

John Lilley & Associates

Marine Surveyors

Timber Specialist

Little Foxes
Cheselbourne

Dorset DT2 7NT

fax/phone 01258 837153 mobile 07963 011390

Email johnlilley@seasurveys.co.uk www.seasurveys.co.uk



PART 2 OF DOCUMENT REF NO.

197/051206

DATE.

January 9 2007

CONDITION SURVEY YACHT

Xaxaxa

A survey of the above yacht was carried out upon the above vessel on behalf of the named client without responsibility to any third party or subsequent holder of this report.

CLIENT NAME

S.G

FULL NAME OF VESSEL

Xaxaxa

PORT OF REGISTRY

Home port, Salcombe

OFF.NO.

70016

CLASS OR TYPE

One off Hillyard

BUILDER

David Hillyard

DESIGNER

Original owner

YEAR OF BUILD

1984 (unconfirmed)

DIMENSIONS

LOA

34ft on deck 41ft oa

LWL

33ft

BEAM

approx 10ft 6in

DRAUGHT

5ft

T.M.

reg. Ton 9 ⁷²/₁₀₀

DISPLACEMENT

In the region of 9 tonnes

LOCATION OF SURVEY

Winters Boatyard, Salcombe

CONSTRUCTION

Carvel Timber hull, plywood deck, solid Iroko coach roof, external ballast keel, timber spars, diesel engine.

SURVEY LIMITATIONS

The vessel was inspected standing on her own keel and supported by beaching legs and or bilge supports and wedges.

No through hull fittings were examined other than those commented upon in this report.

No dismantling of any of the vessel's structure was carried out other than those parts of the vessel that would normally be portable or removable for access without the need for tools and therefore any areas that are inaccessible or obscured by the yacht's permanent fittings or joinery have not been inspected and cannot be declared free of defect.

This inspection and report was carried out at the request of the client and their wishes as set out in the survey booking form prior to survey ,which forms part 1 of this report, and as such expresses no responsibility or obligation to any other party than the client.

No opinion is expressed as to the suitability of the vessel for a particular purpose, and the client should make enquiries themselves as to the limitations of the design of the vessel if so required.

The purpose of this survey is to allow the owner\|s to gain new or continued insurance cover subject to the insurer's conditions and as such is only concerned with factors affecting the vessel's safety. All additional information included in this report was noted in the course of the safety inspection and has been included solely for the client's benefit and is included so that deeper investigation in some areas may be considered if the client so wishes. It is not the intention of this report to identify every existing defect upon the vessel that may have an affect upon the resale value of the vessel, only those that are visually detectable subject to the stated limitations of inspection, affecting the safe operation of the vessel. It is the operator's responsibility to carry out normal routine preventative maintenance upon machinery and other ships equipment to avoid premature failure resulting in putting the vessel in danger.

In the case where specific parts of the vessel are not referred to such as upholstery, soft furnishings paint schemes and certain other parts of the vessel structural or otherwise, it should not be assumed that these are free from defect and the client should satisfy themselves as to the condition of those parts.

The purpose of this inspection is to inform the client of the structural condition of the vessel as accurately and as comprehensively as access and conditions allow. All reported findings are factual (to the surveyor) unbiased interpretations of the visual indications supplemented with physical tests in some areas where the visual indication may warrant. In accepting this report the client understands that even with the closest of examinations, some defects can escape detection. It is also accepted that different conclusions and opinions can be drawn by different professionals in some aspects of the vessel.

Please Note that this inspection is NOT designed to check any vessel for compliance with the Boat Safety Scheme, as the requirements for this are extremely comprehensive and few vessels built prior to 1998 would be able to conform without major upgrading and/or alterations. All further safety information given in the inspection will be in the surveyor's opinion based upon experience and common sense combined with practicality. For full details of the requirements a booklet is available from 01923 201408 free of charge.

Generally no comment will be made upon the original design and structural build detail in the case of professionally designed and built vessels, unless developing faults occasioned by possible building\ design failings are obviously present at the time of survey, the client accepting the original building specifications

For the sake of clarity NO STRIKINGLY OBVIOUS FAULTS means only an overall visual impression has been undertaken of the area. Any fault that would require close visual & physical inspection to identify has NOT been reported.

Only external inspection has been carried out upon any machinery, engine or electrical installation and equipment, and except where stated, no running test of any type has been carried out.

Without complete removal of all coatings above and below the waterline, internally and externally, it is possible that some defects and previous repairs may go undetected.

No report is available upon the condition, existence, operation or installation of any of the ships inventory, electrical or otherwise unless specifically commented upon. Ships inventory will be considered as those parts of the vessel that do not form part of the structure or do have no effect upon the basic designed use of the vessel.

It is obviously not possible to report upon every aspect of the vessel without stripping or invasive inspection and this report is, in part, designed to inform the client of areas in the vessel where some form of inspection or maintenance will, at some time, be advisable. Many of these areas will merely be preventative measures, it does not suggest faults exist, but at the same time cannot confirm the soundness. It should be likened to gaining a full knowledge of the vessel and those areas, which can occasionally be overlooked during the course of ownership.

Conformity with any regulatory body or requirement has not been assessed or checked and the client should ensure that the vessel meets with any regulations that, due to size, expected use (professional trade or otherwise) or location by seeking the appropriate inspection parameters and if required, professional specialist confirmation.

RECOMMENDATION LEGEND.

*** denotes recommendation is mainly for appearance sake and or long term protection or non urgent application.**

**** denotes recommendation is not considered urgent at present but WILL require attention or investigation in time, perhaps within a season or two.**

***** denotes that these items, in the surveyors opinion, require attention or further investigation before the vessel is considered to be suitable for continued use. Some of those as marked will be suggested measures to ensure the vessel and crew's safety and security when in commission, and may not necessarily be structural or detrimental to the value or condition of the vessel.**

Where methods of repair are given, these are in my opinion, possibly the most suitable. I am not suggesting that any or all repairs are carried out in this way, and it is likely that there are alternative options, which may be as good if not better in some circumstances.

Carvel build: wide timber planks laid edge to edge on frames and riveted or nailed or screwed to the frame. The slight external gap is caulked to keep watertight. Not often used in amateur build as it requires more equipment and cannot usually be completed single handed. Possibly the highest retained value for timber construction.

Clinker Build: wide timber planks (usually solid timber, but plywood can sometimes be used in small craft) laid with one edge overlapping the previous plank and fastened through this edge so that one plank is physically connected to the next. Also fastened to the frames as in carvel build. This overlap is called the "Land". On plywood planking the edge is glued and the number of frames is usually reduced. On solid, this seam is not usually caulked.

Strip build: narrow planks edge nailed and glued together screwed to wide spaced frames. Used by many amateur builders and one or two professional builders. Less expensive to construct. Relies for longevity on glue quality and proficiency of build. If built well, a very strong hull, if built poorly often a poor investment.

Double diagonal: older method for building chine craft. Wide thin planks laid at about 45 degrees from vertical with another skin laid at the opposite angle. Calico membrane between skins for proofing. All skins riveted together at each intersection point. A vast number of fastenings used. Occasionally triple diagonal has been used.

Hot moulded: wide thin laminates are laid over a mould with several skins in alternating directions and glue between all skins. The mould is "vacuum" packed and oven baked. A very strong durable hull.

Epoxy saturation: similar to above but the skins are stapled together prior to total epoxy resin saturation of all timber including edges to build up to the required thickness. The resin prevent further water loss or absorption and in theory should not shrink or expand so long as the epoxy coating is not breached.

Cold moulded: a cross between the above hot moulded and epoxy. The glue is standard conventional cold set glue. Only as strong and as long lived as the quality of the glue used and the proficiency of build.

A brief description of some of the structural terms that may be used in this inspection to avoid confusion:

Frames: bent or sawn to shape vertical members that the planks are attached to.

Sheerplank: the first plank from the deck.

Garboard: the first plank from the keel.

Shelf, Shelves: longitudinal timbers used for supporting structure such as deck beams i.e. deck shelf

Carlin: longitudinal timber used for attaching coachroof to deck.

Centreline structure: the heavy timber units that run fore & aft in the middle of the vessel. (backbone)

Clamp: longitudinal member fastened to the coachroof sides at top to support deckhead.

Stringers: longitudinal members to add support to bilge areas.

Floors: shaped members fitting across keel and up two or three planks internally to keep shape.

Apron: shaped member connecting forward section of keel to stem.

Breasthook: shaped member in bow close to deck internally to tie deck shelves and stem together.

Deadwoods: large blocks of timber used as fillers aft of the keel in the prop shaft area externally.

Backbone: the central timber structure from stem to stern.

Keel/keelson: generally the substantial timber member that runs along the centre of the vessel where the garboard plank is attached to as well as the ballast keel where fitted.

Knees: These are shaped pieces of wood (occasionally bronze) that connect and support two sections of timber when they meet at any angle other than straight line connections, where they are butted together square ended with a block spanning both ends and fastened to both end of the timber being connected. Straight connections can also be scarfed together, which creates a tidier and stronger connection.

Quarter knees: usually fitted at the internal top of the transom port & starboard internally to connect the beam shelf to the transom.

Fashion Pieces: these are shaped sections of timber secured around the perimeter of the transom. Because they are made with the grain running around the transom edge, they are able to take the retaining screws from the hood ends of the planking far better than screwing into the end grain of the transom boards. Usually fitted with bolts/copper rivets or less commonly, screws. The usual cause of planking/transom gaps is the fastenings from these fashion pieces failing or moving.

Hanging knees: knees that are fitted vertically.

Lodging knees: knees that are fitted horizontally to locate transverse beams etc.

Tie Bars: These are the timber supports fitted under the sidedeck that connect the beam shelf to the coachroof carlin, the deck structure is secured to these also in the same way deck beams are

Fastenings: a timber vessel has a multitude of fastenings, some of these hold the planking to the keel and frames, others are bolts that hold sections of the timber centreline structure together, commonly seen as scarf bolts. Other bolts/rivets hold knees in position etc. Fastenings can be steel bolts, bronze bolts, screws of all types, copper rivets, blind dumps (bolts without threads hammered home)

Electrolytic decay: This is damage caused to timber by chemicals that are produced when adjacent metal fittings or fastenings decay, either through natural corrosion or more commonly through electrical action between metals immersed in water. This damage can vary in severity to merely causing screws not to hold and having to increase size and length, to wholesale destruction of large timber sections such as deadwoods where stern tubes pass through.

Keel Stepped Mast: where a mast passes through the deck and stands on the keel. Usually incorporating a separate mast step block which is attached to the structure. This is designed to spread the load and prevent distortion to the bilges in this area. The mast usually has a tongue that locates in a mortice slot.

Mast partners: in the area of the mast any vessel needs extra supports to prevent distortion of the hull/deck/coachroof when hard sailing. Parts of this reinforcement is known as the mast partners.

Timber used in boat construction.

A brief list of timber types that can be used for additions/repairs.

Afrormosia : dark brown, heavy. Joinery and varnished railings etc.

Ash : used for tillers, spreaders. Light and strong but not durable.

Douglas fir: also known as Columbian pine. Varnished spars, stringers, beam shelves occasionally deck beams.

Elm : used underwater, commonly for rudder blades and keel sections. Not durable above water.

Idigbo : underrated hardwood, light, easy to work various uses including planking. Uninteresting finish for varnish. Not spars.

Iroko : universally used for most structural parts including planking and keels. Not for spars.

Larch : used for planking, stringers, beam shelves. Fairly durable. Not usual for spars.

Pine : general purpose timber for non external use. I.e. cupboard shelving, joinery framing. Various qualities available. Slow grown is stronger, heavier and more robust for boat work.

Mahogany : many species wrongly called mahogany, African mahogany (Khaya) used for planking and varnished joinery. Brazilian mahogany more easily available. Also ok for similar uses although heavier. Check type before using. Some “mahogany” is totally unsuitable for inclusion in structure of boats.

Oak : various origins, but accepted as the best for bent frames, grown knees and many other uses including rudder blades, deck beams, keel sections etc. Ferrous fastenings corrode when fitted in oak.

Sapele : similar to mahogany, can be used in place of in joinery.

Spruce : clear spruce (knot free) is used for the best varnished spars. Not durable.

Teak : very expensive, but suitable for virtually any use except spars. Can be troublesome gluing because of the inherent oil.

Utile : similar uses to mahogany, makes good attractive joinery.

Many timbers have a use in boat construction and repair, if in doubt make enquiries before using in critical areas such as planking and structural situations. Any timber can be used for joinery according to personal taste.

FINDINGS AS FOLLOWS

Please Note: The majority of professionally constructed timber vessels will be built with scantlings well in excess of the minimum required strength, and many timber vessels will have pockets of decay and minor deficiencies within the structure without any detriment to the structural integrity. Indeed, some vessels started life with the occasional cracked frame and leaf fractured plank and have survived for many decades without incident. It should be borne in mind that it will be practically impossible to inspect a timber vessel and find no structural fault, and it will not be practical or absolutely necessary to attend to every minor detail commented upon in this report. The report is designed to note all those items where possible and highlight the more serious of those. A degree of common sense should be used when deciding upon the extent of rectification of the less serious items. Often it is more practical to use the report as a long term schedule of works over several seasons.

Where hard fillers and other disguising surfacers are used to hide areas of decay under paintwork, hammer testing and spike testing can rarely discover these, only when they become detached and mechanically failing can they be discovered. Inspection does concentrate on vulnerable areas, but to locate these areas means destroying the paint finishes which few owners would accept. The report will stress where some of these areas are likely to be and it is between the owner and client to negotiate further investigation after agreement of invasive inspection. There is always a “risk” factor which must be taken into account if no further examination is undertaken.

At the end of this report is a section devoted to further understanding of some problems and suggestions for repair or managing them as well as further information in connection with timber vessel structure repair & care and where the reader is advised to note these sections in relevant parts of this inspection the comments there should form part of the overall report. This section is included for future reference in some cases and is not implying that any of the faults described there are evident in this vessel unless noted or suspected in the below headings.

HULL EXTERIOR.

I cannot stress how important it is to read **all** of this report as a great deal of information/advice is given that could have far reaching effects if not fully understood and, in some case, not acted upon. No responsibility can be accepted for failure to note and act upon certain information/suggestions/advice. Please contact the surveyor when any uncertainty arises from information and advice contained here. All advice is given in the client's best interests and no other party.

description

Xaxaxa is an extremely rare vessel and is very likely one of the very if not the last timber vessels built by David Hillyards of Littlehampton. Unusually this is not a David Hillyard design and is understood to have been designed by the original owner and commissioner of build. The build is very similar to that of David Hillyard and there has obviously been a degree of consultation between both the designer and builder in their specialist fields. The vessel has been in the same family ownership since original construction, the original owner/designer having sadly passed away a few years ago.

I am not sure of the professional knowledge of the original designer regarding yacht design, but my initial feelings are that the boat would be quite capable in most conditions, backed up by the history that the vessel has cruised the western Channel and as far as North Spain to my knowledge without incident in all types of conditions. It could also be said the vessel has been tested now that she is in excess of 22 years old. It is also quite likely that a high degree of input was forthcoming from the original builders, David Hillyard, under the guidance of the then director, Dennis Cullingford, who would have ensured the structural scantlings were all a minimum appropriate size.

The design is that of a substantial timber gaff rigged sailing cruising vessel. A hull of moderate freeboard with a slight gentle sheer rising toward the raked bow, near vertical transom with substantial timber rudder supported on transom and lower part of keel. Timber coach roof with wide side decks, good size working foredeck. Side decks running past aft cockpit to short after deck. Mast stepped on deck directly forward of forward end of coach roof. Two row guardlines, pulpit and pushpit.

The underwater design is typical heavy displacement gaff sailing cruiser, full bilges, long central keel with ballast keel suspended on the underside. Near vertical sternpost.

To those familiar with Hillyard construction, this particular vessel has striking resemblances between other Hillyards and the way they have been constructed.

Hillyards were renowned for the production of timber vessels from the early 1920's through to the late 1980s in various weights and lengths from as short as 18 ft. up to and in excess of 55 ft., from 2 1/2 tons through to 30 tons and are highly respected. With careful maintenance and a knowledgeable and careful owner, these vessels are capable of surviving numerous decades as the continual presence of very early Hillyards can confirm.

hull planking above waterline

This is one of several areas where it is physically impossible to fully identify and report some underlying faults in the construction if no visual indicators are present due to the protective coatings, which have obviously not been removed in any quantity. It is only when these coatings are removed in total in the course of repair/major refit can they usually be discovered and I cannot guarantee that any area/s will not be thus discovered. The client should always be prepared financially for this occasional eventuality with a timber vessel.

The vessel has been carvel built with laid Iroko planking on steam bent oak framing. This would be the traditional method and the most usual method used at the time of this build. The framing has been copper fastened which is generally accepted as being the most long lived method.

The hull is cream in colour. The paint work is in reasonable condition although it would benefit from a repaint at this time. The plank seams are more evident on starboard where there is a degree of cracking of the hard coatings now, than they are on port however, not excessively so although, this is the reason why it is suggested that painting would be beneficial at this time. Close to the waterline on both sides although, more evident on port, the top coating is flaking away exposing the underlying white undercoat. It is not thought that the vessel has been painted for a few seasons.

There is an area of slight movement in the hull planking on the second plank down from the sheerplank on starboard side just aft of the aft chainplate. This may be associated with some reported movement in the bulkheads below later within this report.

The hull is very fair and free from any strikingly obvious distortion or knuckling and has obviously been carefully laid up at the original build.

Comprehensive hammer testing was carried out throughout both port and starboard topsides and this indicated no areas of suspicion and random spiking throughout both sides suggested the planking was hard and sound throughout. Close examination was undertaken on the sheerplank just below the rubbing strake on both port and starboard and no areas of softening or suspected decay were noted. This is an area which is particularly vulnerable on any timber vessel due to fresh water ingress beneath the rubbing strake.

There was no sign of excessive movement at the hood ends on the stem and there was no sign of movement on the planking/transom junction, and, at this time, there was no paint cracking in any of these areas.

As none of this paint work was particularly new this could be taken as suggesting that there is no deterioration of the fastenings at these points as, old hardened coatings are usually very good at indicating areas that are moving due to either decay or fastening deterioration.

stem

So far as could be examined without removal of any paint coatings, the stem was hard and sound above waterline.

stemhead fitting

This is a substantial galvanised fitting with the facility to carry the anchor in position on starboard side of the stem, small anchor bow roller on port and attachment for twin forestays. All in sound condition, is free from any strikingly obvious movement or deterioration.

transom

A slightly raked transom with Airies windvane steering gear bolted to the transom face. The transom face is very fair, no sign of distortion with this large flat transom. Rudder mountings secured to the transom. No excessive sign of deterioration. Engine exhaust outlet starboard side just above waterline.

rubbing strake

An Iroko rubbing strake, well fitted, it was noted that on starboard side there is a long fracture in the railing approximately 7 ft. forward of the transom. This fracture is of longstanding and is of no substantial structural significance. However, if the railing is refurbished, it is likely that this fracture will be more cosmetically evident and may require the replacement of this last section of rubbing strake.

On port forward section of rubbing strake the short distance back from the stem there is a deep area of abrasion where it is likely anchor chain/mooring chain has been chafing the area, for cosmetic reasons, this would require a new section scarfed in position.

The rubbing strake both sides is in poor cosmetic condition with a substantial degree of water penetration under the varnish and severely weathered varnish.

Below the varnish the timber is blackened and waterlogged in many places and it may be that in the event of refurbishment, some staining may persist however, it is likely that with enough care, the large percentage of this railing could be refurbished to a satisfactory condition if required.

backstay fitting

These are large eyebolts fitted through the deck and through the transom quarter knees for the vessel as rigged at present however, it was noted that two galvanised straps have been fitted to the aft end of the topsides in preparation for the fitting of alternative running backstays. At this time there were no fittings available for these.

rigging chainplates

These are straps bolted to the structure externally and retained with bolts. None of these bolts were removed for inspection at this time, and it is generally accepted that occasional checking of these should be undertaken. These galvanised straps are substantial in size and appear to be sound and free from movement. No rust staining evident at this time.

RECOMMENDATIONS

1. I believe it will be beneficial to consider repainting the topsides. The areas of cracks and loose paint on the seams should be sanded back to sound, these areas filled with appropriate filler where necessary and then the whole of the topsides port and starboard carefully sanded back until fair, final filling and surfacing where required and then a minimum of two undercoats and 1-2 top coats, rubbing down between coats with maximum 240 grade paper. further information on hull painting is given in the section following the end of this report. *
2. The rubbing strakes would also benefit from comprehensive refurbishment, it is likely these would be best achieved by dry scraping with an appropriate blade. It is suggested not to use the low quality triangular type scrapers as sold by the DIY shops as these rarely achieve the result warranted by the efforts. It is likely these would have to be scraped in order to remove the veneer of deteriorated timber on the surface which hides virgin timber beneath, sanding is only suggested for finishing, in this case not for the initial preparation. Cabinet scrapers, bent and sharpened files, broken glass etc can all be useful in this type of work. *
3. It may be necessary if perfection is to be achieved, to scarf a new section of railing on the aft starboard end and to scarf a new section in the port forward end as, these areas are likely to detract from the final finish if not attended to. *

<p>With reference to all of the above recommendations/information there is a considerable amount of extra information contained in the section at the end of this report that may be found relevant in many cases. These use this section to supplement the information as listed above.</p>

HULL BELOW WATERLINE

description

As previously noted, the design is typical of a moderate to heavy displacement gaff rigged cruising vessel and has many similarities with David Hillyard designed vessels. A full hull with deep forward and aft sections, long keel extending to sternpost. Transom hung rudder supported on transom and sternpost, three bladed propeller turning in cavity forward of rudder. External ballast keel suspended on underside of timber keel, this extends more or less full-length. Conventional construction below the waterline, carvel planking laid on steam bent oak frames copper fastened.

hull planking below waterline

This is one of several areas where it is physically impossible to fully identify and report some underlying faults in the construction if no visual indicators are present due to the protective coatings, which have obviously not been removed in any quantity. It is only when these coatings are removed in total in the course of repair/major refit can they usually be discovered and I cannot guarantee that any area/s will not be thus discovered. The client should always be prepared financially for this occasional eventuality with a timber vessel.

Red antifouling coating has been applied. Although the majority of this appears to a fairly well attached, it is obvious that the coatings are beginning to show signs of build up and in one or two areas there are signs of detachment of the coating. Considering the vessel has only been out of the water a few days, it is likely that this coating will continue to deteriorate and in a few months it is likely there will be significant areas where the coating is becoming friable and a degree of attention may be necessary at that time

The lay of the planking is very fair and there is no single area of obvious distortion or knuckling. (Knuckling is usually caused by broken or distorted internal framing where, in the case of the broken frame, the break is on the seam of the plank allowing two planks to meet at the sharp angle instead of the original fair curve) The original build standard appears to be very high with closely fitted planks and even seam width throughout where it was possible to note visually.

Comprehensive hammer testing and spike testing was carried out throughout the underside this indicated no major areas of suspicion other than localised areas here and there where waterlogging was thought to have temporarily effected the surface of the timber.. Where the vessel has been recently lifted ashore from a season afloat it can often be noted that the timber will be slightly surface soft in some places due to the waterlogging of timber. Bearing this comment in mind the very limited areas of minor surface softening here and there on the underside are thought, at this time, to be associated with this occurrence.

There were no signs of obvious movement at the forward hood ends, also there was no evidence of movement of the stern planking on the deadwood or transom edge. These areas were specifically checked for softness and none was found at this time.

Note: No caulking was removed for inspection as this does not form part of this survey, and would be inappropriate at this time.

stem\forefoot

No sign of deterioration or movement, all fair in shape. Hard and sound.

deadwood and wooden keelson

No sign strikingly obvious deterioration or movement, hard and sound.

The underside of the keel and deadwood was inspected so far as access would allow, and no report is available on the inaccessible areas.

sternpost

There is no external sternpost accessible.

ballast keel

This is an external suspended iron keel. There is a degree of corrosion evident on the faces here and there and, it is likely there is further corrosion beneath the antifoul coatings. This is not structural however, it might be wise to consider attending to this to limit the extent and further deterioration.

The ballast keel runs full-length along the underside. There was no sign of movement at the junction of the ballast keel to the timber keel and, at this time there was no suspicion of corrosion staining emanating from keel bolt positions.

keelbolt\scarf bolt corrosion evidence

None at this time however, it must be noted that this type of staining does not become evident until a vessel has been out of the water a minimum of 10 days; this particular vessel was only lifted at the end of the previous week.

fastening type and visible part condition

Only a limited number of plank fastenings were checked for signs of corrosion (heads only in most cases) and given the quantity of fastenings in the vessel, it cannot be guaranteed that the remaining fastenings are in similar condition.

This particular builder used copper fastenings throughout in the majority of their vessels. This included in most cases, using copper nails dead nailed into the keel and stem/stern areas to retain the hood ends and garboard. The majority of timber builders used bronze screws in these circumstances however, in my experience the copper nails are more reliable and certainly have a longer life with the only drawback being that they cannot be easily removed for checking. In this particular case only a limited number of fastenings were checked in order to confirm whether the builders had used screws or nails. Those checked were copper nails. This strongly suggests that the remainder are also copper nails. The only place where occasionally, the builder used screws was in the stern area where a plank required a degree of twisting and fastening into position, a screw would often achieve this more successfully than a nail. Unfortunately in order to locate where these screws may be, if fitted, would require the removal of a considerable amount of paint coatings and fastening stopper which, at this time, would have been inappropriate. It is strongly suggested that in the course of ownership, confirmation of the existence of any screws and their checking should be undertaken.

anodes

One anode is fitted to the starboard lower rudder strap. This is a simple flat bar anode directly located on the galvanised strap. It is approximately 40 % eroded.

wired?

Not applicable

rudder

As previously noted, the rudder is supported on the transom. It is a significant rudder constructed from three separate parts. All these parts are timber. A pair of Iroko cheeks are rivetted to a substantial Colombian pine or perhaps Larch blade. It is unusual to see Colombian pine/Larch used for a blade of this type and it was noted that there is a degree of surface softening to the blade above the waterline between the cheeks just below the tiller stock. This comes as no surprise as this is an area where fresh water can easily penetrate the slightly more vulnerable softwood. At this time I do not believe there is a significant structural weakness however, I believe it is an area that should be regarded with an extra degree of care and certainly worthy of some preventative action at this time. Unfortunately it is not possible to fully access all of the areas of this Colombian pine blade, particularly on the leading edge above waterline where the transom impedes close checking.

full rudder movement?

Yes.

rudder pintles

The rudder appears to be very well supported on galvanised straps and pins of substantial size. No significant wear or movement noted.

rudder stock\tube

Because this is a transom hung rudder, no rudder tube is fitted.

stern gear & prop.

The prop shaft was not drawn to check for wear. A three bladed propeller of significant size is fitted to a bronze shaft with a bronze locking nut and stainless split pin. It is considered there is a degree of dezincification/corrosion on the propeller blades as, on close examination, it can be seen that the bronze is slightly red in colour and has a degree of blotchiness caused by this corrosion. I do not believe there is any imminent danger of structural failure but nevertheless, there is a degree of deterioration occurring.

cutlass bearing / shaft bearing

No significant movement detected in the outer gland bearing. The inner bearing has not been tested for wear, as access and testing of this assembly is not feasible.

prop clearance 10/15% prop dia.

Adequate.

skin fittings accessible faces

All underwater skin fittings appear to be bronze and free from significant corrosion. It was noted that on the aft starboard planking, a small area of, what appears to be epoxy type filler has been used for plugging the timber. This filler was not removed at this inspection for fear of causing damage however, I believe when conditions and circumstances allow, this filler should be removed and the area attended to as required.

It should not be assumed that because the outer faces are found to be reasonably sound, the hidden part within the hull skin is also sound. There is no method of assessing this area without removal.

in number

Six below the waterline.

RECOMMENDATIONS.

I am unable to determine the watertight integrity of the hull in a relatively short inspection, and enquiries should be made and noted from the previous user or keeper about quantity of water bilged.

1. At least 1 bolt from each skin fitting be removed and checked for deterioration, replacing all in each fitting if appropriate. **
2. In the fullness of time it is strongly suggested to gradually ensure that all of the stern hood end fastenings are copper nails and not screws, if screws are encountered, these should be removed for inspection and replaced as necessary if necessary. **
3. Although the rudder is sound at this time, it might be wise to remove the paint coatings on the Colombian pine section above waterline, particularly close to the tiller to allow the timber to dry out if the slight surface softness has been caused by waterlogging, this will also allow close inspection of the structure and more accurate assessment. This would require the removal of the tiller temporarily.**
4. The smaller area of epoxy filler should be removed from the timber where noted in the vicinity of the starboard aft and the area attended to in a more professional manner as appropriate. **
5. The propeller is probably suitable for further use however, it should be further closely examined by removal of all surface crud to see the extent of any metal corrosion that is taking place. As noted elsewhere in this report, when bronze corrodes it loses the golden colour and becomes a dull coppery red. I have highlighted a possible problem, it simply requires further close examination now. This type of corrosion can usually be prevented by the addition of an anode wired up in the normal fashion however, on timber vessel as the fitting of anode is can cause serious structural damage to any timber and the client should be extremely careful before taking any professional advice which suggests fitting and wiring further anodes, this deterioration to the propeller would generally be seen as the lesser of two evils. By ensuring all electrics are turned off when the vessel is vacated can offer a degree of protection from the stray currents that can accentuate this type of decay and corrosion. **
6. It is advisable to remove, inspect and replace if required, the propeller retaining nut and pin. The reason for this is that the hidden threads on the nut can deteriorate without visual warning, allowing the prop. to pull off in some circumstances when driving hard astern .**
7. The ballast keel is showing signs of moderate to heavy surface corrosion here and there. I believe the best way forward would be to either have the keel sandblasted or failing that, hammer chipped followed by aggressive machine wire brush /sander.

Once the loose flakes have been removed it may be possible to use a commercial rust killer such as Fertan followed by application of an epoxy based primer which is very good at sealing the keel from salt water. Never apply copper antifouling direct to non sealed ferrous or iron as the interaction between the copper and the iron set up an adverse reaction causing very quick corrosion to the steel/iron in seawater. **

8. No keelbolts were drawn for this inspection, and unless documentary evidence is available of recent inspection, at least 1 bolt should be drawn for inspection, at the earliest opportunity, and if found to be deteriorated then further bolts should be drawn and inspected. **
9. Although not commonly appreciated, other constructional bolts should be drawn for replacement/checking, although the intervals of checking may be in some cases decades, but nevertheless occasional inspection should be planned. These include stem and stern scarf bolts where accessible, particularly below the waterline, chainplate bolts where fitted and anywhere where corrosion staining is noted bleeding when ashore. **
10. The caulking was not checked at this time, generally cotton caulking is quite long lived, but any area internally where fresh water can remain in pools against the planking for long periods, such as when ashore for instance with cockpit leaks etc. this cotton can rot. Always ensure that fresh water cannot pool, the usual place for this is in the stern are of most vessels, where the bilge is at its deepest. *

With reference to all of the above recommendations there is a considerable amount of extra information contained in the section at the end of this report which may be found relevant in many cases. These use this section to supplement the information as listed above.

Note: When checking for corrosion on bronze fittings and fastenings in future checks, look for signs of dull coppery patches on part or all of the assembly. It will be found that these areas are soft and easily scraped; the material is brittle and chips easily. This is a good indicator of corrosion and all bolts and nuts that have the slightest indication of corrosion should be replaced. Other fittings that show limited corrosion should be further investigated to assess the degree of deterioration and whether the item is suitable for continued use.

DECK AND COACHROOF.

description

Typical layout for an offshore cruising design comprising of a good size working foredeck, bowsprit extending forward of stem, good width side decks running past double height coach roof and aft cockpit to short after deck. Mast stepped on deck directly forward of coach roof end. Varnished Iroko toe rails and rubbing strakes, varnished coach roof. Plywood epoxy sheathed decks.

superstructure

Solid Iroko coach roof sides , these are varnished. They are fitted with three opening ports per side and two fixed four sided windows per side in the raised doghouse section. These cabin sides have been constructed to a good standard of accuracy.

There is an obvious moderate/high degree of cosmetic deterioration to the varnish where maintenance has been lacking over the last few seasons and water has penetrated the varnish coatings discolouring the underlying Iroko. The starboard coach roof sides are in slightly worse condition than the port side with early signs of opening grain and weathering taking place. It was also noted there is a short split/shake emanating from one of the forward fastenings for the central bronze oval port. This split at this time is not particularly significant however, eventually it will extend if these coach roof sides remain free from any attention. It is also likely that further surface damage to the timber will occur if these coach roof sides remain open to the weather as they are present. I feel that at this time the coach roof could be recovered to an almost new condition with care and time however, there will come a point when this option will not be possible if they are allowed to continue to deteriorate.

It is likely these will be recoverable, however, if a good cosmetic varnish finish is to be obtained, there will be a moderate degree of labour intensive work here

It was noted that some attempts have been made to run a fillet of sealant around the forward end of the coach roof deck/superstructure fillets. One has to be suspicious of this type of addition as this does strongly suggest that perhaps there has been some leaking in this area previously. This would be any area which would be subject to more leaking than anywhere else due to the fact that the mast is fitted here and the associated stresses and strains and slight changes of shape due to the mast and mast loadings affect the area on any vessel, usually causing underlying minor leaks in this relatively complex area of structure.

However, it does have to be said that on the day of inspection, no obvious internal leaks were noted despite the fact that there had been heavy rain throughout the previous hours and at times during the course of the inspection.

deck

A plywood sheathed deck, this has likely been constructed with two laminates of thin plywood glued together over the curve of the deck and then has been sheathed with epoxy resin and glass cloth in the conventional manner. Numerous battens of timber have been screwed throughout the top surface of the deck and side decks, presumably to ensure secure footing when moving around the deck however, in my opinion this detracts from the appearance of the deck and, structurally, is a possible source of deterioration due to the risk of water penetrating the plywood and the sheathing at the point of the batten fastenings. It is obviously not possible to test the condition of the plywood at these points but there has to be a risk given the number of fastenings holding the battens to the deck, that there may be localised deterioration around these fastenings here and there. This would not have been an original build feature.

Whenever plywood is exposed to the elements, particularly where end grain or piercings can be accessed by fresh water, deterioration will eventually occur. This deterioration will usually start around holes drilled for fastenings and the end grain of plywood sections such as where the plywood deck terminates at the cabin trunking and on the top edge of the sheerplank (edge of side deck). It is imperative to keep these areas free from any fresh water/rain penetration.

With the high number of these battens running fore and aft it is inevitable that a great deal of water pooling possibilities have been incorporated unintentionally and, although the battens were obviously sealed down when fitted, there will come a time when this sealing starts to deteriorate and, perhaps has deteriorated in some places allowing unseen damage. The removal of these battens will be an exhaustive job and, unfortunately, I do feel that there will be a strong risk of encountering some damage due to fresh water penetration and seepage into the plywood via the fastening screws for these battens.

windows and surrounds (glass or Perspex)

As previously noted, there are three high-quality bronze opening oval ports per side and two glass four sided windows each side in the doghouse section aft. In these last glass windows there has been a fillet of sealant applied in slightly haphazard manner suggesting that there may have been some previous leaks here.

Possibly due to lack of use, the opening oval bronze ports have got slightly displaced seals now and these will have to be refitted as required. As these ports are opened, the seal cannot decide on which part it should be attached to.

hatches

A substantial solid Iroko forehatch is fitted, this has been well designed and well fitted and is in good structural condition although cosmetically it is somewhat weathered. It was noted that one of the screw fastenings for the port hinge is either missing or sheared off. The main companionway is constructed from high-quality panel doors in Iroko and a lower drop-in section to prevent any large quantity of water entering the accommodation. It was noted that the companionway doors have slightly swollen in the damp atmosphere and cannot be fully closed without excessive force.

toe rails

These are varnished Iroko toe rails in similar condition to that of the rubbing strakes, severe to moderate weathering but appear to be structurally sound in most places.

rubbing strakes

These have been referred to in the **hull above waterline.**

hand rails /hand holds etc.

Varnished Iroko hand rails, well secured to the coach roof, all in sound condition although, again, a degree of weathering and varnish deterioration.

pulpit and pushpit

As is typical with many Hillyards, the guardrails and stanchions are constructed from galvanised gas barrel and incorporate the pulpit and part of the railing system. There is no pushpit fitted and the aft end of the vessel is open. The railings are in sound condition and free from any excessive corrosion, no areas of excessive distortion although, after over 20 years it is inevitable there will be one or two minor areas of unfairness in the railings but none too extreme.

stanchions and bases

As noted above, galvanised gas barrel tubing fitted into galvanised fabricated bases bolted to the deck and various T piece connectors. This creates a very secure working platform and is in keeping with the style of vessel. These bases are bolted to the deck and to the toe rail.

Generally they are all sound although there is slight evidence of corrosion staining appearing here and there as might be expected with galvanised units of this age.

guardrails

Stainless steel guardlines running at mid height through the stanchions. These are flexible stainless steel lines of unknown age however, they do appear to be relatively recent. They are secured with lashings at the aft ends. It is usually considered wise to replace these lashings as they eventually do deteriorate.

deck hardware

The deck hardware is a combination of substantial timber cleats and Sampson posts fore and aft. All appear to be sound and secure.

sail tracks and eyes

Some dead eyes are fitted in the side deck, these appear to be secure.

chainplates/rigging attachment points

These have been referred to in the **hull above waterline.**

chainplate fastenings (visible heads only)

No strikingly obvious faults to report.

backstay fitting

This has been referred to in **hull above waterline.**

stemhead fitting

Please see earlier entry in **hull above waterline.**

tabernacle(s)

The mast stepped in a galvanised tabernacle secured to the deck directly forward of the end of the coach roof. With the mast in position part of this unit is inaccessible however, those parts that could be accessed appear to be in good condition.

sidedeck deflection / movement

There is no strikingly obvious distortion in this area.

mast base deflection

Minimal at this time.

navigation lights

Port and starboard navigation lights carried in boxes attached to the rigging in the classic fashion. Not tested.

anchor(s) and chain

A substantial CQR anchor is stored on the starboard side of the stemhead fitting. This is attached to a substantial scope of approximately 10 millimetre chain. The galvanised chain is in sound condition. The bitter end is attached to the vessel however, it is not possible to instantly release the bitter end in the case of emergency.

anchor winch

A substantial manual anchor winch is fitted. It appears to be in working condition although would benefit from a degree of servicing. The anchor winch handle was located below decks.

spare anchor

A spare CQR anchor is stored on the port foredeck, there is also scope of chain available for this below decks in the port side of the anchor chain locker. This extra scope of chain was not removed from the locker for checking.

RECOMMENDATIONS

1. The anchor shackle must be moused, and the bitter end of the scope must be made fast to a strong part of the vessel using a suitably strong cuttable lanyard that is long enough to exit the hawse pipe on deck for cutting in an emergency. **
2. Although not absolutely urgent, I consider the removal of all the deck battens quite important for the long-term structural soundness of the plywood deck. It is likely that there will be some areas of limited repair required once all of these battens have been removed. The likely repairs will be localised areas of softening surrounding the screw attachment point. If this is the case by using a forstner bit or a flat drill bit of appropriate size, a shallow flat bottom hole could be drilled and into this a plug of the right diameter could be glued. The areas would have to be re-sheathed locally to finally finish. This is likely to be a time consuming job. **
3. Again, not structurally urgent but extremely important for the long-term retention of value and the eventually for the prevention of any structural damage, the coach roof sides and ends will require complete refurbishment. This will require the removal of all varnish and re-inspection of any areas of repair such as the shake/split on the starboard coach roof side emanating from one of the opening port fastenings. Where areas such as this split are located it is usually possible to carefully fit a spline, this entails fitting a temporary batten to the coach roof as a guide for a router fitted with the appropriate bit, machining a trench and then machining a spline of the correct size and gluing into position. It is quite likely that when all of the varnish has been removed and there will be one or two further areas of minor repair required. If done to a good standard, this type of repair will be practically invisible and ensure the longevity of the coach roof. Unfortunately this does require the removal of the opening port. This job in total is very time-consuming and, if professionally undertaken will be of considerable cost. There is no reason why an enthusiastic owner cannot undertake this work, the usual working method would be to remove all bronze opening ports, using paint stripper/heat gun as appropriate remove all coatings and then set about scraping the sides back to a good finish using a cabinet scraper or some other effective professional tool. It would be normal than to apply a minimum of six to seven coats of varnish. It is easy to understand why this would be an expensive job if professionally undertaken. **
4. The remainder of the bright work/varnish work throughout the exterior structure does require renovation to maintain the value and give the cosmetic improvement the vessel deserves. *
5. The bronze opening ports seals will have to be repositioned or attended to as necessary. **

6. It may be necessary to re-seal the glass windows in the doghouse if, once renovation work has been undertaken, the fillets of sealant that have been applied externally are removed in this renovation. *
7. There is a mild possibility that the fillets running across the vessel on the forward end of the coach roof/deck may have to be removed and resealed if these are found to be leaking once the seams of sealant has been removed externally. This type of fillet should not require any external sealant however, as previously noted this is an area which is subject to high stresses and strains and occasional movement and it may be that the sealant under the fillets has failed now. It is likely that if these fillets had to be removed they would probably be unusable and new fillets would have to be machined. **

INTERIOR

description

Much of the internal structure is obscured by panelling, and joinery, and although every effort has been made to inspect inaccessible areas, I am unable to confirm the condition of those areas. Those areas include, framing beneath bilge stringers, construction behind tanks, construction below engine and all structure beneath permanently fitted cabin sole etc. Any fitted internal ballast will also obscure a large part of the bilge when fitted. This should be professionally removed if total bilge inspection is required.

The layout is very typical of a timber sailing cruising vessel and comprises of a good size forepeak with two berths, good size WC compartment to port, hanging lockers opposite to starboard, main saloon with port and starboard saloon berth, Central leaf table, large galley area to port aft, substantial navigation area to starboard aft, quarter berth starboard and port aft. Central companionway entrance, over engine up to cockpit.

Taylor's diesel fired heater is fitted on the side of the main bulkhead on port. This was not operated during the course of this inspection and no report will be available upon this anywhere in this inspection.

planking

This is one of several areas where it is physically impossible to fully identify and report some underlying faults in the construction if no visual indicators are present due to the protective coatings which have obviously not been removed in any quantity. It is only when these coatings are removed in total in the course of repair/major refit can they usually be discovered and I cannot guarantee that any area/s will not be thus discovered. The client should always be prepared financially for this occasional eventuality with a timber vessel.

In all of those places where it was possible to visually inspect the planking, it was obvious that the vessel had been well built and carefully finished and there were no areas of excessive gaps in the planking and no areas where the caulking had been pushed through. No strikingly obvious faults could be noticed in those areas where the planking was accessible other than noting one or two nail splits in the sheerplank on the aft starboard side of the main saloon within the quarter berth area.

These emanate from where the plywood deck is fitted, possibly with nails from this builder and the nails have been fitted slightly too close to the inner edge showing signs of breakout here and there. Although not desirable, quite common and not usually of any major consequence.

breasthook fore

Sound.

keelson

Where accessible, the keelson appears to be sound and hard although from new a substantial part of the low part of the bilges has been filled with concrete, this concrete rises above the keelson in some places and inhibits any inspection. Concrete has been used for many decades by some builders without any major consequence. There are occasions on vessels in excess of 70 years old where this concrete can hide a lot of potential damage/deterioration/decay, however, in this particular case I am certain there is no desire to hide any of the structure and its installation has been carefully undertaken with agreement from both the builder and designer. The advantage of concrete is that it does add a degree of internal ballast which places no localised strain on the planking or the ribs.

In the centre of the vessel there is no access to the keel or bilges due to the fitted Iroko cabin sole. There are inspection hatches forward and aft and these were all lifted at the time of inspection but the Central section where the cabin table is situated has no access whatsoever and at this time the cabin sole was not removed as this would have had to have been removed by the yard.

keelbolt nuts

Not all of the keelbolt nuts could be inspected however, they do appear to be approximately 1 in. diameter bolts, likely galvanised mild steel and in those that could be inspected there were no obvious signs of leakage or corrosion however, this cannot under any circumstances indicate the total condition of the bolt and with any timber vessel of any age over say 15 years, keelbolt inspection is a necessary part of ownership.

floors

These are substantial sawn timber floors, the keel bolts pass through these which, in my opinion, is the best constructional method. No strikingly obvious faults with those floors that were accessible however, as earlier noted this does leave an area in the centre of the vessel which is totally inaccessible.

floor fastenings

These could not be checked, it is likely they are dead nailed copper boat nails through the planking into the floors. As earlier noted, these nails cannot be removed for inspection.

bulkheads

Bulkheads appear to be sound although it was noted there has been some movement in the main bulkhead and the aft fore cabin bulkhead. It was noted the bulkhead in the fore cabin has moved away from the main deck beam slightly on both port and starboard, the main bulkhead on port has moved slightly against the hull, this could be seen as a paint crack extending down the forward side of the bulkhead in the WC compartment, there is also a degree of movement on the starboard main bulkhead although to a lesser degree.

There are also some obvious areas of movement directly under the mast and deck structure where the deck beams appear to have settled slightly on to the mahogany pillars. I do not believe any of this is structurally serious although at this time I am unable to comment upon why it has appeared. There is a possibility that it was due to the way the vessel has been lifted at some previous stage. I believe a limited degree of further investigation and reinstatement of the fastenings will be wise.

cockpit bulkhead forward side

No strikingly obvious faults.

through hull fittings and seacocks

Where gate valves are fitted, these were tested at the time for correct function, but the quality of this type of valve can vary widely. The common cause of failure is in the quickthread that operates the “gate”. This can often corrode without any visible sign, eventually completely stripping and leaving the valve uncontrolled. The test for this type of valve is to use reasonable force in both turning the valve fully on and off. A failing valve will develop more and more free movement in the operating shaft or spindle before actuating the “gate”.

The vessel is fitted with a minimum of six underwater skin fittings, each of these is fitted with a seawater valve. The WC inlet and outlet are lever valves in good condition although slightly stiff in operation. The WC compartment vanity basin is fitted with the salt water pump this is supplied via a gate valve fitted in the starboard forward bilge area, this valve is not operating properly and there is a problem with the spindle. The pipework is also loosely attached and the valve requires replacement. Fresh water is supplied via a portable water container in this compartment

Another gate valve is supplied for a seawater inlet for the galley, this is located directly beneath the galley in one of the storage lockers and it is fitted in a position where access is extremely difficult, the valve was seized and could not be operated. Unfortunately it is likely seized in the open condition.

Two more valves are fitted in the engine compartment one port one starboard, these are lever valves in working condition although it was noted the pipework is slightly loose to these.

Generally the underwater pipework and valves require servicing and some replacement.

With reference skin fittings/seacocks & pipework there is a considerable amount of extra information contained in the section at the end of this report which may be found relevant in many cases. These use this section to supplement the information as listed above.

anodes

None fitted to the planking.

anodes wired\ plank deterioration

None fitted to the planking.

When anodes are fitted to planking and wired in the accepted fashion, it is not uncommon for the timber surrounding the protected metal parts and the timber at the anode attachment point to suffer acid or alkaline attack causing severe decay of the timber. The common places of decay are the internal end of the stern tube and the timber planking or framing at the retaining point for the anode/s internally. If anodes are added, obtain expert advice before wiring and fitting,

A common sign that decay is occurring is the appearance of whitish soft crud surrounding all or some of the electrical connections or where the timber and protected metal interphase, similar to that seen on battery terminals. If this is ever noticed it is important to investigate the cause and not let it continue. The areas should be washed with a solution of water and vinegar and finally washed in fresh water and allowed to dry before priming.

framing/stringers/shelves/clamps etc.

The vessel has been constructed with a considerable number of frames stringers and structural members, as far as it could be seen, these have all been fitted to a good standard. It was noted here and there that there is a slight gap between the planking and the frame although the incidence of this type of fitting is very limited and is not likely indicative of anything other than original build. It is impossible to guarantee there are no broken frames but with as close as an examination as could be undertaken, none were found at this time. One of the only areas that could not be assessed whatsoever are those areas in the centre of the vessel beneath the fitted cabin sole where, the cabin sole would have to be removed by the yard before this inspection was possible. However, it will be noted later that in this area is probably a substantial water tank which again would totally inhibit the access to the bilges here. There is also a substantial fuel tank in the aft end of the main saloon bilges, which inhibits the access to this part of the structure. It was also not possible to fully inspect beneath the engine.

Unfortunately it is not possible to guarantee there are no hairline fractures in the framing in inaccessible areas, although every effort was made to inspect these, these include where furniture and other structure passes above the framing. It is not uncommon to have isolated frame fractures and generally these do not usually weaken the structure excessively and have often been present, in some cases since new, without any detrimental effect. Several fractures in the same area usually indicate some previous hull strain and if reported will require repair.

At the end of this report there is a substantial section on the reasons for broken frames and the best way of avoiding broken frames in future, please refer to this area for extra information.

deck beams

These are substantial sawn deck beams for foredeck, laminated Iroko varnished beams for the superstructure, all appear to have been well manufactured and well installed. There was no excessive gaps between the deck and the beams in any of those places where access was possible.

transom quarter knees

These appear to be well fitted and are substantial.

mast(s) support

This area appears to be well supported with a central pillar directly under the mast, and two posts either side of the companionway with the deck beams bridging these. As previously noted there has been some settlement/movement in this area and I am unsure as to why and when this may have occurred. There is a strong suspicion that the vessel has been carelessly handled when lifted or moved at some previous stage. There may also be a possibility that the vessel has been inadequately shored up although, this has to be mere speculation at this time.

engine bearers

These are substantial timber engine bearers of good length bolted to the hull.

It is not generally appreciated that engine bearers are secured to the hull with fastenings, in many cases these are bolts passing through the skin of the hull and are subject to the same deterioration as any fastening and in the case of bolts, should be inspected occasionally.

deckhead & coachroof

This is white painted plywood. It is noticeably blackened with mildew and the underlying paint work has deteriorated somewhat. Structurally no strikingly obvious faults could be found. The vessel does require a degree of cosmetic attention below decks to ensure the longevity and value retention. The vessel lacks any major input of daylight and the fact that the white paint is blackened further highlights the lack of light below.

coachroof cornerposts

Varnished Iroko, sound.

coachroof carlins

Sound.

rigging plate fastenings etc.

No strikingly obvious faults, although it was noted that the additional chainplates fitted on the aft quarters of the vessel that, as yet are unused, had been designed with a slight oversight in the spacing of the bolts as, on port, the lower bolt passes through the deck shelf at too low a point and breaks out on the edge thus negating its effectiveness considerably. The starboard bolt has just managed to pick up the beam.

joinery

Excellent standard of construction, considerable use of solid Iroko and mahogany face plywood. All of the joinery is in good condition. The vessel has been fitted with a solid Iroko planked cabin sole, varnished in very good condition. The access hatch panels have swollen slightly and in most cases, are extremely difficult to lift. It is likely that these will shrink to be more usable when the weather is less humid. This also applies to the main saloon doors to the cockpit which will also swollen slightly making them excessively tight to close and open. There has been good attention to detail in the original design and construction.

Water penetration will usually darken varnished surfaces and, although in moderation will have no structural effect in the short term, the cosmetic effect usually remains until the varnished areas are stripped and dried.

cooking facilities

A Taylors two burner grill and oven gas cooker is fitted. It is not fitted with gimbals as, in the attitude facing fore and aft, the gimbals would be of limited benefit. It appears to be in reasonable cosmetic condition. I cannot be sure where the oven Flue is situated and whether it has been given adequate clearance however, there were no obvious scorch marks on the unit or surroundings.

A Taylors bulkhead mounted heater is fitted. This was not tested for correct installation or working condition and the client should consult with the owner with regard to the operation and installation of this unit.

Regulations for new fitment gas cookers includes a requirement for fitted flame failure devices. None of these devices were noted or inspected at this time and I am unable to confirm the conformity of any gas appliance in the vessel. It is suggested that the client make relevant enquiries to CORGI registered operatives if they have any concern regarding gas equipment.

Most cookers that are combined with ovens have a chimney on the back of the unit to direct the exhaust gasses away from the oven to enable the oven to draw in new oxygen for efficient burning. Although not realised by many, these gasses are very hot and need to be clear of joinery and enclosure by panelling. Whenever this type of cooker is installed or used ensure the back of the cooker has adequate air space from joinery. This also applies to cookers that are gimbaled if the gimbals allow the cooker to swing under joinery.

The cooker as fitted was not tested, and no report upon its operation is available.

cooker clearances

As noted above, I could not ascertain exactly where the oven flue vents, the cooker should be used, in particular the oven and note where the hot exhaust vents from and ensure that the associated joinery is not subject to any overheating due to this.

galley drain pipe and seacock

As previously noted, this is a gate valve that is extremely inaccessible and as such it has not been used or operated the many years and is now completely seized. This will have to be rectified prior to the vessel being commissioned.

gas system /gas line/gas storage

From the back of the cooker an armoured flexible line of unknown age connects up to a solid copper pipe, this runs aft along the port side of the vessel to one of the cockpit lockers where two gas bottles are stored in a shallow retaining box. Flexible pipework connecting to the regulator is dated 1980 and considered out of date. The gas locker is not vented overboard. Generally the system requires a degree of updating.

The gas line is partly obscured behind paneling, I am unable to report upon those areas. The unsecured parts are subject to work hardening, but this is easily rectified. The gas system was NOT pressure tested.

Note. The full safety guidelines for installed gas systems are extremely comprehensive, and few vessels at present are able to conform with all recommendations without extensive modifications to system & structure. It is advised that the Boat Safety Scheme pamphlet (available from 01923 201408) is studied along with the Calor Gas guide as later mentioned if it is required to totally comply with the latest guidelines. The inspection of this system concentrates upon any obvious dangers or faults in the system combined with the practical logistics of storing gas aboard any vessel. The only guaranteed safe gas system aboard any vessel is no system and no gas. Provided care is exercised at all times and good installation and operating practices are adopted then gas is an acceptable risk given the other options available with their associated risks regarding flammable liquids.

Whenever any modifications are carried out to a gas system, this work must be undertaken by a “competent” person who is working to a professional standard using professional practices, including leak testing of all finished work.

fire fighting

Two fire extinguishers were noted as being stored in the aft end of the main saloon. These are fitted with gauges however, they are fairly old and despite them being fitted with gauges, these gauges cannot always absolutely confirm the units will work when required. There are positions for two more fire extinguishers but the owner reported to me that these were removed due to their obvious unreliability.

Where extinguishers are fitted with pressure gauges, this is not absolute assurance these will work even if the gauge is reading in the acceptable zone. These gauges are not always accurate. Please refer to the service information on the extinguisher.

fire blanket ?

Yes, although it was not stored in an immediately accessible position close to the galley.

electrical system

The electrical system appears to be very much as originally built with obvious later additions. It is likely a degree of upgrading is required however, this would be normal for virtually any boat in excess of 20 years old. There are one or two areas of untidy and disorganised wiring and the batteries do not appear to be fitted with any sophisticated isolator switches other than simple terminal isolators.

In the limited time available in the inspection it was not possible to thoroughly test and inspect every circuit on the vessel, and only a brief inspection was undertaken of visible wires and connections reporting obvious areas of chafing, stretched and loose wires and any obvious visual failings.

battery storage

A bank of batteries is fitted either side of the engine compartment. Although there are arrangements to secure these, at the time of inspection they were not secured in position. The owner was aboard the vessel at the time and on attempting to power the systems up, there was no power available suggesting the batteries are flat due to lack of use. A flexible solar panel is attached to the doghouse deck, it appears to have deteriorated somewhat and, in my opinion, the output would be minimal if anything.

water system and tankage

Inspection of the water tank was not possible as this appears to be fitted directly under the part of the cabin sole that could not be lifted. It is likely that it is a galvanised tank however, I obviously cannot confirm this. The deck filler for this is on the port side deck.

Ice damage can be done to any system over the winter period including WC units and any other water filled system. No direct or close inspection was made looking for any of this type of damage other than any strikingly obvious fault and I cannot guarantee that all pipework and units are free from damage caused by freezing unfortunately. All systems should be drained over the winter period.

W.C. facilities

A Baby Blake marine WC is fitted, this appears to be in reasonable condition although it is slightly stiff through lack of use and possibly requires servicing. These units are regarded as possibly the highest quality manual units available and were of considerable cost when new.

RECOMMENDATIONS

1. With the limited amount of water in the tank, it has not been possible to fully gauge any possible leaks, and the complete system should be filled and checked for correct operation and leakage. **
2. It is suggested that the leaflet L.P.G (BOTTLED GAS) FOR MARINE USE is obtained from Calor Gas Advisory 01425 461612, which gives full information and advice concerning regulations covering gas installations aboard yachts. Basically, the requirements are that any gas storage bottles or containers and regulator(s) are stored in fireproof & gas proof boxes, with a drain fitted at the lowest point of the box (min 13mm dia.) that can be connected to a hull fitted skin fitting that is lower than the drain on the box and is connected with a continually falling drain pipe to allow escaped gas to vent overboard. In practical terms this probably means a plywood box that is higher than the top of the gas bottle with the regulator fitted, secured in one of the cockpit lockers with the vent in the topsides. The box can be portable to allow removal of the bottles, provided it can be securely fixed in seagoing position. Flexible pipes of approved type including the armoured line of unknown age at the back of the cooker should (recommended less than five years old) be connected to heavy walled copper tube, and kept to a minimum length (flexibles). The drain pipe can be flexible. Any regulator in excess of ten years old is required to be replaced. Whenever any modifications are carried out to a gas system, this work must be undertaken by a “competent” person who is working to a professional standard using professional practices, including leak testing of all finished work. **Note: regulations stipulate that gas appliances that are newly fitted to a vessel as replacement for existing units or additional units must be of current safety standards. *****
3. Although there were no obvious indicators of failing keel bolts, I feel it is necessary that within a season at least one keelbolt should be dropped for inspection. It would help if accurate records were available of previously removed keel bolts however, in my experience, these records are rarely available. It is later noted that the fuel tank may eventually require replacement and in this vicinity there is another keelbolt which, I am sure would be far more easily accessed when this area is attended to therefore it would be wise to schedule this work and inspection at the same time as the fuel tank work. **
4. With regard to the movement noted on the bulkhead panelling forward it is suggested to draw the panelling back to the deck beam with screws and or bolts. It may be possible to tighten the existing bolts to pull the panel back. The area beneath the mast is not so easy to advise upon at this time as, this may have been a one-off incident. It might be advisable to tighten all the bolts in this area where appropriate, repaint all affected areas in order to note any further movement when the vessel is afloat.

It is strongly advised to repaint all of these areas once these minor structural adjustments have been made in order to note any further movement that takes place. It is unlikely that any significant further movement will take place then however, this would give the ability to monitor any changes in the structure here. If continued movement occurs, then this area of the hull might be subject to further assessment and perhaps a degree of limited structural re-strengthening although, the vessel does appear to have been strongly constructed in this area originally. **

5. The vessel at this size should have at least another two fire extinguishers fitted, one fitted in the forward part of the vessel, one fitted amidships somewhere and ensuring the two aft saloon extinguishers are in serviceable and reliable condition. When adding new fire extinguishers ensure that they have fire rating of at least 5A/34B, this rating will usually be written on the side of most new extinguishers ***
6. The fire blanket should be installed on permanent view around the galley area. **
7. In general with many yachts and vessels of this age, the wiring has been added to over the years to varying standards, with the result that unless one is familiar with the particular system, it is difficult to fully understand immediately in the case of urgency, it is suggested that full familiarisation with the system , perhaps even recording relevant circuit diagrams with wire colours and fuse positions prominently in the log book or other known position for future reference, combined with partial upgrading of the system would be wise, including making good all loose and untidy wires to prevent unwanted chafing ,training and possible disconnections or shorts at any time. **
8. There is a possibility that the batteries may require replacement as, if they have remained low in charge or flat for any length of time they will sulphate excessively and will not accept a new charge and if they do, the capacity would be considerably reduced making them unreliable. **
9. All of the underwater pipework and sea valves require some form of servicing/replacement/attention pipework where necessary. ***
10. Whilst no evidence was noted that suggested any corrosion on the skin fittings was seen, it is not unknown for the hidden section of the skin fitting passing through the skin of the vessel to corrode and weaken the fitting. If no records exist of the skin fittings having been removed and examined within the last five years, it is advisable to carry out checks to these in rotation. **
11. In the case of pre-purchase it is strongly advised that wherever a premium is being paid for included inventory such as electronic equipment, safety equipment and domestic equipment the client must seek demonstration of and in some cases, instruction where relevant (some owner installed installations can be very individual to a particular vessel) of these units to their satisfaction prior to final contract. It is imperative that the client seek assurance from the owner or owner's agent that any items that could not be seen as working due to circumstances of the boat being ashore or any other reason, that these items are also working. Included within this list where fitted will be electric WC units, electronic navigation equipment (echosounder, speed log, chart plotter, radar, navtex etc) fuel fired warm air heaters, engine calorifier units, installed battery chargers, mains circuitry and any mains powered equipment. VHF marine and domestic radio units, electric bilge pumps, any engine powered equipment, refrigeration systems etc.

It is sometimes customary in the case of very expensive items that cannot be tested until the vessel is commissioned or can be fully tested to withhold part of the completion sum if both parties are agreeable. ***

With reference to all of the above recommendations there is a considerable amount of extra information contained in the section at the end of this report that may be found relevant in many cases. These use this section to supplement the information as listed above.

Occasionally frost damage can occur to engines, seacocks, associated pipework, and any other area where water which freezes could cause damage. This can occur unknown to the owner and only be noticed once afloat in some circumstances. This is obviously more particularly relevant over the winter period when before a vessel was lifted out it was fine but without undergoing any invasive changes, the next time the vessel is launched at the beginning of the following season there are areas of frost damage leading to loss of watertight integrity in any underwater pipework or damaged ancillary units such as engines and pumps. This damage can occur and not be noted in some cases where hairline cracks in seacocks and pipework etc are beyond what might be considered acceptable normal identification. Unfortunately in some cases it is impossible for me to identify all or any of these areas and it is extremely important for the client/owner to ensure, when the vessel is lifted in the water that none of this damage, if present is allowed to continue and cause consequential damage to the vessel. The client/owner must appoint an agent to ensure the vessel at is watertight if he/she is not there at the launch. No responsibility can be accepted for this type of damage however caused. This also extends to other underwater skin fittings/pipework and miscellaneous fittings below the waterline which, when ashore could not possibly be tested and checked for watertight integrity. It is the owner/client's responsibility to ensure these areas are free from leakage when afloat.

COCKPIT

description

Conventional aft cockpit, non self draining which is quite common for this type of vessel and need not be of any consequence. The cockpit is quite deep and would be considered suitable for extended cruising. Seating port and starboard, various lockers and storage. Opening doors under aft decking with storage behind. Engine controls fitted on port aft cockpit side. Fully varnished throughout.

The cockpit sole is solid Iroko in panels, this is fully removable for access to the engine and the aft end of the bilges. At the time of inspection it had swollen slightly and was difficult to remove/install however, this need not be of any major consequence.

The main cockpit forward bulkhead has been positioned a short distance forward of the end of the coach roof and creates a shelter cuddy and a degree of protection from the weather

steering type and condition

The vessel is tiller steered, a substantial sawn oak tiller is fitted in sound condition.

As previously noted, the vessel is fitted with Airies windvane steering. These units are quite old now however, have a highly respected reputation and are solidly built. No report is available upon the operation of this.

steering cables hydraulics etc.

None required for the primary function of the transom hung rudder.

sail control

Two small bronze Lewmar two speed winches are fitted. These were not load tested but handles were available and they appeared to be in working condition

bilge pump(s)

Two manual bilge pumps are fitted, one on port another on starboard, these were not load tested but appeared to be in reasonable condition.

cockpit condition

The cockpit has been constructed and finished to a very high standard using, in the main solid Iroko. Unfortunately it is somewhat weathered and is suffering from a degree of varnish deterioration and weathering here and there and does require some cosmetic improvement however, it is likely that with enough care and attention, the cockpit could be refurbished to an almost as new condition however, again, this will be costly in respect of time required. In its present design, any water that flooded the cockpit cannot drain away either into the bilges or overboard. I am sure that if this had been a problem in the previous 22 years it would have been attended to however, a new owner may consider the possibility of installing at very minimum bilge drains in the cockpit which would reduce the considerable weight of water at the aft end of the vessel by spreading it throughout the bilges in a particular instance. I am unaware as to whether the cockpit could be turned into self draining or not at this time without consulting afloat measurements with regard to cockpit height above the water level. However this is only an observation and no direct recommendation has been suggested.

cockpit sole bearers

No strikingly obvious faults

cockpit locker sides

No strikingly obvious faults

cockpit forward bulkhead

Sound.

cockpit drains and pipes

Non self draining.

RECOMMENDATIONS

1. The cockpit does require some cosmetic attention now to prevent any further deterioration and loss in value however, this would not be considered urgent structurally but continued gradual deterioration will result in many extra hours of labour to refurbish. *
2. No report is available upon the function of the windvane steering gear, the client is strongly advised to seek instruction from the owner on the setup of this particular unit if and when required. **

ENGINE

The mechanical condition of engines and transmissions are not in the scope of this survey, and specialist reports should be obtained if these are required.

description

The engine is a Lister STW 3, approximately 30 HP three cylinder diesel engine fitted on the centre line. The engine appears to be in good cosmetic condition with few signs of deterioration or corrosion. The majority of the paintwork is intact on the castings and there is no sign of obvious major oil leakage. There is a suspicion of a corroded exhaust elbow at the aft end of the manifold and this does require further inspection. The engine is fitted with twin alternators. It was noted the air inlet gauze mesh is missing, this would allow, if circumstances were unfortunate enough, to allow detritus and other materials directly into the cylinders which would eventually damage the engine.

engine mounts

The engine is solid mount. When a solid mount engine is used it is usually acceptable to have a rigid drive coupling and a fixed stern tube. However, the line-up of all of these is critical and occasionally lineup of shaft to engine should be checked.

battery storage and battery state if applicable

These have been referred to under **accommodation**.

siphon break

Yes, this is fitted in the starboard cockpit locker.. The purpose of a siphon break is to prevent cooling water siphoning back through the system when the engine is stopped and filling the exhaust manifold and possibly the cylinder(s) under certain circumstances.

fresh water\raw water cooling

Raw water cooled. I am unaware as to whether this engine has been laid up however, it is likely it has not and, the engine should be flushed through with fresh water and all fresh water systems then drained or antifreezed.

The antifreeze solution was not checked, catastrophic damage can occur in cases where antifreeze is too weak or not in solution over the Winter period. Ice damage is not part of this inspection.

fuel tank & lines

It is not possible to access all surfaces of the fuel tank for inspection and only those faces that are in view can be reported upon. The fuel line is not supported at regular intervals, and in some areas it could be in danger of chafing or allowed to come too close to moving parts. A substantial mild steel fuel tank is fitted under the cabin sole at the aft end of the main saloon. There is a high degree of paint flaking of top of the tank and, although in those areas the metal does not appear to have been corroded to any great degree there are areas of deeper corrosion close to the top forward corner and around the fill neck pipework. The tank is fitted with a substantial inspection hatch. I cannot be certain that this inspection hatch could be removed in position at this time. Diesel tanks cannot be galvanised and, unfortunately when fitted in the bilges as this one is, they are subject to a degree more corrosion than one that may be fitted in the less vulnerable position, particularly on the completely hidden lower faces where bilge water could easily have contaminated/affected the base.

I believe that eventually this tank will have to be lifted for inspection however, in order to remove this tank a great deal of joinery construction has to be removed as the galley structure has been planted directly above it. At very minimum in the short-term the inspection hatch will have to be removed, the tank fully drained and cleaned, and the internal structure checked.

The fuel lines are copper fitted with antivibration coils.

fuel filtering

A primary filter and water trap is fitted a short distance forward of the fuel tank under the cabin sole, the engine is also fitted with a disposable filter.

fuel tank vent

Yes.

fuel tank filler pipe

This is large diameter reinforced PVC hose.

fuel filler position

This is fitted on the starboard aft side deck.

transmission

In similar condition to that of the engine, not load tested.

drive coupling

This is a semi flexible coupling, it appears to be in serviceable condition.

prop shaft

This is a bronze shaft.

stern tube & gland

A rigid stern tube is fitted with adjustable packing gland. Access to this was limited and no full report is available regarding possible necessary adjustment or bearing wear.

stern greaser

Yes.

exhaust system

No strikingly obvious faults with the exhaust system, this is a flexible system although it does look as if it is fairly old.

Occasionally on older sections of rubber exhaust internal delamination can occur, this cannot be detected externally but the effect upon the engine can be dramatic. The engine loses power and will not rev because in effect, the exhaust is blocked. Although uncommon, I have included this paragraph for client information for perhaps future reference.

water trap

Yes, fitted close to the transom

exhaust pipe clearance (hot section)

Adequate.

electrical and mechanical controls

The owner reported that the starter motor ignition switch is not in working condition and, at the time of inspection the only way of starting the engine was to hot wire it. This involves flashing the starter motor solenoid activating wire on the live terminal. Obviously not a particularly reliable way for cruising at this time. It was noted that there are some untidy wires that the back of the engine control panel.

One or two wires were noted as running very close to moving parts, and those wires that are relatively unsupported could become chafed, and in extreme circumstances allowing the wiring to short to earth.

RECOMMENDATIONS

1. Drive shaft coupling bolts to be checked for tightness. **
2. Ensure the engine mounting retaining bolts are tight as, these engines, although very reliable, are apt to vibrate somewhat and can cause looseness of some of the bolts. **
3. The suspected corroded elbow on the exhaust close to the engine may need replacement, certainly further examination is required. This is where some exhaust sealant has been applied.. ***
4. The inlet manifold gauze requires refitting. **
5. I feel that it is time for this fuel tank to be removed although this is a job that would probably have to be scheduled for a later time for convenience. In the short-term it is necessary to remove the inspection panel, (provided it is removable bearing in mind there will be a long drop pipe for the fuel feed attached to this) clean the tank entirely of all detritus and further inspect the condition of the tank internally. At that time it may be possible to make some short-term reinstatements as a backup against any corrosion on the lower faces such as sheathing with epoxy resin and glass cloth but, I feel eventually it will be necessary to fully remove the tank for detailed inspection and possibly replacement. This will be an expensive operation if the joinery does have to be removed. It will certainly have to be removed if the tank is to be removed in one piece however, in some cases it is possible to cut the tank in position and remove piecemeal if the joinery is to remain intact. It can then be replaced or refitted to a different design or in a different position. Samples of fuel were not taken for testing, and it is advised that all fuel filters are changed if no recent records of maintenance are available. **
6. Routine servicing and checking of the cable attachment points and clevis pin retaining pins should be carried out as part of routine maintenance on all cable operated mechanisms before commissioning along with confirming their correct adjustment. ***
7. The engine wiring in respect of the starter motor wiring will have to be attended to as, at the time of inspection, it has to be seen as unreliable in its present form, although, fortunately this engine has the ability to be hand started which considerably adds to the reliability. ***
8. Tie back all cables at risk of chafing on the engine and other moving parts with cable clips. This is easily attended to. **

MAST(S) AND SPARS

The mast was stepped in position, and as such, only limited inspection was possible, and no comment can be made upon the mast fittings or rigging attachments including spreader roots, all standing rigging and its terminations, mast structure and all associated extrusions and fittings that are currently inaccessible.

description

A single mast single spreader gaff rigged vessel. A timber spar constructed from two faces glued together and presumably hollowed out in the centre to reduce weight. The spar appears to be spruce. It is rigged with two forestays, two running backstays and three stays per side. As previously noted, two additional chainplates have been fitted on the stern quarters which, at present, have not been initiated into the rig.

main mast

A varnished spar, it appears to have been set up straight. There is a degree of chafing and bruising here and there. It was also noted that there is a degree of deterioration of the varnish coatings. Unfortunately it is not possible to report upon the condition of the spar for the majority of its length as close examination was not possible. The owner reported to me that the spar has been recently inspected (within the last two years) however, I am unaware as to the professional extent of this inspection. There is a degree of water penetration at the base of the mast where it stands in the tabernacle and, although there was no obvious softening in the accessible parts, it must be borne in mind that the majority of this area is completely hidden by the tabernacle. The bottom of any mast is always a vulnerable area due to the fact that this encompasses a high degree of susceptible end grain which can absorb fresh water. It is always fresh water that will eventually cause decay in timber. The other area where decay can become established is in the spreader roots fixings. Unfortunately it was not possible to inspect this area. As this mast is glued together and there are no mechanical fastenings it is imperative to ensure there is no glue line failure however, I could only note that from deck level as far as access would allow there were no signs of glue failure but this does leave a considerable length of non inspected glue line. In this particular case the client either takes a risk on the condition of the spar or has the yard drop the spar and an additional inspection is carried out. At this time I do feel the spar deserves some attention both cosmetically and professionally in that it requires close examination. This examination could be carried out by being hoisted up the mast by a knowledgeable person however, on the day of inspection this would have been entirely impractical would due to the severe gales blowing during the course of the inspection.

mast fittings

Those at deck level appear to be of substantial size and in good condition.

mizzen mast

None fitted.

mizzen mast fittings

Not applicable.

mast foot\bases\step

As noted earlier, this is an area that could not be totally examined at this time.

booms

Two considerable booms are fitted, the main boom appears to be a solid spruce spar, it is severely cosmetically deteriorated however, still appears to be sound. It does appear to have been subject to some alterations with various scarfs and extensions here and there. There was no movement detected in these scarf joints and I am unaware as to the reason why the boom has been altered. These alterations have been professionally undertaken to a good standard.

A substantial gaff is also fitted, this is also a solid spar and, unfortunately also in poor cosmetic condition however, it does appear to be structurally sound. Both of these two spars do require a degree of attention in that they need to be planed back to clean timber and allowed to fully dry out, re-inspect and re-varnish. Again, this will be a time-consuming improvement but, a necessary one.

A spruce bowsprit is fitted, this is in reasonable cosmetic condition although it is beginning to deteriorate, no strikingly obvious structural faults.

spreaders

No report available.

running rigging

A limited amount of running rigging was in position, this appears to be in sound condition apart from a severely corroded flexible galvanised wire bowsprit foresail halyard which does require replacement.

furling gear and luff extrusion

At the time of inspection no furling gear was fitted however, I am informed that various Wykam Martin furling gear swivels were available. These should not be confused with furling/reefing gear, they can only be used as fully furled or fully set.

standing rigging

All standing rigging is galvanised, all hand spliced and appears to be in sound condition. Hand spliced rigging is a very traditional way of terminating the wire ends in to attachment points however, it is usually subject to a degree of occasional maintenance in that inspection of the wire beneath the seizings and parcelling has to be undertaken occasionally to ensure no corrosion is taking place and to re-proof these areas. This is certainly one area where traditional boat work knowledge is required and it is strongly advised that the client familiarise himself with the maintenance issues that are necessary with this type of rigging.

Galvanised bottle screws, substantial in size, a degree of surface corrosion on the exposed threads but probably suitable for continued use if cleaned and greased.

radio aerial(s)

No report available.

navigation lights/other electrical etc.

No report available.

sails

Note; for reasons of space and cleanliness, the inspection of sails is necessarily only limited, and if required, a sail repairers or manufacturers should be contacted for full evaluation of sails including degree of stretch, and other defects.

As the day of inspection was severe gales with intermittent heavy rain it was inappropriate to consider removing the sails from the vessel for inspection. There were five sails aboard the vessel at the time of inspection, two tan coloured forsails, one tan coloured mainsail, one white genoa type forsail and one reported by the owner to be a tan topsail, the briefest of inspections was made on these and I can report that it would appear that the tan sails do not appear to have had a great deal of use with at least one of them being virtually completely unused and the white genoa is fairly old although probably suitable for continued use. None of these sails were completely laid out and no full inspection could be carried out. The owner also reported that there are several more sails that were part of the vessel but on the day of inspection were not aboard the vessel but did form part of the inventory.

RECOMMENDATIONS

1. The mast was not unstepped for this inspection, and no comment can be made on it or its attachments and given that it has not been unstepped for close examination of rigging and associated termination points etc. for this inspection, it should be unstepped and closely inspected at the earliest opportunity. **
2. The main boom and gaff do require cosmetic refurbishment. It is likely that these will have to be allowed to fully dry and then the best way forwards is usually hand planing. The amount of material removed in hand planing is minimal and would not generally affect the structural integrity but, it is the only way of reliably refurbishing the timber. It will probably be necessary to remove the fittings, once removed it will be important to check underneath these fittings for any sign of fresh water deterioration. Once these spars have been fully dried and planed they should be then further inspected for any signs of damage caused by the penetration of fresh water. It is usual to apply a minimum of seven coats of marine varnish to spars such as this. This in itself is a time-consuming exercise. **
3. Cosmetically the mast will eventually require similar treatment in my opinion. There may be areas where graving pieces have to be installed to rectify the abrasion/chafing damage as it would be inappropriate to try and plane this damage away. When inspecting the mast special attention must be paid to the glue line to ensure that there is no failure. The usual sign of glue line failure is a crack in the varnish directly above the glue line. This indicates there is relative movement of the two glue sections taking place because of the glue line failure. This type of glue line failure is fairly easy to remedy in localised areas and for further information regarding how these repairs are accomplished, please refer to the section following the end of this report where there is more comprehensive information available. **
4. The foresail wire halyard will have to be replaced. ***
5. The client should make himself aware of the procedure for inspecting and maintaining galvanised rigging, in particular in those cases where hand splicing has been undertaken.

Briefly galvanised rigging was conventionally soaked in boiled linseed oil and, in case of hand spliced eyes, the seizing/parcelling was removed, the underlying wire was checked for corrosion and other fault, the area was soaked with boiled linseed oil and new seizing was tightly applied. More modern treatments have possibly changed some of this procedure and the client will be well advised to make enquiries. **

6. Due to the complexity of the rig, it is strongly advised that the client consult with the present owner closely in respect of how the vessel is rigged for normal cruising and sailing as, gaff rigged is more complex initially let alone the complexities of this particular setup. I believe it will be several seasons before any new owner successfully acclimatises themselves with this particular rig. ***

With reference to all of the above recommendations there is a considerable amount of extra information contained in the section at the end of this report which may be found relevant in many cases. These use this section to supplement the information as listed above.

Although the main recommendations of this report are listed at the end of each section, it is imperative that the report is fully read as there may be some reported faults/shortcomings within the text of the sub headings that do not appear under **Recommendations** that, in some circumstances, should be given high precedence and if in any doubt concerning full understanding of the report it is imperative that the client contact the surveyor directly to ask any questions that may be of concern regarding understanding or seriousness of findings before acting upon the content of this report.

GENERAL COMMENTS

It must be considered that some of the findings and recommendations in this report are of limited structural significance and would likely be relevant upon many vessels if one were to thoroughly inspect and report, it is therefore suggested before drawing conclusions, the appropriate degree of concern is attached to some of the relatively non significant findings. They have been included because they exist and I am required to report and advise upon them where possible.

Xaxaxa it is a substantially built vessel from a renowned yard and very rare in that she would be one of the last timber vessels constructed on a commercial basis of this size in the country. The commissioning owner and designer were obviously very knowledgeable in his requirements and have maintained the vessel to a very high standard throughout his ownership. Although she is not particularly comprehensively equipped with sophisticated electronic equipment and inventory, she is equipped with a substantial amount of high-quality hardware and boat handling inventory which, on a vessel of this type, is probably the more useful. Structurally there are very few issues of any concern other than strongly advising that any further deterioration cosmetically should be immediately halted as this, if allowed to continue, will eventually cause expensive structural issues on the deck and coach roof and spars. The deck battens do raise one or two long-term structural issues which, cannot be addressed until these battens have been removed.

The spars do require some cosmetic attention and the main mast should be further inspected as this remains a slightly unknown quantity at this time.

A degree of upgrading of the gas system and firefighting is necessary for both safety and insurance. As noted elsewhere, the underwater skin fittings seacocks do require some attention, but these are considered general maintenance items although they should not be under any circumstances neglected.

The hull does not require any obvious structural work but would certainly benefit from repainting at this time now.

Overall there is a considerable amount of cosmetic and maintenance work to be undertaken, the client, if he becomes the owner of the vessel, should prioritise this work in that it is unlikely that it could be accomplished within one season and he should possibly aim to have the boat to completely refitted within two to three seasons. It may be necessary to make one or two short-term improvements such as ensuring the hull paintwork is touched in in those areas where it is deteriorating to prevent major breakdown within the next few seasons as it is obvious that the hull would be time-consuming at the cost of other more important areas and, perhaps in reading this report, the client would gain a better knowledge of those areas which deserve prime attention and those areas that would benefit from limited preventative attention until such time is available to totally refurbish those areas.

I feel that the vessel is easily capable of being refurbished to an almost new condition with enough care and skill. This work is relatively easily accomplished by an enthusiastic and practical owner who is willing to gain experience and skill as they progress therefore, it is possible that making a start on less significant areas before undertaking areas such as the coach roof which needs a degree of care and experience to restore properly.

Once completed, ~~Xaxaxa~~ would be a vessel to be very proud of and surely capable of sustained offshore passages for many years to come.

Finally it must be said that if all of this maintenance/restoration/refurbishment work was professionally commissioned, the cost would be extremely high and run into many thousands of pounds and in the event of the owner being unable to complete the work himself for any reason the value of the vessel would be severely affected if left, with a considerable financial burden if professionally commissioned.

Among the items that are considered important and should be attended to at an early stage and before the vessel is fully commissioned or used are the following:

- With the owner/agents co-operation or assurance, ensure all inventory regarding electronic, safety, and domestic appliances and units are all working satisfactorily.
- Given that some parts of the vessel could not be inspected due to limited access, it is imperative that these parts are further accessed by removal of any necessary furniture or structure, particularly where hull skin connections are hidden/obscured or beyond physical inspection. I cannot stress how important this particular recommendation is as it is usually these unseen and inaccessible items that never receive the maintenance that is due to them.
- Attend to all of the underwater gate valves and pipework as noted throughout the report.
- Upgrade the firefighting ability of the vessel.

- Upgrade the gas system to modern safety requirements.
- Attend to the engine electric system to ensure the engine is fitted with a reliable self starting activation switch.
- Ensure the mast is structurally sound by inspection either in position or lowered.
- In the short-term clean the internal section of the fuel tank and inspect for structural failure due to corrosion.
- Possible replacement of some/all of the batteries aboard.

Among the items that possibly require more thought but nevertheless probably will require attention in time are the following:

- When time permits, removal of the mast and full inspection of the structure and fittings and total refurbishment.
- At some stage it might be wise to remove the paint from the softwood section of the rudder above waterline and further inspect.
- The removal of all deck battens and reinstating the integrity if and where any deterioration is found.
- Seasonal inspection of the propeller blade to check upon the extent and seriousness of any further deterioration.
- Consider removal of the fuel tank for close inspection and perhaps replacement.
- The removal and checking of keelbolts is a necessary requirement for any timber vessel, this is usually be achieved by checking one or two every other season or so.
- A degree of wiring modernisation would be beneficial ultimately including more modern battery isolator switching.
- Removal of all antifoul coatings and starting again.

In a timber vessel of this complexity it is likely that when new areas are exposed in the course of repair, other as yet unidentified defects will be encountered. No matter how much care and effort has been taken to identify these areas beforehand, I am unable to guarantee that other faults and defects may not be encountered. A wise owner will always make future provision for this eventuality

In keeping with any wooden vessel it is advisable to undergo a regular regime of maintenance on a year to year basis this will include items such as occasional checking of alternative keelbolts once every few years, checking and or replacement of seacock fastenings every three or four years, careful inspection of any area of the hull or structure that undergoes any physical visual change to paint work suggesting that either moisture or electrolytic action is affecting the vessel. Cracks in paintwork suggesting excessive movement is occurring (other than normal plank seam movement) Blackened varnish is always the first visual indicator of potential troubles in coach roof assemblies. As reported earlier flaking paint on deckheads is also in indicator that moisture is finding its way into the structure. The main cause of serious deterioration to timber vessels is fresh water decay, electrolysis damage, fastening deterioration (keelbolts etc,) and physical damage to bent frames resulting in cracked or broken timbers caused by stranding or heavy collision damage.

Where the report notes no access, this means that no assessment is available and it should not be assumed that the area is free from any fault or the area surrounding is free from any fault

All of the aforementioned comments, observations and recommendations expressed in this report are strictly in the opinion and experience of the surveyor and as such, can differ from the opinion of other informed or professional persons.

It is assumed that all further investigations, repairs and or replacements and any other works carried out to the vessel as suggested in this report, will be carried out to a high professional standard and will not be responsible for compromising the safety of the vessel under any circumstances.

Whilst every effort has been made to report reliable information in this report no responsibility can be taken for faults latent or not, that remain hidden in either construction and or original design and the client should obtain specialist reports upon equipment or machinery outside the scope of this report to satisfy themselves if that should be the case.

We have not inspected woodwork or other parts of the structure which are covered, unexposed or inaccessible and we are, therefore unable to report that any such part of the structure is free from defect.

No responsibility is accepted for alterations, changes or additions to the vessel in any way made after the date of this survey that might affect this report.

The surveyor accepts no responsibility for any undisclosed information held by the client that may have had a bearing on the findings of this inspection.

Liability is restricted to the instructing client only, no third party liability whatsoever. In the case of professional negligence (the non reporting of a structural fault in those areas of the vessel that would affect the sea-worthiness of the vessel and in an area that was not specifically excluded in the report or reported as being subject to further examination at the client's own cost at a later time or where the remit of the report specified only limited inspection was required) where another professional could have been reasonably expected to report upon it in exactly the same circumstances of this inspection, is limited to a period of one year from the date of inspection

In the case of pre-purchase inspections the financial limitation is a maximum sum not exceeding the final negotiated purchase price of the vessel and will not include subsequent repairs and other expenses whatsoever.

It is the client's responsibility to confirm title of vessel and awareness of any outstanding lien on the vessel via normal professional practice before purchase if that be the case, and the surveyor accepts no responsibility for undisclosed information.

These pages are cleared

Epoxy Saturation

This is a method that can, in some circumstances, be a useful semi permanent repair for damaged/decayed timber in many areas. Where timber has developed softness but still retains enough strength to retain its shape and support its own weight without distorting or fracturing epoxy saturation can help reinstate some of the original strength and prevent further deterioration as well as enabling increased screw holding ability which is one of the reasons decayed or soft timber should not be left in areas where screw holding would be seen as extremely important. (garboard planks to keel, hood ends to stem, hood ends to transom etc.). The area of softness must be dry and accessible. Catalysed epoxy resin is applied over the dry timber and a heat gun is used to warm the area. On warming the epoxy resin has a lowered viscosity and is absorbed into the timber, by constantly applying more resin to the area and warming, the area becomes saturated until the soft timber can absorb no more. When cured the area will have hardened up. Additionally, if the timber is large in section it does help to use a small drill (3mm or less) and pepper the surface with drillings that penetrate down to sound timber. This has the effect of encouraging deeper penetration. Discretion should be used in all cases and this is not a cure for excessively deteriorated structural members.

Plywood

When there is limited deterioration to plywood such as internal delamination, an alternative to the above method can be employed. By drilling a series of 3mm approx. holes in the plywood that DO not penetrate the full thickness in the area of deterioration, a hypodermic syringe (with the needle removed) can be used to pump catalysed epoxy resin into the heart of the plywood. It will usually exude from some of the other holes in the area. When full saturation is complete, tape up the holes to prevent drainage. Again discretion has to be used and will generally only be used for localised areas. It is extremely important to ensure plywood is perfectly dry and all future freshwater leakage that possibly initiated the problem is attended to.

Marine plywood ?

Several types of plywood are available, marine, WBP (water & boil proof), moisture resistant, and interior. The differences come down to structural construction, veneer species and glue type. Marine plywood will generally be produced to a minimum BS standard. This ensures that the glue used is good quality waterproof, the veneers are butted together with a limited number of internal voids (some are allowed), and that the species of timber is reasonably durable. Generally the veneers will be thinner and more numerous which usually makes for a more stable and stronger unit. Unless specified, the finish veneers will usually be plain grained such as gaboon, or other far eastern less well known species. Various finish veneers are available. However, some of these veneers can be exceptionally thin, especially on some teak finish ply where the veneer is so thin that it cannot be sanded without penetrating the few thousands of an inch thick and exposing the base veneer. Others may have full thickness finish veneers which stand more finishing. On hull planking, particularly close to or below the waterline, then it is advisable to use plywood with as many veneers as possible. The lower grade 6mm has only 3 veneers and the same quality 10mm & 12mm has 5 veneers, the higher grade has a minimum of 5 & 7 veneers respectively. The standard thicknesses are 4mm, 6mm, 9-10mm, 12mm, 18mm & 24-25mm in some grades. To make a custom thickness it is acceptable to bond two thicknesses together with a waterproof glue or epoxy (not polyurethanes as they expand on curing forcing the panels apart)

WBP ply generally uses the same glue as marine ply but is allowed more voids internally; species of timber may be less durable but not always so and there may be thicker but less veneers than marine ply. But these all vary upon the manufacturer, the only consistent will be the glue quality. WBP may not be quite as strong, but for many applications, can be used without undue concern. The cost is considerably less than marine. Various face veneers are available.

MR (moisture resistant) often uses multi veneers of good quality, but the glue used is not sure to resist long exposure to the elements.

These pages are cleared

Interior ply used to be only suitable for furniture in homes due to non waterproof glue, but now some manufacturers call their plywood interior grade because it has been fully sanded and constructed with multi veneers for high quality applications where a good surface is required and surprisingly, it has been constructed with marine type glues, so can find uses aboard, but ensure the glue is w.b.p. minimum.

Shuttering ply is not suitable for inclusion in yacht construction as it is low structural quality and rarely stays flat in thinner sections.

All plywood will deteriorate in the right circumstances despite the manufacturers assurances. Generally the exposed edges will be the starting point for water absorption. Also it should not be underestimated that wherever a piercing is cut, be it for a bolt or a window, there will be exposed end grain. It is these areas that should be sealed comprehensively. On a straight edge, for instance joinery etc. the edge should be capped with solid timber glued into position and on piercings, the exposed edges should be sealed with epoxy resin or at very least paint. When water enters the laminate and freezes in winter, this will cause delamination.

Glues

This is one area where there are several choices of types of glue depending upon where the glue is to be used, the circumstances, the strength required etc.

epoxy-based glues

Epoxy resin-based glues found widespread use particularly in new construction where timber can generally be guaranteed to be dry. These glues are known to be very powerful and strong but their strength is partially reliant on the timber initially being very dry which, on some parts of the wooden vessel would not be very practical, the instance underwater planking repairs on a vessel that has not long been out of the water. They are also relatively expensive and once mixed, if not all used, will be wasted. However, in the right circumstances they can create exceptionally strong bonds. The only exceptions are with some of the oily timbers such as teak where a degree of good surface preparation is essential for a reliable bond. The usual method of preparing teak and other such oily timbers is to use a solvent-based cleaner such as cellulose thinners or acetone immediately prior to application. High clamping pressures are not necessarily required. Gap filling qualities can be improved by the addition of purpose designed filler powders.

polyurethane glues

Polyurethane glues are a relatively recent introduction and, so far, have proved to be reliable and strong and entirely suitable for most applications including underwater areas where they are totally waterproof, perhaps more so than epoxy, they are more tolerant of damper timber and utilise the moisture content within the timber for curing. On curing they expand and foam which helps fill areas of unavoidable voids in the joints however, the gap filling qualities of polyurethane do not necessarily add the same strength as gap filling epoxy. They are a single part preparation and it is only required to use as much is needed, the remainder can be stored for a reasonable time. They could be said to be a good constructional adhesive in the right circumstances. The cost of polyurethane glue is considerably less than epoxy.

PVA glues

PVA glues are available and are produced by various manufacturers. These have been used for many years for joinery and lesser constructional areas and provided joints had been produced accurately and good clamping pressures are employed, these glues are suitable for most areas of joinery. They are water-based and available in interior or exterior use. On boats always use the exterior grade whatever the circumstances. They are relatively easy to use and inexpensive and will find uses such as gluing cappings to plywood edges, conventional joinery construction plywood/plywood bonding and many other less critical areas. They are not suitable for continued immersion but will withstand occasional immersion. They are easy and convenient to use.

These pages are cleared

Powder resin glues

Although not used as often, there are still some powder resin glues available. These are mixed up according to quantity required and generally as regarding strength, will fall between the PVA glues and the polyurethane glues. Many of them are relatively waterproof and have been used in the past for cold moulding hulls and other constructional operations. Aerolite is one trade name, this is activated with a formic acid activator after mixing the powder with water.

Resorcinol (cascophen) is perhaps the most widely used structural resin glue used other than epoxy, particularly before the advent of epoxy when, if total waterproof properties and strength were required, this would be the usual glue to choose. It is not particularly suitable for joinery which has to be varnished as the mating line between the two joints is usually easily seen as a black line. This is also a two pot mix. Relatively expensive.

One or two builders/users occasionally use a polyurethane sealant adhesive (not to be confused with polyurethane glue which is very different). The most well-known of these is Sikaflex however, although the adhesion is very good it is not really a constructional timber adhesive but is used occasionally for fixing teak decks to plywood and one or two other specific uses.

The above list is necessarily limited in its description of the glues.

Fastenings

A timber vessel will have countless fastenings, each of these is important structurally. On carvel build these will be either copper boat nails with roves fitted, bronze screws or on older vessels and some heavily built vessels, iron or steel fastenings similar to very thick blunt nails, more likened to bolts without threads are driven into sawn frames These can rarely be extracted without causing damage. Some will have a mixture of all.

Copper boat nails are particularly long lived and rarely cause problems.

Bronze screwed planking can be a problem occasionally because these screws are hidden and are subject to corrosion and weakening and unfortunately, a randomness in their deterioration.

Checking one or two does not indicate the condition of the remainder. When they fail they are extremely time consuming to rectify as they cannot be successfully removed as the heads are prone to break, leaving a shank in the timber. This is not easily removed without causing damage. Often the only way of reinstating the strength is to drive another screw in the same position at a different angle through the same hole after attempting to drill out part of the shank to allow a new screw to pass through. Alternatively a new screw can sometimes be fitted at an intermediate position, such as in the case of garboard fastenings, however, this is not so easy in the case of planking where it is important to secure the plank close to the hood end for instance.

In the case of bronze fastened vessels it is important to remove occasional fastening for inspection and replacement before they reach this point.

Iron nails corrode and affect the planking locally through this corrosion, but they are practically impossible to withdraw and often new fastenings will be fitted close by. Eventually an iron fastened vessel will have too many holes in the planking to be considered structurally sound after a second total refastening.

Occasionally it will be found that a fastening passing through the planking, particularly at the hood ends, will brush against unknowingly one of the other constructional fastenings in the stem or sternpost. This will cause electrolytic action that will affect the timber surrounding the fastenings and may warrant remedial repairs.

These pages are cleared

nail sickness

This is a condition that affects the soundness of the plank fastenings generally. Planking is usually attached to the frames with copper rivets, either clenched or roved (a square section copper nail is bent over or clenched on the inside of the frame, or a copper rove or shaped washer is fitted on the inside end of the nail and the end of the nail is riveted) bronze screws, or steel/iron nails and or bolts. For whatever reason, these fastenings corrode and weaken, potentially structurally weakening the vessel. Unfortunately it is common for the planking to be affected by the localised corrosion in that it becomes soft due to electrolytic decay and in severe cases, requiring plank and fastening replacement. Iron/steel fastened planking is most commonly affected followed by bronze screwed planking and occasionally copper fastenings. The acid present in some timber can also hasten the effect, particularly oak/steel combinations due to the tannin in oak. The usual indicator is, in ferrous fastenings, excessive corrosion staining from the planking in random areas leaching through old paintwork and blackened timber, or in the case of mahogany/iroko/teak planking with bronze/copper corrosion, discoloured timber, usually grey/yellow shades around the suspect fastening. Many timber vessels will have minor localised areas of electrolytic decay surrounding some fastenings without any excessive structural weakening.

other fastenings

It is not just the planking that requires fastenings, the centreline construction requires fastenings, the keel is retained with fastenings, the seacocks are secured with fastenings. All of which will not last forever. Keelbolts vary with the material of the keel.

Lead & cast iron being the most usual. Lead keels require bronze bolts, however, there are countless grades of bronze and a bronze keelbolt should be inspected occasionally. Bronze, when it deteriorates goes a distinctly reddish coppery colour, is dull and is very soft and scrapes easily. It is also brittle.

Cast iron keels will use a variety of materials, mild steel, galvanised mild steel, wrought iron and stainless. All require inspection and none can be guaranteed to outlast another by a large margin with the exception of wrought iron which was traditionally used but is not easily available now. Stainless steel *may* last a long time, but it can sometimes be less long lived than mild steel and ultimately may not be worth the considerable extra cost. Galvanising does add a few more years to the time span of mild steel.

Scarf bolts in the stem and sternpost should also be inspected at intervals. These intervals will be quite long, but nevertheless should be undertaken, especially where there is evidence of corrosion staining leaking externally. When attending to these bolts, ensure that external supports are placed against the area to help prevent any movement of the structure when driving the bolt through as quite a lot of pressure can be placed upon the area. Refit with a grommet of cotton caulking both internally and externally.

fitting fastenings

When replacing/refitting underwater fastenings it is usual to wind a grommet of caulking cotton around the head externally and similarly around the underside of the internal nut/washer. All a grommet is, is a circle of caulking cotton where the ring is made by creating a thumb knot but not pulling tight (this is the diameter of the bolt) and keep tucking the loose ends around the ring until it is of required thickness. This will generally be sufficient to keep the bolt watertight. Adding a non hard setting sealant is an additional back up. It is not usual to wind cotton around bronze screw fastenings such as hood end screws or garboard screws as these should not require any cotton, the same applies to copper boat nails. When removing/refitting particularly large diameter bolts such as scarf bolts etc. if the bolt is stubborn, the area of timber should be supported, for instance if driving a scarf bolt from inside the stempost, a prop should be wedged close to the external position to limit any unwanted movement to the timber. and to allow a solid and firm support which makes the bolt easier to remove with less effort. It is just the bolt that needs moving, not the structure. When removing keelbolts this is not generally a problem for obvious reasons. When refitting fastenings in planking, take care when tightening nuts and bolts as it is easy to over tighten and draw the fitting and associated nut/bolt into the timber thus causing damage to the timber.

These pages are cleared

When fitting flanges etc. i.e. skin fittings of lever valves, apply an underwater sealant to the flange and note when the fitting is home against the planking before it gets drawn into the surface of the plank. Other skin fittings such as the threaded tube type of fitting should be fitted with cotton caulking as if it were a large dia. bolt.

When trying to determine whether a section of timber has softened seriously enough to require replacement, particularly if it forms part of the main structure such as the keel for instance, a reasonable first indicator is whether the timber can hold a screw as well as any unaffected part. This is the prime requirement of a keel for instance, to retain the garboard planking, and if the screws/nails cannot hold given reasonable size and length, then the timber should be declared unsuitable in its present condition. A screw should shear before pulling out, if it pulls out (assuming the pilot hole is not oversized) then a larger screw should be used, or the holding timber at that point should be repaired /discarded or if feasible, the fastening re-sited if the damage can safely remain.

Planking problems

Apart from the obvious problem of decay and physical damage, there are one or two problems that affect the planking and internal framing.

overcaulking

Overcaulking is where for one reason or another, the plank seams have been forced apart by caulking cotton that has been hammered home too hard. This usually results in broken frames and the planking stretching the fastenings to leave a gap between the plank and frame internally. This is extremely difficult to rectify. The usual cause is allowing a vessel to dry excessively and then, noting the gaps in the now dry planking, trying to fill these with new cotton. When the boat enters the water, the planks expand to where they once were and break the frames. In the case of an excessively dry boat, it is better to seal the gaps with any flexible temporary sealant, grease has been successfully used along with soap, but avoid a setting compound at this time and allow the vessel to take up naturally.

Once taken up, which in the case of planking will take a maximum of about two days, longer in the case of keels and heavy sections, up to about 14 days., if required, the boat can be lifted and the leaking seams carefully raked and recaulked without fear of causing damage.

knuckling.

This is where an internally broken frame or series of frames allows two adjacent planks to meet at, instead of a fair curve, an obvious angle to one another. The occasional cracked frame can usually be left undisturbed without too much concern, but several in a row should not be left as these would represent a weakness.

leaf fractures

This occurs in one or two species more than others, pitch pine and larch commonly, it is easier to imagine the plank as a multitude of thin pieces laminated together, these would be the individual growth rings, and as the plank is bent, one of these laminates or growth rings starts to peel off from the body of the plank on the surface depending on the precise original cut and run of grain. It need not be serious as it usually is limited by the next set of fastenings back from the start point. However if water penetrates the area it can cause rot. Always best to glue the failure back but it is not easily fastened mechanically because the end of the failure has very thin timber, best to screw back with a removable pad externally or use a prop against the area once glued until cured.

fitting sections of planking

It is possible to fit a short length of planking to an existing length depending upon the position and one or two other circumstances. If the time and skill is available and if the timber is dry, a long scarf joint across the thickness of the plank can be used in the ratio of approximately 12 –1 ie one inch thick plank, a scarf of 12 inches, ensuring that the inner feather end of the scarf if hidden by the frame. Alternatively the easiest and most common way is to fit a butt block.

These pages are cleared

This is a piece of timber similar to the planking material, very slightly shorter than the distance between the frames (to allow for drainage) and slightly wider than the plank at that point, which helps retain the block behind the above & below planking. The plank is cut halfway between the frames and the butt block is fastened to both old and new plank with three fastenings per plank (6 in all for the block) It is not good practice to use a frame to land and fasten both ends onto, it will not last and will give an unfair shape externally in most cases.

Frame problems

As noted above the occasional broken frame is not particularly serious, and some boats start their days with the odd broken frame, especially designs such as the Folkboat. There are several methods of repairing frames, depending upon the position and the overall degree of work and expense permissible. The most expensive is total replacement, this may not always be required and in some cases may not be possible due to the fact that a full-length frame even on a small boat could be in excess of ten feet long.

The usual method is to "sister" the broken section. This means fitting a frame of similar dimensions alongside the existing frame but extending three planks up and down from the break.

A good repairer will carefully taper the ends to avoid sudden changes in structural rigidity. This method adds more holes to the planking and generally detracts from the aesthetic look if visible in the accommodation.

Another method is to scarf a new section in. Long scarfs are cut to allow a minimum of three rivets per scarf and a laminated section of framing will be carefully fitted. This will generally be laminated in position and then removed once cured for tidying up and precise fitting using the original rivet holes in the planking.

Most frames in this country will be oak or in some cases rock elm. Quite often the oak frames would have been installed "green" the timber bends easier in this state. Oak generally lasts longer than rock elm which can decay, particularly at the low points of the bilge.

Avoiding frame break ages

There are four or five main reasons for frame breakages, as earlier noted one of these is directly connected to original build where they have been overstrained in fitting and any owner should not hold themselves responsible for this however, there are other reasons which can be avoided. Steamed frames are generally used however if a frame is over steamed it can become brittle. As earlier noted, one reason is over caulking where, a dry hull has the caulking fitted too hard and, on taking up the frame breaks because of the excessive tensile stresses, another reason is where a very dry hull has an even dryer plank installed to an exceptionally tight and close fit whereupon subsequent launching swells the planking and causes a series of broken frames, the other area is physical damage to the hull, very occasionally caused by some conditions of sea whilst underway (falling off a wave in a tide race the instance) but, unfortunately more often caused in boat yards and very often in road transportation where excessive strain caused by inappropriately placed supports, always ensure that a boatyard installs props at points of major bulkheads and ensure the hull is not distorted locally by over tight props. Obviously accident damage whilst afloat caused by collision will break frames. The above refers mainly what are known as bent frames. Sawn frames are considerably stronger generally as they should be considerably heavier in their section but, they are less in number in a hull than steamed frames. To break a sawn frame and extreme amount of stress must have been applied. Occasionally a vessel will have a mixture of sawn and steamed frames. Sawn frames are generally used in working vessels such as fishing boats and are very common in Scottish build motor sailers such as the Fifers for instance and occasionally hard chine sailing and motor boats.

Rudders

When wide sections of timber are assembled together such as that which might be used for a rudder for instance, there is always a risk of splitting due to shrinkage, strain etc. A common reinforcement is to install "dumps" These are metal rods driven into pre drilled holes through the edge of the blade and passing into the various separate sections that it may have been constructed from.

These pages are cleared

These rods tie the rudder together and help prevent structural failure. It is not possible to report upon the condition of these for obvious reasons. When a rudder is beginning to fail due to distortion or separation of the individual sections of blade, then the fitting of a couple of rods will often reinstate a high degree of original strength. Often a galvanised mild steel rod will last many decades if sealed in with epoxy or similar.

Splits in timber

By its very nature, some species of timber can be more prone to splitting than others. Large sections of timber as solid spars and deadwoods can develop shakes. These are open splits running with the grain over short distances. They are not generally caused by damage, more often just the nature of timber that may be quite old and dry. Not necessarily serious structurally provided they are within acceptable parameters.

A shake ½ in. deep in a section of timber 10in. thick is relatively insignificant, the same shake in timber 3in. thick would be more of a worry.

The main concern with any shake is the possibility of fresh water entering the unprotected parts and causing decay. Thunder shakes are cracks that go across the timber and these are fractures that are serious. Caused by stress and in the case of thunder shakes, when the tree was originally felled and hit the ground. This damage cannot be left in structurally significant parts.

repairing spilts

A hollow mast may develop glue line failures, if it is not warranted to take the mast to pieces and start again, it is sometimes possible to set a router up on the line and rout a deep runnel along the joint. This exposes clean timber in which a precisely machined spline of similar timber can be glued into. This repair, if done well is quite successful.

This method can also be used in some circumstances such as splits in coachroof assemblies where a window cavity is for instance. Very common in porthole piercings. Temporarily screw a guide batten for the router onto the coachroof. and use a router cutter wide enough to encompass the wandering of the split. It may be possible to access the interior of the split in the same way, but if not, the careful fitting of a batten will serve the purpose, particularly if it can be made to appear as an original fitting. but never try to repair a crack that runs across the grain in this way, it will not succeed.

Floors

Floors are the structural components as earlier described that fit on top of the timber keel and are shaped to fit up the sides of the lower 2 or three planks. They help transfer the loads of the keel to the planking and maintain the shape of the boat at that point. They can be fastened in many ways and made from metal or timber.

Timber floors are usually quite wide in section, perhaps exceeding in most cases, 2 inches wide, they can be screwed or copper nailed to the planking from the outside and either bolted to the timber keel using the keelbolt or bolted to the wooden keel with non removable (when the ballast keel is fitted) nuts/bolts. Metal floors are fitted similarly but occasionally non-compatible metal fastenings are used which causes severe timber degrading. Metal floors are stronger when new, but are prone to serious maintenance problems after fifteen or twenty years if they have been constructed from ferrous, bronze floors are less common but much less prone to corrosion problems, however they can still suffer from fastening problems.

Timber floors, if well fitted, are likely to be less prone to the time associated problems of metal floors but are not as strong when new as metal floors and can suffer from electrolytic damage where the keelbolt passes through, but this is generally more easily repaired.. Some vessels have a limited number of floors fitted, and occasionally the report may suggest the fitting of additional floors. It is usually easier and less expensive to fit timber floors. Vessels with keel stepped masts rely heavily upon the structural soundness of all the floor components in the vicinity of the mast as it is this floor that is responsible for holding the garboard plank tight to the keel as the mast is trying to pull all the planking away from the keel. Any deficiencies in this area will allow the garboard seam to open when hard pressed and allow leakage from this area. Vessels such as the SCOD are particularly prone to leakage here because the steel floors have ferrous bolts passing through the planking, these corrode causing electrolytic damage to the plank allowing the plank to move independently of the floor and leak. The repairs can be extreme occasionally.

These pages are cleared

This scenario can apply to any keel stepped mast vessel with ferrous fastenings/floors. Occasionally the central floor fastenings cannot be replaced or checked unless the ballast keel is completely removed as the heads for these are located on the underside of the wooden keel but above the face of the ballast keel. Bear this in mind in the case of floor fastenings when designed in this way.

Electrolytic decay

This kind of decay is commonly found in many vessels. It is not a bacterial decay but it is the gradual destruction of the timber caused by chemicals present when metals are corroding or otherwise affected by galvanic action where they pass through timber. These chemicals are usually strong alkaline and destroyed part of the structure of the timber. They will often occur around Bronze fastenings, iron fastenings and occasionally round copper fastenings. The effect upon the structure of the vessel can be significant because the timber softens excessively around the fastening causing a degree of leakage past the shank of the fastening and in some cases more importantly, the wood or structure to move around the fastening. In the case of metal floor fastenings for example this will allow the garboard plank to move independently of the structure and not be restrained, as it should have been by the floor fastenings thus causing leakage. Other areas that can be severely affected are deadwoods where stern tubes run through and areas around rigging chainplate bolts. Keelbolts are another area where this damage can occur. Provided it is not too severe, the area should be thoroughly cleaned of all paint and, provided it is alkaline attack, which is the usual cause the area should be flooded with a weak acid solution such as vinegar and then comprehensively flush with fresh water. When dry the area should be fully assessed as to whether it requires repair and the fitting graving pieces or whether epoxy saturation would be sufficient.

Anodes

These can also be responsible for significant electrochemical damage and when fitting them to wooden vessels extreme caution has to be taken as to the full advantage of fitting as often they can often cause severe electrochemical damage to the timber to the extent of requiring structural repairs, in some cases these structural repairs may be very comprehensive including partial replacement of internal and external deadwoods and underwater planking due to the strong build up of chemicals around the anode and those parts of the structure where protected metal items are passing through such as stern tubes, keel bolts, seacocks etc. By wiring the anode to some of the metal items as suggested by the manufacturers, electrical circuits can be produced which causes these damaging chemicals. Under all circumstances take professional advice when fitting anodes, each particular vessel will have different characteristics.

Seacocks

Virtually every vessel will have at least one seacock fitted. These are absolutely required on all underwater skin openings other than speedo and echosounder transducers. The inspection should have tested each and every one of these where accessible to ensure they are in working condition. There are three basic types of metal valve, lever valves which have a tapered cone which is turned to line up inlet holes with the body of the valve. These can be adjusted by tightening the plate that adjusts the cone depth into the body. Usually bronze, often fastened with through bolts that pass through the hull, these bolts can fail due to corrosion eventually and have to be checked on occasion. Perhaps every six – eight years,

They are very reliable but expensive. They can suffer from corrosion. They should be serviced every season by removing the plate and cone, cleaning and polishing the mating surface of the cone/body and lapping in if required and reassembling with underwater grease.

Gate valves are inexpensive, available in many sizes but relatively prone to failure with age and corrosion. The pressed steel turn handle can rust severely and fail, the quality of the valves is very variable with many using inferior brass internal mechanisms that eventually fail.

These pages are cleared

The normal tests for this type of valve is to undo the valve to its maximum using a reasonable force but obviously not excessive and then go to the other extreme, tighten the valve up to a reasonable degree. It will be noted that on a failing valve the degree of take-up or free movement noted on the handle before the valve starts to open or close depending upon which end of the thread is being used will, gradually become more and more as the valve gets older eventually completely failing when the free movement reaches approximately a half turn. This leaves the valve in either a permanently open or permanently closed position. If compared with a new valve it will be noted that the new valve has very limited free movement, perhaps about ten degrees.

Ball valves have gained quite a lot of popularity and are also a relatively inexpensive, available in many different sizes and, unfortunately are available in various qualities. These simply use a ball with a through hole drilled in it which is held captive in a nylon shell within the body the valve and a simple handle is attached externally to align the hole with the body of the valve or close the hole off. Again, these are fitted with a pressed steel handle which often rusts severely .

Both a gate valve and ball valve are fitted to a skin fitting; this is usually a threaded tube of bronze with an external flange and any internal nut which tightens the fitting to the hull. being bronze, this is also subject to occasional deterioration due to metal fatigue and dezincification. Unfortunately the most susceptible area for deterioration of these is the part that passes through the hull skin It is not possible in the majority of inspections to be precise on the condition of these hidden parts and these should also occasionally be removed from the vessel for inspection. Quite often, it is found difficult to unscrew valves from the skin fitting without disturbing the skin fitting.

All underwater kin fittings should be metal; PVC or nylon should not generally be used unless it has been specifically passed for this purpose, which is unlikely.

The other main fault noted with seacocks is usually to do with the connecting pipework, method of retaining the pipework to the seacock, condition of the pipework and in some cases, surprisingly, the access to the seacock. Occasionally it is found that some builders install seacocks and then install the joinery surrounding them and in these cases can prove practically impossible to access the seacock for normal maintenance or replacement without damaging the associated joinery. All underwater seacocks should be fitted with pipework that it is of a suitable standard. This would not usually be anything less than reinforced PVC that has been particularly constructed for this purpose.

Car heater hose pipe rubber tubing is not acceptable. In all cases pipework should have retaining clips fitted, and these should be in good condition and preferably of stainless steel, however, plated jubilee clips although they will be much less longer lasting, are still acceptable provided they are in very good condition. Where possible all pipework should be double clipped, but there are one or two exceptional cases that due to the reduced length of the stub on the seacock, the fitting of an additional clip has the effect of trying to pull the pipe off instead of clapping it securely on, always use the safest method.

When replacing skin fittings and/or seacock fastenings, wind a grommet of cotton caulking around the external flange of skin fitting or head of bolt to seal.

Taking up

This is an area that concerns any owner of a timber vessel at some time in the life of ownership. Timber shrinks as the moisture escapes. Areas exposed to drying winds and strong sun are the most vulnerable. The more paint a vessel has the slower this evaporation will be, the paler colour the less absorbed sun responsible temperature. Generally it is safe to assume that if the timber shrinks when dry, it will expand to the original size when wet. This can fortunately be reasonably safe to rely upon, 1 inch thick planking will take up in 24 hours, but large keel timbers and deadwoods may take 10 days to fully assume normal sizes so some vessels will take up in a few hours, others will not fully take up until perhaps as long as 14 days, although if any serious leaks remain after two days, it is unlikely that these will ease significantly without attention.

These pages are cleared

Occasionally this attention could be as simple as tightening a stem or stern scarf bolt, or perhaps a keelbolt. It is generally thought that other than making good any obvious breaches before launching, a boat that has had no works carried out since last afloat (provided within a year or so) will assume the previous afloat state within 10 days and it is unwise to attempt any recaulking or preventative structural measures (always check for any areas that may have suffered since last afloat such as echo sounder fairing blocks which can split occasionally once dried out and cause new leakage). until the vessel has fully taken up as more damage can be done by trying to caulk and seal what is a very dried boat before it has been allowed to take up.. Damage can extend to broken framing, distorted and stretched fastenings etc. Always best to keep the vessel safe and continually monitored afloat with reliable pumps at the ready if in doubt.

Bear in mind that the topsides, although not subject to the same degree of expansion due to moisture content, will also help the taking up process, as the topside planking expands, which will be much slower than the bottom planking, it will help force all planks around the vessel tighter to one another, this will take several days and can be significant if the topside planking is exceptionally dry.

Only when it is obvious after a few days that leakage is too serious to allow the vessel to remain afloat, should any caulking works be undertaken. Of course, this is assuming that the vessel has no caulking failures due to faulty or decayed caulking.

Excessive drying out can cause irreparable to some components, rudders can split and distort, deadwoods can develop serious open shakes and distort, and keels can split, but this damage is only likely on vessels that remain uncovered in an open and exposed location for in excess of 2 years although 6 weeks in June/July can do far more drying on a boat that ever could take place on a normal layup season of say October to April.

Some suggestions on painting timber vessels

The following suggestions are made in the light of experience however many professionals and owners of longstanding will have their own preferred methods. External underwater sections of planking, deadwoods and rudders etc are usually primed with a metallic aluminium primer on the bare wood, this is very good and effective at providing a good waterproof barrier coating. Usually a minimum of two coats will be applied. There are various manufacturers of this type of paint, some are available from well known DIY stores which, generally are perfectly acceptable others are more expensive Marine brands. On planking above waterline the previous primer can be used but it is also possible to use a less expensive primer in some situations. In my experience it is possible to apply a good quality undercoat to all underwater sections once primed however, it may require the application of antifoul primer on top of these coatings (this is usually chlorinated rubber compound which acts as a barrier between coatings which may be adversely affected by an aggressive new coatings such as some antifoul coatings).

Occasionally it is possible to apply the antifouling directly to a well cured primer coat however, it can be safer to apply antifouling primer to prevent the oil based primer being affected. It is usually best to adhere to the manufacturers instructions as stated on the tins. Always avoid using polyester based fillers on the bare planking on any underwater sections as this deteriorates when exposed to long-term immersion. In areas where the caulking putty has dropped out, the traditional method is to apply a red lead putty in these areas. Some builders use ordinary glaziers putty in limited areas although this is inclined to harden excessively with age. Occasionally the addition of a knob of car grease prevents it hardening too quickly. Quite often a polyurethane type sealant is applied however, although this is relatively easily obtained and appears to be eminently suitable, the adherence to old/wet/diesel contaminated timber is exceptionally poor. In critical situations the use of polyurethane sealants should be carefully considered to ensure the timber is suitable.

topsides

If topside coatings are in good condition then all that is usually required is flattening back to both provide a key and to create a clean smooth surface, filling of all imperfections, it is possible to use polyester filler in these circumstances above waterline, and application of one or two undercoats, careful flattening back of the final undercoat with perhaps 240-400 wet or dry paper and the final application of the chosen topcoat. Some owners will apply two topcoats

These pages are cleared

In the case of any areas of bare wood then these will be primed as earlier noted and built up with coat on coat of undercoat finally allowing these to harden before flattening back. It will usually take a minimum of four/five undercoats before any finish whatsoever is found to be acceptable for topcoat. When a vessel has been completely stripped on the topsides, it will usually be at least two/three years of seasonal painting before the topside finishes become acceptable as, within the first year there is always a degree of movement which causes cracking in the new paint coatings as the timber re-stabilises.

Masts & spars (alloy)

When it is reported that masts and spars have not been inspected because they were stepped at the time of inspection then the report will suggest that these are checked at some later stage. The usual items to check on alloy spars are as follows:

Depending upon the type of rigging attachments used, the areas can suffer through stress and strain and physical fatigue. When T ball fittings are fitted, these are swages fitted to the mast end of the standing rigging that locate in the mast simply by twisting and turning the free end of the swage. Once in position, provided the rigging remains even slightly tight, these cannot jump out.

However, they are fitted in replaceable stainless steel backing plates which are pop riveted to the mast. These can often distort and in more severe cases can cause cracking of the wall of the mast at these points. These areas can be repaired by the addition of alloy backing plates however, they have to be checked. Other types of fittings are stainless steel plates which are pop riveted/bolted to the wall of the mast. Occasionally corrosion can be a problem between the stainless steel and the alloy. Check these areas for any sign of excessive distortion and/or wear. The other common area with damage can occur is to the spreader roots.

Commonly these are stainless steel brackets fixed to the mast and occasionally due to one circumstance or another the spreaders can strain or buckle these. The usual indicators are that the fitting no longer is flush to the mast and there may also be some mast distortion at these points. Any distortion on the mast should be viewed with extreme caution, as this could be a natural folding point for the spar.

Generally aluminium masts should have fittings secured with monel metal pop rivets, but it is often the case that aluminium rivets are used and these are prone to corrosion and crumbling and all rivets should be thoroughly checked. It is very common also to find that aluminium pop rivets have the residue of the steel pin remaining in the pop rivets which can corrode and at minimum cause rust staining. Stainless can fracture at work hardening points so look for hairline cracking at welds and flex points. Where the anodising coating has failed, usually at the foot of the mast and at places where abrasion has occurred, check for corrosion that on alloy takes the form of white powdery coating and associated pitting which can be very deep.

It is always advisable to insulate stainless steel from aluminium wherever possible, as the interaction between the two metals in sea air is quite destructive to the alloy. There are also one or two inhibiting pastes that are available specifically designed for this purpose.

Masts & Spars (timber)

if the report has been unable to make any report of the mast because it is stepped at the time inspection, then the areas to further inspect when the mast is lowered will include the condition of the timber with reference to rot and decay and the constructional techniques and degree of deterioration evident here, along with all mast and rigging fittings. Hollow masts are generally constructed from either two or four sections of timber in the case of two sections hollow masts it is usual for the inside of the two planks to have been hollowed out to degree to save weight.

In the case of four section box type construction the mast will have solid sections fitted at certain points, these points would include the top and bottom extremes of the mast and usually a section of solid is fitted around the spreaders position. In both types of construction the usual constructional fault is glue line failure, this shows as varying lengths of obvious glue line where in some cases, the glue line has opened and is large enough to fit a razor blade or other such thin blade between joints.

These pages are cleared

This has to be seen as structural failure due to the fact that both structurally the mast is failing and ultimately water will find its way into this joint and cause decay it is not already present.

Provided the mast is sound, these areas can be repaired in varying ways. It may be possible in relatively minor cases to precisely rout out an area along this failing glue line (by using a purpose built guide that can be temporarily clamped to the mast) and insert and precisely cut spline which would be glued into position. It is never successful trying to fill this open glue joint with epoxy or other such preparation as it cannot be relied upon because the area cannot be fully prepared and there is always a possibility that in trying to prepare the area, further glue joint failure will be encouraged. The spine should be as deep as practically possible. More extensive areas of failure will probably require the mast to be separated into the individual original components, the areas fully prepared, and the mast re-glued with suitable glues.

Solid masts are relatively unusual on cruising vessels now, but these are prone to decay as with any other timber construction. The usual areas of decay are under fittings such as spreader fittings, masthead fittings etc. These should all be checked thoroughly. Solid spars will usually have some shakes running in line with the grain, these should not necessarily be of any structural consequence, other than they can allow fresh water to penetrate deep into the mast with the risk of underlying decay.

Any cracks running across the grain 90° to the run are structurally significant and, if they are more than surface deep which would inevitably be the case in most circumstances, then these areas would have to be repaired. The usual repair of this type of damage will be to fit graving pieces. Graving pieces in solid spars the usually take the form of segment shaped pieces of timber rather like scoops of wood which, once glued and planed back, apart from perhaps a different colour, are practically invisible without the addition of any weakening corners or edges.

Gas Systems

Gas systems are often found as a cause for concern on any boat and built prior to 1988. The usual reason is that either vessels have been previously surveyed and the gas systems have been picked up but the owner has never got round to altering the system or that there has been some deterioration in the system since original build. The general requirements are that no gas storage should be below decks whatsoever and any storage container for gas cylinder/should be able to safely drain any escaping gas directly overboard without fear of any escaping into the accommodation. All connecting pipework should be so far as possible continuous lengths of copper tubing that is well secured to the structure, connecting up to BS standard flexible gas piping. On the side of any approved flexible gas tubing are two dates, the year of the British standard, and the month and year of manufacture. If these dates are not evident, then it is likely that tubing is not of approved standard.

Regulators should be replaced approximately every ten years. It is often the case that these regulators, because they are in relatively exposed atmospheric conditions and subject to continual seawater contact because they are in cockpit lockers etc will often require replacement much earlier. Any regulator that is in cosmetically very poor condition should also be seen as structurally unreliable. Wherever possible it is advisable to fit a gas tap close to the cooker or gas appliance, but always ensure this gas tap is rigidly secured to the structure of the vessel.

Calor Gas presently advises replacing the flexible tubing every five years. Any gas appliances newly fitted to any vessel of any age have to comply with the safety standards and specifications currently in force.

This also means that it is generally not acceptable to fit an old gas appliance as a new fitting unless it meets with current specifications, this is particularly the case in gas cookers which should be fitted with flame failure devices. (Originally fitted devices in the vessel are still accepted)

For further information regarding gas systems it is advised to study the Boat Safety Scheme pamphlet (available from 01923 201408) along with the Calor Gas guide which is available from Calor Gas on 0800 626626, which gives full information and advice concerning regulations covering gas installations aboard yachts.

These pages are cleared

Fire fighting

The other common area where vessels are inadequately suited is in the area of fire fighting. A degree of common sense is required here as a vessel that has accommodation spread out with, for instance, a centre cockpit, will probably require more extinguishers than one which has an open plan accommodation all in the same area.

A sensible rule of thumb would be to install one extinguisher in each separate part of the accommodation and, as the vessel becomes larger, a minimum of two extinguishers would normally be carried in the main saloon, one forward one aft, particularly around the cooking area.

Another should be accessible from the cockpit for use into the main saloon, the same one being accessible from the main saloon to use directly in the cockpit. In practice, depending upon the size of vessel this is somewhere between 1 and 4 in total.

On any substantial petrol engine inboard installation the best advice would be to install an automatic unit of appropriate power in the engine bay, perhaps two in some cases. In the case of a large cockpit, such as a substantial power driven vessel, a separate extinguisher should be permanently stored in an accessible position.

All the extinguishers should be permanently stored and easily accessible and highly visible. All modern extinguishers will have a date stamp written on them and the date of replacement due. Those fitted with pressure gauges should have the needle registering in the acceptable sector, and those that are subject to regular servicing intervals should have historical records attached.

The generally accepted minimum fire rating is 5A/34B, this should be stamped on the side of all extinguishers and is an indication of what size of fire this particular extinguisher is capable of tackling. The A, B, C rating that is stamped on the side of extinguishers indicates the type of fire that this extinguisher can tackle, **A** referring to paper, wood & textile fires, **B** flammable liquids petrol etc, **C** flammable gasses, propane, butane etc. Any vessel that uses flammable liquids or gas for cooking is required to have a fire blanket permanently located in this cooking area

Anchor and ground tackle.

Max. Boat Length	Boat Displacement	Min. Anchor Weight		Dia Shackle	Dia Chain	Nylon Rope Dia
Dinghy, Tender, Optimist	n/a	2 kg	4.4 lb	8 mm	6 mm	6mm
Dinghy, Inflatable Boat, Small Catamaran upto 4m	300kg	3.5 kg	7.7 lb	8 mm	6 mm	6-8 mm
Boat upto 5.50 m	800 kg	6 kg	13 lb	8 mm	6 mm	10 mm
6.50 m	1000 kg	8 kg	17 lb	8 mm	6-7 mm	10 mm
7.50 m	2000 kg	10 kg	22 lb	10 mm	8 mm	14 mm
9 m	3000 kg	12 kg	26 lb	10 mm	8 mm	14 mm
10.50 m	4500 kg	14 kg	31 lb	10 mm	8 mm	14 mm
12.50 m	8000 kg	16 kg	35 lb	12 mm	10 mm	18 mm
16 m	12000 kg	20 kg	44 lb	12 mm	10 mm	18 mm
18 m	16000 kg	24 kg	50 lb	16 mm	12 mm	22 mm
20 m	20000 kg	34 kg	75 lb	16 mm	14 mm	24 mm
25 m	30000 kg	40 kg	88 lb	16 mm	14 mm	24 mm
25 m +	30000 kg +	60 kg	140 lb	18 mm	16 mm	28 mm

The anchor weight is only given as an indication, per length of boat. However, this criterion alone is not sufficient, and your anchor selection should also recognise the specific construction of your vessel.

These pages are cleared

The above table should be used as a guide to approximate weight and size of anchor. Any vessel that is used for extended cruising or any vessel over approximately 26 ft. should have the option of a secondary anchor with a dedicated anchor chain/warp.

All anchor shackles should be securely moued and the bitter end of any chain should be securely attached to the vessel are by a strong lanyard that is long enough to exit the hawse pipe to enable it to be cut in an emergency. The loss of the chain is preferable to the loss of the vessel if needs require.

The above information is given in good faith and without bias based upon experience. Where the report makes reference to this section, it is imperative that the relevant sections are fully understood and applied to the vessel if appropriate, as some of the relevant comments above **will** form part of the report.

Some other professionals may have differing views and methods. If in doubt, please make other enquiries with regard to methods before embarking upon a complex repair. Always seek professional advice if unexpected problems occur in the course of any repair work or any uncertainty is present because of lack of experience in particular areas. It is assumed that all repair work carried out based upon this report will be to a professional standard at all times. No responsibility can or will be accepted by inferior workmanship or materials.

The information in this section should NOT be used without reference to professional techniques and knowledge and is necessarily limited in its scope and is not meant as a professional guide to interpretation and repair of any of the faults described. No responsibility will be accepted for unnecessary or failed repairs undertaken on the basis of the information in this section.

Reproduction of this section for commercial use is not permitted and should only be used for information and client use. No copying of part or all of this section for commercial financial gain will be permitted except where written permission has been obtained.

In any cases where a degree of misunderstanding or ambiguity about any conclusion, comment or speculation remains, it is imperative the client contact the surveyor for total clarification of any points. No responsibility will be accepted for actions taken where the client does not have full understanding of the implications of any action taken upon reading the report.

Please retain the above information as part of the survey report as it forms part of the report in many cases where any reference has been made to it.

SURVEYOR

DATE January 10 2007

copyright remains the property of John Lilley 1998.the document shall not be reproduced or passed to a third party other than the client's insurers or authorised repairers