

Mike's
Wooden Wayfarer
Restoration Manual



By

Mike Smith

Legal Notices

Disclaimer

"Whilst this manual has been carefully written based on the writer's experience, neither the writer, Wayfarer Class Association, or Ian Proctor Designs accept any liabilities for its use, as every old Wayfarer varies in its condition."

Compliance with Class Rules

1. Restorers are advised to take all precautions to ensure compliance with the Wayfarer Class rules and in particular the proposed new Rules 2.7 and 2.8 which will probably state:

2.7 Any repairs and or replacement of wooden parts which involve the removal of any bulkheads, transom, framing, stringers, hog, and centreboard case or any substantial part thereof, and or employs any jig, framework or other such device to maintain the boats shape shall not be undertaken without prior authorization from the NCA except when this work is undertaken by a licensed builder.

2.8 Any work undertaken as defined in 2.7 shall ensure that the original hull shape is maintained and or the hull shape and materials meet specification.

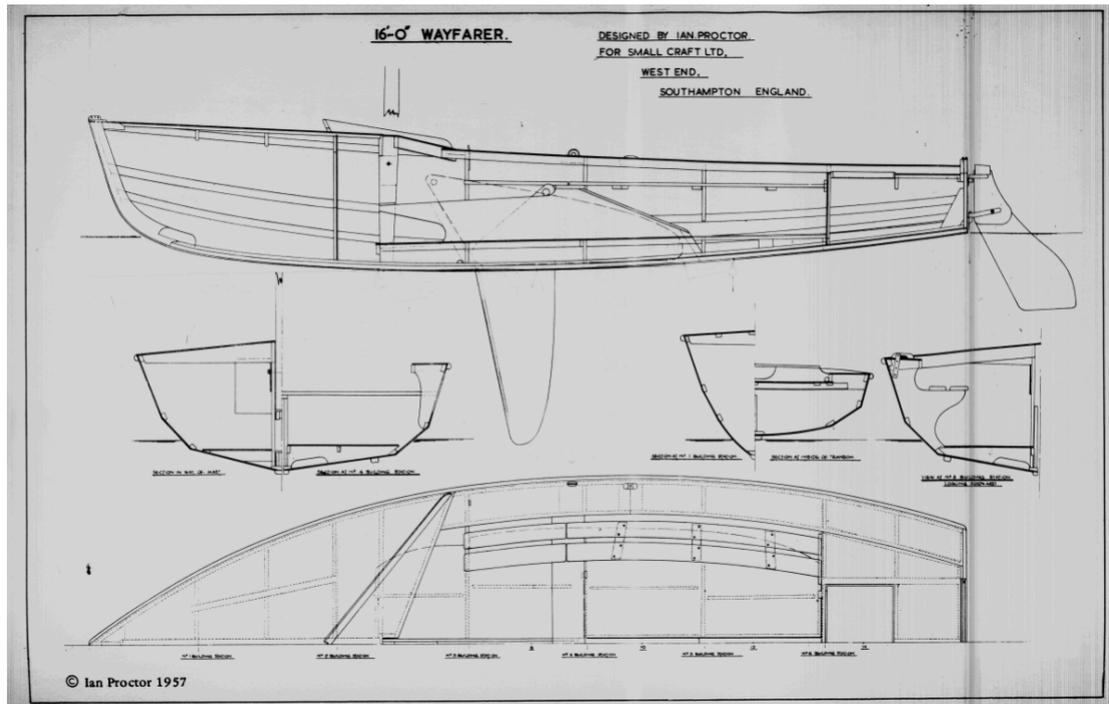
2. Any repairs must comply with the revised specification, which will shortly be issued by Ian Proctor Designs and will be available from UKWA.

3. If you make major repairs then you must get your Wayfarer remeasured if you intend to race it or represent it as a Wayfarer when selling it.

History

The Wayfarer was designed by Ian Proctor in 1957 as an all purpose dinghy which could be day sailed, Cruised, used for teaching people to sail yet still be lively enough to provided exciting and competitive racing. In nearly 50 years, later designs seeking to fill the same niche have not succeeded in equalling the Wayfarer's success.

The Wayfarer was designed to be built in wood in an era when



marine ply was the established construction technique. Many Wayfarer enthusiasts believe that GRP versions cannot approach the strength, lightness and appearance of the original. Therefore there will always be a demand for the "Woodie". Unfortunately the cost of labour and the lack of competition has put the wooden Wayfarer out of economic reach. However the great advantage of plywood construction is that old boats can be repaired and restored, with simple tools and basic handyman skills. This book is devoted to keeping old woodies on the water. Long may they live!

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Chapter One

Introduction

The Wayfarer was designed in the 1950s as a double chine plywood boat. At the time this was "state of the art" technology which offered advantages of producing a strong, light boat capable of planing off the wind, which was much cheaper to produce than traditional methods of boatbuilding. However, the requirement to build a complex shape like a boat hull from flat sheets of plywood required boats to be designed specifically for the material. The system of hard chine construction was developed to join the sheets of plywood together to form a boat and countless new designs of sailing dinghy emerged over just a few years in the early '50s virtually sweeping away the traditional clinker and carvel built sailing dinghies of the pre-war years. Earlier designs like the GP14 and Heron produced strong, light but rather boxy hull forms and double chine designs soon appeared offering a close approximation to a round bilge hull. These appeared in the mid to late 50s the most popular of which were the Enterprise and the Wayfarer.

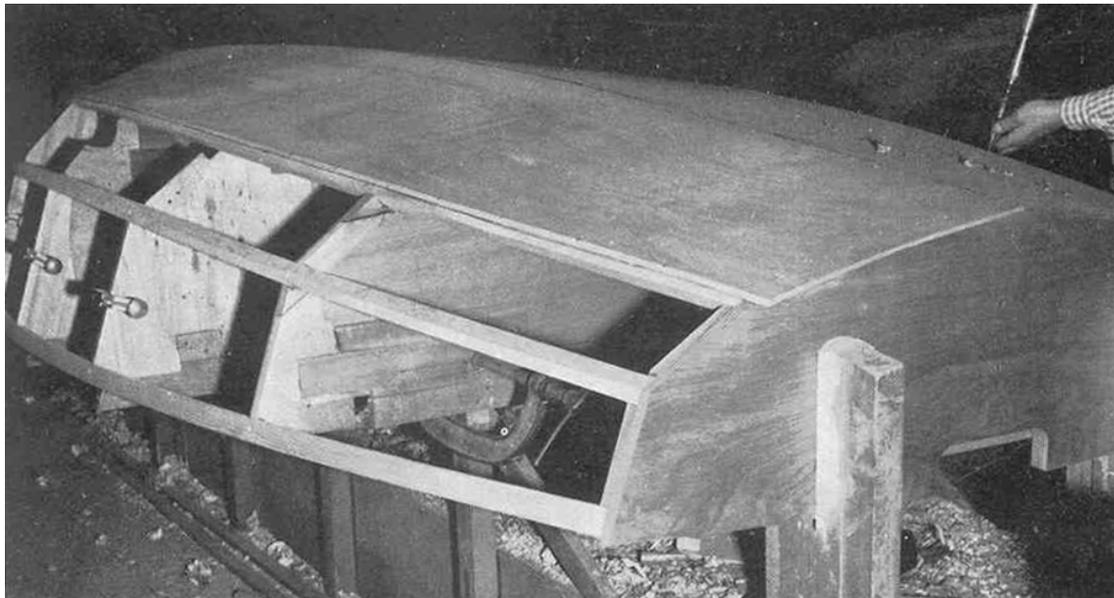
However, technology was developing apace and soon GRP emerged as the new wonder material. This offered the boat builder even bigger advantages, as once the mould was produced thousands of identical hulls could be produced quickly using relatively unskilled labour. However, the hard chine and double chine hull shapes developed for marine plywood did not suit GRP construction, so new designs emerged, bringing us up to the current day, when designers are not constrained in the hull shapes they design for GRP construction.

However there was a downside to the GRP revolution. The material despite its advantages is heavier than plywood and so has to be thinner to achieve a given weight. This is not so much of a challenge in a round bilged hull form but is a real problem when producing flat sheets. So the material is not particularly suitable for designs incorporating large flat areas, like hard and double chine dinghies. By the time GRP emerged as the favoured method of boatbuilding, plywood designs like the Wayfarer, Enterprise and GP 14 had gained a stronghold and sailors wanted the low cost and low maintenance of GRP in the designs they were already sailing, so these designs were soon produced in GRP. However, they were never as good as the original plywood product. For example it has taken over 30 years for competitive GRP Enterprises to be produced and that was only due to the introduction of foam sandwich technology. Heavier boats like the GP14 and Wayfarer fared better as the compromises imposed by GRP were not as keenly felt.

However, GRP Wayfarers are not as stiff and strong as plywood boats for a given weight and many keen racers still favour "woodies".

So plywood is still the best material for a Wayfarer and with modern coatings such as epoxy and polyurethanes, the maintenance disadvantages of wooden boats are minimised. Also a wooden boat can be kept in top condition and competitive for decades as witnessed by 45 year old boats frequently beating brand new GRP ones in top-level racing. The cost of skilled labour however has made wooden boat construction uneconomic and wooden Wayfarers are no longer in series production, so if you want a new one it has to be built as a one-off and will be very expensive. Probably worth it, but expensive.

The good news is that the double chine method of construction was developed for amateur construction and a competent DIY boat builder can produce an excellent product. The bad news is that the copyright holder will not allow amateurs to build Wayfarers except from a kit of parts produced by a license holder. In these cash-rich/time-poor days most people don't want to spend hundreds of hours completing a kit, so no one produces kits anymore, so the only way you can get a "new" wooden Wayfarer is start with an old one, which already has a sail number and on which the license fee has already been paid. This book will tell you how to achieve just that.



Wayfarer Being Built at Small Craft

Chapter Two

Selecting and Surveying a Wayfarer for Restoration

You might already have a Wayfarer ripe for restoration or still searching. Whichever, this is the most important chapter as your selection of a donor boat will be the major influence on the time and money you will spend on the project.

Almost all Wayfarers have been professionally built. Wooden Wayfarers were built by: Moores of Wroxham, Westerly Boats of Rock, Cornwall; Small Craft of West End (Southampton); J and D Stone of Salcombe and latterly the current licensed builders: Porters of Emsworth. This means that all should have been originally built properly and to measurement rules in force at the time. However some were completed from kits, so it's worth looking at the original measurement certificate (available from the UKWA) for the builder.

As far as I know there are no pluses or minuses for particular builders. It is more a case of what has happened to the dinghy in the intervening years and how it has been used. Like a used car the ideal is a fastidiously maintained and lightly used example that has been in the possession of the original owner for years. But if you have found one of these, it is unlikely that you will be reading this! So most important, before you start looking around, it would help to know:

1. What you are planning to use the Wayfarer for
2. How much work you are prepared to do
3. What you would like to end up with.
4. How much money you plan to spend

Extremes range from. "I am looking for a basically sound Wayfarer, that just needs a bit of fixing up, so I can day sail it." To "I'm planning to build a new hull to race at the highest level and just need any old basket case, so that I can use its identity". Most of us will be somewhere in between these extremes.

Is it all there? Or what's important and what's not!

The most important thing is that the Wayfarer you buy is as complete as possible, as drawings for many parts are not readily available. It is also important that it has been kept original and not heavily modified by a cruising type. Unless you are planning to completely re-rig and fit out to the latest racing specification, then good mast, boom fittings sails trailer, trolley, and cover will save

you a small fortune. Wooden parts like centreboard, tiller and rudder can be easily and straightforwardly made from drawings available from UKWA.

Condition

I am Planning a Complete Rebuild

If you are planning to do a complete rebuild, you are best advised to buy the cheapest "end of life" Wayfarer you can find, otherwise you'll end up replacing lots of wood and stripping layers of paint and varnish that you have paid a premium for! However, remember that you can not get your hands on official moulds, so you need the frame to be sound. The plywood is cheap and easy to replace (and best replaced anyway), but the solid mahogany frame must be pretty much sound and complete. If you can source good mahogany to replace it, you will be lucky indeed and you will find it very expensive!

I Just Want to Fix it Up!

OK you just want to get it on the water quickly and cheaply. Beware! (This is how I started out and ended up with virtually a complete rebuild!). So what standard are you aiming to achieve? Prioritise as below: -

1. I want a strong Wayfarer that will last a good few years.
2. I want it to "measure" so I can race it or sell it to a racer later.
3. I want a light Wayfarer that will be competitive in racing.
4. I want my Wayfarer to look like a brand new one built by a professional boat builder.

You decide how far down the list you want to go.

So firstly look at all the solid wood framing (including under the floorboards and inside the forward and aft buoyancy tanks) for rot and splits. In "bad news" order (ease of replacement)

- ? Bilge keels
- ? Floorboard supports
- ? Gunwales
- ? Side Benches
- ? Thwart
- ? Keel
- ? The "knees" which support the deck and seats.
- ? Deck framing
- ? Carlins (the strips around the inside of the decks)
- ? The mast tabernacle
- ? Transom

- ? Bulkhead framing
- ? Centreboard Case
- ? Hog (inner keel)

If you have problems with the last three, you are approaching total rebuild territory!

Then have a look at the plywood. What you are looking for is delamination or disintegration of the outer layers. If it has been painted all over, then assume the worst as you are in for a reskinning project. Again in bad news order...

- ? Floorboards
- ? Hatch covers
- ? Decking
- ? Bulkheads
- ? Topsides
- ? Chine Panels
- ? Bottom

The last two again take you into total rebuild territory

Sticky Business

The glue that early boats were stuck together with is a problem. They were the wonder adhesives of the fifties and sixties: Urea Formaldehyde synthetic resins such as Cascamite and Aerolite. If they suffer a wet existence they seem to last about 30 years or less and fail. So you can have a perfectly sound Wayfarer that has come apart at the seams – literally! So expect to find this in the wetter parts of the boat. You would be advised to re-glue everything with epoxy resin anyway. This does not necessarily require taking everything apart (“how to” later).

Plying Up

In my experience, old plywood, however good it looks, seems to weaken with age. When I came to dispose of the old plywood by breaking it up to fit in my trailer, it was very brittle and snapped in half ***much*** easier than the new stuff. My local boat builder told me that old plywood although strong enough in tension has poor impact resistance, so you would be advised to check that “sound” plywood is what it seems by tapping with a light hammer or a sharpened screw driver. Anyway in my experience, it takes no more time to replace an outer panel than to strip and rub down both sides to bare wood so it’s maybe not such a big deal.

All Screwed Up?

Wayfarers were screwed together with brass wood screws, most of which seem to survive well and can be successfully removed. Usually the glue has failed and the screws are still holding it all together. Those ones that fail “waist” just under the head, if they have been exposed to water, so the heads twist off when you try to remove them. Sometimes the heads have crumbled and these can be easily drilled out. In either case they can be easily removed with pliers or mole grips after the wooden components have been separated. So don't worry about problems with fasteners. If some clown has used mild steel screws, you have a bigger problem. You will have to drill, saw and seal with epoxy as the shanks won't come out.

Sticks and Stones

Well sticks anyway! If you have been lucky enough to find a classic Wayfarer still with wooden mast and boom, would you like to keep them? There are two main problems. They are made in two halves and glued right down the middle. The glue fails and they split along the join. Also the spruce they are made of, likes to split anyway. If you are careful they can be split apart and re-glued successfully, or you can spend a few hundred pounds on new alloy spars – up to you. Old alloy spars can be fitted with new sheaves spreaders etc, slightly bent ones can be straightened, they can be welded re-anodised etc, so no problems usually.



W1100 “As Found”

Chapter Three

Repair or Restore?

Wayfaring with Attitude!

So you've bought a boat. Is it exactly what you were looking for? - No? Better or worse? OK: Worse or you wouldn't be reading this bit! Repair or restore is a question of attitude. Obviously you can start out repairing and do so many repairs you end up with a complete restoration. So what do I mean by restoration? By restoration I mean stripping right down and building back up, ensuring that all necessary repairs and replacements are carried out and your Wayfarer will voyage on for another 30 years, before the process needs to be repeated. ***If*** you suspect that you will end up with a near full restoration, you will probably spend less time and money if you start out with restoration in mind.

I have written this book with restoration in mind, but the layout is such you can find the part you need if you just want to repair. I will also tell you where to start if you don't already have the boat dismantled – a bit like a Haynes Manual for Wayfarers but easier to use. The famous phrase “assembly is the reverse of disassembly” is not used. I assume you are intelligent enough to work that out for yourself!

Restoration or Renovation?

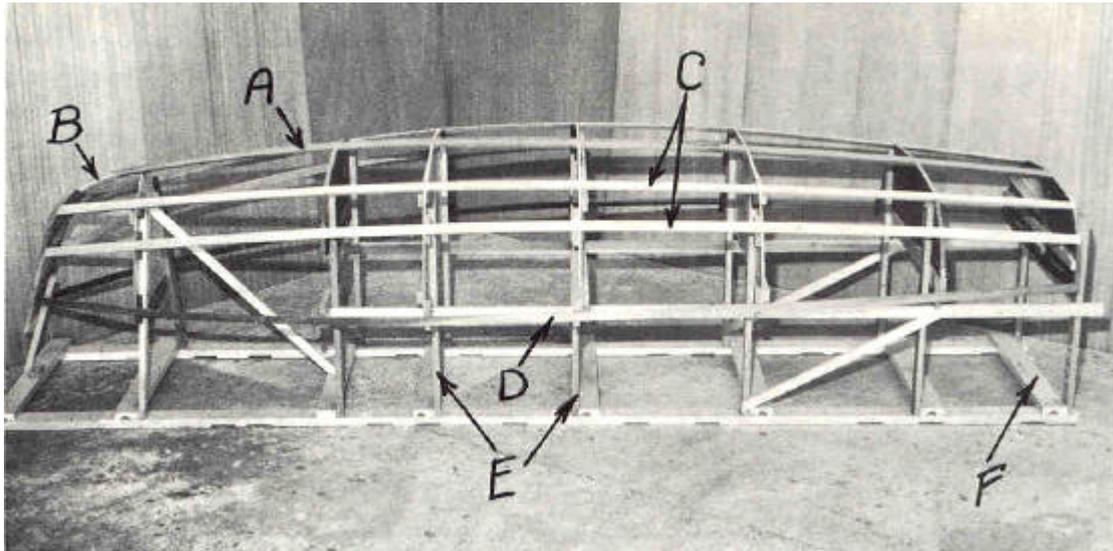
Do you want it to look like a classic wooden Wayfarer, which has been kept immaculate or a new Wayfarer that has just been pushed out of Porters' workshop. The difference is whether a slightly distressed but functional piece of wood is re-used or used as the pattern for a new piece. Obviously this is just a matter of choice, but try to be consistent otherwise it will just look like an old dinghy which has been repaired, which is OK, but will look odd.

All gone pear shaped?

You slag! No this is not an episode of The Sweeney, but you don't want to end up with a misshapen Wayfarer (a Wyafraer?). So you need to think about how to keep in shape. No this is not a fitness guide either! What I mean is.....

The Wayfarer is a very strong boat, even when it's falling apart, so you can get away with replacing one piece at a time, without much risk of losing the shape, providing you take reasonable precautions, that is. As you probably know, your Wayfarer was built upside down

on frames or moulds. What you might *not* have guessed is that 3 of the moulds are still in your boat. The transom and the two bulkheads, plus the centreboard case which defines the keel profile. So if you don't take them out, you are halfway there. If you are going in for heroic surgery then you need the moulds back. The bad news is that the drawings for the moulds are not available. However all is not lost, a bit of secondary school maths (remember trigonometry?) would enable you to work out what they looked like.



Moulds for Wayfarer (Small Craft)

There is an easier way though. I'll give you a clue. The other "building stations" which is where the moulds were placed were at the "knees" which support the side decks: One at the forward end of the front seats, one at the aft edge of the thwart and one halfway between the thwart and the aft bulkhead. There was also one under the foredeck where the first deck beam is. You will notice that there are also "floors" (the beams that support the floorboards) which tie the chines to the hog. These are also where the moulds were. So the moulds which shaped the boat are still there really, which is why you can replace whole panels without much fear of losing the shape. So before major surgery, the best thing to do is to follow the procedure below: -

- ? Get a measuring form from UKWA (or download it from the website) and measure your Wayfarer to make sure it hasn't moved since it was built.
- ? Rip off the decks (you were going to do that anyway!)
- ? Repair and re-glue all of the frames and floors, before removing **any** panels.

- ? Fabricate some frames in situ from plywood, particle board, MDF or some such or "skeleton" frames from 2x1, making sure you put some X braces in (like a 5 bar gate) to stop frames from distorting.

Then you can be fairly sure your Wayfarer will stay in shape.

Twist and Shout!

So you've got some frames in place. The problem is that old boats are inclined to corkscrew. Check by looking along from the bow with one eye (boat right way up). The way to avoid this is to extend your frames with legs so that you can bolt them to the floor or to a strong (6x4) subframe –X braced of course! Although as I said before one piece at a time you are probably OK.

Setting it all up

So you've got your frames in. Next steps:-

- ? Remove the rubbing strips from the gunwales without destroying them if you can (not easy!).
- ? Get lots of friends and turn your Wayfarer upside down and screw it to your sub frame or the floor.

Ready to go?

Chapter Four

Planning

How Long will it take?

How long have you got? How good are your facilities? I reckon for a first-time amateur with a basic tool kit, you are looking at 500 hours for a full hull rebuild. This does **not** include painting, varnishing and preparation, fitting out etc. or making new centreboards, rudders, tillers etc. Painting, varnishing and preparation are dependent on your personal standards! This how long it will take for "common" operations.

1. Replace a plywood hull panel - 2 days per panel.
2. Replace the decks – 2-3 days
3. Replace a bulkhead (assuming the decks are off) – 1 day.
4. Replace the transom – 3 days
5. Remove keel, manufacture a new one and refit 2-3 days
6. Remove centreboard case, reseal and refit 3-4 days

Note that these times do not include stripping off paint/varnish or incidental repairs to stuff that you find to be rotten, broken or bodedged, or the bits you break while dismantling. In other words, assuming all goes well (which it won't always!).

What tools will I need?

Wayfarers were designed and built by craftsmen with standard woodworking tools and for completion from kits by amateurs in an era when the only power tool the average handyman possessed was an electric drill! So you have probably got most of the tools you need. Non exhaustive list below:

Necessary Tools

- ? Hot air gun for paint/varnish stripping (plus paint scrapers)
- ? Cordless electric drill/screwdriver (get a good one!)
- ? Complete set of drill/screwdriver bits in a "briefcase" from B&Q
- ? Fine-tooth saw for cutting plywood - Those Japanese "pull saws" or "shark saws" are brilliant for this.
- ? Power jigsaw with fine cutting blades for plywood
- ? Set of chisels
- ? Hammers
- ? Block Plane
- ? Surform Plane
- ? Oilstone and jig for sharpening chisels and plane irons
- ? Pincers, Pliers, Mole Grips

- ? Standard and Junior hacksaw with blades
- ? Combination square
- ? Bevel gauge
- ? Lots of Clamps! (Car boot sales)
- ? Rulers and Tape Rule
- ? Dusk Mask and Goggles
- ? Rubber gloves
- ? Pencil (Racking my brain now!)

Really Useful Tools

- ? Router and set of bits (they are ever so expensive to buy one at a time)
- ? Rebating Plane
- ? Power planer
- ? Belt sander
- ? Orbital sander
- ? Callipers (inside and outside)
- ? Vernier callipers
- ? Depth gauge
- ? Vacuum cleaner

Bloody Luxuries! Eh Lad in my day we 'ad to knock nails in with our 'eads!

- ? Table Saw
- ? Mitre Saw (power mitre box)
- ? Drill press
- ? Radial Arm Saw (OK now I'm just dreaming)

Facilities

In some parts of the world boats are still built on the beach. So outside is OK, in the summer at least, provided you have a good, completely waterproof cover. Cheapest is a polyxxylene tarpaulin from B&Q (about a fiver!). Indoors is better. Room to turn it over. Power would help. A workbench (workmate will do) and a saw horse or two (or the odd old dining chair.)

Materials

Well of course it's mostly plywood. Wayfarers have strict timber specifications, which you can follow or ignore according to your conscience.

- ? Decks, Bulkheads, Hatch Covers – 6mm Marine Ply to BS1088 – Outer veneers minimum 1mm (yeah right!) and no baboons (sorry gaboon) in the outer layers.

- ? Outer Skin and Floorboards; 8mm Marine Ply. Trouble is 8mm plywood (which I suppose was (5/16 in) is not a standard size any more, the nearest being 9mm which is obviously a bit heavier.
- ? Transom 18mm marine ply.
- ? Frames, Hog, Keel, Bilge Runners, Thwart, Side Benches, Mast Tabernacle, Knees etc. mahogany.
- ? Chines and Gunwales spruce or mahogany

The only supplier, I am aware of for 6mm plywood strictly to spec is Robbins of Bristol. However I have found quite nice 6mm Marine Ply at my local timber yard. Ask for mahogany at your timber yard and they will sell you a red hardwood of some other species which they will suffix with mahogany. It'll be OK though.

For white wood, I use Parana Pine, a Brazilian species, with no knots and some nice red streaks which is easy to work, but not rot proof, so coat it well with epoxy.

Crew Required

Most jobs you can do on your own, with the aid of clamps but you will need to co-opt help from time to time: Turning the boat over being one obvious example. Fitting long bits like the gunwales and topside panels. I've found an obedient medium size child to be generally helpful for many jobs. If you don't already have on they do take a long time to make and train though!

Implementation

So you are fed up with thinking about it and want to get started. Turn the page...

Chapter Five

Getting Started

The Full Monty

How far will you go? Slightly undressed or the Full Monty? No need to decide yet! Let's get stripping! Have you decided which bits you are going to replace? If not, it's a good idea to strip off all the paint, so you can see what you've got. The side benefit is that you will see every detail as you strip. Don't bother stripping any panels you know you are going to replace though, for example if you've decided to re-deck.

Chemical Alley or a Load of Hot Air?

Paint stripper ain't what it used to be, due to our having more regard for health and safety and the environment nowadays, but it is worth using for removing varnish from visible surfaces, as it won't mark the wood and varnish comes off easily anyway. Paint stripper is also now very expensive, even if you buy it in gallon cans. I worked out with one job I did, it would have been cheaper to buy new plywood and not taken any longer to replace a panel rather than strip both sides of multiple layers of paint. However a hot air gun does a great job and only costs as much as one gallon of Nitromors.

Clear the Decks!

Take off all the fittings from the deck. Carefully remove the gunwale rubbing strips. They are held on with lots of screws, usually the heads are covered with matching wooden plugs. The screws usually come out OK, with a bit of heat from the hot air gun, or you can easily drill off the heads if the screws are brass. They will be glued on too. It is quite likely they are not original and the glue will be modern and tenacious. If the strips are mahogany and in nice condition it will be well worth trying to get them off undamaged (perhaps using a jig saw), mahogany is very brittle and will break if you try and lever them off. When you've smashed them up and found out the cost of new ones (£140 per pair from Porters), you'll wish you had been more careful!

The next step is to remove the side decks. They may be glued and tacked or just glued (or stapled on with ferrous staples 1½ in long as W1100 was!). Either way, lever them off carefully, with wide chisels, so that you preserve the framing beneath. If the glue is strong, leave on bits of plywood, rather than damage the framing. You can always plane off the bits of plywood and glue afterwards. Then do the same with the foredeck. The aft decking is screwed on with screws, through the carlines, concealed by the side decks. This

means you can't easily and neatly replace the aft deck alone. Try to get the decks off in as large pieces as you can... and keep them. It makes planning and cutting out the new ones easier.

Under the Kimono

So now you can see the entire skeleton of your Wayfarer. How does it look? Now you need to examine it in minute detail for splits, rot and boded repairs. It is vital you get all the deck framing in tip top order, before proceeding further. The joinery is very simple. Remove all the screws and test the glued joints, reglue with epoxy and replace the screws. Make sure you replace all split and rotted or damaged wood. If you are not planning to replace the topside panels and there are problems with crossbeam joints, you can repair the joints with epoxy fillets, or carefully chisel out the plywood to gain access to the screws, then carefully cut out and glue in "invisible" patches. You may now continue the "undressing". If you are planning the total rebuild, now is the time to make and fit the temporary frames (or moulds) and carefully turn over your Wayfarer. If you are doing it "one piece at a time" you can leave her the right way up on a trailer or trolley.



W1100 Ready for Re-decking

Chapter Six

The Hull

Topside of Wayfarer!

The topside was the last panel to go on, so is the easiest to take off first! It will be screwed or nailed and glued on to the chine stringers. Remove the screws, first gouging out the filler with an awl or sharpened screwdriver. I find an electric screwdriver with good quality bits works well, after heating up with a hot air gun. Then using a wide, not very sharp chisel very carefully try and separate the plywood from the frame. Do not split the frames, although you can epoxy them back together if necessary. If the glue is too strong, leave the last veneer of the plywood attached, then plane it off later. Remember it will also be attached to other bits like the thwart. Bulkhead frames, knees etc, so make sure you find all of the screws/nails. If you find it really difficult you can always jigsaw through the plywood close to the frames, then you've only got thin strips to remove. Make sure you don't cut through any frames! Usually though, the glue has failed and the panel is very easily removed.

IF YOU PLAN TO REPLACE ALL THREE PANELS ON A PARTICULAR SIDE (OR TWO ADJACENT PANELS). LIFE WILL BE MUCH EASIER IF YOU REMOVE ALL THREE (OR TWO) PANELS FIRST, BUT ENSURE YOU JIG UP FIRST!

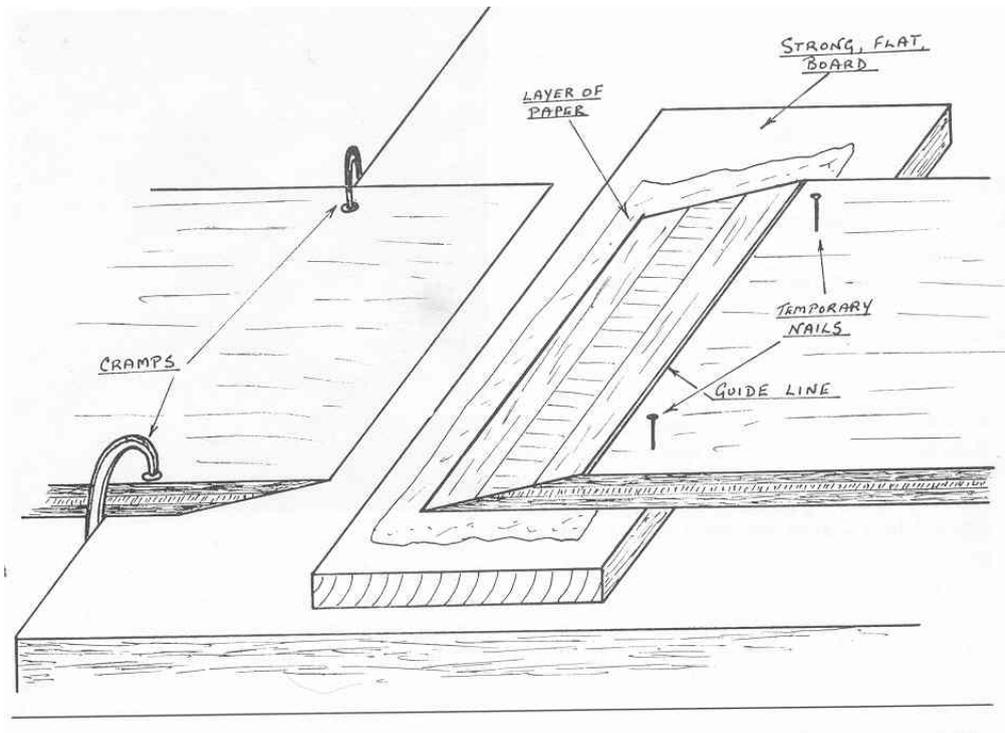


Replacement is more work, though easier if you got the old panel off in one piece. The topside panel is made from 3 pieces of plywood

glued together, but you can get it out of one piece of 8ft x 4ft plywood (8mm). Draw round the old panel allowing at least one inch (25mm) all round or you will never get it to fit. The midships joint will have to be "scarfed", if you want the finished boat to look neat. The aft one can be butt-strapped as it is hidden away in the aft buoyancy tank.

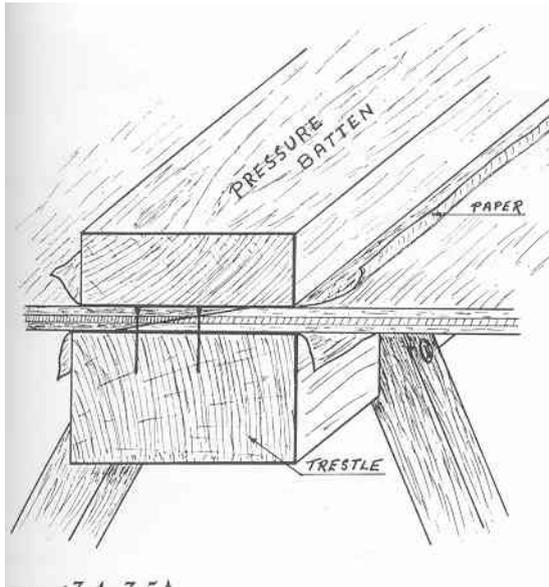
Joining the plywood

Scarfig refers to a diagonal join across the thickness of the plywood. It should be at least eight times the thickness, so 64mm for 8mm plywood. The easiest way is if you can get your plywood supplier or a local boatyard to do it, but it isn't too difficult to do yourself. The traditional way is to plane a taper (I found an electric planer to be easiest). Do a few pieces at once by arranging in a "staircase" of the desired slope, clamp or pin firmly and plane a nice smooth slope.



Scarfig Plywood Stage 1

Then turn over alternate pieces and slide together to make a smooth joint. The critical part is planing a nice flat even slope, so you don't have any gaps or steps when you glue it together. Pin firmly when you glue (using epoxy) as below. I was very careful about gluing my scarfs. I "pre-cemented" the plywood with un-thickened epoxy first, then glued using thickened epoxy.



Stage 2 Gluing a Scarf on plywood.

Another Route

The alternative method needs a router, which you use to rout "stairs" on your plywood. I used three steps (one for each ply), but in retrospect, I can see why a single step wouldn't be just as strong. After all plywood is made that way! For 9mm plywood you set your router to take off 6mm on the first step then 3mm off the second step. This can be done extremely accurately and leads to very neat and strong joints.

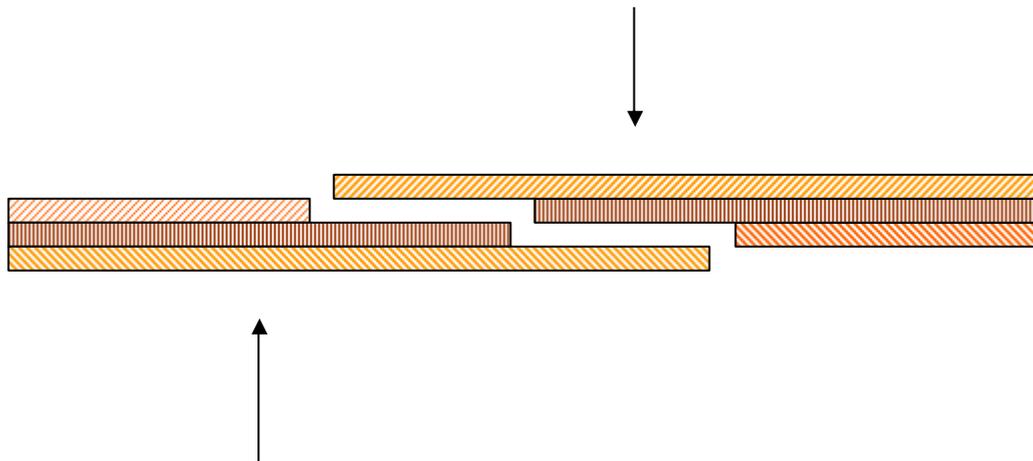
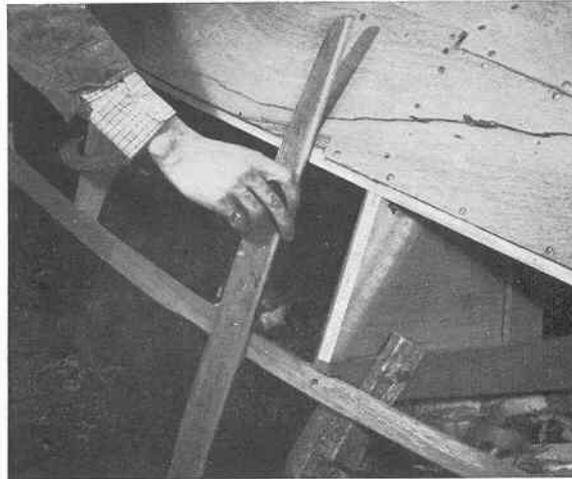


Diagram – Routed Scarfs

Glue in the same way as with a traditional scarf.

Sticky Moments!

So you've got your slightly oversized panel nicely scarfed together. Find an assistant and a clamp or six and roughly fit the panel so that it overlaps all edges slightly. You will notice that towards the bows the joint between the topside panel and the chine panel changes from an overlap joint to a butt joint. Note where this happens as from that point forward you will have to plane the new panel to exactly fit to the chine panel. This is not as difficult as it sounds and the best way is to secure the panel as far as this transition point, then trim the new panel a bit at a time until it fits exactly, adding screws as you go forward. A rebate plane (where the blade (or "iron") goes right to the edge) is the best tool for this.



The panel will feel heavy and hard to handle (now you know why Wayfarers are strong – and heavy!). So imagine how difficult this would be if everything were covered in slippery epoxy! This exercise is called a "dry run". The panel will tend to bulge in the middle and

just as you think you have got it to fit at one end you will find that it doesn't at the other so you just have to keep fiddling until it does. This is why you made it oversize. Insert a reasonable number of screws so that the panel touches in all the important places. This is where two cordless drill/screwdrivers come in handy. Get one of those bits that drills the pilot hole, shank and countersink all in one operation and use Pozidriv screws as they are much easier to "power drive".

When you have fitted the panel to your satisfaction, put pencil marks in strategic locations so you can make sure that it goes back in exactly the same position. Then remove it, but leave the screws in the panel so you can locate the panel easily in exactly the right place. Make sure the surfaces to be glued are sanded and degreased and then mix and apply the epoxy according to the manufacturer's instructions. Then screw the panel back on and insert as many additional screws as are necessary to pull it evenly and firmly on to the stringers. Do not forget to insert screws into bulkhead frames, knees etc, where appropriate. Check glue has oozed out of all joints, but with epoxy there is no need to over tighten screws, especially to the extent all the glue is forced out leaving a "dry" joint. Clean off excess glue before it hardens otherwise you are in for a lot of work when you come to varnish the inside!

When the glue has hardened, just plane the edges of the ply flush with deck framing at the top and with the chine panel at the bottom. A power planer will make this job much quicker!



Chine Panel

This is the narrow one at the turn of the bilges. If you are replacing this as a single panel or a "one piece at a time" exercise. Life is slightly more difficult as it has to butt join the topside panel along its entire length. This would appear a bit awkward, but there is a simple technique for dealing with this.

Remove the panel as described above, draw round, scarf up and make a slightly oversized new panel. If you are replacing this panel alone, you can leave an overlap at the bottom edge, but will need to butt-up to the topside. Do this as follows. Fit the panel to overlap all edges, but fit screws to the bottom edge only. At the top, slip a steel tape measure under the panel and pull so that the "hook" on the end hooks around the adjoining topside panel. Make a mark where the tape is and write the measurement on the new panel next to it. Do this every couple of inches or so all along the join. Then remove the panel transfer the measurements to it, join up to make a line, then jigsaw along it. This should give you a near perfect fit. You can trim with a planer to an exact fit and any small gaps can be filled with epoxy. Glue and screw as with the topside panel. The lower edge of the chine panel can be planed level with the bottom.

Getting to the bottom of it!

The good news with the bottom is that it is short enough to require only one scarf joint. The bad news is that it is a "bu**er" to fit! You are going to remove the keel first. Rubbing strips of paint off the keel and remove all the paint. Then remove the keel in as few pieces as possible. If it breaks, don't worry, how to make it OK? Remove the keel, not forgetting the keel attach to the keel and bulkheads and bulkheads slightly



Remove the keel to locate the screws. Endeavour to remove the keel in as few pieces as possible. If it breaks, I'll tell you how to make another one. Remove the keel, not the screws that attach the floor supports and make a nice oversized one as described above.

Did you notice the twist in the panel? This is an advert for the fun yet to come! If you are planning to repair or replace the hog and or centreboard case, once you have removed the keel and bottom panels, removing the hog and C/B case is a piece of cake and the necessary repairs can be done more satisfactorily on the bench.

Twist and Shout!

Or in my own case, swear quite a lot! Dry fit the panel using the techniques shown above. As you get nearer to the bows, you will notice the bottom panel twist from near horizontal to near vertical. This is nearly impossible to achieve with 9mm plywood. The forces are so great the screw heads will pull through the plywood and defeat all efforts. What you need are nice long (75mm) steel decking screws (as used by Tommy Walsh) and penny washers to fit under the heads, use these and a steam wallpaper stripper or kettles of boiling water to gradually pull the panel down (whilst carefully trimming it to fit of course!). Leave the panel dry fitted for a day or seven and hopefully it will get the idea of its new shape. When you remove it; it will immediately untwist! But trust me it will twist more easily next time. Glue and screw as normal. After the epoxy has fully cured, you can remove the steel screws and penny washers, making sure you fit plenty of brass screws in this region!

Transom

You *can* change the transom. W1100 was horrible – more holes than a Swiss cheese. Just locate all the attaching screws to all of the skin panels. The ones from inside the aft tank, which attach the framing and gently extract it without doing too much damage!



W1100 Transom Removed

The new one is easily made by drawing round the old one (outside down). Remember you will need to plane a slight chamfer on each edge to match the "run" of the bottom and side panels. It is better to measure this using a adjustable bevel gauge before you extract the old one.

The 18mm marine plywood I found was slightly thicker than the original transom, so in order to fit correctly the areas where it was to be glued to the framing had to be routed to the correct thickness in order to maintain the original dimensions.



New Transom Routed to fit
(Bottom frames fitted as new bottom required)



Ready for sanding!

Cutting the slot

You'll be needing a slot for the centreboard? The easiest way is with a laminate trimmer bit in your router. This will follow the slot in the keel exactly and do a very neat job. No router? You're on your own mate!

The Keel Haul

So you now have a nicely reskinned or repaired hull. How's the keel? Still in one piece? Great! No? Well here is how to make another one. First get a Wayfarer measurement form and get the wood yard to cut you a nice piece of your selected timber (you know, African mahogany.... or more likely anything they can do in the length with no knots!). Get it cut to the appropriate maximum width and depth. With a big round over bit in your router, round over the edges. measurement clearly where tapering the depth. I found it this after I had boat.



From the form, mark you can start width and easier to do fitted it to the

Mark the width on the bottom of your Wayfarer and plane a flat to the appropriate width. Then glue and screw the new keel on. Plane the taper allowable from the measurement form, so that keel blends nicely to the bows. Take your time as this is a very important and satisfying job. The centreboard slot? See above – get a nice deep laminate trimmer bit for your router.

Job Done!

Well almost, don't forget the bilge keels (check position with the



measurement form), then just a few hundred screw holes to fill, scarf-joints to fill and fair-in. Epoxy coating, undercoats, top coats metal rubbing bands....

Then you can turn it over to reveal the interior of the boat!

Chapter Seven

The Interior

Changing Rooms!

You're not going to need an interior designer for this job. The look you are going for is an English Gentlemen's Club – All mahogany and panelling. The jobs you may be faced with (in order of horribleness) are:-

- Floorboards
- Side Benches
- Thwart
- Floor Supports
- Knees
- Mast Tabernacle
- Bulkheads
- Centreboard Case

Floorboards

You don't need marine plywood, just 9mm "Exterior" or "WBP" will do. Use the old ones as a pattern. If you haven't got the old ones borrow some for a start. You can make them in two halves for each side or one each side. I don't see the problem with one per side as they are easy to remove.

Side Benches

Trust me: However horrible they look when you start, strip the varnish and lots of patience with an orbital sander are going to give you a "better than new look". New wood can not match the colour and glow of a nice old piece of mahogany.

Thwart

Ditto, unless some clod has filled it full of holes for long discarded fittings which have turned black. Good luck in finding a new piece of mahogany at a reasonable price. Personally I don't object to a nice piece of 18mm plywood, but that may be going too far for you. W1100 had more holes in the thwart than you can shake a stick at, but they were all along the centreline, so I routed out a strip and let in a contrasting stripe as a styling feature. By the way, you **can** get the thwart out...There is a certain angle and a small incantation that works, I can't describe it, but it will come out and go back in!

Floor Supports

I know the correct nautical term for these pieces of wood is "floors", but whenever I talk about floors, people think I am referring to the plywood floorboards. They are very structural and stiffen and

strengthen the bottom skin of the boat and the centreboard case as well as support the floorboards. They should be screwed in from the outside, but are notorious for coming adrift, so an epoxy fillet (use microfibres) of about 1in radius will keep them in place.

A right old Knees-Up!

Your knees are two parts of your anatomy which will suffer during the restoration, but it is the flat but elegantly shaped pieces of wood I am referring to which connect the hull to the deck. Mahogany is a great wood, but in my experience is liable to split along the grain, so you may find knees that have separated into two pieces (particularly the big ones that support the for'ard end of the front seats). You have two options: either to repair them with epoxy or make new ones, which is simple and satisfying. You might lay your hands on an offcut of mahogany, but 18mm marine plywood will do just as well. Just make sure the grain is diagonal, to maximise the strength. Just draw round 'em and jigsaw them, then round over the edges with your router.

Mast Tabernacle

Comes under a lot of stress and likely to split. New ones are very satisfying to make. Carefully copy the old ones (more use for your router) and check against the measurement form.

Bulkheads

Forward Bulkhead

So some clod has put the boom through the forward bulkhead? The bad news is the bulkhead was there before the rest of the boat was built. It

the jigs.
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(split vertically), unless you can wiggle a whole one in somehow. I don't know I haven't tried it on a Wayfarer. The forward bulkhead is inaccessible and separating it from the framing is an unpleasant job.

It will be attached with glue (which has probably failed) and numerous very sharp panel pins to tear your hands to shreds. If someone has sealed it with glass fibre tape and resin, it will be that much harder. Anyway allow a day to take it out. Try and get it out in as few pieces as possible, so that you can put it back together like a jigsaw puzzle and draw around it to make new one out of 6 mm marine plywood. If you can't piece it together than you can spile it to make a new one.



Take a piece of hardboard or scrap plywood and cut bulkhead that will roughly fit but is a bit to small. Lightly tack it to the frames. Then take a 1in square block of wood and mark out a 2in smaller version on the scrap piece, by running one edge along the hull sides and marking the trial panel with a pencil on the opposite edge. Then remove the trial panel, place it on the "new" bulkhead and reverse the process (cunning what?). To do the tricky bits around the chines and gunwales you will need one of those devices that look like a comb that they sell in DIY stores for making out tiles and flooring etc. in similar circumstances. When you have cut it out, don't forget you'll have to bevel the edges as you are at the pointy end. Then it's just a matter of trial fitting and trimming until it fits. The really frustrating thing is that even if you make an exact replica, you won't get it in. The various angles will defeat you, so will inevitably end up with a slightly smaller one. When cutting the aperture for

the forward hatch, you must consult the measurement form as there are strict measurement rules on the size and position.

Despite my hatred of nails in any form, I have not found a satisfactory way of fitting a bulkhead without using panel pins! Use plenty of thickened epoxy on the frames and firmly fix the bulkhead so that the epoxy oozes out all the way round. Remember this is buoyancy tank and you are looking for a watertight seal. After you have fitted it a quarter inch fillet of epoxy mixed up with micro-balloons, will seal it and make sure it looks nice too.

Aft Bulkhead

Use the same methods as for the forward bulkhead. Again it easier if you have the decks off, but not as tricky as the forward one. If not, be very careful not to damage the forward edge of the aft deck in removing the old one and ditto the bottom skin of the hull. The awkward bits are those that project up to meet the underside of the side decks. Again make sure you have a watertight seal. You have the advantage of being able to access the "other side" – That is if you don't mind hanging upside down with your head in the aft tank!

Centreboard Case

As well as being a well known source of leakage, this component is a vital strengthening component and is literally the backbone of the Wayfarer linking the mast tabernacle to thwart and to the keel of the boat. It is also bonded to the stiffening floor supports, which are in turn bonded to the lower chine stringers.

When originally built, the Centreboard Case was bedded in on a mastic strip. The Centreboard case was secured through both the keel and the hog with 3in x 12g galvanised steel countersunk head wood screws rather than brass. The reason for this was that with the joint at the bottom of the boat it was likely to be in contact with water lying in the bilge and Aerolite 300 glue does not like continual immersion in water. Also, being a highly-stressed joint, steel screws provided good strength and the mastic bedding allowed for some movement without cracking which would have been the case if it had been glued.

Eventually the mastic hardens and the seal between the centreboard case and the hog breaks leading to leaks. If you decide to remove the assembly, what you need to know is that it is secured from below by about 24 large steel screws through the hog and keel. Subsequent owners may have added additional screws as well.

Either way it's major surgery involving removal of the thwart, keel, at least some of the bottom plywood skin and the removal, or more likely drilling out of the securing screws. Alternatively several happy hours with a hacksaw blade, cutting along the several feet required to release the bond between the centreboard case and the hog.

If you have the bottom out of the boat then there are only a very few screws securing the hog to the rest of the hull. Then you can have the luxury of sorting the whole problem out at bench level, which is what I did with W1100.

If you decide to make a new centreboard case, the structure is simple, but massive. It is a key component though and you need to make an exact copy of the original, as it determines the "rocker" on the keel. However one of the problems of Wayfarer measurement is that there is no control of the rocker, so.....

To refit the CB case then you need to get the case and the hog really dry. Any damage you have done to the CB case and hog in removing the case needs to be repaired and made "fair" with epoxy filler. Then epoxy the CB case to the hog, securing with new screws, use plenty of epoxy and a little filler in the "mix" to fill any gaps. Then for belt and braces a one inch diameter epoxy fillet all around the joint will add strength and waterproof it. Similarly fillet the joints with the floor stiffeners and also the joints between the stiffeners and the bottom.

If you wish to reseal the case without removing it and can get it really, really, really dry then you can try the epoxy fillet method "in situ" I can't guarantee it will work, though it's worth a try if that is your only problem. W1100 had been sealed with glassfibre tape and resin. It hadn't worked... Personally I think radical surgery is the best approach. I used this with an Enterprise and never had any further problems in the 10 years I owned it.

Putting the seal on it

Roll on a couple of coats of epoxy, especially on the bottom panels as they will inevitably be wet for all of their lives. Then mix up some lightweight filler with epoxy, colloidal silica and microballoons (the brown powder) and put a small fillet around the bulkhead to hull/deck joins. Also fillet along the join between the bottom panels and the hog and the hog/centreboard joint, if you haven't already done so. This will have the advantage of stopping water seeping into the end grain of the plywood as well as preventing leaks and securing buoyancy. For the same reason carefully check that the joints between the chines and the gunwales are properly sealed. Although not intended to be structural, these fillets will stiffen the

structure of your Wayfarer, while adding very little weight.

Chapter Eight

The Decks

Clear the Decks (again!)

You might be reading this chapter first if re-decking is your priority. If this is the case, go to Chapter Five for advice on removing the decks and repairing the deck frames. You will need 6mm marine ply with outer laminates of 1mm minimum. Robbins of Bristol (UK) do the right stuff, stripey if that's what you want. A couple of matching sheets will do the trick. Matching the grain for the two halves of the foredeck and aft deck is essential and for the joins in the side decks. You will need to match the hatch cover to the aft deck as well. If you can stretch to three matching sheets, life will be easier.

The Foredeck

Start with the foredeck, you can easily get this in two pieces out of one sheet of ply. Cut the halves out slightly oversize.

Trim the centreline edges very carefully, taking account of the

camber to get a perfect match. Take all day if that is how long it needs as if this join looks a mess, you will be very disappointed with the whole job. If you have a contrasting strip along the centre line, this makes the



job easier. If not, you can always fit one. Make it slightly too thick then you can plane and it down to a perfect level. You can leave the other edges overhanging until the glue is dry.

No pins

I don't use panel pins to attach the decks.

However I have been known to use a few hammered halfway in to ensure a tight fit at panel joins. I remove them when the glue is dry and carefully fill them. They are unnoticeable. I use "Gravity Clamps". You can get them from any builder's merchants. To avoid confusion, ask for "bricks" (they'll know what you mean). Roll epoxy over the whole of the underside and apply epoxy glue to the deck frames, before clamping.



Trimming the Edges

The inner edges (cockpit sides) can be trimmed exactly using your trusty router and the laminate trimmer. However if you plan to use this on the outer edges, be careful! The angle between the topsides and the deck is not a right angle. You can wrap tape around the "bearing" of the cutter to compensate. But a plane or power planer is your best bet.

The Aft Deck

Fit the aft deck next, in two halves the joint along the grain will disappear if done properly. Refer to the measurement form for the correct dimensions of the aft hatch opening.

Hatch Cover

Consider the width of the foam sealing rubber (one inch) when making the hatch cover and ensure that it overlaps accordingly. The framework needs to be made to fit inside the hatch opening with

minimal clearances. The framework should be half lap joined and epoxied to the cover.



Side Decks

Straightforward to fit, but take your time in trimming the panel joints. Undercutting the panels will give you a perfect joint. Pin the joints when gluing and remove the pins once the glue is dry. Trim the cockpit edges with a laminate trimmer, but a plane is preferable on the outside edges.



Remedial Measures (Dog Watch!)

If you've made a real dog's breakfast of the foredeck joint, you can rout out a one inch strip along the joint and drop in a contrasting strip, then it'll look the dog's b*ll*cks!

Rubbing Strips

If you have not saved the old ones, you can make new ones with your router. The profile of this is strictly controlled. You can get a drawing from the UKWA. You are allowed to laminate them up from

two strips, which makes bending them around the decks a little easier!



W1100 Redecked

Chapter Nine

The Foils

Curses - Foiled again!

A fancy name for the centreboard and rudder. Here you can save a lot of money! (Check the prices). Shape, thickness and profile are tightly controlled, so you will need to get the drawings from the Wayfarer Owner Association. They can be made from solid wood, laminated wood, plywood or GRP – take your pick! If you are making new ones, you want to go for maximum thickness, but first check the width of the “slot” in the CB case (which is also closely controlled).

Methods of Construction

Plywood is the easiest, but the weakest. I have used plywood foils for years and had no problems. You can get anti-fracture plywood, but I have found ordinary marine ply OK, provided that you have the grain at 45 degrees to the length of the foil. Just jigsaw it to the correct shape and then profile the edges with a plane. The “layers in the plywood make it easy to get this even. Make sure you seal it well with epoxy and protect the tip with brass edging.

Solid Wood W1100 came with a solid mahogany rudder, which came up beautifully once all the layers of paint had been removed. If you can get a plank wide enough and get it planed to the required thickness, your only problem is being sure it won't twist or warp – then it won't fit properly etc. If you can find a nice old piece that has been lying around for years, it will have done all the warping years ago.

Laminated This is supposed to give you the stiffest foils. Made from planks about two inches wide and “edge laminated” with the grain in alternate directions, this construction gives you ultimate strength until the glue fails between the planks. The answer of course is to get it nice and dry and split the offending joins and reglue with epoxy. You will need some sash cramps and a means of keeping it all flat whilst the glue dries, such as a nice piece of MDF and a lot of house bricks. If the joints haven't split all the way up then you can run up them with a jigsaw and epoxy in a length of veneer. The only problem is that if one joint has failed so might they all! On W1100 centreboard there was one split “the handle” so I reglued it. Whilst clamping it another joint split and whilst repairing this, another! So the ultimate solution is required: Glass epoxy sheathing. If your board is at maximum width you will need to lose a millimetre or so for the thickness of the sheathing. I used a belt sander (very messy!) Do one side at a time. Roll on the epoxy so that it soaks in to the wood. Wait until the epoxy is tacky (if you let it harden you will need to wash with detergent and a scotchbrite pad then sand down) and apply another coat and then

roll on a layer of woven glass, as thin as you can get so it goes transparent. When this goes tacky, roll on another coat of epoxy, by this time the woven glass will have "disappeared", if not another coat is needed. Then do the other side. When the epoxy has hardened, you can rub down with progressively fine papers ending up with 1200 grade wet and dry. Now you have the ultimate strong and stiff foil, which is worth a few hundred quid! Worth it wasn't it? Clearly to make a new one like this isn't rocket science either. Will it work better than a piece of plywood? Dunno, the nut on the tiller is probably much more important!

Rudder Stock

You need one to copy or a drawing. Good quality marine ply will give you no problems. Best to make it roughly to shape then cut out when the glue is dry. If you are making a new rudder blade at the same time, use the same piece of ply for the "filler" at the top of the stock, to ensure a snug fit.

Tiller (Four Candles)

If you don't like aluminium, ash is the wood to use – its traditional for fork handles ('andles for forks) and the like.. Or if you want a nicely curved one to clear the side decks, laminate one up to the shape you like out of thin strips of wood. Very satisfying. I suppose everyone uses aluminium tiller extensions nowadays, but I quite like wood, and a length of dowelling with a "knob" on the end so it doesn't slip through your fingers. Works very well.

Chapter Ten

The Fittings

Down to Essentials

So you've finished the boat and are ready for the most satisfying part, screwing those shiny fittings on. If you are a racer, then you will have your own ideas about fancy fittings etc. Here I am talking about the essentials, which for a Wayfarer are very few.

Keelband

This is required by the rules and must be as described as stipulated in the International Wayfarer Class Rules?

Rigging

There are three wires that hold up the mast: The forestay and two shrouds. There is a standard bow fitting that all Wayfarers seem to have nowadays for the forestay consisting of a channel section for the forestay and jib and a screw holes to the foredeck and the stem. I used stainless steel self-tapping screws. You can epoxy the screws in if you like. Check them regularly.

The shroud plates are fixed either to the knees inside the boat or screwed on to the knees from the outside; it seems to vary from boat to boat or builder to builder. The position of these is critical and is controlled by the class rules in distance athwartships and from the transom. If yours are attached to the inside of the knees they are best bolted through with stainless steel machine screws. In this case they will need to pierce the deck plywood. I advise measuring very carefully and then use a very small drill - 1.5mm or 2mm - to make test borings to make sure you are in the right place, before you make the holes through the decks. Epoxy up the holes to protect the end grain of the deck plywood.

Rudder Fittings

Widgeon and Pintail or is it Gudgeon and Pintle? The position of these is a matter of juggling the tiller height, so that it clears the side decks and having the maximum amount of the rudder blade in the water, but none of the stock (which would create unnecessary drag).

When you have decided the position for the fixings, decide whether you want to use woodscrews or nuts and bolts. Some recommend woodscrews into sacrificial softwood blocks which will pull out if the rudder hits an obstruction – Hence saving the transom. Others prefer nuts and bolts, relying on bungee to take the shock if the rudder hits anything. Most Wayfarers have a knee between the transom and the hog, which makes it difficult to use nuts and bolts,

but you can just about squeeze a nut either side of the knee, if you chisel a bit of the knee away first. Use a "Nylok" nut, otherwise you will forever be tightening the screws, which is a fiddle to say the least!

Fairleads

The position of the fairleads is optional. Most Wayfarers have them either on the inner edge side decks or on the front seats. Adjustable fore and aft is preferable to allow for differing wind strengths. The racers have them adjustable athwartships as well! Some have ratchet blocks rather than fairleads and jamming cleats on the thwart. Have a look at everyone else's and see what suits you. Check against the measurement form to see what restrictions there are. If you have a small cruising jib, the usual place for the fairleads is on the foredeck.

Mainsheet

Aft sheeting was the original design with a track on the transom. This works well, but many prefer centre sheeting. The rules do not allow full centre sheeting, but you can lead the mainsheet back along the boom to a block on top of the centreboard case. Your preference, but one warning: The top of the centreboard case was not built to take the strain of the mainsheet on older boats and you might just pull the top off! Make sure you have adequate fixings into the centreboard case itself.

Kicker

Standard is a multiple block and tackle arrangement from the boom to the bottom of the mast. Winches through the mast tabernacle were popular a few years ago and make it easy to lead controls aft for the helmsman. Cascade kickers are the thing now. Have a look at some other boats, to see which suits you.

Self-Bailers

Optional, but desirable on any boat with floorboards. The best place is right against the centreboard case, just in front of the floor bearers at the lowest point of the boat. There are two types of the classic "Elvström" design, one designed to fit from the inside and the other to fit from the outside. I find the ones that fit from the inside easier. Whichever you use, mark out the corners with a small drill from the inside, so that you don't cut through anything structural, then jigsaw from the outside. Make sure you make a large enough hole in the floorboards to get your hand in easily to operate them!

Drain-Holes

Rubber bungs are OK, but most people like the screw-in type. Transom drains are useful, but unnecessary, so long as you don't mind bailing out any small amount of water that gets into the aft tank after the occasional capsize. If you have self-bailers then you can do without cockpit drains too. Drains from the forward tank are necessary as it is a pain to try and bail out via the forward hatch in the event of getting any water in there. Make sure you seal the fittings in with sealant in order to preserve the integrity of the buoyancy.

Hatch Covers

The large hatches are, at the same time, a blessing and a pain. The front compartment is not very accessible, because the mast gets in the way and you are allowed to screw down and seal the hatch. You are also allowed to fit a circular access hatch (of a certain size) in the cover if you want. See the rules! This would seem to be the best option. Apparently you are not allowed to omit the forward hatch, presumably for maintenance reasons.

The aft hatch is not allowed to be permanently sealed and is seated on foam rubber draft excluder usually tightened down by turnbuckles and latches of various types. They are a pain to seal and compromise the buoyancy. I have seen "wing-nut" type fixings, which would seem to be better, but not as convenient if you regularly use the tank for storage. The rules say they must be "adequate".

Chapter Eleven

The Spars

Materials

Most wooden Wayfarers and early GRP ones were fitted with wooden masts and booms. Aluminium was an option from the early 60s onwards. Very few wooden masts have survived. Booms seem to have done better and there are still a few Wayfarers to be found with aluminium masts and wooden booms. If you have found a wooden mast in good condition, it will complement your wooden Wayfarer perfectly; though will probably not be your choice for racing. The only aluminium mast correct for a Wayfarer is a Proctor "E" section. In the early days these were gold anodised to look like timber, from the early seventies onwards; silver became more fashionable, then, for a while, black was in vogue. Gold is not listed anymore but I am advised it is still available on special order.

Wooden Spars

These are made from two pieces of timber glued along the whole length. The basic principle involves cutting the wood down the middle and the bottom outside of the mast becomes the top inside, before gluing together. This counteracts any stress there may be, and also allows the grain to flow in the same direction, making it easier for shaping. If the mast is to be hollow it is still turned but before gluing, a matching semi circle is machined into each half, making a perfect round hollow when glued together.

Gluing

The glue line has sometimes been a weak point, improving technology now allows for a very strong joint. Resorcinols together with other such traditional products are sometimes used, but Aerolite 300 is said to be the best for this application.

Shaping

Once the section has been glued, it is squared up to the finished size in a thicknesser. Tapers are then marked on with a long straight edge before it is run through a circular saw to remove the excess. The initial shaping is first done with the aid of a drawknife to remove the corners and take it down to the approximate size. Traditional wood planes are then used to perfectly shape or round the mast bit by bit until ready for sanding through the different grades of glass paper. Four coats of a polyurethane varnish are then applied for protection, as an unfinished wooden mast is very prone to changes in temperature and moisture".

Repair

The most common problem is failure of the glue line, which will eventually result in breakage of the mast or boom. This can be rectified by removing all fittings, carefully splitting the mast along the glue line (which will be easy if the glue has failed), then removing the residue of the old glue and re-gluing. The supplier for Aerolite 300 is Dynochem UK Ltd Alyn Works Denbigh Rd, Mold, Clwyd Tel: (01352) 757657 Fax: (01352) 75891. The other area for repair is the groove for the bolt rope of the sail. I have successfully repaired these by scarfing in a new piece of wood. If you would like a new wooden mast then Collars www.collars.co.uk will make one for you.

Aluminium Spars

Proctors Metal Masts have made two designs of Wayfarer masts, both in the "E" section. The earlier type had a sealed chamber in the mast for buoyancy and the halyards ran down the luff groove of the mast. This mast is superior because it is inherently buoyant (like wood) and helps prevent inversion in the event of a capsize. The heel of this design of mast is made from wood. The later design is not sealed and the halyards run down the hollow chamber of the mast. This type can be easily recognised as the halyards exit through the fitting at the heel of the mast. This design can be ordered with buoyant foam filling to aid flotation.

Repair

Masts

If it's badly bent (kinked) then it can not be repaired easily. Slightly bent ones can be straightened professionally. The usual problem however is the sheaves, which seize up with salt water and get damaged by wire halyards. Parts for the later design of mast are readily available from Proctor dealers. The parts for the earlier design are not. Although I have found that Seamark Nunn www.seamarknunn.co.uk list the sheaves, but I have not tried them for fit.

The spreader design has changed too. The earlier design has tubular spreaders which are not adjustable. The later design has adjustable aerodynamic spreaders. These can be fitted to the earlier design, provided that you change the mast fittings as well. You will find scrapped Proctor masts lying around the dinghy park after a very windy race day. The owner will have claimed for a new mast on his insurance and even if he has salvaged the fittings, the riveted on mast fittings will still be there. Grab them before the mast goes into the rubbish skip!

The earlier mast can be converted to accept the later sheaves, although it is a fair amount of work and you will lose the watertight chamber. The heel, which you will want to change if you wish to fit a new aluminium mast step, is easy to change. Carefully measure the heel to mast swivel pin distance. Find the pin which goes through the mast to secure the wooden heel and drive it out, then remove the heel (which goes a surprisingly long way up the mast) or drill it out with wood bits and chisel out the remnants. Insert the new heel and carefully measure the distance to the mast pin and shorten the mast accordingly (large hacksaw). Then secure the new heel with three self tapping screws. The problem you now have is that the sheaves at the mast heel expect to receive halyards through the mast chamber and not through the halyard slot, so you need to retain the original sheaves, or modify the mast to receive the new design of masthead sheaves. This is not so easy, because the original jib halyard sheave fits in a sealed welded recess (to preserve the buoyancy), which you will need cut out somehow, because the new jib sheave is slightly larger and you will need to get access to the chamber inside the mast, to run the halyard down to the heel. Also the fitting for attaching the standing rigging tends to interfere with the sheave. I have managed to convert the new style of sheave to work on an old mast, but with a lot of surgery to the sheave. You can convert to the new style of standing rigging with a swaged on tang, but you will need to salvage the reinforcing plates from an old mast and invest in new standing rigging. You will need to check all the measurements from a new style mast to get everything in the right place.

The main halyard sheave is a completely different design and is welded to the top of the mast. To fit this you will need to cut off the top of your mast and get someone to weld on the new fitting for you.

The gooseneck fittings are different too. The earlier design had the sliding gooseneck (which I prefer). The later design has a fixed one, which is easy enough to retrofit if you want to.

This all sounds a lot of work, but will eliminate spares problems for a while. However, beware Proctor Metal Masts have introduced a completely new design for 2004!

Booms

The latest design is the Proctor 2633, which is a purpose-designed boom section. I guess that there were other boom sections used

over the years. Fittings are no longer available for the section originally used for the boom. The end fittings are vulnerable and prone to damage. It is possible that Proctor 2520 end fittings (which look similar) can be made to fit, but I haven't tried. There is no lower track to fit the kicker, which is attached using a fixed fitting, which should have survived.

Techniques

Aluminium is an easy metal to work as it is soft and malleable. To remove riveted-on fittings, just drill off the rivet head and punch out the inner part with a pin-punch. To attach new fittings use marine grade pop rivets available from chandlers. They are harder to "snap" though and will need a heavy duty riveting tool. You may be able to hire one from hire shops, or borrow one from a chandler or boat builder. You will need to bed stainless steel fittings to the mast with some kind of sealant smeared over the surfaces before riveting. This will prevent water getting in and causing corrosion and minimise electrolytic effects. It is worth sealing the hole in the centre of the rivet too. Any unwanted holes, where you have removed fittings can be plugged with a pop rivet.

Finishing

The mast that came with W1100, which was I think, the original gold anodised every respect, kept on the owner's garden. Therefore it was from being some firms in re-anodise the time was short invest until I had replacement the conversion to I decided to try an decided to use the paint sprays that shops for I thoroughly rubbed them and gave them



item, was satisfactory in except that it had been ground in the previous for some years. badly scratched all over dragged around. I found Yellow Pages that could mast and boom, but and I didn't want to either found sheaves or completed the new type. Therefore "economy" solution. I silver wheel aerosol are sold in car accessory refinishing alloy wheels. washed the spars and down with "wet and dry" several coats of "Silver Wheels". It takes a few weeks to harden properly and although it doesn't seem to have any great adhesion it is holding up well and is indistinguishable from a normal silver mast. I think this would work even better with silver masts, as any scratches would be silver

underneath. If I decide to have the mast re-anodised the paint would come off easily with paint stripper and wire wool.

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