Pre Purchase Survey Report No: CHE0002

Name of Vessel: [redacted]

Survey Commissioned by:
[redacted]

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About the Survey and this Report

This survey was carried out by Hugh Ellacott at the request of [redacted] who is a prospective buyer of the vessel.

Scope of Survey

- This is a pre-purchase survey and its purpose is to establish the structural and general condition of the vessel. Where items of equipment have been tested this is stated in the text.

Limitations

- Where access is restricted by fixed panels, linings etc. it was not possible to carry out an examination and I cannot say those areas are free from defects.
- This report has been prepared for the use of the commissioning client and no liability is extended to others who may read it.
- At the time of the survey the mast was stepped and rigging was in place. It was not possible to carry out detailed inspection of spars, sails, rigging or other equipment above head height.
- In some cases it was not possible to detect latent and hidden defects without destructive testing which was not possible without owner's consent.
- On instruction from the owner, it was not possible to carry out all tests normally employed during a pre-purchase survey; notably it was not possible to scrape the anti foul coating from the hull in order to examine the underlying coatings and laminate. Presence of the anti fouling also affected the confidence in the moisture readings take on the underbody – this is discussed below.

Conditions of Survey

The survey took place on [redacted] June 2011 while [redacted] was lying ashore at [redacted]. According to [redacted] the vessel was lifted ashore approximately two months prior to the survey.

The weather on the day of the survey was overcast with intermittent and occasionally heavy rain for the most part of the day. This prevented the taking of reliable moisture readings, and therefore the following day was used to complete the survey. The weather on the second day was dry, breezy with sunny intervals.

Methods

<u>Moisture Measurements</u>

All moisture measurements on the vessel were taken using a Sovereign Quantum Marine Moisture Meter, a capacitance-type moisture meter. The calibration of the meter was checked on the day of survey, prior to any readings being taken. Readings were taken in the relative mode, which ranges between 0-100. The values should be regarded as an index and **do not** represent moisture content as a percentage of dry weight. Where appropriate both shallow and deep reading modes were employed. Direct comparisons between readings taken with the Sovereign Quantum and other meters, including those made by Sovereign, are not valid.

The conditions prevailing when the readings were taken are given below.

- Air Temperature 22.1°C
- Relative Humidity 44.5%
- Surface Temperature 23.1° C
- Dew Point* 9.2°C
- Vessel brought out approximately two months prior to the survey

* Actual dew point and not difference between surface temperature and dew point

In summary, the conditions were good for obtaining moisture readings within structural components of the vessel.

Interpretation of Moisture Measurements

High moisture content is not generally a structural defect, and is to be expected in older boats. However, where some moisture has been absorbed the likelihood of moisture-related problems occurring is higher, and the actual state of the laminate cannot be completely guaranteed without destructive testing followed by chemical analysis. The opinions given in this report are based on all the evidence available at the time but without destructive testing. Further discussion is given in the body of the survey report.

Conventions

Numbered items in the text are referred to from forward to aft, e.g. frame 4 is the fourth frame aft of the stem and forward of frame 5.

Recommendations

Recommendations in this report fall into two categories, which are explained below.

Recommendations

Recommendations are limited to those defects which should be rectified before the vessel is used (or within a given time span if specified) or may affect the ability to obtain insurance for the vessel.

Advice

Advice is given concerning defects that do not restrict the use of the vessel or her safe use. These defects may be cosmetic or concern actions that will prevent more serious defects developing in the future. Although these defects may be considered minor, do not assume repair costs are low.

Recommendations and advice made in the body of the report are both printed in italic font. A table of all recommendations and advice is reproduced at the end of the conclusions.

1. Particulars of the Vessel

[redacted] is advertised by the broker, [redacted] Yacht Sales, as a Moody 376, designed by Bill Dixon and built for Moody by Marine Projects in 1988 and launched in 1989. The design is a modern fin keel yacht with a centre cockpit and sugar scoop stern. She is a sloop with a masthead rig. The hull's construction is a solid glass reinforced

plastic (GRP) lay up; however, the deck and coachroof employ a sandwich construction.

According to the broker, [redacted] has been in the same ownership for the last fifteen years and during the sailing season has been on a river mooring and hauled ashore each winter apart from 2010/2011. A document on board indicates she was moored at [redacted].

The broker's details report the following specifications that accord with data researched elsewhere on the internet.

- Length Overall 37' 10"
- Length Waterline 31' 3"
- Beam 12' 6"
- Draft 5' 6"
- Displacement 16,250 lbs
- Ballast 6,500 lbs

Identifying Numbers

- Lloyds Register No. [redacted]

A plaque on the port side of the saloon reported the following information: official number 717108 and registered tonnage 13 $^{39}/_{100}$, indicating the vessel is or has been Part 1 registered.

The following number was recorded on the battery isolator switch panel on the main switchboard, above the chart table.

- Yard No. [redacted]
- Log Reading 3978.85 nautical miles

The broker's inventory has been checked and found to be correct apart from two items which were not found during the survey. They were the mooring pickup and webbing jackstays. It was also noted that the freshwater tanks were not as described on the inventory.

2. Keel

The vessel has a long fin keel made of cast iron. It was lying fair to the hull and the seam with the hull was visually inspected and no visible defects were found. However, the keel was not seen with the keel bolts in tension, i.e. when the boat is lifted in slings. The keel has been antifouled, though there was surface rusting where the antifouling had come off in a few places. The forward edge of the keel was visually examined and no signs of significant impacts were seen.

Internally access to keel bolts was limited and only four were accessed for examination. The centre sole board under the table in the saloon was lifted to reveal two keel bolts. A further two keel bolts were seen under the companionway steps, in the bilge pump well. Access here was difficult, requiring removal of the steps and a

locker to provide access to a lifting panel. The keel bolts are studs fastened with what appeared to be mild steel nuts and backing plates. The four keel bolts were hammer tested. Though crusted with surface rust all four nuts were sound.

Salt crystals were noted in the well, which may indicate a very minor leak to between the ballast keel and the hull. However, there was no tidemark present to indicate that a significant amount of water enters the vessel when she is afloat. It would be prudent to monitor water in the bilge.

3. Hull below Waterline

The hull is solid GRP construction, which was seen in the cockpit locker. The hull was viewed from various angles; no deflection or unfairness was seen in the vicinity of the keel or shores. The skeg was aggressively tested and no weakness was discovered. The broker's details state that the hull was given an epoxy coating pre 1996. This was seen in places where the antifouling had come away from the hull.

The underbody was hammer sounded and no defects were identified.

Moisture measurements were taken at 24 places throughout the underbody. As the owner had not given permission for antifouling to be removed, the locations were selected where previous patches had been scraped or where antifouling has peeled away. However, some readings were taken through the antifouling. No difference was noted between readings with or without antifouling present. The table below shows the range of moisture readings found in the underbody; above-the-waterline readings are included for comparison.

Mode	Range Below Waterline	Range Above Waterline
Shallow Mode	**16 – 19**	**13 – 16**
Deep Mode	**16 – 20**	**12 – 17**

Moisture readings are low for a hull of this age, which to some extent can be attributed to the benefit from the epoxy treatment, but also to the fact that the vessel has been hauled ashore each winter. Visual inspection did not reveal any evidence of osmosis, e.g. blistering. This is consistent with the low moisture measurements.

Minor impact damage was found to the bottom edge of the transom, where several chips in the hull have been repaired. The filler in the repair was no longer adhering and a spike could be inserted to a depth of 8mm. Although, a good depth to the GRP lay up was noted and this point and it was not considered water-tightness should be compromised, the extent of the damage should be investigated and a repair made. Moisture measurements taken around the repair were slightly elevated (20-26 in shallow and deep modes). The degree of moisture ingress is not considered to be of concern currently, but the proposed repair should prevent any further water penetration.

Recommendation
Investigate and make good the poor repair to the chipped laminate in the lower edge of the transom.

The antifouling was in poor condition; the surface is rough in places and there were extensive areas where the coating has come away from the hull.

Advice
Scrape hull back to epoxy coating and apply fresh antifouling coating.

4. Topsides above Waterline

Unlike the underbody the topsides retain their original white gelcoat finish. The topsides were lightly hammer sounded and no areas of delamination were detected apart from those associated with visible damage that is described below.

Impact damage was seen on the stem, which appears to be the effect of two separate collisions, see photo left. Crazing has occurred in a radius of approximately 250mm around the points of impact. Hammer sounding did not identify any delamination of the laminate within this radius apart from at the very point of impact. The laminate was spike tested at the point of impact and it was found to be solid. Moisture was high in the immediate vicinity of the point of impact (60-80 on both shallow and deep modes). In summary, it is considered that there is little loss of structural strength as a result of the damage to the stem and main consideration is cosmetic.

Crazing was found on the port topside, in two places 200mm below deck level and 1m and 1.75m aft of the mast. It is thought that this damage may be the result of a single incident, because of the arced shape of both areas of crazing. Hammer sounding indicated a small and very localised area of delamination in the forward area of crazing. Moisture readings corresponded with average readings for the topside. It was not possible to inspect the internal structure of the hull at this point. In summary, it is considered that there is little loss of structural strength in this area, especially given the close proximity of the deck which has a reinforcing effect; repair is not necessary. However, the damage should be monitored during annual inspections.

A minor repair was noted on the port topside, amidships, 300mm above the waterline.

There are no rubbing strakes fitted to the topsides. Cosmetically the topsides are in average condition for the age of the hull, though the styling stripes are badly abraded and broken in places. There are minor abrasions present consistent with the age of the hull. Polishing would improve the hull's appearance.

5. Deck moulding

The deck is GRP moulded with areas of core construction using endgrain balsa. An example of the construction could be seen in the port cockpit locker. The deck lay up in the locker is some 8-10mm thick, where it reverts to solid construction. Surface

panels finished with a light grey non-slip material have been moulded in as part of the original construction.

The entire deck was found to be firm underfoot and light hammer sounding revealed no defects such as delamination of the core. The only point where the deck could be deflected was the attachment points for the davits. Pressure on the davits was seen to deflect the deck, though no crazing has occurred around the timber deck pads supporting the davits. Strengthening pads can also be seen inside the aft cabin.

Advice
Consider increasing the size of strengthening pads for the davits mountings found in the aft cabin.

Moisture measurements were taken across the deck, particularly in areas around deck fittings. Elevated moisture measures were recorded around cleats and rigging attachment points. These were in the range 23 to 35 in deep mode and returned to normal levels for this deck (16-19) generally within 300mm of the fitting. Elevated moisture levels (34-35 on deep mode) were also detected adjacent to the coachroof coaming on the port side. These are not high levels for a deck of core construction on a vessel of this age. The deck should continue to be monitored for debonding of the core, but at this time there is no evidence of structural deterioration.

A few areas of crazing were noted, none of which currently significantly compromises the strength of the deck. Crazing was found around the inboard leg of the port pushpit. It is my opinion that this is due to the wind generator mounted to this section of the pushpit. When the wind generator is moved to and fro movement is seen being transferred to the deck via the inboard leg. There is minor crazing at the aft end of the jib sheet pulley attachment on both sides.

Advice
Either strengthen wind generator support or mount generator elsewhere.

The toe rails are made from aluminium extrusions, which are in two pieces, the join being 1.5m aft of the stem. A few fastenings were randomly selected for hammer testing and found to be secure. The toerails lie fair to the decks.

Cosmetically the appearance of the deck is good for a 23-year-old yacht.

6. Coachroof

As with the deck, the coachroof has light grey non-slip panels. Its construction is assumed to be the same as the deck, i.e. GRP with a balsa core, but despite attempts to remove trim around two vents the nature of the construction was not seen.

The entire coachroof, including that above the aft cabin, was found to be firm underfoot, and hammer sounding revealed no defects. No distortion was noted to the coachroof near the mast step. A hairline crack was noted in the gelcoat aft of the inner forestay (see Section 17 for further information).

Moisture readings were comparable to other “dry” deck readings of the vessel, though a slightly elevated level was measured in close proximity to the electrical cable glands

forward of the mast. There was also elevated moisture in the coaming on both sides (14 –30 in deep mode), probably due to leaking port lights (see page 13).

Both hardwood and chromed handrails were securely attached to the coachroof. Cosmetically the appearance of the coachroof is good for a 23-year-old yacht.

7. Cockpit

The cockpit is self-draining with two drains to the aft. The hoses for the two drains are connected together and discharge from the port topside. The hoses and their attachments were examined, tested and found to be secure.

The sole boards and bench seats were covered with teak-faced plywood that was in very poor condition. Renovation might be costly because removal of the plywood can damage the underlying laminate.

The cockpit sole is removable to allow lifting of the engine. It is fastened with stainless steel bolts, nuts and washers, some of which were tested at random and found to be secure.

The pedestal for the steering wheel and compass was tested forcefully and no movement was found. All four bolt heads were hammer tested and did not fail under test. Internally the pedestal is mounted on a plywood pad, which appears as good as new. It was noted that some of the plastic coating was “bubbling” away on the starboard side of the pedestal, probably as a result of minor surface corrosion on the metallic surface of the pedestal. It is of cosmetic concern only.

Chips were noted to cockpit moulding below the hatch boards; they are only of cosmetic concern. Cosmetically the appearance of the cockpit is poor owing to the deterioration in the teak-covered sole boards and bench seats.

8. Hull/Deck Join

The hull deck join was seen in the porthand cockpit locker. The join is mechanical, whereby the hull moulding is fastened to the deck moulding using stainless steel bolts. Sealant is used to make the join waterproof. The bolts are used to attach the aluminium toe rail to the deck. Four bolts were selected at random and hammer tested and found to be secure.

9. Bulkheads and Structural Stiffening including Internal Mouldings

The mast compression post is stainless steel and is located in the saloon. The sole board under the saloon table was lifted, revealing the compression post resting on a massive transverse girder. There was no evidence of the post being driven into the girder. The girder was hammer tested which indicated it was sound.

Bulkheads and structural members were hammer sounded throughout the vessel, where access allowed. This included hammer sounding along the horizontal longitudinal attachment between the hull and inner mouldings, i.e. along berths and settees in the saloon and cabins. Structural members and GRP attachment between bulkheads and the hull were visually inspected, also where access allowed.

No significant defects were discovered as a result of the above tests. The following minor defects were noted.

Loose fibres were noted on the forward side of the forward heads bulkhead; spike testing indicated that the attachment to the hull is secure. On the other side of this bulkhead, in the locker under the sink, minor delamination of the bulkhead/hull attachment was seen. A feeler could be inserted to a depth of approximately 50mm and this defect extends from the lower end of the bonding upward for some 200mm. The defect is not considered to be of serious concern.

Debonding of the GRP attachment was also observed in the aft bulkhead in the aft heads. This minor defect does not constitute significant loss of structural strength.

Moisture readings were taken in bulkheads throughout the vessel, where access allowed. As a comparison moisture readings were taken in the door for the aft cabin. One of the most important structural bulkheads in the vessel is that at the forward end of the saloon; moisture measurements for this bulkhead are given below. It can be seen that the moisture levels are not above the ambient levels for the vessel.

Mode	Range - Fwd bulkhead, saloon	Range – "Dry" Bulkhead
Shallow Mode	**14 – 30**	**22 - 28**
Deep Mode	**24 - 29**	

It was generally noted that moisture levels were lower in lower parts of bulkheads, in lockers and below sole level. This is a good indication that the bulkheads are not suffering from significant water ingress.

The only bulkhead with very high moisture levels was the aft bulkhead in the port cockpit locker. The timber was spike tested but resisted penetration. It was noted that rain can get into the locker and the bulkhead is adjacent to the aft heads, which may explain why high moisture was found here.

Mode	Range - Aft Bulkhead in locker	Range – "Dry" Bulkheads
Shallow Mode	**25 - 35**	**22 - 28**
Deep Mode	**35 - 70**	

10. Rudder and Steering

The rudder is of GRP construction with a stainless steel rudderstock. The stock was not magnetic, indicating it is probably made of austenitic marine grade stainless steel. None of the rudderstock could be seen on the outside of the vessel, preventing inspection for corrosion. It would be prudent to drop the rudder to inspect for corrosion as part of routine maintenance.

The rudder was aggressively tested for movement and weakness; there was very little play around the stock and the rudder withstood the test. The rudder was hammer sounded and no defects were detected. Visual inspection of the rudder, including its underside, found no defects. Moisture measurements were taken of the rudder and are shown in the table below.

Mode	Range in Rudder	Range in Hull above Waterline
Shallow Mode	**18 - 26**	**13 – 16**
Deep Mode	**28 - 42 (most in 30s)**	**12 – 17**

As can be seen, there has been some moisture ingress into the rudder. This is very common in vessels of this age, as it is exceedingly difficult to permanently seal the junction between the rudderstock and the rudder. As no other defects have been detected in the rudder, there is no requirement for remedial action at this time.

The rudder is actuated by means of cables running from the steering wheel to a cast bronze quadrant mounted on the stock. There is no gland sealing the stock in the rubber tube; it is known that two O rings are fitted inside the tube to effect a seal. There was no evidence of any leaks around the tube. If the rudder is dropped for inspection of the stock the O rings should be replaced.

Cables were of stainless steel 7x7 wire rope. Stops were present on the quadrant. It was noted that the bulldog grips securing the cable to the quadrant were attached the wrong way around; the bridge of the grip should be on the standing end of the cable and not the free end. Grips should be position six rope diameters apart.

The steering wheel was turned through its full travel both to port and starboard, and was seen to turn the rudder. It moved freely and there was no noticeable play. A mild steel emergency tiller was stowed adjacent to the steering quadrant.

The vessel is fitted with an autohelm which was not tested. The control unit is located under the pilot berth. The hydraulic arm was visually inspected; no leak of hydraulic fluid was noted.

11. Stern Gear

The vessel is fitted with a two-blade, right-hand propeller that was probably cast in manganese bronze. It was inspected for signs of corrosion and only very minor pitting was noted. The edges of the blades were in good condition and no signs of corrosion or damage due to impacts were noted. The propeller was securely fastened to its shaft with a nut secured in place with a split pin. The propeller turned freely.

The shaft is of stainless steel; it is non magnetic, indicating it is probably made of austenitic marine-grade stainless steel. The outboard bearing is held in a P-bracket which was vigorously tested and did not exhibit any movement (internal access to the bracket's fastenings was not possible). When a small area of antifouling was removed the metal (assumed to be manganese bronze) was seen to be bright and no corrosion was evident. The cutlass bearing could not be seen, as it was recessed too deeply within the bracket. However, there was very little vertical play in the shaft when tested.

A rope cutter was fitted to the shaft forward of the propeller.

The inboard gland consists of a traditional stuffing box fitted with a greaser. It was attached to the stern log with a flexible hose that was double clipped at both ends. The hose was visually inspected and the stainless steel hose clips hammer tested; no

defects were found. The "glassing-in" of the stern log to the hull was a little untidy, but it was tested with a spike and found to be sound.

12. Cathodic Protection

A zinc anode was located on the starboard side of the prop shaft close to its entry through the hull. It was between 10% - 20% wasted. A backing plate was noted, allowing its replacement without access to the interior of the hull. However, when inspected internally it was found that the bolts were not backed with large washers or backing plates and untidily sealed with sealant. The accessible forward bolt and nuts were physically tested and judged to be secure, so although acceptable it would be preferable to improve the internally mounting of the anode bolts.

Continuity between the anode and the propeller (and therefore its shaft), and also the anode and the P-bracket were tested with a multimeter. Good connections were found. As noted above, the condition of the propeller and the P-bracket were good so the anode has provided good protection of these components.

13. Skin Fittings and Other Through Hull Apertures

No skin fittings or their valves were dismantled as part of this survey. Instead the following tests were carried out to all skin fittings listed below, as appropriate.

- Visual examination outside the vessel; this was hampered by the presence of antifouling which I was instructed not to remove
- Visual examination inside the vessel
- All valves were opened and closed through the full extend
- All fixing bolts were hammer tested where accessible
- The bodies of all valves and seacocks were tested with a hammer
- All metal fittings were aggressively tested for security of attachment to the hull (plastic fittings, e.g. log housings, were also tested but with less vigour)
- Hoses were tested for security and hose clips were visually examined as far as access would allow.

The following waterline or below waterline skin fittings were identified:

- Forward (fore cabin, forward heads and forward part of saloon)
- Forward heads intake (under starboard V-berth)
- Shower discharge (under starboard V-berth)
- Forward sink discharge (locker under sink)
- Forward heads discharge (sole hatch, forward end of saloon)
- Log (sole hatch, forward end of saloon)
- Engine intake (engine compartment)
- Cockpit drain (port cockpit locker)
- Aft sink discharge (locker under sink in aft heads)
- Aft heads intake (locker under sink in aft heads)
- Aft heads discharge (under aft cabin double bunk)

Only one ball valve was found to be inoperable and that was for the cockpit drains located in the cockpit locker.

Recommendation
As a minimum, service the cockpit drain ball valve, but as it is almost certainly brass see advice below concerning the replacement of brass valves on skin fittings.

The external fittings for both heads intakes displayed signs of corrosion and are believed to be brass or other high zinc content, copper alloy. No corrosion was noted to any other external fitting; however, the presence of antifouling prevented thorough inspection.

All valves were ball valves apart from the seawater intake for engine cooling which was a traditional bronze seacock. The valves were silvery coloured and to my knowledge there are no bronze or dezincification resistance DZR valves made with this finish; they are therefore almost certainly made of brass. Yachting Monthly are currently investigating the use and suitability of brass through hulls. One marine insurer has indicated that it might not settle claims where brass through hull fittings have failed. Internal corrosion to the ball valves may not be seen until it fails.

Advice
It is strongly advised that the brass ball valves on through hull fittings are replaced, but advice from insurers should be monitored as requirements are evolving at the time of writing this report. Replace external fittings for the heads intakes with bronze or (DZR) fittings. Examine all other external waterline or below waterline skin fittings and replace if made of brass or other high zinc content, copper alloy.

With the exception of the log and transducer all skin fittings were hammer tested and did not yield when so tested. Throughout the vessel hoses attached to skin fittings were fastened with two stainless steel clips. These were visually inspected and hammer tested and no defects were detected apart from the aft heads intake where one of the hose clips is pinching the hose and could cause a leak. It is normally good practice to double clip all through hull fittings except where the hose tail is too short to accept two clips, which is the case in this instance.

Advice
Remove second hose clip from aft heads intake.

A log and echo sound transducer are mounted near the centreline immediately forward of the keel. Both are fastened to the hull utilising a large plastic nut located on the body. The fittings are secure but there have been a few incidents involving this type of fitting where the external flange has sheered off, allowing the body of the fitting to come loose in the boat and leaving a 37mm hole. This is rare but all unreinforced plastic such as this will deteriorate over time and the life of the fitting is largely dependent on the amount of tension it has endured since being fitted in the first place. Many installers over-tighten these fittings and it is therefore prudent to apply a light GRP lamination or epoxy fillet over the securing nut and onto the surrounding hull surface inside the boat in order that the fitting remains *in situ* should the flange sheer off. Obviously the flange should be inspected whenever the opportunity arises. A second transducer, which does not penetrate the hull, is also present. If it can be established that the through hull transducer is not needed, then it may be preferable to

remove it and make good the hull by grinding back around the aperture, relaminating with epoxy resin and finishing.

The following above waterline skin fittings were identified:

- Exhaust discharge for diesel heater (port cockpit locker)
- Bilge pump discharge (port cockpit locker)
- Drainage for gas locker (port quarter)

14. Main Companionway and Other Access to Accommodation

The main hatch is of perspex and is secure. The companionway steps are well secured. There is a plywood hatch board that has ventilation grills let into it. It is in sound condition but has a 20mm diameter hole cut on one side near its top. A second perspex hatch board was found on board. This was of sufficient strength for its purpose, but was a loose fit and its handle on the upper edge was broken. There was no means of securing the main hatch or boards from inside the boat.

Advice
Provide means of securing hatch from inside the boat and provide lanyards for hatch boards.

The garage for the main hatch has a number of minor defects; it has cracks to the moulding on both sides at the aft end and the attaching screws do not lie fair. The cracks have been made good with a soft sealant that appeared to be watertight. There is a 100-150mm crack in the starboard side just forward of the hood and another small crack around the foremost screw and the starboard side. In summary the garage is in poor condition but is serviceable.

Both the fore cabin and aft cabin have perspex hatches that provide adequate means of escape from the vessel. They are secured by means of two lockable handles. Both hatches exhibit crazing, but are serviceable. No leaks were apparent during the incessant rain during the first day of the survey. The fore hatch has a ventilator set in its centre and it was noted there was some brown staining around the self-tapping screws holding the ventilator in place. The screws were hammer tested for soundness and did not yield. However, it would be prudent to replace the screws with 316 stainless steel screws during routine maintenance.

The hatch at the forward end of the main saloon was free from leaks but is severely crazed (worse than all the other hatches). It was tested by application of firm pressure – I stood on it – and did not break, but I consider it is on the borderline of serviceable life. Replacement of perspex hatches can be quite expensive.

Advice
It is strongly advised to replace the hatch in the saloon; the fore hatch and aft cabin hatch will require replacement in due course.

Both forward and aft heads have small hatches that are also crazed but are serviceable and did not exhibit any leaks in the rain. The upper part of one of the handles on the forward heads hatch was missing. It was physically tested and found to move more

than the other handle, but only marginally so and is therefore considered to be secure at the present time. However, it would be prudent to replace during routine maintenance.

15. Ports

There are six non-opening ports in the coach roof sides, four in the saloon and two in the aft cabin. The frames are made of aluminium and secured with stainless steel screws. One screw in each window was loosened and retightened. They were all found to turn easily and be in good condition, although very minor corrosion was noted on the aluminium around some screwheads. All the perspex in the windows was crazed to a greater or lesser extent. The windows flexed under firm pressure but were secure and are therefore considered to be serviceable. Leaks were noted in four of the ports.

Advice
Reseal all six non-opening ports or otherwise expect uncomfortably damp berths on longer passages.

Two small opening ports are found in the aft cabin and are positioned in the transom. Again there is slight crazing of the perspex, but under firm pressure they were found to be secure. They could be securely closed, but were easily opened with their handles.

16. Pulpit, Stanchions, Pushpit and Jackstays

The pulpit is bolted to the toerail; one bolt was tested and found to be secure.

The port and starboard granny bars were vigorously tested and found to be secure. All securing pins in their feet were present.

The pushpit is in two pieces, each part having three feet. The two outboard feet are attached to the toerail and are very secure. However, the inboard legs are attached to the deck and on the starboard side the attachment is loose. The port one is secure, but causing crazing to the deck (see page 5).

Advice
Tighten fastening for inboard leg of starboard pushpit.

The stanchions are attached to the toerail; each was physically tested and found to be secure apart from those around the port and starboard boarding gates. The forward port gate stanchion was loose and the feet for the aft one did not lie fair to the deck. On the starboard side the foot for the forward gate stanchion has been refastened to the deck, though it still does not lie fair, see photo. The stanchion itself was more secure than the equivalent one on the port side.

Advice
Fasten gate stanchions more securely.

The guardlines and their terminals were visually inspected for evidence of broken strands; none were found. No jackstays were rigged on deck and none were seen amongst the stowed gear, though they are listed in the broker's details. A complete inventory of gear was not made during the survey, so the jackstays may be present amongst gear on the vessel.

17. Rigging Attachment Points

The rigging set up was taut and stays were aggressively swigged to test attachment points. The rigging attachment points are described below.

- Main forestay is attached to a substantial stemhead fitting securely through-bolted.
- Inner forestay is attached to a stainless steel chain plate through coachroof; no internal access was possible from inside the vessel. However, a hairline crack was noted just aft of the chain plate, see page 6, which could be a result of stresses cause by the stay. No distortion was noted to the coachroof or internal structures such as bulkheads or doorways. It is therefore considered that no remedial measures are necessary, but the crack should be monitored.
- Main cap and lower shrouds are attached to deck plates that are through bolted to internal structures. Internal linings prevent visual inspection of the attachments internally. No distortion was noted to the deck plates or in the topsides. The deck plates were lying fair to the deck.
- Backstay is plate bolted through transom that is simple and strong.

18. Ground Tackle and Mooring Arrangements

A Lofrans manual anchor winch is set below deck level in a recess in the bow, under a deck hatch. The winch handle was present allowing the winch to be tested with no load. It was seen to operate. The stemhead fitting has a roller for the anchor chain and the chain can be secured in place by a pin. From the anchor locker (accessed through the forward cabin) a mounting plate for the anchor winch can be seen. A layer of rust was present, but on testing with a hammer the plate and the nuts were found to secure.

The stemhead fitting is secured by large bolts, which were tested and found to be secure. Some brown staining on the fitting around the boltholes. The security of the fitting should be regularly monitored.

Anchors had been stowed in the cockpit locker. The main anchor is Bruce anchor of 33lbs. In addition, a Danforth anchor with chain (not inspected) was also present in the locker. A very rusty chain was seen in the anchor locker, as was a three-stranded warp. Further inspection of the anchor chain was not undertaken as the broker's details state it should be replaced. The warp was not inspected.

Recommendation
Replace anchor chain.

There are six mooring cleats fitted to the deck, forward, aft and amidships. All were tested with a bar, and a number of bolt heads hammer tested. All cleats were found to be very secure and no flexing of the deck was seen around the cleats.

19. Other Deck Gear and Fittings

In the cockpit there are six winches:

- 3 x Lewmar 16
- 2 x Lewmar 43 (two speed)
- 1 x Lewmar 8

All winches were operated (not under load) and found to work smoothly, apart from the starboard forward winch that sounded slightly rough, though it operated well enough. The winches were vigorously tested and found to be well secured to the cockpit/deck mouldings.

Tracks for the headsails were secure; six bolt heads were tested at random. Similarly the mainsail track was found to be secure.

Wood pads under the pulleys mounted on the coachroof were deteriorating as a result of being exposed to the sun and rain. The endgrain on the portside one in particular was starting to open up. They were spike tested and are both serviceable but their condition should be monitored.

20. Davits and Boarding Ladders

The arrangement of the davits allows the dinghy to obscure the stern navigation light.

Advice
Hang dinghy from davits so that the stern navigation light is not obscured.

The presence of the dinghy hampered examination of the boarding ladder. It was adjudged to extend at least 1m below the waterline, but this could not be measured. The attachment of the davits is discussed on page 5. No further tests were performed on the davits.

21. Spars

Mast
The broker's details state the mast was serviced in 2006. As far as could be seen from deck level with mast stepped the silver anodised Kemp aluminium mast is in good condition with no serious corrosion around fittings and rivets. All fittings accessible from deck level were secure. No stress cracks were noted to the cast heel fitting.

The mast has been retrofitted with behind-the-mast roller reefing for the mainsail. Two winches are mounted on the mast; a Lewmar 30 and a Lewmar 16. There were not operated but found to be securely attached.

Boom
The silver anodised aluminium boom was in similar condition to the mast. Rigid mechanical kicking strap arrangement was secure and in good order. No due play was noted in the gooseneck.

Spinnaker Pole
The only other spar, a telescopic spinnaker pole, was inspected. The pin at one end was jammed.

22. Standing Rigging

The mast is supported by a forestay, inner forestay, backstay and strouds arranged in two panels. The broker's details state the rigging was inspected along with the mast in 2006; there was no information on the age of the standing rigging. As far as could be seen from deck level with mast stepped the 1x19 stainless steel rigging is in good condition with no visible damage or kinks to the wire noted. The shrouds were aggressively swigged; spreaders were seen to be secure and set correctly. The shroud terminals with the mast were viewed from below and seen to lie true to the line of tension; essential if premature fatigue of the shrouds and attachments is to be avoided.

The four bottle screws and their toggles were examined with a 10x magnification hand lens; no corrosion or stress cracks were observed. Terminals were swaged.

Headsail roller reefing was found to operate freely and well secured at base.

23. Running Rigging

The running rigging was in below average condition and replacement of sheets and halyards has not been undertaken in recent seasons. The looped lift for the spinnaker boom slide was very stiff and quite old (the lovely seaman's whipping on its ends suggests it is not a recent addition to the running rigging). The outhaul for the mainsail was frayed in places and in the worst condition of all the running rigging. The headsail sheets, mainsheet, mainsail inhaul, jib inhaul, and halyards were considered serviceable.

24. Sails and Covers

The broker's details list four sails including the original mainsail. A strong breeze prevented unfurling more than a few feet of the furling jib and furling mainsail. Broken stitches were noted on the jib and there was considerable UV degradation to the foot and luff where the sail is exposed to sunlight and weather on the roller. It was the poorest of the sails onboard, though only a small part was seen. The condition of the few feet of the mainsail viewed was good apart from the sacrificial clew that is exposed to the weather.

The genoa was viewed onboard so only a very small part of the sail was seen. No broken stitches or UV degradation were noted, and on the basis of this limited inspection the genoa was in good condition.

Also onboard was the original mainsail, though it would be very difficult to set this sail because of the roller reefing now fitted to the mast. It was in poor condition with broken stitches and UV degradation along its leech.

Covers were in need of a wash. Those present were a sprayhood, steering wheel cover and six covers for the winches in the cockpit. The piping on the sprayhood had seriously deteriorated but was in a serviceable condition. The bungies securing the winch covers had lost their spring and need replacing.

25. Navigation Lights

Switches for the following navigation lights are present on the panel above the chart table:

- Masthead light
- Steaming light
- Tricolour / Anchor

The labelling is confused because the masthead light and steaming light refer to the same operation. On testing the port and starboard lights mounted on the pulpit were seen to work, as was the steaming light at the mast. The stern light did not come on. Owing to bright sunlight it was not possible to test the masthead light or the tricolour.

Recommendation
Fix the stern light and fully test navigation lights.

26. Bilge Pumping Arrangements

The only bilge pump aboard the vessel is a hand-operated "Whale Gusher" located in the cockpit locker. The handle was present but pump was not operated. It discharges to a skin fitting located high on the port topside. Access to the strum box was difficult requiring removal of the companionway steps and a locker underneath it.

Although the pumping capacity (thought to be 64 litres per minute) is sufficient with reference to the Marine and Coastguard Agency (MCA) guidance for this size of vessel[1], a single hand-operated pump is considered less than ideal. A second pump would provide a backup in case the first pump fails in an emergency, and if it were an electric pump it would provide protection against sinking in the event of a leak occurring while the vessel is unattended.

Advice
Fit a second bilge pump.

27. Firefighting Equipment

There are three fire extinguishers on board.

- Under table in saloon
- Opposite pilot bunk
- In aft cabin
- A fire blanket is located in the galley

1 Marine Guidance Note, MGN 280 (M). The note is not a requirement for [redacted] but provides a good benchmark for best practice.

All are dry powder and, judging by the expiry dates (circa 1993), have been on the vessel since she was built. All are out of date. Also, there appears to be a wall bracket for a fire extinguisher in the engine compartment but one was not present. The BSS[2], which provides guidance for recreational craft operating on UK inland waterways, requires a vessel of 36 feet or more to have at least three extinguishers with a combined fire rating of 21A/144B. The BSS is not applicable to [redacted] but it is a good guideline for provision of fire extinguishers.

Recommendation
Replace all fire extinguishers and give consideration to including an automatically operated one in the engine compartment.

A smoke alarm was fitted to the headlining in the forward cabin. It was not tested.

28. Lifesaving and Emergency Equipment

A Dan buoy is mounted on the starboard side of the pushpit. It is disintegrating and it is odds on for sinking if deployed. There were also two yellow lifebuoy lights above the chart table. Their operation or condition was not examined.

Advice
Replace the Dan buoy.

The two horseshoe lifebuoys noted on the broker's details were located in the port cockpit locker. Their lights were not tested. Also listed by the broker is a RIB dinghy; it was present in the davits at the time of the survey. It was not inspected.

29. Engine and Installation

According to the broker's details the engine is a Thornycroft T80D rated at 35hp. It is mounted below the cockpit and the main access is via a panel opposite the pilot's berth. A second access panel, on the port side, can be found via the cockpit locker. A plate on the engine recorded the following details:

- Engine Serial No. [redacted]
- Engine No.
- Engine 80D

The control panel above the chart table records the engine running hours as 1941.1. However, it is not possible to corroborate if this is a true record of engine hours without access to a log book and engine service history.

The broker's details recorded that a new sump has been fitted to the engine; this was seen. An oil absorbent pad has been placed in the bilge below the engine; it did not show any signs of oil contamination.

[2] The Boat Safety Scheme operated by British Waterways and the Environment Agency; www.boatsafetyscheme.com/site/Home_1.asp

The engine is mounted on massive longitudinal girders attached to the hull. These were hammer-sounded as far as access would allow and no defects were detected. Flexible mounts attach the engine to the girders; the bolts and mounts were physically tested and found to be secure.

The fan belt was too loose and should be tightened. There is evidence of a leak of engine coolant from around the thermostat housing. In general hoses and their clips were in good condition. They were probably replaced during the recent engine overall and it was nice to see hoses running through a second sacrificial hose where chafing could occur. A short red hose (located under the secondary fuel filter) was fastened with what appeared to be mild steel hose clips. Though these were tested and found to be secure it would be prudent to replace these with stainless steel hose clips.

The filler cap was removed, but the water level was not visible though water was clearly present. A rusty sludge was noted coating the internal surface of the heat exchanger indicating that the corrosion inhibitor may not have been used. It would be advisable to flush the engine coolant system and ensure inhibitor (included in proprietary antifreeze) is always used.

Oil was checked in both the engine dipstick and the gearbox dipstick. Engine oil was black, did not display signs of water or any untoward odour. Automatic transmission fluid (ATF) was present in the gearbox and was clean, i.e. still a pinky red.

The overall impression of the engine was good; it was generally clean and the paintwork was in good condition apart from on the water cooler. However, a visual inspection of the kind undertaken cannot be expected to identify many engine defects that may be present and it is always prudent to commission a sea trial or full engine survey from a marine engineer when purchasing a used vessel.

A wet exhaust feeds a mild steel muffler mounted to the aft port side of the engine compartment. The muffler was hammer tested for soundness and no defects were detected. The exhaust is then discharged through a purpose made GRP pipe just below the waterline under the transom. There is no waterlock present on the exhaust. As the gooseneck rises some 1.5m and there is a muffler present, it is not considered that seawater could be syphoned into the engine and therefore a waterlock is not considered necessary. Visual inspection revealed the exhaust hose to be in good condition (possibly new), as were the hose clips (doubled at all locations) which were physically tested at the join with the GRP pipe.

The gearbox is a Hurth HBW100-2R, serial number [redacted]. The broker reports that it has recently been overhauled, but this can only be confirmed by viewing invoices for this work. It is suggested that the invoices are requested.

The stainless steel prop shaft is attached to the gearbox with a flexible coupling. Four of the eight bolts are bright, which suggests they were replaced when the gearbox was reportedly overhauled. The other four exhibited surface rusting but were found to be secure when hammer tested. The prop shaft was found to be non-magnetic, suggesting that is made from austenitic stainless steel, i.e. marine grade.

There is a single lever engine control mounted on the pedestal in the cockpit. It was not tested.

30. Fuel System

A diesel tank made of mild steel is located immediately forward of the engine, more or less in the same compartment as the engine. Access to the tank was difficult as acoustic foam has been glued to its most accessible side. The tank is painted blue and the sides and top were in good condition, where they could be viewed. The underside was viewed with a mirror and tapped with a hammer. Although some minor surface rust was noted on the underside it is in good condition as far as could be ascertained during the inspection. A securing point for the tank could only be viewed at one location; a flange welded onto the tank was secured to a longitudinal girder by means of a stainless steel screw. The screw was tested and did not yield. It is my opinion that the screws (it is assumed there are four holding the tank, but this could not be confirmed) are undersize for the function they perform. It would be prudent to monitor the condition of the bolts securing the fuel tank, particularly after a rough passage.

The tank is fed via a marked filler point in the deck via a rubber fuel hose which is double clipped to a mild steel pipe extending from the tank. The clips at both ends were tested and found to be secure. A plastic site gauge is fitted by the side of the tank. It is open topped and operated by opening a valve at the bottom of the tank.

Advice
The sight gauge does not conform to best practice and consideration should be given to its removal and replacement with an alternative type of gauge.

The delivery line from the tank to the engine is from the top and is fitted with a valve near its junction with the tank. A copper pipe then links to a primary filter with a plastic bowl. The filter is in turn linked to the engine lift pump via both copper pipe and a plastic reinforced hose that does not meet BS EN ISO 7840. Supports for the pipe and hose are lacking.

Recommendation
Replace all reinforced plastic hose used as a fuel line with pipe that meets ISO 7840. When this work is undertaken consideration should be given to improvement to the routing of the fuel line from the tank so it can be supported, and replacement of the plastic bowl in the primary fuel filter with a metal one which is fire resistant.

In addition to the engine delivery line there is a second line that supplies a diesel heater fitted in the engine compartment. The take-off for this fuel line is adjacent to the engine take-off, but consists of a plastic auto fuel pipe held to the top of the tank by electrical tape. It was unclear whether there is a proper fitting underneath the tape and I felt it best not to disturb the precarious hold the tape has to the top of the tank, see photo below. The diesel is then delivered to the heater via a series of unsupported plastic components. In addition, another plastic auto fuel pipe is “T”ed onto this line. (It ends in a valve downstream of which is another piece of plastic pipe filled with diesel blanked off with a self-tapping screw.) It was not leaking when viewed, see photo below. All the above are in the engine compartment and could exacerbate a fire in the compartment.

Advice
The fuel delivery system should be upgraded to meet best practice. All plastic and rubber hose should be replaced by supported copper pipe. Valves should be placed on all fuel lines leaving the tank in such a position that they can be shut in the event of a fire in the engine compartment. Redundant fuel lines should be removed.

31. General Accommodation

The condition of the accommodation is moderate for the age of the boat. There were certain areas where the age of the vessel was evident: both mirrors in the forward and aft heads were losing their silvering; chrome latches on the lockers in the heads were seriously marred by corrosion, as were taps in the forward heads; and the carpets in the forward and aft cabins were worn. Head linings were in fair condition. On the other hand the teak panelling throughout the boat was in good condition. Soft furnishings were presentable, but there were occasional marks consistent with the vessel's age.

32. Gas Installation

The gas system was examined with the aim of finding visually identifiable deficiencies in the gas system. There may be other defects in the system that cannot be found by visual examination. The visual examination does not constitute any kind of gas safety certificate, which is only obtainable in the UK after comprehensive pressure testing and assessment by a qualified person registered by Gas Safe (www.gassaferegister.co.uk). It should also be noted that the broker's details state that the gas system is not guaranteed to "latest B.S.".

Gas bottles are stored in a purpose-built gas locker on the port side of the vessel, outboard from the cockpit. The locker drains overboard. A hose forming part of the gas locker drain was seen from a locker in the aft heads. No U-bend was present, which could trap gas and prevent it from draining away safely. The hose clips could not be tested as they were out of reach.

The locker contained two 4.5kg bottles of butane (it was not ascertained whether they were full or empty). No date could be found on the gas hose between the connected bottle and the regulator. Although its condition appeared serviceable, i.e. there was no cracking and it was not brittle, it has probably been on the vessel since she was

new. (Similarly the regulator had signs of surface corrosion.) Most advice recommends replacing regulators and hose at least every ten years.

A plastic hose was seen in the port cockpit locker running forward just below deck level. The hose contains the copper gas pipe.

In the galley there is a Plastimo Atlantic two burner gas cooker with oven and grill. The cooker was not tested. An armoured hose was seen running from the back of the cooker.

Advice
Replace gas hoses (in gas locker and at back of cooker) and regulator.

33. Fresh Water Tanks and Delivery

There are two fresh water tanks under both the port and starboard berths in the saloon. Tanks appeared to be constructed of black polyethylene and not stainless steel as stated in the broker's details. The capacity was not obviously marked on either, but their total capacity is estimated to be in excess of 600 litres. The water filler is amidships on the starboard side. It was not established how the tanks are interlinked, but it is assumed that they are, given that there is only one filler point on deck.

34. Heads

There are two heads, one forward and the second accessed from the aft cabin. Both discharge directly overboard. Goosenecks are present on intake and discharge hoses. The lid to the aft heads has become detached from the bowl.

35. Electrical Installation

240 volt AC

There are a number of 240-volt sockets installed throughout the boat. It appears these are not part of the original electrical installation. A 240-volt shoreline can be attached to a 16 amp plug mounted in the cockpit. An RCD was noted in the engine compartment adjacent to a domestic-type main breaker switch with fuses.

A 240-volt Cetek auto battery charger is mounted in the engine compartment. It is rated at 10 amps. It was not tested.

12-volt DC

Two batteries were located in a purpose-made battery box under the double bunk in the aft cabin. Batteries are well secured with steel straps across the top. The battery box is vented by means of a duct that terminates in the portside cockpit locker. This discharge for the duct, which is designed to safely vent hydrogen to atmosphere if the batteries are overcharged, is located within 1.5m of the air intake for the diesel heater. It is unlikely but not impossible that hydrogen could be sucked into the heater.

Advice
Relocate the discharge for the battery box vent or the diesel heater air intake externally, i.e. in the port topside near to deck level.

Two batteries were present in the battery box:

- A 90 amp hour, wet cell battery with an SAE 580 rating; it was wired as a domestic battery, but appears to be an engine starting battery given it has an SAE rating. Its condition indicator was on red, i.e. poor.
- An Exrider XV31MF rated at 800 CCA, which was assumed to be the engine starting battery judging by the heavy duty cables.

The domestic batteries and engine battery are isolated from one another by an isolating diode, which allows electrical continuity during charging.

A third battery was discovered in a locker under the settee in the aft cabin. It is not properly installed; the battery box is in a recycled food carton that has split, so would not retain any spilt battery acid; the battery is not restrained in any way; there are no terminal covers and the compartment is not vented. Again the battery is an engine cranking battery, rated at 105 amp hr and 750 CCA. It was not determined how the battery is connected to the 12v system.

The actuating arm for the autohelm chafes the main battery cable. No wear was noted at present but electrical tape has been ineffectually placed around the cable near the rub. As the metallic parts of the steering system are bonded, a high current short could result if the battery cable wears through, possibly resulting in a fire. The remedy is simple, would take five minutes and a few pence.

Recommendation
Clip the positive battery cable so it is not chaffed by the autohelm.

The battery isolator switch is located on the main switch panel above the chart table. There was also a volt meter in the panel for measuring the condition of “Battery 1” or “Battery 2”. Both battery banks had an initial reading of 12.3 volts, but on testing the navigation lights both fell to 11.7 volts indicating the batteries need replacing.

Advice
Replace engine and domestic battery. Either do without the third battery or install a battery box that will retain a spillage and is vented.

The general impression of the 12 volt system was of a poor installation; a number of examples are given below.

- There were no covers on the battery terminals
- The domestic battery cable was 4mm^2 or 6mm^2, which in my opinion is undersized. Correctly sizing this cable may circumvent the need for a third battery
- Yellow crimp connectors, designed for minimum cable size of 2.63mm^2, have been crimped to undersize cable
- Two wires, a brown and blue one, were noted twisted together under the aft end of the hatch in the aft cabin. These appear to have been part of a redundant magnetic burglar alarm switch

Advice
Commission a marine electrician (not a domestic electrician) to examine the electrical systems with a view to providing a schedule for upgrading both the DC and AC systems.

36. Electronic and Navigation Equipment

Navigation equipment is as listed on the broker's details. The following equipment was turned on and seen to power up. Further testing was not undertaken.

- Furano 1721 radar
- Yeoman plotter interface
- Philips MK9 GPS
- ICS Nav 4 paper-type Navtex
- AIS display

The autohelm interface and the VHF radio were not seen to power up, though this does not necessarily indicate any defects.

37. Heating and Refrigeration

The exhaust from the heater is vented overboard via a pipe that passes through the cockpit locker. It expels via a bronze/brass skin fitting in the port topside. The pipe is lagged, but it is not fully effective as heat damage can be seen to the plywood bulkhead in the locker. However, the paint is not scorched and spiking did not indicate any deterioration to the plywood. The lagging was visually examined and was found to be a woven cloth consisting of a white fibrous material. Where strands of cloth were broken the fibres were seen to be friable and it is possible the lagging is made of asbestos. Asbestos was used as pipe lagging until the early 1980s and as the heater does not appear to be part of the original services aboard there is the possibility that asbestos was used. It should also be noted that the lagging is right next to the ladder into the locker and will be occasionally knocked and rubbed, which increases the risks of disturbing fibres if the lagging is made of asbestos.

Advice
Test whether lagging on heater exhaust is asbestos. Arrange for professional removal and disposal if the test is positive, and then replace lagging. If replacement of lagging were necessary it would be an opportunity to place insulation board between the lagged exhaust pipe and bulkhead. However, do not disturb the lagging until its nature has been confirmed.

A 240v calorifier is located in the port cockpit locker. The broker's details state that it needs replacement, but it is unclear whether this refers to the heating element or the whole calorifier. It was noted that the electric cable to the heating element had been cut.

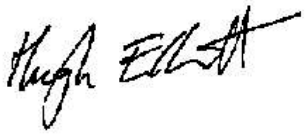
A 240v fan heater is fitted into the L-shaped settee on the starboard side to the saloon. The heater draws air from inside the locker, but no vents have been cut into the locker. It would advisable to cut holes into the locker so that the heater is not starved of airflow.

CONCLUSIONS AND RECOMMENDATIONS:

Conclusions

[redacted] is known to have been built to high standards. The survey did not reveal any structural defects and it is apparent she has not been sailed hard in the past. The low level of moisture in the underbody is a significant advantage which in part must be due to the epoxy treatment applied in the mid 1990s. The low moisture levels and the epoxy coating will protect against the possibility of osmotic defects occurring in the hull laminate.

However, her cosmetic condition is only moderate and there are signs of "tiredness" inside the yacht. There is also a pressing need to assess the AC and DC electrical systems and upgrade to acceptable standards. Similarly the diesel feeds from the fuel tank really should be improved. Replacement of brass ball valves associated with most of the skin fittings is certainly advisable and may become a requirement of insurance. With these and some other improvements [redacted] has many years of sailing ahead of her.



Hugh Ellacott, [redacted]

List of Recommendations

The recommendations made in the report are listed below with their respective page numbers. All recommendations should be carried out before use of the vessel.

Page 4
Investigate and make good the poor repair to the chipped laminate in the lower edge of the transom.

Page 11
As a minimum, service the cockpit drain ball valve, but as it is almost certainly brass see advice below concerning the replacement of brass valves on skin fittings.

Page 14
Replace anchor chain.

Page 17
Fix the stern light and fully test navigation lights.

Page 18
Replace all fire extinguishers and give consideration to including an automatically operated one in the engine compartment.

Page 20
Replace all reinforced plastic hose used as a fuel line with pipe that meets ISO 7840. When this work is undertaken consideration should be given to improvement to the routing of the fuel line from the tank so it can be supported, and replacement of the plastic bowl in the primary fuel filter with a metal one which is fire resistant.

Page 23
Clip the positive battery cable so it is not chaffed by the autohelm.

List of Advice

The advice notes given in the report are listed below with their respective page numbers. It is not necessary to carry out advice before use of vessel.

Page 5
Scrape hull back to epoxy coating and apply fresh antifouling coating.

Page 6
Consider increasing the size of strengthening pads for the davits mountings found in the aft cabin.

Page 6
Either strengthen wind generator support or mount generator elsewhere.

Page 11
It is strongly advised that the brass ball valves on through hull fittings are replaced, but advice from insurers should be monitored as requirements are evolving at the time of writing this report. Replace external fittings for the heads intakes with bronze or (DZR) fittings. Examine all other external waterline or below waterline skin fittings and replace if made of brass or other high zinc content, copper alloy.

Page 11
Remove second hose clip from aft heads intake.

Page 12
Provide means of securing hatch from inside the boat and provide lanyards for hatch boards.

Page 12
It is strongly advised to replace the hatch in the saloon; the fore hatch and aft cabin hatch will require replacement in due course.

Page 13
Reseal all six non-opening ports or otherwise expect uncomfortably damp berths on longer passages.

Page 13
Tighten fastening for inboard leg of starboard pushpit.

Page 14
Fasten gate stanchions more securely.

Page 15
Hang dinghy from davits so that the stern navigation light is not obscured.

Page 17
Fit a second bilge pump.

Page 18
Replace the Dan buoy.

Page 20
The sight gauge does not conform to best practice and consideration should be given to its removal and replacement with an alternative type of gauge.

Page 21
The fuel delivery system should be upgraded to meet best practice. All plastic and rubber hose should be replaced by supported copper pipe. Valves should be placed on all fuel lines leaving the tank in such a position that they can be shut in the event of a fire in the engine compartment. Redundant fuel lines should be removed.

Page 22
Replace gas hoses (in gas locker and at back of cooker) and regulator.

Page 22
Relocate the discharge for the battery box vent or the diesel heater air intake externally, i.e. in the port topside near to deck level.

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Page 24
Commission a marine electrician (not a domestic electrician) to examine the electrical systems with a view to providing a schedule for upgrading both the DC and AC systems.

Page 24
Test whether lagging on heater exhaust is asbestos. Arrange for professional removal and disposal if the test is positive, and then replace lagging. If replacement of lagging were necessary it would be an opportunity to place insulation board between the lagged exhaust pipe and bulkhead. However, do not disturb the lagging until its nature has been confirmed.