the polymer bonds form is dependent on the chemical properties of the hardener used and the ambient temperature. The reaction that forms the bonds is exothermic which means heat is generated each time a new bond is formed. The hotter it is, the faster the bonds form and the hotter it gets, so new bonds form even faster. The heat usually escapes to the surrounding air by conduction so it is important to spread the epoxy out in a tray rather than keep it in a pot after mixing. The greater surface area of the tray allows more heat to escape and increases the pot life, the time when the mixture is still thin enough to apply effectively. Warning in extreme situations, such as mixing and leaving a large quantity of epoxy in an insulated container like a polystyrene cup, the mixture may become hot enough to ignite. If your mixture rapidly increases in temperature spread it out in a tray immediately or take it outside and put it where it can burn safely.

## Chapter 3 : Build a Boat, tips for the DIY Wooden Boat Builder.

*Wooden Boats To Build And Use Northwest Profiles Passion for the Past handcrafted wooden boats BOBBING BACK AND FORTH WHILE CONTINUALLY RIDING THE WAVES OF SUCCESS, POST FALLS BASED STANCRAFT, HAS MANAGED TO WEATHER THE VOLATILE AND CHANGING PLEASURE BOAT MARKET BY PRODUCING QUALITY HAND CRAFTED WOODEN BOATS.*

The Yacht Design Process - How is a new boat design created? The boat design process is made up of a series of incremental steps. This is a summary of how a new yacht design is imagined, sketched, planned, calculated and drawn. Nomadic Watercraft - What are they? A distinguishing characteristic of my boat design work over the last two decades has been a focus on what I call Nomadic Watercraft. By that, I mean truly pelagic blue water boats that provide a comfortable habitat on the water. This article is a brief summary of my design philosophy. Our Stock Boat Designs - What is a stock boat design? This article is a general overview of how we approach the design of boat structure, using aluminum structure as an example. As such, it provides an outline of our work-flow and describes a few of the variables and options that can be considered. Essential Design Data - What essential data should be readily available for a modern boat design? In view of the cost of the vessel, and the cost of the entire expedition that any ocean voyaging represents, the cost of thorough design analysis does not amount to a significant percentage of the cost of ownership. In most answers to this questions, strong opinions abound. But why and how? Was there something magical inherent in the design? If so, what can we learn from it? Those are excellent questions. Chronicle of a Refit - What can be done to improve a pre-existing vessel? I receive various questions from prospective yacht design students who want to know if it is a good career for them. This brief note is in way of advance response to that commonly posed question Testimonials - What do our clients have to say? A few selected comments from our yacht design clients. Why is such an article included here? While building a boat we require shelter - not only for the boat but also for ourselves. We should therefore consider what types of structures might satisfy both requirements. Computerized Boat Building - Computer aided boat design Does it save building costs? Computer modeling is by far the most efficient means of defining hull form, offering a designer access to powerful analysis tools for assessing stability and performance, as well as a highly accurate means of creating the structural parts and pieces of a boat via computer controlled cutting. For more information about the benefits and cost savings offered by up-to-date computer aided boat design and computer aided boat building check out this article. It simply means "Numerically Controlled" The aluminum tug-yacht Boojum made excellent use of NC cutting. The computer is an enormously useful tool for creating a vessel prototype in order to visualize the shape in a "virtual" 3D environment. What about lofting and fairing? One can then use the computer generated model as a fairing and lofting tool. The Vessel Specification is the central document from which any boat gets built. The Vessel Spec is intended to be a guide to construction as well as a valuable estimating tool for a builder to calculate the cost of building the boat. According to published reports, in the US, out of the annual average of about deaths due to lightning, 13 are aboard boats. If lightning is a hazard where the boat will be used, a plan should be developed to deal with the possibility of a strike. In the Pacific Northwest, lightning is relatively rare. In Florida, strikes are measured in numbers annually per square mile, with some areas having more than fifty! Here is a brief overview of what we consider to be important with regard to strength, cost and finish. Except for our plank-on-frame wooden vessel designs, all of our metal and fiberglass yacht designs include integral tanks. The benefits are many, including an excellent return on investment in terms of access to the hull for maintenance and inspection. This article was originally prepared for Professional Boatbuilder magazine, and was subsequently modified for use in the Metal Boat Quarterly, now offered here Are they still being built anywhere in the world? This article is an introduction to the large wooden sailing and cargo craft of Indonesia, locally called Pinisi. Indonesia is a nation as large in its extent and population as is the US, however it consists of some 18, islands separated by quite a lot of water! These wooden cargo vessels are effectively the "semi trucks" of Indonesia. These are not small craft! It is a stunning sight these days to see several dozen large wooden vessels ranging in size between 20 and 55 meters being built right on the beach. Upon beholding such

a spectacle, snobby Wooden Boat Magazine aficionados would simply wilt out of sheer embarrassment! Now that would be a sight worth seeing Indonesian Pinisi Sailing Types vs. What is their range under power? Additional notes are provided regarding vessel size, displacement, and hull materials. Although it is not uncommon, we have several reservations about this concept. The rationale for our position is based on having studied these vessels carefully, both under construction and on the water. What are the essential ingredients for a successful project? Can these cargo vessel types actually be transformed into Yachts? In order to successfully create a yacht or luxury charter vessel out of the traditionally built Pinisi or KLM types, it is first a matter of adequate planning, and then of follow-through during construction. This is a good introduction to the process we recommend. What makes them so successful? There are a few high quality vessels in the charter fleet, and they have been quite successful. In terms of their safety, longevity, comfort and aesthetics, they are able to inspire confidence, and can therefore appeal to the discerning world-traveling charter guest. Just how is this accomplished? Here is a snapshot of our approach to this question. Indonesian Boatbuilding Photo Gallery - A travelogue of sorts This is a collection of images taken during the last several years which show our involvement with the traditional Indonesian craft, including a number of wooden boats being built and on the water. Several good photos of the local builders and their culture as well Much of this article may well be plain common sense to the majority of boat builders and to many boat owners, however even a casual stroll through just about any boat yard or marina will quickly reveal the need for considerably more awareness of metals and how they should be used aboard! Applies to boats of all materials! Notes on Metal Boats - A brief outline of the rationale for building a metal boat. A few thoughts on steel vs aluminum construction, the basic differences between the two metals, and the rationale for choosing one vs another Any discussion of metal boats inevitably encounters the question of whether a boat should be aluminum or steel. Not often realized is that there are other metals that may be effectively used. Steel Yachts - Some people claim that steel is too heavy for use as a yacht building material. Is there any truth in that claim? What is a practical size limit? In the mind of the public, there seems to be quite a bit of misleading information. Check out a few thoughts on the possible advantages of steel. Aluminum for Boats - Is there good reason to consider aluminum over other hull materials? This article first appeared in the September issue of Cruising World magazine. It includes several good images showing different hull forms suited to metal construction, the relative advantages of each, and what factors one should have in mind when considering the use of aluminum as a hull construction material. Steel - A comparison of their relative strengths, and the advantages of each The choice of hull materials is the most fundamental of choices when considering a new vessel design, or even when considering the purchase of an existing boat. If you intend to make use of metal as a hull material this article will be of some value in that choice. Corrosion Prevention - A simple summary of the critical elements of what one can do to prevent corrosion in metal boats or any boats that have metal below the water! The strategies outlined here are aimed at the boat building process, at which time one has the very best opportunity to create a hassle free, low lifetime maintenance situation for any metal vessel. Vigilance and good workmanship are vital! Except for our plank-on-frame wooden vessel designs, all of our metal and fiberglass yacht designs feature integral tanks. Should you erect the frames first and then apply the plating, or vice versa, should you first pre-cut the plating, weld it all up, and then install the frames afterward? Or are there yet other approaches? Metal Boat Framing - Should there be internal framing on a metal boat? Silly question you might think, but there are those who favor frameless construction..! What is the real story? This article was originally prepared as a response to a post to the Trawler World mailing list on the subject of Twin Keels and Roll reduction. It includes a brief description of the research done by Lord Riverdale and includes a summary of the research of others on the benefits of various roll reduction strategies for power vessels and Motor Sailors. For long range passage making, does the motor sailor have merit? What is the optimum hull form for a motor sailor?

### Chapter 4 : Wooden Boats | Port Carling Boats - Antique & Classic Wooden Boats for Sale

*A complement to "Classic Small Craft You Can Build", this work contains background essays and construction plans for 16 boats, including three dories, the four-oared gigs "American Star" and "General Lafayette", a Hampton boat, and eight powerboats that range from an foot garvey to a foot V-bottom lobsterboat-type for commercial or recreational use.*

Boat building requires a certain wood that has characteristics suitable for a marine environment. Boat building wood can not be too soft, brittle, decay-prone, light and airy, or too short to fabricate necessary lengths for keels and planking. Over generations of trial and error, many wood species have proven their worth by standing the test of time. Dense hardwoods, and some softwoods, have the most applications in boat-building. Marine lumber is picked for its rot-resistant qualities, durability and grain texture. Apitong Apitong weighs 44 pounds per cubic foot, and 3. It comes from the Philippines, Malaysia and Indonesia. It has a creamy yellow, gray or white sapwood, with a typically straight grain. Apitong dries slowly and resists decay moderately. It has excellent strength, able to hold fasteners well and frequently replaces white oak, yet remains less durable than white oak. White Ash White ash weighs 42 pounds a cubic foot, with 3. White ash hails mainly from the Easter United States. It has a brown heartwood, with a sapwood that approaches white in color. It possesses a straight grain, holds its strength well and lends itself well to steam bending. It has low-decay resistance qualities, limiting its use to joinery, small-boat framework, tillers and oars. Greenheart Greenheart has a very dense core, weighing 61 pounds per cubic foot and 5. Its properties make it decay-resistant to moisture and even some marine boring animals. It has stiff qualities, making it once famous in European boat-building circles. Its colors range from greenish-yellow to deep brown or purple. It has a very dense and heavy weight that makes it strong and shock-resistant, but can also add unwanted weight. Iroko Iroko weighs in at 40 pounds a cubic foot and 3. Iroko mainly comes from Africa and resembles teak, but weaker in structure. It has moderate decay and marine borer resistance. It can be easy to work with, comes in a green or yellow heartwood, but changes color to brown upon sunlight exposure. Europe has favored Iroko as a boat-building material for generations. Lignumvitae Lignumvitae weighs in at the heaviest of woods known at 76 pounds per cubic foot and 6. It grows in the West Indies and Central America. The wood contains naturally occurring oil pockets, which makes it ideal for rudder shaft bearings, worm shoes and keels, with some rubbing strake applications. The heartwood ranges from blue to nearly black, with a cream sapwood. It resists decay and marine borers extremely well, possessing a high stress and crush strength. African Mahogany At 32 pounds per cubic foot and 2. It does not work nearly as easily as genuine mahogany, but resists decay and has good lasting qualities. The wood resists shrinkage well and endures seasonal changes without deformation. The heartwood can vary considerably, depending upon its region of origin, but it usually contains reddish or brown pigments, with a cream-colored sap. It has excellent decay resistance, weathers well and has a moderate shrinkage rate. The Central American species holds the most value for boat-building. White Oak White oak can be fairly dense at 47 pounds per cubic foot, and nearly four pounds per board foot. White oak, considered an Eastern wood, has a weaker structure than red oak. It rots easily unless treated. The heartwood appears tan to light brown. In its green condition, white oaks steam and bend easily. It still remains hard to work with, though, and needs very sharp cutting tools to fashion it. Teak Teak weighs in at 43 pounds per cubic foot, and takes up 3. Called the most decay-resistant wood in the world, it still has a slight problem with some marine borer adhesion. Teak grows in Thailand, the East Indies and Burma. The sapwood can be white to brown. The grain runs straight and the wood texture has a coarse or oily feel to it. The wood can be brittle, and dulls cutting tools. It has common uses for decking, salons, joinery and cabinet structures. Cedar Port Orford cedar weighs 30 pounds per cubic foot, and 2. The Port Orford variety of cedar has the most uses in boat-building than any other cedar, due to its fine grain and strength. It has a light yellow to brown heartwood, and exudes a spicy odor. It has excellent rot resistance and holds up to moderate standards in all other characteristics.

### Chapter 5 : Spira Boats - Easy to Build Boat Plans

*Background essays and complete building plans for 16 boats. Also included are discussions of half models, taking off lines, building techniques, and an essay on the future of wooden boats.*

Nature had already built them a superhighway right through the middle of their empire called the Nile River. Most of the major cities in Ancient Egypt were located along the banks of the Nile River. As a result, the Egyptians used the Nile for transportation and shipping from very early on. They became experts at building boats and navigating the river. They were easy to construct and worked well for fishing and short trips. Most of the papyrus boats were small and were steered with oars and poles. The typical boat was long and thin and the ends came to a point that stuck out of the water. **Wooden Boats** Eventually the Egyptians began to make boats from wood. They used acacia wood from Egypt and imported cedar wood from Lebanon. They also began to use a giant sail in the middle of the boat so they could catch the wind when heading upstream. The Egyptians built their wooden boats without nails. Boats were often made from a number of short planks that were hooked together and tied tight with ropes. Steering was accomplished by using a large rudder oar at the back of the ships. **Cargo Ships** The Egyptians learned how to build large and sturdy cargo ships. They sailed these up and down the Nile and into the Mediterranean Sea to trade with other countries. These ships could hold lots of cargo. Some ships were used to carry huge stones weighing as much as tons from the rock quarry to where the pyramids were being constructed. **Funeral Boats** The Egyptians believed that a boat was needed in the afterlife in order to journey to the heavens. Sometimes a small model of a boat was buried with a person. Often times a full size boat was included in the tombs of Pharaohs and other wealthy Egyptians. **Model of a riverboat by Unknown** **Rowing or Sailing** It turns out that the Nile had another great advantage for boating. When boats were traveling north, they would be going with the current. When the ships were traveling south, they generally had the wind blowing in their direction and would use a sail. The ships often had oars to gain even more speed when traveling in either direction. **How do we know about the boats of Ancient Egypt?** Very few boats from Ancient Egypt have survived for archeologists to study. However, because of the religious importance of boats, there are many surviving models and pictures of boats. These models and pictures tell archeologists a lot about how the boats were constructed and how they were used. The Egyptians developed many types of boats. Some were specialized for fishing and traveling, while others were designed for carrying cargo or going to war. Temples and palaces were often connected to the Nile River using manmade canals. The Pharaoh used a magnificent boat covered with gold and fancy carvings. The Egyptian sun god was said to travel across the sky on a boat during the day and across the Underworld on a boat at night. **Activities** Take a ten question quiz about this page. Listen to a recorded reading of this page: Your browser does not support the audio element. More information on the civilization of Ancient Egypt:

### Chapter 6 : Ten Things That Can Hurt Your Wooden Boat | WoodenBoat Magazine

*John Gardner Wooden Boats to Build and Use page an 18 foot inch Garvey. This is a traditional Garvey that Gardner modified with a narrow bow a rockered stern and an inboard motorwell. hp was the minimum hp.*

The best timber for boat building is an introductory guide Published Thursday 13th November Timber is the traditional boat building material. But, as with most timber-based projects, when it comes to constructing water-going vessels some woods are better than others. If this occurs, warping of its structure or contamination from microorganisms can occur, rotting the timber and degrading its ability to stay afloat. While some types of wood naturally produce chemicals that help protect against this, others are highly susceptible and therefore unsuitable for use in boat building. Techniques As wood has been used in boat construction for eons, there are a raft of techniques that can be used to put vessels together. From ancient approaches to modern methodologies and which is right for your project will depend on the size, scope and intended use of your vessel. Some of the most commonly used techniques from either category include: Where individual, tapered planks are positioned edge-to-edge and fastened to a framework. While it can deliver fantastic results - this traditional technique requires a great deal of expertise to carry out and due to its antiquated nature, sourcing the correct materials can be a drain in terms of cost and resources. Where a number of thin veneers are layered on to a jig or framework. Despite requiring relatively expensive materials and the construction of a jig, this tends to produce a strong hull. This method involves individual, tapered planks that are laid out with overlapping edges, which are in turn secured to transverse timbers. It also requires more maintenance than several other methods and can even precipitate hull leaks as it ages. A modern update to the carvel technique this involves glued construction where flexible strips of timber are fastened around temporary forms. Similar to traditional clinker, but with the joins between planks fastened by epoxy, as opposed to nails. What makes for good boatbuilding timber? The grain is also a major factor in whether timber is suitable for use in a boat. Ash Ash provides tough timber that can stand up to the elements, while still being fairly lightweight to boot. However, it does tend to require treatment before being exposed to a marine environment. Cedar Several varieties of cedar are ideal for ideal for construction work and Western Red exemplifies the qualities of this lightweight softwood. Douglas Fir Providing the ideal combination of low weight and strength Douglas Fir has seen use in a variety of boatbuilding roles from heavy construction to masts and spars. Iroko This low-cost wood provides a great alternative to Teak for those on a budget. However, it can be tricky to finish and contains a lot of internal stresses limiting the roles it can be utilised in. Oak Oak has been a historically popular boat building material particularly for heavy constructional purposes, although only some varieties are suitable for marine usage. Sapele A favourite for musical instruments, as well as water-borne vessels, this African wood is similar to mahogany and combines reasonable rot resistance with great aesthetics. Utile Utile is a similar species to Sapele, which tends to produce a more interesting grain and consequently, a better finish. However, be prepared to shell out a little bit more for these features. Image used courtesy of nwclassicyacht on Flickr.

### Chapter 7 : Ancient Egyptian History for Kids: Boats and Transportation

*Build a Boat from Wood. How to Build a Boat using wood, one of the most beautiful and satisfying of materials for the DIY, backyard, builder to use.*

**Bending Plywood** In many cases the plywood will have sufficient flex to be able to bend it cold around your hull shape. Bend it as far as you can, clamp it, then leave it for a few hours. Now pull it in some more, it may take a few goes but eventually you should be able to pull it all the way. Having said that, it is easier to bend short, narrow panels than wide, long ones. As with timber generally heat and moisture can be used to bend ply. Simply laying it on wet grass or spraying water over the sheets, then covering with black plastic and leaving it in the sun for a few hours will make bending easier. Another way is to use a steam wallpaper stripper on the outside surface while gradually pulling the sheet into place with clamps. An alternative is to wrap the area which needs most bending in towels then pour on hot water. Or simply soak the ply overnight and encourage the bending by propping it on some batons then placing a weight on top. But the caveat is that the plywood must be allowed to dry completely again before sealing it especially if you are going to be using Epoxy. Epoxy and moisture do not mix. Plywood can be kerfed but it must be done carefully. The kerfs should be less than half the thickness, relatively narrow and finished by filling with epoxy. In some cases, it may just be that you cannot get enough leverage on say a nib end. In which case if you cut the plank over length it will give you the leverage to get the end in position, clamp and fasten it, then trim it off afterwards. If it needs to be cut to size before gluing you could clamp a long baton onto the ply and use that to give you the extra leverage. However, for a very tight radius it is probably best to laminate it up from several layers of thinner more flexible ply. And if planking a hull, bend and prepare both corresponding sides before gluing. Delaminating occurs when the laminating glue fails. Moisture then penetrates causing the wood to rot. This causes swelling and raised edges. Areas of delamination can be detected where the surface flexes and by a dull sound when tapped. Repair of a badly delaminated boat can be difficult and uneconomic. **Protection** As with any other wood, ply will need to be protected from the elements with a coat of paint or varnish. Where the ply has been coated with epoxy, the epoxy will need to be coated to protect it from UV light. Any cuts or abrasions in the glass skin will inevitably expose the plywood. Moisture will then wick up into the plywood and getting trapped between the glass skins. Any damage to coating must be touched as soon as possible. To protect softwood ply from checking when it has been bent it may be necessary to apply a light fabric coating to the skin. Take care when sanding ply as the top veneer will be thin too much scraping or sanding will expose the lower unattractive layers. **Storage and Handling** Like any materials you use, plywood should be properly stored and handled. Protect the edges and ends of panels during handling. Keep it dry and clean. Stack panels flat on stringers or other blocking to help stop panels from warping. **Comment Form is loading comments Latest Borum Star Chief Nov 08, 18** I was wondering if anyone has a picture of an original boat so I can see what it was supposed to look.

## Chapter 8 : Spira Boats - Wood Boat Plans, Wooden Boat Plans

*The best timber for boat building - An introductory guide Published Thursday 13th November Timber is the traditional boat building material. It's been in use for thousands of years and is prized for its resilience, buoyancy, widespread availability and the ease with which it can be worked.*

One of the interesting aspect of the Antique Boat Museum in Clayton NY is the workshop where volunteers restore boats that have been donated to the Museum for display. The Museum has the most extensive Wooden Race Boat collection building, as well as other a canoe building and their other buildings. The Wild Goose is a large triple cockpit that has undergone a one and half year restoration under a number of volunteers. It is a great project being undertaken in a wonderful building, the stone building. Check out this link in facebook to see a series of photos of this transformation. This is what wooden boating is all about. Built over 5 years by Gary Mac Norius from Ft. Lauderdale, Florida, the boat is built with balsa core construction laid over a mold, and glassed inside and out. It was drawn out on his garage floor and finished with automotive paint. Gary work is recognized as the Gold Standard for Fiberglass restoration. At hp this boat has the get up and go that its design reflects. The number and diversity of wooden boats is the most extensive anywhere. For a look at Henry J. The auction is being put on by www. The falls flyer name comes from Charles Lindeberg who was a falls flyer. He tried to show in his collection the evolution of the flyers. He was very proud of his inboard boats as they are the rarest and they only made 18 of them. There are a number of other very unique wooden outboard boats and I think their will be a lot of happy buyers out there. Nick spent three and a half years building a hydroplane racer from John Hacker plans he discovered in a Motor Boating article. This allowed me to put a modern V8 power plant in the boat. The chines were turned down and I added some camber to the bottom. The aft section behind the step is prismatic and a little steeper deadrise than the original. All suggestion from a naval architect that I am good friends with. The shaft angle is at 7 degrees and it has a rudder under the hull. The power plant is a MerCruiser Ford with a 1: This is a fiberglass boat with the mahogany epoxied to the deck. I created all the plugs and molds myself in the garage. S shows First show in Madison ,WI won best of show. Second show was Pewaukee, WI and it won the contemporary award. It was recovered in feet of water, 45 years after its sinking. Unsworth for undertaking such a significant project and sharing it with us. This boat may be repowered by a V10 viper engine. I am really enamored with the windscreen and the sheer size of the boat. Looking forward to seeing this magnificent boat when it is completed in late May. Please see video below Video: The shops were humming with activityâ€ everything from a re-canvassed cedar strip canoe to a thirty-five foot Chris-Craft cabin cruiser. Captain Randy Potts of Bracebridge deserves credit for working through a Muskoka winter to breathe new life into Peerless. For further information and a video, please click on the link below. Baby Bootlegger Captain Randy Potts of Bracebridge Ontario is at it againâ€ taking a tired vessel and transforming it into a viable tourist cruise boat. Peerless II will offer public cruises and charters on the Muskoka Lakes. Harold and Lorna Docu Drama Harold and Lorna Wilson were a husband and wife wooden boat racing team who set out to conquer speed. In the process they brought international fame to Canada from to as a young couple in love, who loved pushing race boats as fast as possible. They piloted a wooden boat built in Gravenhurst that could run up to mph and put Canada in the world spotlight. Enjoy the great pictures and video footage of some incredible Muskoka Wooden Race boat history. This shop is the premier repair shop for these legends and I hope you will take a minute to look at their creative web site which has a lot of interesting information on these boats. Enjoy the photos of Riva restorations below. Barts in the Carribean! Pirates and Privateers is a half hour documentary about the exciting history of piracy and privateering in Atlantic Canada. It introduces the viewer to several notorious pirates who pillaged Atlantic Canada, and explains how the business of privateering was practiced. The two Swedes standing on the dock in white overalls are also ready. They put on their flight hoods and motor goggles and enters the boat. The words are Gits Olssons, a very well known Swedish journalist, and the scenario could have been a reality. However, the plans unfortunately stayed just plans at that time. And the precise architectural description is preserved. So the possibility still exists today.? Today it is still an

incredible speed – something that few people will be fortunate to experience. And especially not in a boat made of mahogany! But now it becomes reality! The construction of one of the most spectacular wooden boats could begin. The clients, two thrill-seeking men from Stockholm wants to realize the old dream of beating knots with a Swedish-built boat. Here is the link to this exciting race boat [http: Seth Vore](http://) is one of them. Starting Memorial Day, he hopes to find many others like him and offer them spins on the Willamette River. Vore is launching a new business called Portland Boat Tours. Vore put out the word on Kickstarter on Dec. Vore plans to store the boat at his Southwest Portland home, then pick up people who reserve tours at Willamette Park or other points along the river. His boat, made in Kelso, Wash. Jim is meeting the sister ship in Lake Worth Florida and together they will travel across the ocean towards the Bahamas. This is a first in a series of updates on this family adventure. Stay tuned for more great info and pictures. The Roo, a virtual clone of a larger Hacker-Craft Racer, is now in our showroom until next summer. The boat is owned by the Larters – Coughlins of Silver Bay, where the family has maintained a camp for over years. The boat came to the showroom after discussions with the family. He offered to buy it on the spot. The tiny boat was put back in service three years ago, after spending fifteen years in storage. To view the progress on this mammoth project, please click on the video below. In the sequence below, Jay cuts through the ice and then runs the boat back and forth many times to chop the ice into harmless pieces. The dream is that Perlita Too will make her debut on Lago Iseo in Italy, where she was born in In late August, a very special event will take place on Lago Iseo; a celebration of years of the Riva yard; Carlo Rivas 90th birthday, and the 50th anniversary of the Riva Aquarama introduction. This is particularly significant because the Tritone model was the precursor to the Aquarama; in fact the first Aquaramas were built on modified Tritone hulls. Perlita Too was the prototype for a significant part of Riva history. See more pictures and info on [http: For further information, please click on this link: Father Ernest A Wilson and his racing team were able to build the Little Miss Canada and Miss Canada series of speedboats into a dynasty of championship vessels. Harold was the first Canadian speed boat driver to make a lasting mark on the international racing scene, claiming three world championship titles and setting numerous speed records over the course of his year competitive career. The beauty of this boat is enough of a reason to get down to The Toronto. It is believed to be a one off boat. It is powered by a very rare Lockwood Speedibee dual cylinder engine of which five are known to exist. Looking for a cool winter boat building project? Why not skeedaddle down to Annapolis, Maryland this coming Feb 6 to Feb 11th, ? A lot of fun for a very reasonable cost! The pleasure craft, which dates from , has already has three other marinized engines from car manufacturers, a Lincoln and two Chrysler Hemi powerplants. The gents at Freeport Boat Outlet in Freeport, Maine are overseeing the wooden hull restoration and have said that 85 percent of the mahogany will need replacing. In the meantime, the name of the boat is being put to the public. This is a major restoration, including a newly discovered, rare replacement Rolls Royce engine. Enlarge the doors, of course! Stay tuned for more news of the restoration of this lovely classic cruiser. This Shepherd below was on display at the Chicago Boat Show when it was purchased it new in In the boat bottom needed replacing at which time my Uncle debated on selling it. However he passed away right before doing so.](http://)

## Chapter 9 : 18" Garvey from Gardner's "Wooden Boats to Build and Use" -anyone have a picture?

*In my years of teaching boatbuilding and repairing wooden boats, I've noticed many mistakes owners make in the upkeep of their boats—common practices, done with good intent, that can often do more harm than good.*

Boat building in Greece. Side view of the wooden frame. Common types are Plow or Fisherman and Danforth. Modern anchors are made of steel but in pre-industrial societies rocks were used. The chain is added to the lower anchor end to add weight and prevent chafing of the rope warp on rocks or shellfish beds. Angel also virgin or maiden. A Norsemen invention used in sailing long ships from about the 10th century AD that predates blocks. The V-shape at the lower part of the "wings" acted as a V jam cleat. Two short strong posts often made of steel, located on the fore and aft side decks of a heavily built boat or ship, that are designed to take heavy mooring lines. Often water and or fuel tanks are placed in the bilges to lower the centre of gravity. In Britain twin bilge keels are often used on small boats moored in estuaries with a large tidal range so the boat stay upright when dried out. With their much shallower draft yachts of this type can be sailed in shallow waters. Not as hydro dynamically efficient as a fin keel. The inlet is protected by a screen to stop blockages Block a fitting with a circular wheel inside 2 cheeks designed to hold the turn of a rope. Originally made of wood, they are now made of plastic, stainless steel or carbon fibre. They are mainly used in rigging in pairs or quads to allow a single person to operate a sail that creates a lot of force. Similar to a pulley or sheave. The front and generally sharp end of the hull. It is designed to reduce the resistance of the hull cutting through water and should be tall enough to prevent water from easily washing over the deck of the hull. A spar that extends forward from the foredeck, outboard of the hull proper. Common in square rigged ships where they were used to attach the outer or flying jib. In modern sailboats they are often made of lightweight carbon and used for attaching the luff of lightweight down-wind sails. A roughly triangular piece of wood fitted immediately aft of the stem and between the two inwales or sheer clamps usually in a wooden dinghy. The internal transverse walls of the hull. The upstanding part of the topsides, above the deck, providing safe footing when a boat is heeled. The sheet can be easily pulled forward and upwards to release it but is held tight in the cam jaws when unattended. A short timber or pair of timbers that protrudes approximately at right angles from the foredeck of a square rigged sailing ship. Its purpose is to support the weight of the anchor and keep the anchor secure and outboard of the hull to avoid damaging the hull planking. Capstan A vertical metal or wooden winch secured to the foredeck of a ship, used for hoisting the anchor. Capstans may be manually operated or powered hydraulically or electrically. A traditional wooden capstan is fitted with removable wooden arms fitted into sockets on which the seaman push. Seashanties were often chanted to keep the seamen together as they pushed. A longitudinal strip parallel to, but inboard of, the inwale sheer clamp. It supports the inboard edge of the side deck and the side of the cabin cladding. A strip of strong metal, often stainless steel, through-bolted to the topsides and a frame and protruding above deck level to take the load of a stay in a sail boat. It can be retracted so the boat can float in very shallow water. The board has a length to breadth ratio of about 4:1. The board is tapered to a hydrodynamic teardrop shape in plan section to promote laminar flow of the water. This shape prevents stalling or eddying when sailing to windward. Together with the sails it lifts the hull in the windward direction. Common materials are wood often reinforced with fibreglass or carbon to obtain more stiffness and abrasion resistance. When sailing to windward the board is fully down but is retracted about half way when sailing directly down wind. When sailing to windward an efficient board prevents most leeway sideways movement. Are the abrupt change of angle where the topside meets the bottom of a hull. In a power or fast sail boat the chine deflect spray down wards when the hull is travelling at speed. A multi chine hull has 4 or more chines to allow an approximation of a round bottomed shape using flat panels. It also refers to the longitudinal structural members inside the hull which support the edges of these panels. Traditionally these were called chine logs especially in Eastern USA. A fitting designed to tie off ropes. The seating area towards the stern of a small decked vessel where the rudder controls are located. The stern is rounded when in plan-view. The counter is usually decked over. Often it is detachable for access to the engine or storage. In a large vessel it is a permanent ladder between decks. A companion way

usually has non slip treads and handholds. Mast side stays are tensioned by running through the outboard end of the arms, often forming a diamond shape. Similar to a spreader. The top surface of the hull keeps water and weather out of the hull and allows the crew to operate the boat more easily. It stiffens the hull. Temporary frames or moulds can be removed and kept for another boat. A heavy timber running athwartwise across from the top of a frame under the deck. It usually has a gentle convex upward curve for extra strength, extra head height below deck along the centre line and to allow water to run off the deck when the boat is upright. A short spar fitted mid-way and vertically downwards, midway along a bowsprit that holds the bobstay and prevents the outboard end of the bowsprit riding upwards under the load of a tensioned headsail. A ventilation intake consisting of a cowling connected to a short vertical tube connected to a deck mounted scuppered Dorade box, usually made from teak. The cabin intake is offset to prevent water entering the cabin. The upper section swivels to stop breaking seas entering the dorade. Named after the yacht Dorade where it was first used. The method was popularized by the WEST system. Sometimes used in conjunction with various cloths such as fibreglass, kevlar or carbon fibre. A thinned mixture of resin is used to penetrate the fibres of light weight woods such as Balsa and Western red cedar forming a waterproof barrier, far superior to single pot paint or varnish. Typically few nails or screws are needed as the resin is so strong. Slow drying and far stronger but more difficult to sand than polyester resin. Typically applied with a roller, throw away brushes and radiused flat tongue depressor for coving using thickened epoxy. Softens and weakens slightly at high ambient temperatures so vessels in tropical waters should be lighter coloured. A U-shape or circular fitting often positioned near the bow that leads an anchor warp or a sheet to a cleat or winch. The anchor fairlead is usually bronze or stainless steel as it must take the regular abrasion of the warp and chain. The anchor fairlead is usually set on the change of angle between the deck and the topside to prevent wear and tear. The vertical component is similar to a conventional dagger board but much narrower due to the high sailing speed of foiling craft. The vertical component is a symmetrical NASA foil shape. The main vertical foil is often angled forward to prevent air being sucked down the leading edge and creating a disturbed water flow. The winglets or blades are asymmetrical NASA foil shapes like a plane wing. This depends mainly on wind and boat speeds. Winglets with a wider cross section give more lift at lower speeds but have more drag as speed increases whereas narrower ones have less lift but less drag at higher speed. Foils are usually made of lightweight carbon fibre because of its extreme strength and stiffness. Frames may be solid or peripheral. They may be made of wood, plywood, steel, aluminium or composite materials. They may be removed after construction to save weight or to be reused or left in-situ. In ancient shipbuilding the frames were put in after the planking but now most boats are built with the frames first. This gives greater control over the shape. Today frames can be cut directly from a computer programme by a robot, with extreme accuracy. In old heavily built, square rigged ships, the frames were made up of 4 individual timbers called futtocks, as it was impossible to make the shape from a single piece of wood. The futtock closest to the keel was the ground futtock and the other pieces were called upper futtocks. Boats using sheltered waters can have low free board but seagoing vessels need high freeboard. The lower section of the furling gear has a spring-loaded retrieval system that rolls up the headsail. These are often used in cruising boats or when a yacht is sailed short-handed. The operating lines are operated from the safety of the cockpit avoiding crew working on the exposed foredeck. On very large yachts the furling gear is attached to an electric motor for ease of use. The strake immediately adjacent to the keel in a traditional wooden boat. This makes the compass needle steady and easier to read and allows food to be cooked carefully in seaway.