fieldhouse yacht surveys

BIRD SONG

Pre-purchase Survey

Completed for

John West,
Address

On Friday 12th April 2018

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Law and Jurisdiction

This document is to be construed under English Law and English Law shall be used in interpreting the document and for resolving all claims or disputes arising out of or connected with the document.

1. INTRODUCTION

1.1. This is to certify that Nic Fieldhouse, Principal Surveyor of Fieldhouse Yacht Surveys and Consulting Ltd, carried out a Pre-purchase survey on BIRD SONG in accordance with instructions received from John West of Westbury Farm, South Westbury.

1.2. The primary aim of this document is to report on the factual condition of BIRD SONG at the time of the survey. Where the equipment has been inspected or tested and found to be in an unsatisfactory condition, recommendations for rectification, repair or replacement will be detailed in this report. These recommendations will be assigned one of the five categories detailed in Section 7. For clarity, all recommendations will be printed in upper case and red font thus: RECOMMENDED.

1.3. Where reference is made to the condition, this must be considered in relation to the age of the vessel.

1.4. The vessel was inspected whilst afloat on her pontoon berth and also when out of the water & held in lifting slings at Chichester Marina on Friday 16th March 2018.

1.5. The survey was conducted by Nic Fieldhouse, Principal Surveyor of Fieldhouse Yacht Surveys and Consulting Ltd.

1.6. The survey was carried out in accordance with Fieldhouse Yacht Surveys Standard Terms and conditions and with relevant codes of practice published by the International Institute of Marine Surveying.

1.7. Those present during the survey were:

Marvin Smith, Owner of BIRD SONG (for part of the survey)

John West, Client (for part of the survey)

Eur Ing Nic Fieldhouse BEng (Hons) CEng MIMechE AssocIIMS

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2. SUMMARY

BIRD SONG was seen to be a good example of a 1995 Moody 35 sailing vessel. The GRP hull seemed to be in good structural condition and retained a very good cosmetic finish.

The deck moulding, masthead rig, engine, domestic services and interior finish were generally all in good working order. Minor water leaks into the living quarters have resulted in some deterioration of the plywood panels and sole boards at a few locations

Once the recommendations detailed below have been addressed, there is no reason why BIRD SONG should not give good service.

2.1. TYPE A2 RECOMMENDATIONS

2.1.1. There were twenty one **type A2 recommendations** that must be implemented before the vessel is taken cruising. Please refer to Section 7 for a full description of the categories of recommendations used in this report.

2.1.2. There were two short cracks in the resin coating of the hull, located just forwards of the forward-most keel stud. There was no evidence to indicate the origin of these cracks, but they may have been caused by the over-tightening of the fastening stud, by a minor grounding impact or by normal flexing of the hull moulding in this region. The two cracks are shown in Figure 7. The exposed parts of the two cracks ran along the surface of the resinous coating, but did not extend athwartships and into the hull laminate. It could not be determined if the cracks extended deep into the resin or if they extended into the laminate beneath the resin. It is RECOMMENDED (type A2 recommendation) that the two cracks are investigated further to determine if they extend into the structural laminate beneath this keel stud (see paragraph 5.2.3.2).

2.1.3. The visible parts of the keel studs, nuts and backing plates showed evidence of significant corrosion, with oxide scale on the surfaces of some of the nuts and backing plates. When hammer tested, small pieces of rust were found to break away from the nuts and backing pads, with some evidence of wasting of these items. None of the keel studs were removed for inspection, therefore the parts of the fasteners that were unexposed or inaccessible cannot be confirmed to be free from defect. In consideration of the condition of the exposed parts of the fasteners, it is possible that the inaccessible parts of the studs may be significantly corroded. There was no evidence to indicate that any of the fasteners have ever been removed in order to asses their condition. It is RECOMMENDED (type A2 recommendation) that at least two of the studs are withdrawn from the keel casting for inspection. The condition of the withdrawn fasteners and backing pads should then be assessed. If significant corrosion or wastage of the studs is encountered, all of the fasteners and backing pads should be replaced (see paragraph 5.2.6.2).

2.1.4. There were two stainless steel ECS vents located on the vessel: one in the Lewmar hatch of the forepeak and one in the hatch of the aft cabin. The stainless steel bodies of both vents were in good condition and free of damage, but two of the four screws that secured the vent onto the foredeck hatch were missing. It is RECOMMENDED (type A2 recommendation) that the vent on the foredeck hatch is suitably secured (see paragraph 5.3.6.6.).

2.1.5. A tubular welded stainless steel grab handle was secured to the aft edge of the spray hood frame. This was in good condition, but the securing nut of one of the starboard plastic mounting brackets was missing. It is RECOMMENDED (type A2 recommendation) that this nut is replaced. It is suggested that all similarly mounted nuts are replaced with nyloc nuts, to prevent the fasteners from working loose (see paragraph 5.3.7.6).

2.1.6. At deck level the lower parts of the cap shrouds, intermediate shrouds and forward lower shrouds were fitted with white PVC sheathing to protect the genoa from chafing against the wires. The wire beneath the sheathing was wet and very dirty. Stainless steel is susceptible to pitting corrosion in this partially oxygenated environment, where the protective outer layer of the stainless steel can break down, leading to localised corrosion. It is RECOMMENDED (type A2 recommendation) that the PVC sheathing is temporarily removed. The wires should be thoroughly cleaned before re-fitting the sheathing (see paragraph 5.4.5.5).

2.1.7. The Broker's information sheet stated that the engine mounts have been replaced, although no date or year was specified. It was found that the two forward mounts were relatively new, but the two aft mounts were much older. All four mounts were tested with a crow bar and the bonded rubber joints between the rubber and the adjoining steel brackets were found to be in good order. It was found that the rubber of the two aft mounts was heavily degraded and both mounts had lost their stiffness. As a result of this degradation, the engine mounts have collapsed downwards. The upper steel bracket of the port, aft mount was found to be touching the lower steel bracket, effectively by-passing the rubber of this mount. The downward collapse of these mounts is likely to have lead to some misalignment of the propeller shaft relative to the gearbox and relative to the P-bracket axis. The lack of stiffness of the rubber and the by-passing of the rubber on the port, aft mount is likely to have lead to an increased level of vibration passing from the engine & gearbox to the hull. It is RECOMMENDED (type A2 recommendation) that the two aft engine mounts are replaced. It is advisable to also replace the forward pair of mounts as all four mounts should have matched stiffness and damping characteristics (see paragraph 5.5.1.15).

2.1.8. There was one welded steel diesel fuel tank mounted under the cockpit sole, positioned forwards of the engine and aft of the companionway steps. Access to the fuel tank was from the starboard engine access door, mounted in the starboard side of the engine compartment. Access to the fuel isolation valve was gained via the circular access hatch, installed on the top of the engine compartment and located behind the companionway steps. Due to the proximity of the engine compartment panels and the attached sound-proofing material, only the aft face of the fuel tank, parts of the underside and the upper parts around the fuel isolation valve could be accessed for inspection. The visible parts of the fuel tank were clean and generally free of damage. The paint was in acceptable condition, but with evidence of underlying corrosion in some areas. The fuel tank was held in place by three straps, each constructed from strips of steel plate. It was found that the top-most strap was loose and its starboard end. It is RECOMMENDED (type A2 recommendation) that the fuel tank straps are adequately fastened to the surrounding structure (see paragraph 5.5.2.1).

2.1.9. A spare anchor and length of 7 mm diameter chain & 12 mm diameter warp was stowed in the lazerette, located on the starboard side of the aft deck. This 18 lb Danforth anchor was in serviceable condition and free of damage or deformation. This anchor was connected to the chain via a steel shackle. The chain & shackle had some surface corrosion but were in serviceable condition. The chain was connected to the sliced eye of the warp via a steel shackle. This shackle was heavily corroded. It is RECOMMENDED (type A2 recommendation) that this shackle is replaced (see paragraph 5.6.1.6).

2.1.10. From the LPG gas cylinder isolation valve & pressure regulator, rubber hose led the gas supply to a copper pipe inside the gas locker. The rubber hose was manufactured in April 2011. Gas hose should be replaced every five years. There was no evidence of cracking or degradation of the hose. It is RECOMMENDED (type A2 recommendation) that this hose is replaced by a maximum length of one metre of appropriately labelled gas hose. The hose should be marked to BS 3212 type 2 or BS 3212:1991 or BS EN 1763 class 2/3/4. This work should be performed by a qualified gas technician, such as those listed on the gas safety register. This recommendation also applies to the gas hose behind the galley stove. It is suggested that the hose behind the cooker is replaced with plain gas hose, rather than armoured hose as the condition beneath the steel armour can not be inspected for damage or degradation (see paragraph 5.6.5.5).

2.1.11. The 12 volts d.c. batteries were load tested. All batteries were found to be 'good'. It was noted that numerous wires have been connected directly to the terminals of the two service batteries. The function of these wires was not determined, although it was noted that the electric bilge pump was wired independently of the master battery switch, therefore one set of wires would have provided power to the electric bilge pump. Some of the positive wires did not appear to have any in-line fuses fitted. One of the in-line fuses was disconnected, suggesting that this wiring circuit was no longer in use. It is RECOMMENDED (type A2 recommendation) that the battery connections are inspected by a qualified electrician and modified where necessary, in order to meet current electrical installations standards (see paragraph 5.6.7.2).

2.1.12. A Clipper Navtex unit was mounted at the chart table. This unit did not power up. It is RECOMMENDED (type A2 recommendation) that this unit is repaired (see paragraph 5.6.9.9).

2.1.13. One Whale Gusher 10, Mk3 manual diaphragm bilge pump was installed in the cockpit sole, positioned just forwards of the helm binnacle. The handle of this pump was stowed behind the companionway steps. The intake of the pump was located in the lowest part of the bilge. It was correctly fitted with a strum box. The pump was tested and was found to function very poorly. It is RECOMMENDED (type A2 recommendation) that the pump is serviced and the diaphragm seal replaced Additionally, the handle should be mounted close to the pump and tethered to prevent its loss (see paragraph 6.1.1).

2.1.14. One Rule electric bilge pump was positioned at the lowest part of the bilge. It was actuated by a manual switch, located at the chart table, or by an automatic float switch which was positioned next to the pump. It was found that the power supply to the bilge pump was wired independently of the battery master switch, allowing the bilge pump to activate even when the vessel's 12 volts electrical system is switched off. The pump was rated at 1100 gallons (4165 litres) per hour. When powered up using the manual switch, the pump was found to operate but its efficiency could not be verified. When the switch at the chart table was set to automatic mode and the float switch lifted, the pump did not operate. It is RECOMMENDED (type A2 recommendation) that the float switch is repaired or replaced (see paragraph 6.1.2).

2.1.15. It is RECOMMENDED (type A2 recommendation) that two buckets (with lanyards) are stowed on board. These should be between 9 and 14 litres in capacity (see paragraph 6.1.3).

2.1.16. There was no motoring cone found on board. This is required by COLREGS. It is RECOMMENDED (type A2 recommendation) that one is procured and stowed ready for use (see paragraph 6.2.3).

2.1.17. There was no anchor ball found on board. This is required by COLREGS. It is RECOMMENDED (type A2 recommendation) that one is purchased and stowed ready for use (see paragraph 6.2.4).

2.1.18. A number of fire extinguishers were found on board. These are summarised in Table 5. All units were five years or greater than five years old. It is RECOMMENDED (type A2 recommendation) that all of the units are serviced or replaced (see paragraph 6.3.1).

2.1.19. There were no Carbon Monoxide alarms installed on BIRD SONG. It is RECOMMENDED (type A2 recommendation) that at least two units are procured and mounted in an appropriate location. It is suggested that one alarm is mounted in the aft cabin, positioned at sleeping head height. A second alarm should be installed in the saloon and mounted at a position that is approximately 1' below the level of the coachroof. Note that the air space closest to the coachroof is considered to be 'dead space' and the sensor will not function so well in this area (see section 6.4).

2.1.20. Two yellow horse shoe lifebuoys was stowed on their mounting brackets, one on each side of the pushpit. The starboard buoy was fitted with a flotation light. The lens of the light was filled with water. It is RECOMMENDED (type A2 recommendation) that the light is replaced. Both buoys should be labelled with the vessel's name. The buoy with the flotation light should be fitted with a length of floating line (see paragraph 6.6.1).

2.1.21. An Ocean Standard 4C, four person, ORC type liferaft was secured to the port side of the pushpit, mounted in a stainless steel frame. The liferaft was packaged within its plastic case. It was not opened up for inspection. The service date of the liferaft was May 2018. The serial number of the liferaft was LR203154_ORC_0159. It is RECOMMENDED (type C recommendation with an implementation time of three months or before an offshore voyage) that this liferaft is serviced (see paragraph 6.7.1).

2.1.22. No emergency flares were found on the vessel. It is RECOMMENDED (type A2 recommendation) that a set of flares (size and quantity appropriate to the sea areas and sea states expected to be encountered) is procured and stowed ready for use (see paragraph 6.8.1).

2.2. TYPE C RECOMMENDATIONS

2.2.1. There were six **type C recommendations** that do not require immediate attention but are to be dealt with within a specified time period:

2.2.2. The topsides were inspected visually. The gel-coat was found to be in very good condition with no signs of major trauma. There was one localised area of gel-coat cracking on the starboard topside, positioned 320 mm below the deck edge and aligned with the second stanchion post aft from the bow. This area of cracking consisted of two arc-shaped cracks, with one arc approximately approximately 50 mm in diameter and the other 20 mm in diameter. These cracks can be seen in Figure 5. Hammer testing of the laminate around these cracks was performed. The dull-sounding return of the hammer indicated that there may be some impact damage of the underlying laminate immediately beneath the cracks. The dull hammer sound may also be due to a localised area of poor laminate construction, where the glass fibres have been poorly wetted by the resin during construction of the hull. The moisture of the laminate around these cracks was measured and was found to be higher than the adjacent topsides, indicating that some moisture has been absorbed into the laminate via these cracks. The internal linings of the living quarters prevented access to the internal surfaces of the hull in the region of this damage. It is RECOMMENDED (type C recommendation with an implementation time of one to two years) that the cracks are cut back to sound material and suitably repaired. If any laminate is cut out during this work, it should be replaced with fibreglass cloth and epoxy resin or good quality polyester resin (see paragraph 5.1.3.2).

2.2.3. The insulated stainless steel exhaust pipe for the Eberspächer space heater was secured at each end with an Eberspächer type of stainless steel hose clamp. The securing screw of each clamp was also constructed from stainless steel. The clamps and securing screws were found to be securely attached and free of corrosion. It was noted that the stainless steel screw that secured exhaust hose to the skin fitting, located inside the lazerette (the storage locker located on the starboard corner of the aft deck), was also fitted with a mild steel washer. This washer was found to have significant surface corrosion. At the time of survey the hose and clamp were found to be securely attached and functioning correctly, but it is likely that further corrosion and wasting of the washer may lead to a reduction in clamping pressure and subsequent loosening of the clamp. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the mild steel washer is replaced with one constructed from marine grade stainless steel (see paragraph 5.1.9.7).

2.2.4. The electrical connection between the pear anode and the skin fittings of the heads outlet, heads inlet, engine cooling intake, cockpit drains (items 1, 2, 8 and 10 in Figure 6 and Table 3), the propeller shaft, the bronze P-bracket, the rudder stock and the engine casing was tested with a multimeter. The continuity between the hull anode and these items of equipment is summarised in Table 4. The recommended maximum resistance is 1.0 Ω. It was found that the wire between the anode and the rudder stock was broken. It is RECOMMENDED (type C recommendation with an implementation time of two months) that the bonding of the anode to the skin fittings, propeller shaft, rudder stock and engine casing is inspected further and the wires & terminals overhauled if necessary (see paragraph 5.1.12.3).

2.2.5. On BIRD SONG, moisture levels in the deck and coachroof moulding were measured at regular intervals, paying particular attention to the laminate adjacent to deck fittings. All readings were found to be low, apart from the regions of the deck moulding around both port shroud chain plates and the chain plate of the starboard cap shroud. At these locations, moisture readings were found to be very high (moisture readings were at least 30, with the meter's needle hitting the end-stop for many of the readings. Refer to section 5.1.5 for a description of the moisture measuring process). Water ingress around these chain plates could not be ruled out. It is also possible that moisture has entered the balsa or plywood core of the deck moulding at these locations, via the cut-out holes of the shroud chain plates. This moisture ingress could eventually lead to the de-bonding of the interfaces between the core and the adjoining laminate. Impact tests with a plastic headed hammer gave no indications of loss of stiffness of these three regions. Due to the fixed trim panels surrounding the chain plates, the internal surfaces of the decks in these areas could not be accessed for inspection. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the plywood & timber panels concealing all four shroud chain plates and the underside of the adjacent side decks are removed, or inspection holes are cut into the

plywood trim panels. The exposed surfaces should then be inspected to determine if water has been leaking into the vessel from around the chain plates. It may be necessary to re-seal each of the chain plates to prevent further water ingress. At the same time that this work is being performed, the condition of the exposed chain plates and fasteners should be inspected for evidence of corrosion, distortion or other damage. If no surface water can be detected, small inspection holes should be cut into the lower skin of the side decks in the regions of the chain plates. From these holes, a sample of the deck core material should be removed and inspected for evidence of moisture. If the core is found to be wet or de-bonded from the inner or outer skins, the damaged core sections should be repaired. Refer to the Fiberglass Boat Repair & Maintenance manual by West System. Section 5.1.3 of the manual describes the re-bonding delaminated skin when the core is wet. This manual can be found through the following link: http://www.westsystem.com/wp-content/uploads/Fiberglass-Manual-2015.pdf (see paragraph 5.3.3.8).

2.2.6. The Jabsco manually operated sea toilet was clean and the bowl and pump were adequately attached to the GRP moulding of the heads compartment. The installation was tested and the pump in and pump out mechanisms functioned, but the hand plunger was found to be very stiff. It is likely that the o-ring seal of the plunger shaft is worn and degraded, leading to increased friction when the plunger is moved up and down. No leaks were noted. It is RECOMMENDED (type C recommendation with an implementation time of six months) that the toilet pump is serviced (see paragraph 5.6.4.1).

2.2.7. The shore power sockets were tested with a domestic socket tester. It was found that the live and neutral feeds of the 240 volts a.c. system were reversed. Note that this fault may be due to incorrect wiring of the pontoon power supply. It is RECOMMENDED (type C recommendation with an implementation time of two weeks) that this fault is investigated by the Marina maintenance technicians or by a qualified electrician. It is suggested that before an electrician is contracted to check the vessel's wiring, the Marina Office are informed of this issue, so that they can investigate the electrical wiring of the pontoon power supply (see paragraph 5.6.7.7).

3. SCOPE & LIMITATIONS

3.1. The vessel was inspected whilst afloat at her pontoon berth and also when out of the water & held in lifting slings. For the shore-based part of the survey (75 minutes duration), there was good, all-round access to the exterior of the hull. The only minor obstructions were those presented by the two lifting slings of the travel hoist. Additionally, the aft lifting sling obscured the skin fitting of the heads toilet inlet (item 2 in Figure 6 and Table 3), therefore the condition of the external parts of this fitting could not be assessed.

3.2. At the time of survey the ambient temperature was approximately 12°C, with clear skies and a light wind. There had been rain for the two days prior to the survey.

3.3. Internal inspection was limited to the areas that are normally accessible directly or through lockers, inspection hatches, removable panels, etc. No part of the vessel was dismantled; no bolts were removed for inspection and no linings removed, except in order to gain access to the internal fastenings of the forestay chain plate and to gain access beneath the majority of the screwed down saloon sole boards. Consequently, any part of the vessel, her equipment or fittings, which were unexposed or inaccessible, cannot be confirmed to be free from defect.

3.4. All tanks were inspected where visible but not internally inspected and they have not been pressure tested; their contents have not been tested for contamination.

3.5. Window hatches and external doors have not been tested for water tightness.

3.6. We have not inspected fibreglass laminate, 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 defects, rot or deterioration.

3.7. The vessel and her equipment were not assessed for design or suitability for any particular purpose, or compliance with any rules, regulation, standard or code.

3.8. Note that the terms “serviceable” or “serviceable condition”, as used in the report, means that the item remained usable, despite possible wear or deterioration. The item may nevertheless require maintenance or replacement in due course.

3.9. No dismantling of the engine took place and so the internal condition of the engine cannot be commented upon. Components hidden from view, such as the sump, crankshaft, camshafts, pistons, valves and cylinder head gaskets could not be examined for latent defects. No compression tests of the cylinders took place. Comments can only be made with regard to the general condition of the engine on the day of the inspection. No guarantee can be made regarding the life expectancy of the engine.

4. THE VESSEL

4.1. DETAILS

Name	BIRD SONG
Yard Number	Gxxx
Hull Identification Number	MPPGBxxxF595
Lloyds Registration Certificate Number	LR-BRS-xxxxx
Deck Moulding Number	xxx
Sail Number	xxx
Built by	Marine Projects Ltd, Plymouth, England
Designed by	Bill Dixon
Model	Moody 35
Type	Bermudian sloop
Build date	1995
Engine manufacturer & Model	Volvo Penta MD2040
Engine type	4 stroke, 3 cylinder diesel, fresh water cooled
Engine power	29.1 kW (40 HP)

Table 1: Vessel Details

4.1.1. BIRD SONG was seen to be a Moody 35 - a centre cockpit, masthead rigged sailing yacht with a cast iron fin keel. She was designed by Bill Dixon and built by Marine Projects Ltd in 1995.

4.1.2. The hull moulding of BIRD SONG was of GRP construction. The GRP was made up of polyester resin, mixed-strand fibreglass mat and woven rovings finished with a white pigmented gel-coat. The fin keel was made from cast iron and was fastened to the hull with eleven steel studs and nuts. The hull was seen to be stiffened internally by a GRP Hull Internal Moulding and foam-filled glass fibre transverse frames. Further reinforcing was provided by bulkheads and the bases of the furniture.

4.1.3. The deck moulding was a balsa and plywood cored GRP composite, finished with white pigmented gel-coat. It incorporated the decks, saloon coachroof, cockpit and aft cabin coachroof. The deck was joined to the hull by the in-turned flange joining method. The external joint was concealed behind aluminium toe rails running along each side deck, with an aluminium finishing plate across the stern.

4.1.4. BIRD SONG had a semi-balanced skeg-mounted rudder constructed from a stainless steel rudder stock encapsulated in a foam-filled GRP moulding. She had a self-draining cockpit and wheel steering. She had a masthead sloop rig, featuring a deck-stepped mast, a mainsail and a roller furling genoa.

4.1.5. Accommodation was well laid out with a double berth forward. The saloon had two settee berths and a folding table in the centre. The galley space was along the starboard side, aft of the saloon seating. A navigation station lay on the port side, just next to the companionway steps, with heads & shower compartment aft of the navigation station. A companionway next to the galley and beneath the starboard cockpit seating led aft to a double berth, with a seat on the starboard side of the cabin. Access to the aft cabin was also gained via a door installed at the aft end of the heads & shower compartment.

4.1.6. A Volvo Penta 2040B, three cylinder diesel engine, with fresh water cooling, drove a 17" diameter, fixed pitch, bronze propeller through a reduction gearbox. Engine control was via a single lever, giving forward and reverse gears and throttle control, mounted next to the helm on the starboard side of the helm binnacle. One welded steel fuel tank was mounted under the cockpit sole, positioned forwards of the engine and aft of the companionway steps.

4.2. DIMENSIONS

Dimension	Metres	Feet / inches
Length Overall	10.52	34 feet and 6 inches
Length on Waterline	8.78	28 feet and 10 inches
Beam	3.62	11 feet and 11 inches
Draft	1.60	5 feet and 3 inches
Displacement	5,811 kg	12,811 lb
Ballast	2,157 kg	4,760 lb

Table 2: Vessel Dimensions (Moodyowners.org)

4.3. VESSEL'S NAME

4.3.1. BIRD SONG had her name positioned on both sides of her hull topsides, located at the bow. These were applied in blue self-adhesive lettering.

4.4. YARD NUMBER

4.4.1. The vessel's Yard Number was Gxxx. This number was applied to the cover plate of the electrical switch panel, located at the chart table in the saloon. This number is shown in Figure 1.

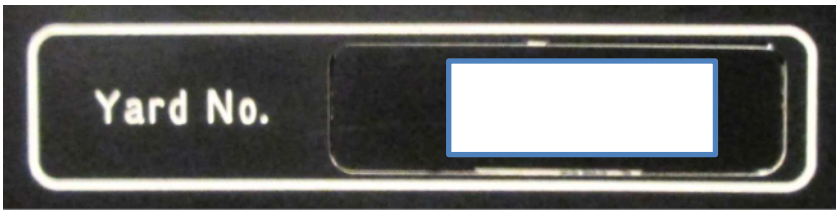

Figure 1: Yard Number

4.5. HULL IDENTIFICATION NUMBER

4.5.1. The vessel's Hull Identification Number (HIN) was moulded into the starboard, upper corner of the vessel's bathing platform. The number was MPPGBxxxF595, as shown in Figure 2. This number indicates that the build of the vessel was commenced in June 1995.

Figure 2: Hull Identification Number

4.6. LLOYD'S REGISTRATION CERTIFICATE NUMBER

4.6.1. This number was moulded into the port, upper corner of the vessel's bathing platform. The number was LR-BRS-xxxxx, as shown in Figure 3. This number was also printed on a blue plastic plate, which was fastened to the side panel of the chart table.

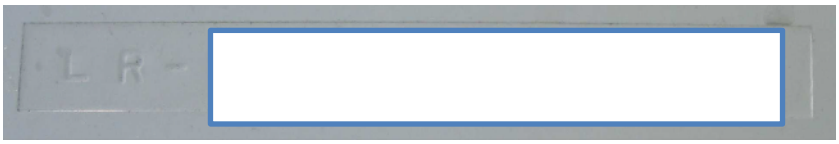

Figure 3: Lloyd's Register of Shipping Number

4.7. DECK MOULDING NUMBER

4.7.1. The Deck Moulding Number was xxx. This number was moulded into the upper, aft edge of the anchor chain locker, located on the foredeck. This number is shown in Figure 4.

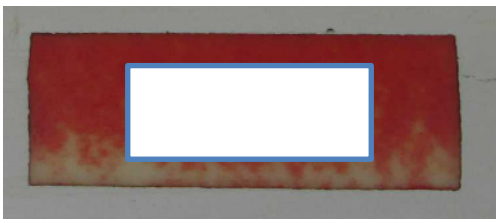

Figure 4: Deck Moulding Number

5. THE SURVEY

5.1. HULL EXTERIOR

5.1.1. Material & Details of Construction

5.1.1.1. The hull moulding was of GRP construction. The GRP was made up of polyester resin, mixed-strand fibreglass mat and woven rovings finished with a white pigmented gel-coat. The fin keel was made from cast iron and was fastened to the hull with eleven steel studs and nuts.

5.1.2. General Appearance

5.1.2.1. The hull was sighted from a distance fore and aft and visually inspected all round. Her lines were symmetrical, fair and true, with no signs of distortion or flat areas.

5.1.3. Topsides

5.1.3.1. The topsides were finished with unpainted white-pigmented gel-coat. There was one 15 mm wide blue PVC trim line positioned 200 mm below the deck edge. There was one 30 mm wide trim line positioned above one 55 mm wide line, both formed from blue ablative antifouling paint and positioned just above the top edge of the copper-coat antifouling. All trim lines were well applied and in very good cosmetic condition. Note that copper-coat anti-fouling treatment extended approximately 120 mm above the waterline.

5.1.3.2. The topsides were inspected visually. The gel-coat was found to be in very good condition with no signs of major trauma. There was one localised area of gel-coat cracking on the starboard topside, positioned 320 mm below the deck edge and aligned with the second stanchion post aft from the bow. This area of cracking consisted of two arc-shaped cracks, with one arc approximately approximately 50 mm in diameter and the other 20 mm in diameter. These cracks can be seen in Figure 5. Hammer testing of the laminate around these cracks was performed. The dull-sounding return of the hammer indicated that there may be some impact damage of the underlying laminate immediately beneath the cracks. The dull hammer sound may also be due to a localised area of poor laminate construction, where the glass fibres have been poorly wetted by the resin during construction of the hull. The moisture of the laminate around these cracks was measured and was found to be higher than the adjacent topsides, indicating that some moisture has been absorbed into the laminate via these cracks. The internal linings of the living quarters prevented access to the internal surfaces of the hull in the region of this damage. It is RECOMMENDED (type C recommendation with an implementation time of one to two years) that the cracks are cut back to sound material and suitably repaired. If any laminate is cut out during this work, it should be replaced with fibreglass cloth and epoxy resin or good quality polyester resin.

5.1.3.3. The gel-coat retained a very good level of gloss and appeared to be well polished with no evidence of UV degradation. There were small cosmetic scuff and scratch marks from mooring fenders on the starboard beam. There were various horizontal scratches in the gel-coat, none of which had penetrated the gel-coat. There were numerous scratches and one gel-coat chip near to the stem, most likely caused by light impacts from the anchor flukes. There was some minor gel-coat damage along the edges of the transom, one of which had been repaired with a brown-coloured filler material.

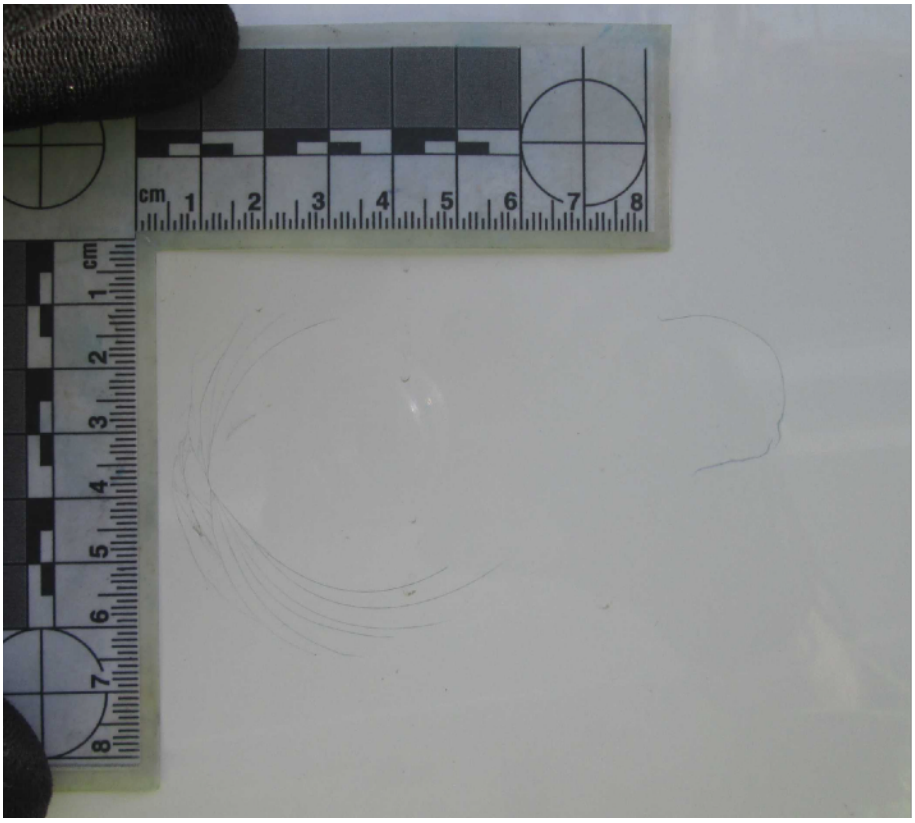

Figure 5: Two arc-shaped cracks in starboard topside

5.1.4. Hull Below the Waterline

5.1.4.1. The hull surfaces below the waterline and the surfaces of the rudder blade (but not the surfaces of the keel or P-bracket) had been treated with a number of coats of copper-loaded epoxy resin. Discussions with the current owner indicated that this treatment was applied in 2015. The cosmetic finish of this treatment was found to be acceptable, but with streaking of the coatings in some areas.

5.1.4.2. The entire hull was visually inspected, except where surfaces were hidden behind the two lifting slings. The copper-coat treatment was found to be bonding well to the underlying hull & rudder surfaces, with no evidence of de-bonding, peeling or flaking. There was no evidence of blistering or other damage attributable to water penetration. No evidence of scratching or chipping of the hull was found. Particular attention was paid to the areas around the keel root and skeg. There was no evidence of stress cracking due to flexing of the hull or due to damage from grounding impacts to the keel.

5.1.4.3. At the time of survey, the P-bracket, propeller shaft and propeller were coated with a white, hard antifouling paint. During the 75 minute period in which the vessel was ashore and held in the lifting slings of the boat hoist, it was found that parts of this antifouling dried and flaked off the shaft and forward faces of the propeller blades.

5.1.5. Moisture Readings

5.1.5.1. Moisture readings were taken using a Tramex Skipper Plus capacitance type moisture meter. The meter was set to range 2, which measures deep into the layup. Figures quoted are from the meter's percentage H_20 scale. Note that by convention, moisture meters are calibrated for timber, so the percentage moisture readings are not directly applicable to GRP. The true moisture content of GRP is very approximately 10% of those quoted.

5.1.5.2. Readings were taken both above and below the waterline in order to obtain a comparison. Note that high moisture content is not generally a structural defect and is to be expected in older boats. Where some moisture has been absorbed, the likelihood of moisture related problems occurring are higher. When this occurs, the actual state of

the laminate cannot be completely guaranteed without destructive testing and chemical analysis. The opinion given in this survey report is based on all the evidence available at the time but without destructive testing.

5.1.5.3. Moisture readings taken on the topsides were between 10 and 12, with a few readings of 18 noted in the area of the anchor chain locker. This indicates a low moisture level in the laminate. The higher readings noted in the anchor chain locker may have been due to the presence of the galvanised steel anchor chain, which will affect the readings taken in this region.

5.1.5.4. Readings taken of the hull below the waterline (but not the lower bilges) were between 17 and 20. These readings indicate that where the measurements were taken, the hull laminate below the waterline had a medium moisture content. Moisture readings of the lower bilges could not be taken as the surface water on these parts of the hull did not evaporate during the period in which the vessel was ashore.

5.1.5.5. To limit the moisture levels in the hull laminate, the boat should ideally be stored ashore for a few months each winter. The Owner should endeavour to keep the bilges as dry as possible. Sources of any leakage into the vessel should be found and cured. It is suggested that some of the fixed sole boards in the saloon should be modified so that they can be readily lifted. When the vessel is to be left unattended for more than a few days, these lifting sole boards and the internal locker covers should be opened up to allow the moisture in the bilges to evaporate.

5.1.6. Hammer Testing of Hull Surfaces

5.1.6.1. In order to identify any areas of delamination or poorly resinated laminate, the exterior surfaces of the hull were then tested with a small plastic-headed hammer. The test gave sound returns with no indications of softening, poor lay-up or delamination of the GRP, except for one location on the starboard side of the hull topsides. This area is described in paragraph 5.1.3.2.

5.1.7. Keel

5.1.7.1. The fin keel of BIRD SONG was made from cast iron. The Broker's information sheet stated that the keel surfaces had been treated in 2015 with a number of coats of epoxy resin.

5.1.7.2. The keel was inspected and no evidence of hard grounding or impact was found. The surface of the keel was found to be reasonably smooth and free of significant corrosion or pitting. There was some light surface corrosion at a few locations, particularly on the underside of the casting. Light impacts from a hammer and testing with a magnet revealed no areas of thick filler material.

5.1.7.3. The hull to keel join was carefully inspected. The stopping compound was found to be generally intact, but with some minor shrinking & cracking of the compound at the forward end of the join. No evidence of lateral movement was found in the keel. There were no cracks or gaps in the join that could be attributed to flexing in this region.

5.1.7.4. The keel was fastened to the hull using eleven carbon steel studs, nuts and large backing plates. See section 5.2.6 for details of the inspection of the keel studs.

5.1.8. Rudder & Steering

5.1.8.1. BIRD SONG had a semi-balanced skeg-mounted rudder constructed from a stainless steel rudder stock encapsulated in a foam-filled GRP moulding. It was inspected visually and found to be in serviceable condition and free from damage or cracks. Moisture levels in the blade were found to be high. This is typical of GRP rudder blades with this type of construction method.

5.1.8.2. The $1^1/_2$" diameter stainless steel rudder stock was inspected where access allowed. The visible portions of the stock were found to be free of pitting corrosion or evidence of cracking. It should be noted that the portions of the rudder stock within the rudder tube and within the blade could not be accessed for inspection; therefore the condition of the stock cannot be guaranteed.

5.1.8.3. It was found that the rudder stock was made from a grade of stainless steel that was heavily magnetic and was therefore possibly made from A2 grade stainless steel, which is more susceptible than the A4 grade to corrosion in the marine environment. It

is also possible that the stock was constructed from Aquamet, which is a high strength and corrosion resistant grade of stainless steel. Martensitic or ferritic stainless steels are also magnetic, but these are rarely found in marine applications. As the grade of stainless steel used in the stock could not be determined and the fact that the portion of the stock concealed inside the rudder tube and within the blade could not be accessed for inspection, the stock should be carefully inspected for signs of pitting, cracking or excessive wear when the rudder bearings are next replaced.

5.1.8.4. See paragraph 5.1.12.3 for a recommendation relating to the electrical connection of the rudder stock to the zinc hull anode.

5.1.8.5. The bearings of the rudder were inspected and found to be free of lateral or vertical movement.

5.1.8.6. The lower bearing was housed in a bronze casting. This was secured to the underside of the skeg by five bronze or copper rivets. The casting and fasteners were inspected and found to be well secured and free of dezincification.

5.1.8.7. The GRP rudder tube (this is the tube that is fixed to the hull moulding, through which the rudder stock passes) was inspected by lifting the locker covers located beneath the aft cabin bunk. It was found to be attached to the hull by GRP tabbing. The GRP tube and tabbing were in good condition and free of cracks or debonding. The lower bearing was housed within the GRP rudder tube.

5.1.8.8. The six spoke stainless steel and leather sheathed Whitlock wheel was inspected and found to be adequately secured to the cockpit structure via a white GRP binnacle. The wheel operated with full and free movement from lock to lock.

5.1.8.9. The steering gear was driven by a Bowden cable and quadrant drive system. The parts of the mechanism that were located in the steering binnacle were not accessible for inspection.

5.1.8.10. The cast aluminium steering quadrant was adequately secured to the rudder stock by four stainless steel fasteners that were screwed into tapped holes in the quadrant. The fasteners were inspected and found to be free of corrosion and well secured to the quadrant.

5.1.8.11. The parts of the quadrant that make contact with the steering wires were adequately lubricated and free of visible wear. The visible parts of the wires were also well lubricated and free of corrosion, damage or visible wear.

5.1.8.12. The upper end of the rudder stock could be accessed via a removable stainless steel cover installed on the aft deck. The end of the stock was machined to a square cross section in order to provide a positive location for an emergency tiller.

5.1.8.13. The tubular steel emergency tiller was comprised of two sections that fasten to one another with clevis pins. The assembly was stowed in a canvas bag, located beneath the bunk of the aft cabin. A third section of tubing was stowed inside the lazerette (the storage locker located on the starboard corner of the aft deck). The fit of the lowest section of the emergency tiller to the upper end of the rudder stock was tested and the two parts were found to fit correctly. The Owner should familiarise himself with the installation of the emergency tiller and should ensure that the tool to remove the stainless steel cover installed on the aft deck is always readily available.

5.1.9. Skin Fittings and Valves

5.1.9.1. Figure 6 and Table 3 below show the location and function of the skin fittings, together with the condition of the valves, hoses and clips. The items in red text in Table 3 indicate a defect or poor condition of the items and are addressed in the recommendations below.

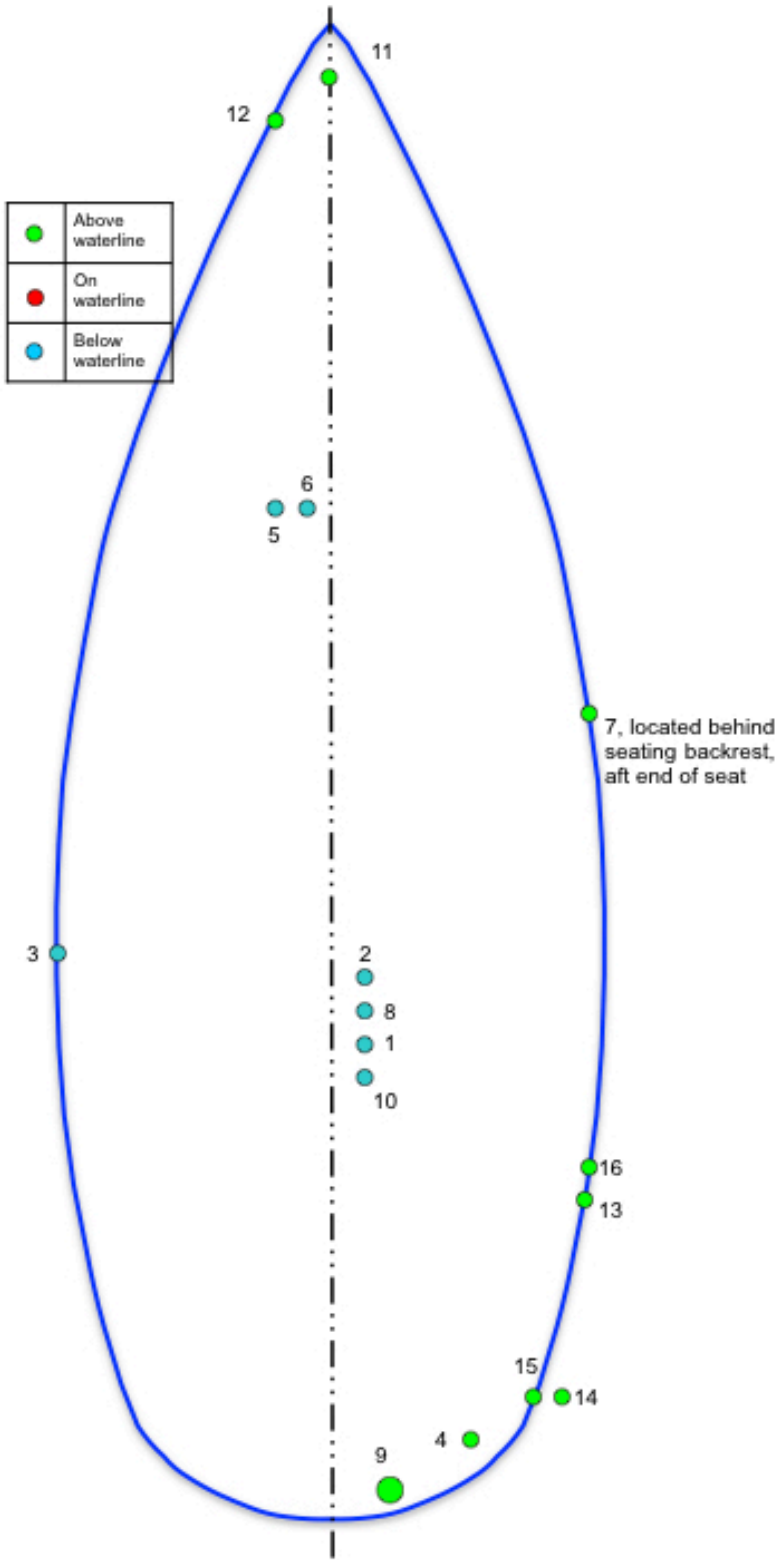

Figure 6: Location of skin fittings (plan view looking from above)

#	Function	Above / Below WL	EXTERNAL		INTERNAL							
			Skin Fitting		Valve			Hose		Clips		
			Mat.	Cond.	Type	Mat.	Cond.	Reinf.	Cond.	#	Mat.	Cond.
1	Heads outlet	B	Br	✓	90°	Br	✓	✓	✓	2	ss	✓
2	Heads inlet	200mm A	Br	No access	90°	Br	✓	✓	✓	2	ss	✓
3	Heads sink outlet	B	Br	✓	90°	Br	✓	✓	✓	2	ss	✓
4	Space heater exhaust	A	ss	✓	N/A			ss pipe	✓	1	ss	see para 5.1.9.7
5	Depth transducer	B	Pl	✓	N/A							
6	Speed Impeller	B	Pl	✓	N/A							
7	Galley sink outlet	140mm A	Br	✓	90°	Br	✓	✓	✓	2	ss	✓
8	Engine cooling intake	B	Br	✓	90°	Br	✓	✓	✓	2	ss	✓
9	Engine exhaust & coolant outlet	A	GRP	✓	N/A			✓	✓	2	ss	✓
10	Cockpit drain port & starboard	B	Br	✓	90°	Br	✓	✓	✓	2	ss	✓
11	Foredeck anchor locker	A	GRP	✓	N/A							
12	Lower anchor chain locker	A	GRP / ss	Distorted	N/A							
13	Gas locker drain	A	GRP	✓	N/A							
14	Manual & electrical bilge pump outlet	A	PVC	✓	N/A			✓	✓	2	ss	✓
15	Lazerette hatch frame drain	A	PVC	✓	N/A			✓	✓	2	ss	✓
16	Fuel tank vent	A	ss	Distorted	N/A			No access				

WL	Waterline	Pl	Plastic
Br	Bronze or Brass	ss	Stainless steel

Table 3: Function and condition of skin fittings, valves, hoses and clips

5.1.9.2. No skin fittings or valves were dismantled as part of the survey but the following tests were performed:

Examination from outside and inside the vessel

All valves opened and closed to their full extent

The through-hull fittings, hose clips and valve bodies were hammer tested

The fittings were aggressively tested to assess their security of attachment to the hull

Where accessible, hose clips were inspected and hoses were aggressively tested

5.1.9.3. The skin fittings were all in serviceable condition. All fittings on or below the waterline were bronze or dezincification resistant brass (apart from the plastic speed impeller & depth transducer) and showed no signs of dezincification. All skin fittings located below the waterline were fitted with an isolation valve.

5.1.9.4. During the out-of-water part of the survey, the aft lifting sling of the travel hoist

obscured the skin fitting of the heads toilet inlet (item 2 in Figure 6 and Table 3), therefore the condition of the external parts of this fitting could not be assessed.

5.1.9.5. There was clear access inside the vessel to all valves. All hoses were constructed from reinforced material and were in good working order. All hoses (except for the exhaust pipe of the Eberspächer space heater) were secured at both ends with two stainless steel hoses clips. All hose clips were in good working order.

5.1.9.6. Refer to paragraph 5.1.12.3 for the recommendation relating to the bonding of the skin fittings of the heads outlet, heads inlet, engine cooling intake and cockpit drains (items 1, 2, 8 and 10 in Figure 6 and Table 3) to the hull anode.

5.1.9.7. The insulated stainless steel exhaust pipe for the Eberspächer space heater was secured at each end with an Eberspächer type of stainless steel hose clamp. The securing screw of each clamp was also constructed from stainless steel. The clamps and securing screws were found to be securely attached and free of corrosion. It was noted that the stainless steel screw that secured exhaust hose to the skin fitting, located inside the lazerette (the storage locker located on the starboard corner of the aft deck), was also fitted with a mild steel washer. This washer was found to have significant surface corrosion. At the time of survey the hose and clamp were found to be securely attached and functioning correctly, but it is likely that further corrosion and wasting of the washer may lead to a reduction in clamping pressure and subsequent loosening of the clamp. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the mild steel washer is replaced with one constructed from marine grade stainless steel.

5.1.12.Anodes

5.1.12.1. The propeller shaft and propeller was protected by one ring anode, mounted to the propeller shaft, just forward of the propeller. This anode was found to be nearly new, was free of wasting and was adequately secured to the shaft. The electrical connection between this anode and the propeller shaft was tested with a multimeter and the resistance found to be 0.0 Ω.

5.1.12.2. A pear anode (195 mm between fastening centres) was through-bolted to the hull, positioned on the port side of the hull and 620 mm forwards of the P-bracket. The anode was secured to the hull with two galvanised steel studs. The studs and nuts had some minor surface corrosion but were in good working order. The anode was approximately 5% wasted.

5.1.12.3. The electrical connection between the pear anode and the skin fittings of the heads outlet, heads inlet, engine cooling intake, cockpit drains (items 1, 2, 8 and 10 in Figure 6 and Table 3), the propeller shaft, the bronze P-bracket, the rudder stock and the engine casing was tested with a multimeter. The continuity between the hull anode and these items of equipment is summarised in Table 4. The recommended maximum resistance is 1.0 Ω. It was found that the wire between the anode and the rudder stock was broken. It is RECOMMENDED (type C recommendation with an implementation time of two months) that the bonding of the anode to the skin fittings, propeller shaft, rudder stock and engine casing is inspected further and the wires & terminals overhauled if necessary.

Equipment to be protected	Resistance (Ω)	Pass / Fail
Skin fittings of heads outlet, heads inlet, engine cooling intake, cockpit drains	No continuity	Fail
Propeller shaft	No continuity	Fail
Bronze P-bracket	0.0 Ω	Pass
Rudder stock	No continuity, broken wire connection at rudder stock	Fail
Engine casing	> 100 Ω	Fail

Table 4: Summary of anode continuity

5.2. HULL INTERNAL STRUCTURE

5.2.1. General Appearance

5.2.1.1. Within the aft cabin, saloon and forepeak accommodation, there were a number of removable sole boards. These were all lifted in order to inspect the internal hull and stiffening structure. The majority of the screwed-down sole boards in the saloon were also lifted. Access to the hull structure was also gained by lifting the seats in the saloon and aft cabin, lifting the bunk covers in the forepeak & aft cabin and also via the engine compartment, anchor chain locker and lazerette.

5.2.1.2. The bilge compartments were mostly dry, but with some standing water in all of the lower bilges, located in the region of the keel mounting studs. There was evidence of old, oily bilge water beneath the sole board of the galley area, positioned to starboard of the forward end of the engine. The bilge space of the engine compartment was found to be much cleaner than the bilge spaces around the keel fastenings, indicating that the engine compartment may have been recently cleaned. There was some standing water, combined with a small amount of oil, located in the bilge at the forward end of the engine.

5.2.1.3. There was some standing water beneath the propeller shaft seal and with evidence of water draining to this area from beneath the sole boards of the aft cabin. Whilst the engine was tested in gear (as described in paragraph 5.5.1.9), no water was found to be leaking from the propeller shaft seal. There was one bilge compartment inside the lazerette (the storage locker located on the starboard corner of the aft deck) that contained a significant volume of water. The origin of this water could not be determined, but it is possible that this water has leaked into the bilges of the aft cabin and has collected around the propeller shaft seal, beneath the engine and in the keel sump. Water staining of the plywood frame of the triple-drawer unit in the aft cabin also provides evidence that water has been entering the vessel via the lazerette of from the starboard side of the aft deck.

5.2.2. Hull Internal Moulding

5.2.2.1. A Hull Internal Moulding of GRP was located in the area that stretched from beneath the forepeak bunks to the forward bulkhead of the aft cabin. This Hull Internal Moulding was bonded to the hull and strengthened & stiffened the hull moulding around the keel fastenings. It transferred the loads from the mast, via the mast compression post, to the keel.

5.2.2.2. The exposed parts of the hull moulding were coated in white paint. The paint was well bonded to the hull and in mostly in clean condition.

5.2.2.3. In areas that could be accessed for inspection, there was no evidence of separation of the Internal Moulding from the hull surface. There was no evidence of any cracking, delamination or damage to this moulding. The visible gel-coat surfaces of the Internal Moulding were in good cosmetic condition.

5.2.2.4. The engine beds were formed as part of the Hull Internal Moulding. The engine beds were examined and found to be sturdily built and were free of signs of cracks or deformation.

5.2.3. Stiffeners & Hull Internal Surface

5.2.3.1. In addition to the Hull Internal Moulding, the hull was also stiffened internally by foam-filled glass fibre transverse frames. Further reinforcing was provided by bulkheads and the bases of the furniture. In areas that could be accessed for inspection, there was no evidence of damage of the frames or evidence of separation of the frames from the hull. Moisture readings were taken of the hull frames. These readings were found to be low.

5.2.3.2. There were two short cracks in the resin coating of the hull, located just forwards of the forward-most keel stud. There was no evidence to indicate the origin of these cracks, but they may have been caused by the over-tightening of the fastening stud, by a minor grounding impact or by normal flexing of the hull moulding in this region. The two cracks are shown in Figure 7. The exposed parts of the two cracks ran along the surface of the resinous coating, but did not extend athwartships and into the hull laminate. It could not be determined if the cracks extended deep into the resin or if

they extended into the laminate beneath the resin. It is RECOMMENDED (type A2 recommendation) that the two cracks are investigated further to determine if they extend into the structural laminate beneath this keel stud.

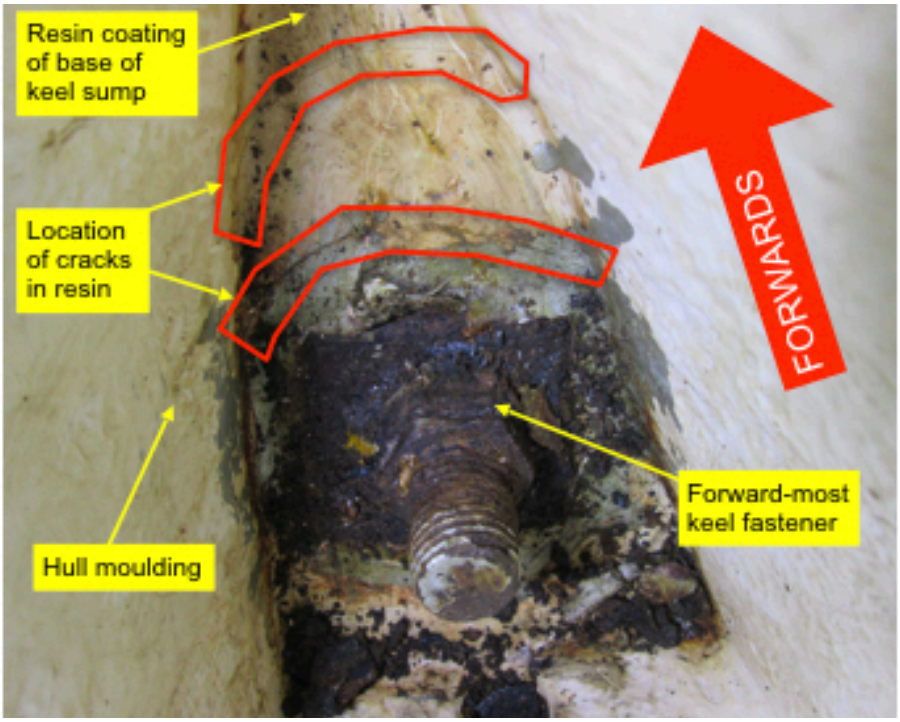

Figure 7: Cracks in resin of keel sump, located at forward-most keel stud.

5.2.4. Mast Compression Post

5.2.4.1. A 90 mm diameter stainless steel cylindrical column supported the coachroof and transferred the mast compression load to the hull and keel of BIRD SONG. The upper parts of the post were concealed beneath the fixed vinyl headlining, therefore the condition of these parts could not be assessed. The lower end of the tubular compression post was connected to the Hull internal Moulding and a substantial GRP hull frame via a welded carbon steel bracket. This bracket was secured to the hull frame by four carbon steel screws. It was found that the carbon steel bracket and four screws were damp and had some surface corrosion. The screws were securely fastened. It is suggested that these items are cleaned of all corrosion deposits and treated with a rust-inhibiting compound and coatings of protective paint.

5.2.5. Bulkheads & Plywood Panels

5.2.5.1. Where accessible the plywood bulkheads were inspected and found to be in very good condition with no evidence of moisture ingress, wood rot or delamination.

5.2.5.2. There was some discolouration of the plywood frame of the triple-drawer unit in the aft cabin, due to moisture ingress. See paragraph 5.2.1.3 for a description of the probable cause of this water ingress.

5.2.5.3. There was significant softening and discolouration of a plywood panel, positioned beneath the lower edge of the cockpit entrance, on the starboard side of the companionway hatch. The same water leak may have also caused some discolouration of the plywood sole board, positioned next to the galley cooker. It could not be confirmed, but it is likely that the water leak around the companionway hatch that has lead to this damage may only occur when the canvas sprayhood is not fitted.

5.2.5.4. The bulkheads were secured to the hull & deck by GRP cloth tabbing. Where accessible, the integrity of the tabbing was inspected and found to be free of de-bonding, cracks or movement. Additional strength was provided by galvanised steel bolts & backing washers, bolted through the tabbing and plywood. Where accessible for inspection, these fasteners were found to be free of significant corrosion and in good order.

5.2.6. Keel Studs

5.2.6.1. The keel was fastened to the hull by eleven carbon steel studs & nuts with steel backing plates. Where accessible, the studs and nuts were hammer tested and found to be securely attached. Some parts of the fasteners were coated in grey paint. The poor condition of this paint indicated that this protective coating had been applied many years ago.

5.2.6.2. The visible parts of the keel studs, nuts and backing plates showed evidence of significant corrosion, with oxide scale on the surfaces of some of the nuts and backing plates. When hammer tested, small pieces of rust were found to break away from the nuts and backing pads, with some evidence of wasting of these items. None of the keel studs were removed for inspection, therefore the parts of the fasteners that were unexposed or inaccessible cannot be confirmed to be free from defect. In consideration of the condition of the exposed parts of the fasteners, it is possible that the inaccessible parts of the studs may be significantly corroded. There was no evidence to indicate that any of the fasteners have ever been removed in order to asses their condition. It is RECOMMENDED (type A2 recommendation) that at least two of the studs are withdrawn from the keel casting for inspection. The condition of the withdrawn fasteners and backing pads should then be assessed. If significant corrosion or wastage of the studs is encountered, all of the fasteners and backing pads should be replaced.

5.3. Deck and External Fittings

5.3.1. A number of possible leaks into the vessel were identified. These were:

- Through the lazerette (the storage locker located on the starboard corner of the aft deck). This is discussed in paragraph 5.2.1.3.
- An old leak around the coaming of the companionway hatch. This is discussed in paragraph 5.2.5.3.
- Around the chain plate that supported the starboard cap shroud, intermediate shroud and aft lower shroud. The recommendation relating to this possible cause of water ingress is discussed in paragraph 5.3.3.8.

5.3.2. Hull / Deck Join

5.3.2.1. The deck was joined to the hull by the in-turned flange joining method. The external joint was concealed behind aluminium toe rails running along each side deck. The part of the joint running along the edge of the transom was capped by an aluminium finishing plate. The toe rails were secured at 100 mm intervals with stainless steel coach bolts, with additional strength & water proofing provided by a mastic sealing compound.

5.3.2.2. Direct inspection of the interior faces of the join was limited to the lazerette locker. The interior faces of the join located inside the anchor chain locker could be inspected remotely using a digital camera. As far as could be ascertained, the hull to deck joint appeared to be sound and in areas that could be accessed for inspection, there was no evidence of water ingress to the vessel interior through this joint.

5.3.3. Deck Moulding

5.3.3.1. The deck moulding was a balsa and plywood cored GRP composite, finished with white pigmented gel-coat. It incorporated the decks, saloon coachroof, cockpit and aft cabin coachroof. Structurally the moulding seemed to be in serviceable condition, with no signs of damage or delamination between core and skin.

5.3.3.2. The decks, coachroof surfaces and the tread surfaces of the bathing platform were surfaced with an integrally moulded slip-resistant finish. These were treated with a grey paint. These surfaces were found to be in good order, with no significant wear. Small sections of Treadmaster slip-resistant material were bonded to the aft deck and parts of the aft cabin coachroof, close to the bathing platform access point. These bonded surfaces were found to be in good order and free of peeling or lifting.

5.3.3.3. There was one lazerette located on the starboard corner of the aft deck. The GRP cover was secured to the deck by two stainless steel hinges and locked down with a quarter turn latch. The cover & hinges functioned correctly, but the latch was corroded

and seized. A simple aluminium latch had been fitted along the aft edge of the deck moulding in order to hold this locker cover in the closed position. The lazerette provided access to the Eberspächer heater unit and provided stowage for the kedge anchor & chain, an emergency throw line, a bucket and one section of the emergency steering tiller.

5.3.3.4. Two small storage lockers were set into the aft end of the aft cabin coachroof. These two lockers were for for the storage of mooring warps or similar. Each was fitted with two stainless steel hinges and two lockable chrome-plated brass latches. All were in good working order and good cosmetic condition.

5.3.3.5. On the starboard side deck there was one locker specifically equipped as a gas cylinder storage container. The gas locker was set into the deck moulding, with the locker lid flush with the adjacent side deck. See Section 5.6.5 for details of the inspection of the gas cylinder storage locker.

5.3.3.6. The gel-coat of the deck moulding was found to be in good condition with minor scuff & scratch marks, but with some gel-coat cracking at a number of locations. These cracks were located at all four corners of the anchor locker, at the port aft corner of the lazerette locker and at the two aft corners of the aft cabin, where the sides of the coachroof meet the horizontal surfaces of the deck.

5.3.3.7. The gel-coat generally retained a good level of gloss and with no evidence of UV degradation. A small amount of deformation of the coachroof around the mast base was noted. There was no cracking or other evidence of damage of the coachroof moulding in this area. The integrity of the deck structure was checked by applying the surveyor's weight to the deck surface. No excessive deformation was noted.

5.3.3.8. On BIRD SONG, moisture levels in the deck and coachroof moulding were measured at regular intervals, paying particular attention to the laminate adjacent to deck fittings. All readings were found to be low, apart from the regions of the deck moulding around both port shroud chain plates and the chain plate of the starboard cap shroud. At these locations, moisture readings were found to be very high (moisture readings were at least 30, with the meter's needle hitting the end-stop for many of the readings. Refer to section 5.1.5 for a description of the moisture measuring process). Water ingress around these chain plates could not be ruled out. It is also possible that moisture has entered the balsa or plywood core of the deck moulding at these locations, via the cut-out holes of the shroud chain plates. This moisture ingress could eventually lead to the de-bonding of the interfaces between the core and the adjoining laminate. Impact tests with a plastic headed hammer gave no indications of loss of stiffness of these three regions. Due to the fixed trim panels surrounding the chain plates, the internal surfaces of the decks in these areas could not be accessed for inspection. It is RECOMMENDED (type C recommendation with an implementation time of one year) that the plywood & timber panels concealing all four shroud chain plates and the underside of the adjacent side decks are removed, or inspection holes are cut into the plywood trim panels. The exposed surfaces should then be inspected to determine if water has been leaking into the vessel from around the chain plates. It may be necessary to re-seal each of the chain plates to prevent further water ingress. At the same time that this work is being performed, the condition of the exposed chain plates and fasteners should be inspected for evidence of corrosion, distortion or other damage. If no surface water can be detected, small inspection holes should be cut into the lower skin of the side decks in the regions of the chain plates. From these holes, a sample of the deck core material should be removed and inspected for evidence of moisture. If the core is found to be wet or de-bonded from the inner or outer skins, the damaged core sections should be repaired. Refer to the Fiberglass Boat Repair & Maintenance manual by West System. Section 5.1.3 of the manual describes the re-bonding delaminated skin when the core is wet. This manual can be found through the following link:

http://www.westsystem.com/wp-content/uploads/Fiberglass-Manual-2015.pdf

5.3.4. Cockpit

5.3.4.1. The cockpit floor, seats and coaming were all in good cosmetic condition, with minor scratches in some areas. There was evidence of a repair to some gel-coat damage on the starboard cockpit coaming, positioned next to the sliding track of the cockpit canopy. This repair had been carried out to a good standard.

5.3.4.2. The cockpit seats, sole and small areas of the cockpit coaming were covered in

synthetic teak strip and black caulking. These slip-resistant surfaces were found to be in good cosmetic condition and all were free of damage and suitably bonded to the underlying surfaces of the deck moulding.

5.3.4.3. The diesel filling point was located on the port, aft corner of the cockpit sole. See paragraph 5.5.2.2 for a description of the diesel fuel tank filler cap.

5.3.4.4. A manual diaphragm bilge pump was installed in the cockpit sole, just forwards of the helm binnacle. See section 6.1 for a description of the bilge pump.

5.3.4.5. Access to the main cabin was from the cockpit hatch, located on the centreline of the cockpit. The hatch and single-piece timber locking washboard were in good cosmetic condition and free of damage. The washboard and integral vent were well varnished.

5.3.5. Anchor Locker & Lower Chain Locker

5.3.5.1. The electrically-operated windlass and the anchor warp were stowed in a locker, located in the foredeck. The cover of this locker was constructed from a GRP moulding, finished with a white gel-coat and a grey painted slip-resistant texture. The moulding was in serviceable condition, but with some cracking and laminate damage at the forward end of the moulding. The hatch cover was secured to the deck by two stainless steel hinges and a single chrome-plated brass latch. The hinges and latch were in serviceable condition and adequately secured.

5.3.5.2. The internal surfaces of the anchor locker were formed by the deck moulding, finished with white gel-coat. The sides and base of the locker were in good order and free of significant damage or cracking. The locker had a single drain hole located in the stem of the hull moulding. The GRP tube that formed this drain was in good condition and the drain hole functioned correctly.

5.3.5.3. From the hawse pipe of the electrically-operated windlass, the anchor chain passed down and into a lower chain locker, located at the forward end of the forepeak. The port & starboard sides of this locker were formed the sides of the hull moulding. The aft face of this locker was formed by a GRP bulkhead, which was secured to the hull sides and the underside of the deck moulding by GRP tabbing. This bulkhead was in good order and free of damage, but the screw-in plastic inspection hatch cover of the bulkhead was missing. In order to maintain the watertight integrity of this GRP bulkhead, it is suggested that a new plastic hatch cover is installed.

5.3.5.4. The lower chain locker was fitted with one drain hole, located on the port topside. This drain hole was not tested. the stainless steel cowl on the outside of this vent was damaged.

5.3.6. Hatches, Windows & Ventilation

5.3.6.1. One forward hinging Lewmar hatch (500 x 500 mm opening) was installed in the roof of the forepeak. This size meets the recommendation for the minimum dimension to allow escape in an emergency, which is 380mm [BS EN ISO 9094-1:2003, Small Craft - Fire Protection]. It was found to be securely attached and showed no signs of water ingress. The acrylic window and aluminium frame were in serviceable condition, but with moderate crazing of the acrylic material. It should be noted that the friction mechanisms of the lever stays were not functioning correctly, allowing the hatch to drop shut under its own weight. These stays should be adjusted by turning the 3 mm hexagon key screws in a clock-wise direction to increase the positioning force.

5.3.6.2. One smaller, forward hinging Lewmar hatch was installed in the coachroof of the saloon, positioned forwards of the mast. It was found to be securely attached and showed no signs of water ingress. The acrylic window and aluminium frame were in very good condition, but with crazing of the acrylic.

5.3.6.3. One forward hinging Lewmar hatch (500 x 500 mm opening) was installed in the roof of the aft cabin. This size meets the recommendation for the minimum dimension to allow escape in an emergency. It was found to be securely attached and showed no signs of water ingress. The acrylic window and aluminium frame were in serviceable condition, but with moderate crazing of the acrylic material.

5.3.6.4. There were four fixed acrylic windows bonded into the sides of the saloon coachroof. The acrylic material had light scratching and some light crazing. One of these windows showed evidence of water ingress: The port, aft window, located just forwards of the

chart table showed evidence of previous water leakage onto the plywood surfaces beneath the window. I was informed by the Owner that the window has been recently re-sealed in order to cure this leak.

5.3.6.5. A total of five small, inward opening, Aluminium & acrylic Lewmar windows were set into the sides of the saloon coachroof and aft cabin coachroof: One above the galley, one in the heads compartment, one on each side of the aft cabin and one at the aft end of the aft cabin, installed in the port side of the transom. These were in good condition and with all seals in good working order. There was minor crazing in the acrylic material of all five windows.

5.3.6.6. There were two stainless steel ECS vents located on the vessel: one in the Lewmar hatch of the forepeak and one in the hatch of the aft cabin. The stainless steel bodies of both vents were in good condition and free of damage, but two of the four screws that secured the vent onto the foredeck hatch were missing. It is RECOMMENDED (type A2 recommendation) that the vent on the foredeck hatch is suitably secured.

5.3.7. Deck Fittings and Equipment

5.3.7.1. There were eight large aluminium mooring cleats: Two on the foredeck, one at each of the aft corners and two on each side deck. All were inspected and found to be adequately secured to the deck or to the aluminium toe rails. The cleat on the starboard side of the aft deck was found to be fitted with adequately sized backing pads. Access to the underside of all other cleats could not be gained.

5.3.7.2. There were two fairleads on the foredeck and one at each of the aft corners. These were fitted to each end of the toe rail extrusions. They were in good condition and free of significant damage or deformation.

5.3.7.3. A total of four hardwood grab rails were located on top of the saloon coachroof and two on top of the aft cabin coachroof / aft ends of the cockpit coaming. They were in good order, with all wooden plugs intact and securely mounted. The wood was clean and un-varnished.

5.3.7.4. Two tubular stainless steel grab handles were mounted on the outside of the cockpit bulkheads, on either side of the companionway hatch. They were tested with the surveyor's weight and were found secure and in generally good order.

5.3.7.5. A tubular welded stainless steel grab handle was securely fastened to the helm binnacle. This was in good condition and free of damage or distortion.

5.3.7.6. A tubular welded stainless steel grab handle was secured to the aft edge of the spray hood frame. This was in good condition, but the securing nut of one of the starboard plastic mounting brackets was missing. It is RECOMMENDED (type A2 recommendation) that this nut is replaced. It is suggested that all similarly mounted nuts are replaced with nyloc nuts, to prevent the fasteners from working loose.

5.3.7.7. One tubular stainless steel grab handle was fitted to the transom, to assist entry onto the boat from the stern. This handle was in good working order and securely mounted.

5.3.7.8. The vessel was fitted with a pulpit, side stanchions and pushpit.

5.3.7.9. The four post pulpit was constructed from 1” outside diameter tubular stainless steel. It was mounted to the aluminium toe rails by cast aluminium bases and by two stainless steel fasteners at each base. The welded fabrication was adequately secured and free of distortion.

5.3.7.10. The 610 mm high side stanchions were constructed from tapered stainless steel. Each post was secured to the aluminium toe rails by cast aluminium bases and two stainless steel fasteners. They were fitted with twin stainless steel, 4 mm diameter, 1 x 19 construction safety wires. The forward ends of the wires were secured to the pulpit with stainless steel swaged end-fittings. The aft ends of three of the wires were secured to the pushpit with lengths of cord. One wire was secured via a stainless steel bottle screw. Ensure that the tethering lines are replaced every few seasons. The stanchions, bases, fasteners and safety wires were found to be secure and in good order.

5.3.7.11. The six post pushpit was constructed in two halves from 1” diameter and 3/4” diameter tubular stainless steel and was found secure and in good order. Each post was mounted directly to the deck moulding or to the toe rails via cast aluminium bases and stainless steel screws. The stainless steel fabrication, aluminium bases and fasteners were found secure and in good order. It was noted that the 3/4” diameter mid-rail on the

starboard side was slightly distorted.

5.3.7.12. An entry point was provided through the pushpit. This was closed off by a single safety rope, with a stainless steel snap shackle at the starboard end of the rope. The rope, spliced ends and snap shackle were in good order, but the rope tension was slightly loose.

5.3.7.13. A three step, hinging, welded stainless steel boarding ladder was secured to the hull moulding on the stern of the vessel by a total of four stainless steel fasteners. It was found to be adequately secured and free of cracks or distortion. When folded down, the ladder extended 500 mm below the waterline in order to aid man overboard recovery.

5.4. Rigging and Sails

5.4.1. Mast & Boom

5.4.1.1. The Kemp mast was an aluminium construction protected by grey coloured anodising. The mast was ascended using a climbing harness, secured by one halyard.

5.4.1.2. The mast was in serviceable condition, with no sign of serious corrosion or physical damage. The grey anodised protective coating was in good condition. There was minor corrosion of the aluminium where stainless steel hardware has been attached to the mast.

5.4.1.3. The cast aluminium deck plate was closely inspected and found to be free of cracks and was securely mounted to the coachroof with stainless steel screws.

5.4.1.4. The two sets of aluminium spreaders were in good working order. The cast aluminium spreader sockets were inspected and found to be well secured to the mast and free of visible cracks. The rivets that attach the spreader sockets were inspected and found to be well fastened and free from corrosion.

5.4.1.5. The extruded mast head was inspected closely and found to be free of cracks or deformation. All mast head fittings, as far as could be ascertained, were securely fastened and adequately locked.

5.4.1.6. The Kemp boom was in good condition, with no significant wear of the anodised coating. The gooseneck was in good working order and free of significant wear. The rivets that secure the gooseneck to the mast and boom were adequately secured and free of damage.

5.4.1.7. The boom vang was good working order and functioned correctly.

5.4.1.8. A telescopic Seldén, grey anodised aluminium spinnaker pole was mounted on the forward face of the mast. The telescoping mechanism functioned correctly, with no excessive sticking of the friction surfaces. The single stainless steel locking pin at each end of the pole was in good working order and free of damage. The aluminium extrusions of the pole were free of significant wear or damage.

5.4.2. Shroud Chain Plates

5.4.2.1. The stainless steel shroud chain plates were of the straight plate variety that pass through a slot in the deck moulding. The chain plates of the forward lower shrouds were formed from 10 x 40 mm stainless steel plate. The chain plates of the combined cap shroud, intermediate shroud & aft lower shroud were formed from 10 x 90 mm stainless steel plate. They were closely examined from the side decks and found to be free of damage, cracks and corrosion.

5.4.2.2. Note that the internal fittings of the shroud chain plates were concealed behind plywood and timber panels. The panelling could not be removed in order to inspect the chain plate fasteners and any tie bars or GRP knees that may transfer loads through to the hull. It is not uncommon for chain plate fasteners to corrode where they are secured through the deck or secured to the hull.

5.4.2.3. Brown water stains were noted on the carpet lining of the cave locker located behind the backrest of the starboard saloon seating, positioned beneath the chain plate of the combined cap shroud, intermediate shroud & aft lower shroud. See paragraph 5.3.3.8 for a recommendation relating to the inspection of the chain plate fasteners and the re-sealing of the chain plates to the decks.

5.4.3. Forestay & Backstay Chain Plates

5.4.3.1. The bow roller and forestay deck plate was fabricated from welded stainless steel plate, bolted through the deck moulding by five stainless steel fasteners. An additional strap extended down the stem and was bolted through the hull by three stainless steel fasteners. Inspection from inside chain locker showed that these fasteners were supported by large stainless steel backing pads. The forestay chain plate & fasteners were examined and found to be free of damage or corrosion, adequately secured to the hull and with no evidence of undue strain on the mountings. There was some minor cosmetic scratching of the two flukes of the bow roller support plates.

5.4.3.2. The backstay chain plate was constructed from 10 mm thick, welded stainless steel plate. This fabrication was bolted to the hull moulding by four stainless steel bolts. The inspection of the internal parts of the chain plate fasteners could not be accessed for inspection. The external parts of the fabrication and fasteners were found to be free of damage or corrosion, adequately secured to the hull and with no evidence of undue strain on the mountings.

5.4.4. Jib Furling Mechanism

5.4.4.1. The Furlex roller furling equipment was tested as far as practical and found generally in good working order, with the reefing line square to the drum and of suitable length. The drum was examined and no defects were seen in either the bearings or in the rigging screw attachment.The aluminium alloy luff extrusion appeared to be in serviceable condition, but with a minor bend at a point positioned approximately 200 mm above the lower end of the extrusion.

5.4.5. Standing Rigging

5.4.5.1. The Broker's information sheet stated that the rigging wires were replaced in 2007. To be safe, stainless steel standing rigging should be replaced every ten years on a cruising yacht. If the rigging wires are likely to be more than ten years old, they should be carefully monitored for evidence of cracks in the swaged fittings and for evidence of broken, worn or pitted wire. Consideration should be made for the likelihood that replacement will be necessary in the near future. Even in the absence of problems, replacement of rigging wires that are more than ten years old should be considered before embarking on major offshore passages or extended cruises.

5.4.5.2. The masthead standing rigging was formed from 1x19 stainless steel wire, with swaged terminals secured to the chain plates by toggles and bottle screws.

5.4.5.3. The standing rigging comprised 8 mm diameter double lower shrouds, 8 mm diameter cap shrouds passing over double spreaders, with additional support provide by 7 mm diameter continuous intermediate shrouds. There was an 8 mm diameter single backstay terminating on the transom. The 8 mm diameter forestay was formed by the headsail reefing foil.

5.4.5.4. The swaged terminals were inspected and appeared to be free from any bending or distortion that might occur during their manufacture. As far as could be ascertained, the bottle screws and toggles appeared to be in good working order, with no signs of bending, splitting, cracking or other failure. As far as could be ascertained, the shrouds and stays appeared to be in serviceable condition.

5.4.5.5. At deck level the lower parts of the cap shrouds, intermediate shrouds and forward lower shrouds were fitted with white PVC sheathing to protect the genoa from chafing against the wires. The wire beneath the sheathing was wet and very dirty. Stainless steel is susceptible to pitting corrosion in this partially oxygenated environment, where the protective outer layer of the stainless steel can break down, leading to localised corrosion. It is RECOMMENDED (type A2 recommendation) that the PVC sheathing is temporarily removed. The wires should be thoroughly cleaned before re-fitting the sheathing.

5.4.6. Running Rigging, Travellers & Winches

5.4.6.1. The running rigging that was stored on the vessel was inspected and found to be dirty, but showed only minor signs of wear. These all remain serviceable.

5.4.6.2. Lewmar headsail sheet leads were mounted on travelling cars on the side decks. The

aluminium tracks were securely mounted. The nylon sheave on the port track was very stiff.

5.4.6.3. The aluminium Lewmar mainsheet track and car were securely mounted to the top of the aft cabin coachroof and were in good working order.

5.4.6.4. Two primary winches (Lewmar ST44, two-speed, self-tailing) were located on the cockpit coaming. They were found to be adequately secured and in good working order. There was some wear & tarnishing of the chrome-plated drums.

5.4.6.5. One halyard winch (Lewmar 8 single-speed, non self-tailing but with add-on rubber tailer) was mounted on the coachroof, on the starboard side of the cockpit hatch. It was found to be adequately secured and in good working order.

5.4.6.6. One winch (Lewmar 6 single-speed, non self-tailing) was mounted on the aft face of the mast, between the boom and foot. It was found to be adequately secured and in serviceable condition.

5.4.6.7. One genoa furling winch (Lewmar 8 single-speed, non self-tailing but with add-on rubber tailer) was mounted on the port side of the aft cabin coachroof. It was found to be adequately secured and in good working order.

5.4.7. Sails & Canvas

5.4.7.1. At the time of survey the white Dacron, double-stitched Jeckells mainsail was stowed inside its stack-pack cover, positioned on the boom. It was uncovered and inspected without hoisting. The cloth & stitching were free of wear, but with minor black marks on some parts of the cloth. The aluminium headboard was free of damage. The plastic mast sliders were free of wear and well secured. All batten pockets were free of damage. The tack eye, clew eye and reefing eyes of the two slab reefs were in good order and well secured.

5.4.7.2. At the time of survey the genoa was furled on the forestay reefing foil. It was fully unfurled and inspected without taking down. The Broker's information sheet stated that this sail was new in 2017. The white, double stitched Dacron cloth of this Jeckells sail was in very good condition and free of evidence of any use. The blue UV cloth strips were free of fading. All cloth & stitching was clean. The stainless steel clew eye and head & tack tapes were free of damage or degradation.

5.4.7.3. A Saturn, double-stitched white Dacron mainsail was stowed inside a sail bag. It was removed from the bag and partially opened up inside the saloon and inspected. There was minor wear of the cloth and stitching, with some evidence of softening of the cloth, indicating moderate use. One 25 mm diameter adhesive repair patch was noted. The aluminium headboard, tack eye, clew eye and reefing eyes of the two slab reefs were in good order, well secured and free of damage. The cloth & stitching were reasonably clean.

5.4.7.4. The two-part blue canvas mainsail cover was in 'as new' condition and free of wear. It was found to provide good protection of all parts of the stowed mainsail.

5.4.7.5. The blue canvas spray hood was in 'as new' condition and suitably installed to the coachroof and cockpit coamings via a stainless steel frame. the two clear plastic windows were free of damage. All elastic cords, zips and webbing straps were in good working order.

5.4.7.6. The blue canvas cockpit canopy was in 'as new' condition. The three clear plastic windows were free of damage. The hinging & sliding stainless steel support frame was in good condition and free of damage.

5.5. PROPULSION

5.5.1. Engine & Transmission

5.5.1.1. BIRD SONG was fitted with a Volvo Penta 2040B, three cylinder diesel engine, with fresh water cooling, driving through a reduction gearbox. Engine control was via a single lever, giving forward and reverse gears and throttle control, mounted next to the helm on the starboard side of the helm binnacle.

5.5.1.2. The Product Number of the engine was xxxxx. The Serial Number of the engine was 5101_xxxx.

5.5.1.3. The LCD engine hours meter did not function and therefore did not give any indication of the engine's usage.

5.5.1.4. There was no evidence of engine overheating. There was evidence to indicate that some parts of the engine and attached components, particularly on the starboard side of the engine, had recently been re-sprayed with green Volvo Penta paint. For example, some parts of the new oil filter cartridge were found to have a fresh coating of spray-applied green paint.

5.5.1.5. The cast iron exhaust elbow was inspected and found to be free of external corrosion and free of evidence of gas or coolant leakage.

5.5.1.6. The engine oil was inspected and found to be clean, free of moisture and at the correct level.

5.5.1.7. The Volvo Penta reduction drive gearbox was a Type MS2LD_23_873075 and had a Serial Number of xxxxx.

5.5.1.8. The gearbox oil was inspected and found to be clean, free of moisture and at the correct level.

5.5.1.9. Whilst the vessel was afloat and tied up at her pontoon berth, the engine was tested. The engine started readily from cold, but with some grey smoke emitted for the first minute of running. Exhaust gases were then clear and free of soot. The engine was not be run up to working temperature or run under high load.

5.5.1.10. When in forward or reverse gear and running under partial load (2000 rpm), no fuming was noted in the engine space. No leaks from the engine cooling water, fuel and exhaust systems were evident.

5.5.1.11. There was evidence of oil leakage around the forward, lower edge of the engine. The oil deposits at this location were black, possibly due to dust from the alternator drive belt, suggesting that this oil leak has existed for some time. Further investigation is required in order to determine the origin of this oil leak.

5.5.1.12. Ahead and reverse gears engaged normally. When engine speed was increased to part-load, no excessive smoking from the exhaust was noted.

5.5.1.13. Once the engine had been run for a few minutes, it was turned off. After one minute the engine was started again at tick over speed. The engine immediately reached normal engine speed.

5.5.1.14. The alternator belt appeared to be correctly tensioned.

5.5.1.15. The Broker's information sheet stated that the engine mounts have been replaced, although no date or year was specified. It was found that the two forward mounts were relatively new, but the two aft mounts were much older. All four mounts were tested with a crow bar and the bonded rubber joints between the rubber and the adjoining steel brackets were found to be in good order. It was found that the rubber of the two aft mounts was heavily degraded and both mounts had lost their stiffness. As a result of this degradation, the engine mounts have collapsed downwards. The upper steel bracket of the port, aft mount was found to be touching the lower steel bracket, effectively by-passing the rubber of this mount. The downward collapse of these mounts is likely to have lead to some misalignment of the propeller shaft relative to the gearbox and relative to the P-bracket axis. The lack of stiffness of the rubber and the by-passing of the rubber on the port, aft mount is likely to have lead to an increased level of vibration passing from the engine & gearbox to the hull. It is RECOMMENDED (type A2 recommendation) that the two aft engine mounts are replaced. It is advisable to also replace the forward pair of mounts as all four mounts should have matched stiffness and damping characteristics.

5.5.1.16. Access to the engine's coolant impeller was difficult. Access to the alternator, raw water strainer, oil filter and oil dipstick were good.

5.5.1.17. Engine exhaust and cooling water were discharged through a stainless steel muffler box and an armoured flexible hose, to a hull fitting on the starboard quarter. Where accessible for inspection, these were found to be free of cracking, significant degradation and in serviceable condition.

5.5.1.18. The engine switch panel was mounted in the side of the starboard cockpit coaming, next to the helm position. The panel included the rev counter, engine hour meter, starter button, glow plug switch and lamps for alternator output, oil pressure, engine

coolant temperature and pre-start glow plug operation. The alarm buzzer and all lamps functioned, but the correct operation of the alternator output sensor, coolant temperature sensor and the oil pressure sensor could not be verified. The rev counter functioned intermittently. The LCD engine hour meter did not function.

5.5.1.19. The engine stop pull handle was mounted next to the engine control panel. It operated with full and free movement.

5.5.2. Fuel System

5.5.2.1. There was one welded steel fuel tank mounted under the cockpit sole, positioned forwards of the engine and aft of the companionway steps. Access to the fuel tank was from the starboard engine access door, mounted in the starboard side of the engine compartment. Access to the fuel isolation valve was gained via the circular access hatch, installed on the top of the engine compartment and located behind the companionway steps. Due to the proximity of the engine compartment panels and the attached sound-proofing material, only the aft face of the fuel tank, parts of the underside and the upper parts around the fuel isolation valve could be accessed for inspection. The visible parts of the fuel tank were clean and generally free of damage. The paint was in acceptable condition, but with evidence of underlying corrosion in some areas. The fuel tank was held in place by three straps, each constructed from strips of steel plate. It was found that the top-most strap was loose and its starboard end. It is RECOMMENDED (type A2 recommendation) that the fuel tank straps are adequately fastened to the surrounding structure.

5.5.2.2. The diesel fuel filler cap was located on the port, aft corner of the cockpit sole. The cap was suitably labelled. The rubber seal attached to the filler cap was in good condition and free of degradation. The short length of chain that secures the filler cap to the main body of the filler pipe was broken.

5.5.2.3. The fuel shut-off valve was installed on top of the fuel tank and was accessed via the circular plywood access hatch, located behind the companionway steps. The quarter-turn valve functioned correctly.

5.5.2.4. The analogue fuel gauge was mounted at the main electrical switch panel, positioned above the chart table. This gauge was tested and functioned, although its accuracy could not be verified. Electrical power to this gauge was only provided when the engine ignition switch was set to ‘on’.

5.5.3. Stern Gear

5.5.3.1. The exposed section of the 1” diameter stainless steel propeller shaft was in good condition and as far as could be ascertained, the alignment appeared to be correct. There was minimum wear between the propeller shaft and cutlass bearing in all directions.

5.5.3.2. The Broker’s information sheet stated that the propeller was a two-blade folding type. The propeller found on BIRD SONG was a 17” diameter, fixed pitch, bronze propeller. It was found to be free of dezincification or impact damage and was securely attached to the propeller shaft with a stainless steel nut, which was locked by a stainless steel split pin. These were in good order and free of visible corrosion.

5.5.3.3. The bronze P-bracket was inspected and found to be free of corrosion and adequately secured to the hull by four bronze bolts. The parts of these fasteners located beneath the sole board of the aft cabin were found to be free of corrosion, adequately secured and suitably supported by two brass or bronze backing plates. There was no evidence of water ingress around these fasteners.

5.5.3.4. The inboard shaft seal was of the mechanical type. It was inspected and found to be in good working order, with no evidence of perishing or cracking of the plasticised rubber hose. The seal was secured by a total of two stainless steel hose clips at each end. These were in good condition and free of significant corrosion. Ensure that the seal is replaced periodically and within the time limits recommended by the manufacturer.

5.5.3.5. When the engine was run, no leaks were evident from the inboard shaft seal.

5.5.3.6. A rope cutter was mounted forwards of the propeller. This was inspected and found to be free of damage.

5.6. SYSTEMS AND SERVICES

5.6.1. Anchor and Chain

5.6.1.1. The 35 lb painted and galvanised steel CQR anchor was in serviceable condition, but with some corrosion and wasting where the shackle is connected to the hole at the end of the shank. Consideration should be given to replacing this anchor in the next few seasons.

5.6.1.2. The anchor was secured to a length of chain by a single galvanised steel shackle. This shackle was in good working order and suitably locked with seizing wire.

5.6.1.3. The chain was generally free of wear & significant corrosion and in serviceable condition. The chain was spliced to a length of 19 mm diameter warp. This splice was in good condition.

5.6.1.4. The bitter end of the warp was correctly tethered to a stainless steel eye via a length of thin line that could easily be cut in an emergency. The stainless steel eye was secured to the side of the anchor locker moulding.

5.6.1.5. The anchor chain was made from short plain-linked galvanised steel. Dimensions of the chain were 10 mm x 33 mm x 47 mm. The recommended length of anchor chain that should be stowed on a small craft is 45 metres, which equates to a length: depth ratio of 5:1 in 9 metres of water. [Gerr, Dave. Boat Mechanical Systems Handbook. Adlard Coles Nautical, 2009]. The chain was measured and found to be approximately 33.5 metres long, which generally agrees with length stated on the Broker's information sheet.

5.6.1.6. A spare anchor and length of 7 mm diameter chain & 12 mm diameter warp was stowed in the lazerette, located on the starboard side of the aft deck. This 18 lb Danforth anchor was in serviceable condition and free of damage or deformation. This anchor was connected to the chain via a steel shackle. The chain & shackle had some surface corrosion but were in serviceable condition. The chain was connected to the sliced eye of the warp via a steel shackle. This shackle was heavily corroded. It is RECOMMENDED (type A2 recommendation) that this shackle is replaced.

5.6.2. Anchor Windlass

5.6.2.1. The Simpson Lawrence 1500, 12 volt d.c. windlass was installed inside the anchor locker, mounted to the GRP deck moulding. This was inspected and found to be adequately secured to the deck moulding. The cast aluminium deck unit was inspected and found to be in serviceable condition, but with corroded surfaces. The external surfaces of the electric motor, mounted under the deck, were not accessible for inspection.

5.6.2.2. The windlass was tested from the control button mounted on the foredeck and was found to function correctly.

5.6.2.3. The heavy duty trip switch for the windlass was installed at the electrical switch panel, located above the chart table. The unit was powered from the two main service batteries, with all high current wires constructed from suitably sized, heavy duty cable. The parts of the cabling and relay switching assembly that were located beneath the forepeak bunk were in good order and free of corrosion.

5.6.3. Fresh Water System

5.6.3.1. There were two black polyethylene fresh water tanks. They were located under the port & starboard saloon seats. These were found to be adequately secured to the adjacent structure and where access allowed, were found to be free of damage.

5.6.3.2. The suitably labelled filler cap for the fresh water tanks was located on the starboard side deck. Water from the tanks was fed into a pressurised water system. This water system supplied hot & cold water to taps in the galley, heads and to a shower nozzle mounted in the heads compartment. A 22 litre stainless steel calorifier installed beneath the bunk of the aft cabin provided hot water to the taps and shower head. The calorifier was heated by either hot water from the engine cooling system or by 240 volts a.c. electric heating.

5.6.3.3. The pump, taps and shower nozzle were tested and found to function correctly. The

water that came out of the taps was found to be clear. The first litre of water that came out of the shower nozzle was dirty. It is suggested that the fresh water system is cleaned before use. The 240 volts a.c. element of the calorifier was tested and was found to function well. The water heating system from the engine could not be checked as the hot water tank had already been heated from the 240 volts a.c. heating element.

5.6.4. Heads

5.6.4.1. The Jabsco manually operated sea toilet was clean and the bowl and pump were adequately attached to the GRP moulding of the heads compartment. The installation was tested and the pump in and pump out mechanisms functioned, but the hand plunger was found to be very stiff. It is likely that the o-ring seal of the plunger shaft is worn and degraded, leading to increased friction when the plunger is moved up and down. No leaks were noted. It is RECOMMENDED (type C recommendation with an implementation time of six months) that the toilet pump is serviced.

5.6.4.2. The shower tray, sink unit and sides of the heads compartment were formed by a GRP moulding and were finished in a beige gel-coat. This was in good cosmetic condition and free of damage. The moulded GRP cupboard door beneath the sink was in serviceable condition, but the domestic quality hinges were partially corroded.

5.6.4.3. There was a pull switch next to the sink which operated an electric water pump. This pumped the water out of the shower tray and out of the vessel via the skin fitting of the heads sink drain. The pump functioned correctly.

5.6.4.4. The toilet inlet and outlet hoses were of suitable material. Both hoses correctly extended upwards inside the engine compartment to form anti-siphon loops. The apex of these loops reached as far upwards as the underside of the cockpit sole.

5.6.5. LPG Installation

5.6.5.1. On the starboard side deck there was one locker specifically equipped as a gas cylinder storage container. The gas locker was set into the deck moulding, with the locker lid flush with the adjacent side deck. The GRP lid was in good cosmetic condition and free of damage. The two stainless steel hinges were in good working order. The quarter-turn steel latch was corroded and seized.

5.6.5.2. Two 4.5 kg, butane gas cylinders were stored inside this locker. The locker base and sides were constructed from the GRP deck moulding. The sides of the locker were free of significant damage. The locker was not tested for integrity but was considered to be gas-tight to a level above the pressure regulator.

5.6.5.3. A locker drain was installed at the bottom of the gas cylinder locker in order to allow any leaked gas to escape to the outside of the hull. This drain was formed from GRP tube and was bonded to the underside of the locker and to the hull sides with GRP tabbing. The drain was in good order and was found to be clear and free of blockages. The outlet of the locker drain was suitably located above the waterline. The gradient of the fall of the drain was such that no water trap could be formed.

5.6.5.4. Connected to one of the butane gas cylinders was a manual isolation valve and pressure regulator. There was no date on the regulator to indicate its age but it is likely that the regulator is less than ten years old. Pressure regulators should be replaced when ten years old.

5.6.5.5. From the isolation valve & pressure regulator, rubber hose led the gas supply to a copper pipe inside the gas locker. The rubber hose was manufactured in April 2011. Gas hose should be replaced every five years. There was no evidence of cracking or degradation of the hose. It is RECOMMENDED (type A2 recommendation) that this hose is replaced by a maximum length of one metre of appropriately labelled gas hose. The hose should be marked to BS 3212 type 2 or BS 3212:1991 or BS EN 1763 class 2/3/4. This work should be performed by a qualified gas technician, such as those listed on the gas safety register. This recommendation also applies to the gas hose behind the galley stove. It is suggested that the hose behind the cooker is replaced with plain gas hose, rather than armoured hose as the condition beneath the steel armour can not be inspected for damage or degradation.

5.6.5.6. From the side of the cylinder storage locker, copper pipe then led the supply to an isolating valve located beneath the stove. This valve was in good working order and suitably located. A length of armoured gas hose conveyed the gas supply to the

cooker. The armoured hose was manufactured in January 2012.

5.6.5.7. The copper pipe was protected and supported along its length by polyethylene hose.

5.6.5.8. Strong consideration should be given to installing a bubble leak tester on BIRD SONG.

5.6.5.9. The Force 10 twin hob, grill and oven was secured by a gimbal mechanism to the galley structure. The gimbal and lock functioned well. The cooker was very clean. All burners lit easily and burned with a clean blue flame.

5.6.5.10. The installation was not further inspected or pressure tested for leaks.

5.6.5.11. Note that this survey is not any kind of gas safety certificate. This is only obtainable after comprehensive pressure testing and assessment by a qualified person listed on the gas safety register. The above recommendation should be undertaken by a qualified gas technician, such as those listed on the gas safety register. See http://www.gassaferegister.co.uk for further details.

5.6.6. Galley

5.6.6.1. The L-shaped galley was situated on the starboard side of the vessel, at the bottom of the companionway steps. There was a 12 volt d.c. top-access Frigomatic fridge unit located on the galley worktop, next to the Force 10 stove. The fridge functioned correctly. One top-access moulded GRP cool box was installed in the galley worktop, positioned forwards of the cooker. The lining of the cool box was in good cosmetic condition.

5.6.6.2. There were two round stainless steel sinks in the area of the galley that runs athwartships. Both sinks were supplied with hot and cold fresh water from a chrome mixer tap. One of the sinks was supplied with cold filtered, fresh water via a single tap. This tap was not tested.

5.6.6.3. There were a range of timber cupboards with hinging & latching timber doors. The domestic grade hinges had some surface corrosion. The latches of the cupboard beneath the sink and the cupboard beneath the fridge were broken or did not function correctly.

5.6.6.4. The grey speckled melamine work surfaces were fitted with fiddles to prevent items from sliding off when at sea. The varnish coatings of the timber fiddles and the side panels of the sink were worn and faded.

5.6.7. Electrical System

5.6.7.1. BIRD SONG had a 12 volt d.c. electrical system, with one engine starting battery (115Ah) and two batteries (115Ah each) for services. All three batteries were installed beneath the bunk of the aft cabin. The engine starting battery was not fitted with tie down straps to prevent movement, but the adjacent panels of the bunk frame were considered to provide a degree of restraint. It is suggested that this battery is fitted with tie down straps to prevent movement in the event of a capsize. The two service batteries were fitted with one steel security bar, but this bar was not fastened down at the time of survey.

5.6.7.2. The batteries were load tested. All batteries were found to be ‘good’. It was noted that numerous wires have been connected directly to the terminals of the two service batteries. The function of these wires was not determined, although it was noted that the electric bilge pump was wired independently of the master battery switch, therefore one set of wires would have provided power to the electric bilge pump. Some of the positive wires did not appear to have any in-line fuses fitted. One of the in-line fuses was disconnected, suggesting that this wiring circuit was no longer in use. It is RECOMMENDED (type A2 recommendation) that the battery connections are inspected by a qualified electrician and modified where necessary, in order to meet current electrical installations standards.

5.6.7.3. Battery charging was from the Rutland 913 wind generator, from the engine alternator or from shore power through a Mobitronic battery charger located beneath the starboard bunk in the aft cabin. The Mobitronic battery charger functioned correctly.

5.6.7.4. Battery charging from the alternator was managed by a Sterling Power Products alternator regulator, mounted inside the engine compartment. The output from the alternator was checked whilst the engine was running and the alternator was found to

function correctly.

5.6.7.5. A single rotary breaker switch controlled the output from the batteries. Battery switch number one is for the engine battery. Battery switch number two is for the service batteries. Service power was then distributed via a switch panel, consisting of sixteen push button trip switches, mounted above the chart table. The switch panel incorporated three analogue gauges to monitor the fresh water tank level, the fuel tank level and the voltage of both battery banks. All three functioned, but their accuracy could not be assessed.

5.6.7.6. Shore power was connected to the vessel at a socket mounted on the starboard side of the transom. This was connected to a 240 volts a.c. master switch unit, mounted inside the engine compartment. This unit housed the breakers to isolate the shore power. Shore power was distributed to conventional domestic 13 amp sockets.

5.6.7.7. The shore power sockets were tested with a domestic socket tester. It was found that the live and neutral feeds of the 240 volts a.c. system were reversed. Note that this fault may be due to incorrect wiring of the pontoon power supply. It is RECOMMENDED (type C recommendation with an implementation time of two weeks) that this fault is investigated by the Marina maintenance technicians or by a qualified electrician. It is suggested that before an electrician is contracted to check the vessel's wiring, the Marina Office are informed of this issue, so that they can investigate the electrical wiring of the pontoon power supply.

5.6.7.8. It was noted that the on/off switch of the 240 volts a.c. supply of the fresh water immersion heater was installed at the 12 volts d.c. control panel, above the chart table. The fascia of the electrical switch panel was not opened up during the survey, therefore it could not be determined whether the 240 volts wiring was suitably shielded in order to prevent electric shock when the panel is opened up. It is suggested that the 240 volts a.c. power supply is isolated before the 12 volts d.c. switch panel is opened for inspection or maintenance. It is also suggested that the 240 volts a.c wiring behind the 12 volts d.c. switch panel is inspected by a qualified electrician at the same time as the battery terminal wiring discussed in paragraph 5.6.7.2 is inspected.

5.6.7.9. All internal lights functioned correctly.

5.6.7.10. The wiring that could be seen appeared to be serviceable, well supported and routed clear of the lower bilges.

5.6.8. Navigation Lights

5.6.8.1. A stern light was adequately attached to the transom. The lens was crazed but currently in serviceable condition. A bicolour light was mounted on the pulpit. The lens of this light was also slightly crazed. A steaming light unit was mounted on the mast. A mast-top tricolour and anchor light were installed. All navigation lights were tested and found to function correctly.

5.6.9. Navigation Equipment

5.6.9.1. A Plastimo Olympic 100 compass was mounted on the helm binnacle. The damping fluid was free of bubbles. The plastic lens had some mild discolouration, but was in serviceable condition. The compass light functioned correctly.

5.6.9.2. A Raymarine e97 hybrid touch colour chart plotter was mounted on the helm binnacle. This unit powered up and gave an accurate position fix on the colour chart.

5.6.9.3. A Raymarine ST4000 autopilot was installed at the helm wheel. The control panel of this unit was mounted in the side of the starboard cockpit coaming. This autopilot was tested and found to function correctly, but the accuracy of the built-in compass could not be assessed.

5.6.9.4. An Autohelm Tridata speed and water depth indicator display was mounted in front of the sliding cockpit hatch. This unit powered up correctly. The depth and speed functions worked normally.

5.6.9.5. An Autohelm wind speed and wind direction display unit was mounted in front of the sliding cockpit hatch. This unit powered up and gave readings of wind speed & direction.

5.6.9.6. An Autohelm VMG display unit was mounted in front of the sliding cockpit hatch. This

unit powered up and gave a magnified indication of the wind direction. The boat speed indicator (velocity made good) powered up but was not tested.

5.6.9.7. An Autohelm boat speed and water depth repeater display unit was mounted at the chart table. This unit powered up correctly and gave readings of depth and boat speed.

5.6.9.8. An Autohelm GPS position display unit was mounted at the chart table. This unit powered up correctly and gave readings of latitude & longitude.

5.6.9.9. A Clipper Navtex unit was mounted at the chart table. This unit did not power up. It is RECOMMENDED (type A2 recommendation) that this unit is repaired.

5.6.9.10. A Simrad RD68 VHF/DSC radio unit was installed at the chart table. This unit powered up, received signals, but was not tested for transmission.

5.6.9.11. A clock & barometer were mounted on the main bulkhead in the saloon.

5.6.9.12. A Pioneer radio, CD and iphone-connected player was installed near to the chart table. The radio function worked normally. The speakers in the saloon functioned normally. The cockpit speakers were not tested.

5.6.10. Space Heating System

5.6.10.1. BIRD SONG was fitted with a 4000 Watt Eberspächer Airtronic_M, D4 Plus, diesel powered heating system. The Factory Number of the unit was xxxxx0CC and the main unit had an Order Number of xx_xxx. The unit was installed in lazerette, located at the starboard side of the aft deck. The unit was tested and found to function correctly.

5.6.10.2. The heater body appeared to be correctly installed and the thermally lagged exhaust hose was found to be routed clear of combustible surfaces.

5.6.10.3. Refer to paragraph 5.1.9.7 for a recommendation relating to the replacement of a corroded washer that formed part of the hose clamp used to secure the exhaust pipe to the skin fitting on the transom.

5.7. Accommodation and Décor

5.7.1. Access to the main cabin was from the cockpit hatch, located on the centreline of the vessel.

5.7.2. Refer to Section 5.2.5 for a description of water staining of a number areas of the plywood bulkheads and plywood panels within the living areas.

5.7.3. The teak & holly faced plywood sole boards were generally in very good cosmetic condition, but with some discolouration due to water ingress of parts of the sole boards located next to the galley cooker. All plywood sole boards were fastened down with stainless steel screws, but with one corroded steel screw located next to the base of the saloon table.

5.7.4. The plywood and solid timber saloon table functioned well and was able to fold and stow correctly. The forward end of the table was supported in the vertical direction via a stainless steel bracket that was clamped around the stainless steel mast compression post. The four stainless steel screws that secured the bracket to the table were poorly fastened to the underside of the table.

5.7.5. The bunk and seating cushions were found to be dry and in very good condition, were generally free of stains or fading, but with one dirt mark on top of the seating cushion located nearest to the chart table.

5.7.6. Vinyl covered panels were fitted to the top and sides of the coachroof. These were in good cosmetic condition and free of damage.

5.7.7. The two plywood doors of the heads compartment, the door of the aft cabin and the door of the forepeak cabin were in good cosmetic condition and free of damage. All closed normally, except for the door of the forepeak cabin. The brass closing latch of this door was found to rub against the latch plate of the door frame.

6. SAFETY EQUIPMENT

Refer to the Boat Safety Handbook [RYA publication, 2012, ISBN 978-1-906435-53-0]. This book gives recommendations and advice concerning the selection and installation of safety equipment.

6.1. BAILING / BILGE PUMPING

6.1.1. One Whale Gusher 10, Mk3 manual diaphragm bilge pump was installed in the cockpit sole, positioned just forwards of the helm binnacle. The handle of this pump was stowed behind the companionway steps. The intake of the pump was located in the lowest part of the bilge. It was correctly fitted with a strum box. The pump was tested and was found to function very poorly. It is RECOMMENDED (type A2 recommendation) that the pump is serviced and the diaphragm seal replaced Additionally, the handle should be mounted close to the pump and tethered to prevent its loss.

6.1.2. One Rule electric bilge pump was positioned at the lowest part of the bilge. It was actuated by a manual switch, located at the chart table, or by an automatic float switch which was positioned next to the pump. It was found that the power supply to the bilge pump was wired independently of the battery master switch, allowing the bilge pump to activate even when the vessel's 12 volts electrical system is switched off. The pump was rated at 1100 gallons (4165 litres) per hour. When powered up using the manual switch, the pump was found to operate but its efficiency could not be verified. When the switch at the chart table was set to automatic mode and the float switch lifted, the pump did not operate. It is RECOMMENDED (type A2 recommendation) that the float switch is repaired or replaced.

6.1.3. It is RECOMMENDED (type A2 recommendation) that two buckets (with lanyards) are stowed on board. These should be between 9 and 14 litres in capacity.

6.1.4. It is suggested that in order to minimise the risk of the bilge pumps clogging with dirt & debris, the bilges should be cleaned as far as practicable of all dirt & dust, particularly in the bilge compartments nearest to the pumps.

6.2. DETECTION EQUIPMENT

6.2.1. Two hand-held compressed gas fog horns were found on the vessel. One of the cylinders was nearly empty. A fully charged spare cylinder should be carried on board.

6.2.2. An Echomax, passive type radar reflector was secured to the mast.

6.2.3. There was no motoring cone found on board. This is required by COLREGS. It is RECOMMENDED (type A2 recommendation) that one is procured and stowed ready for use.

6.2.4. There was no anchor ball found on board. This is required by COLREGS. It is RECOMMENDED (type A2 recommendation) that one is purchased and stowed ready for use.

6.3. FIRE FIGHTING EQUIPMENT

6.3.1. A number of fire extinguishers were found on board. These are summarised in Table 5. All units were five years or greater than five years old. It is RECOMMENDED (type A2 recommendation) that all of the units are serviced or replaced.

Type	Location	Date Stamp	Pressure Gauge
1 kg ABC dry powder	Galley	Manufactured 1995	Green
1 kg ABC dry powder	Forepeak cabin	Manufactured 1995	Green
1 kg FX1000, clean agent	Engine compartment	Manufactured 2013	Green

Table 5: Fire Extinguishers on board BIRD SONG

6.3.5. Most fire extinguishers have a five year service life. Ensure that the extinguishers are serviced or replaced after this five year period. Regularly shake dry powder extinguishers to prevent the powder coagulating.

6.3.6. A fire blanket was hanging in the galley area. It was located within suitable distance of the cooker.

6.3.7. The engine compartment was not fitted with a fire extinguisher injection port. Consideration should be given to installing one.

6.4. CARBON MONOXIDE ALARM

6.4.1. There were no Carbon Monoxide alarms installed on BIRD SONG. It is RECOMMENDED (type A2 recommendation) that at least two units are procured and mounted in an appropriate location. It is suggested that one alarm is mounted in the aft cabin, positioned at sleeping head height. A second alarm should be installed in the saloon and mounted at a position that is approximately 1' below the level of the coachroof. Note that the air space closest to the coachroof is considered to be 'dead space' and the sensor will not function so well in this area.

6.4.2. Refer to the following website for details of alarms that are approved as meeting BS EN 50291-2. These are best suited for boats:

http://www.boatsafetyscheme.org/stay-safe/carbon-monoxide-(co)/co-alarms-save-lives/

6.5. STRONG POINTS

6.5.1. The vessel had webbing jackstays. The ends of each jackstay were shackled to the aluminium toe rails. The webbing, stitching and shackles were in good working order.

6.5.2. One lifeline strong point was secured to the deck moulding, on the port side of the companionway hatch. The loop was free from deformation and was well secured to the deck moulding. A second strong point should be installed in the cockpit, located close to the helm position.

6.6. MAN OVERBOARD RECOVERY EQUIPMENT

6.6.1. Two yellow horse shoe lifebuoys was stowed on their mounting brackets, one on each side of the pushpit. The starboard buoy was fitted with a flotation light. The lens of the light was filled with water. It is RECOMMENDED (type A2 recommendation) that the light is replaced. Both buoys should be labelled with the vessel's name. The buoy with the flotation light should be fitted with a length of floating line.

6.6.2. One rescue line was stowed inside its yellow canvas bag, stored inside the lazerette. The yellow floating line was free of fading and appeared to be unused.

6.7. LIFERAFT

6.7.1. An Ocean Standard 4C, four person, ORC type liferaft was secured to the port side of the pushpit, mounted in a stainless steel frame. The liferaft was packaged within its plastic case. It was not opened up for inspection. The service date of the liferaft was May xxx. The serial number of the liferaft was LRxxx_ORC_xxx. It is RECOMMENDED (type C recommendation with an implementation time of three months or before an offshore voyage) that this liferaft is serviced.

6.8. PYROTECHNICS

6.8.1. No emergency flares were found on the vessel. It is RECOMMENDED (type A2 recommendation) that a set of flares (size and quantity appropriate to the sea areas and sea states expected to be encountered) is procured and stowed ready for use.

Date of publication: Wednesday 21st March 2018

7. TYPES OF RECOMMENDATIONS USED IN THIS REPORT

The recommendations detailed within the body of this report are presented in five categories and are classified as follows:

Type A1	Structural, mechanical or other defects requiring IMMEDIATE attention i.e. those affecting structural strength, seaworthiness or safety which MUST be repaired BEFORE the vessel is relaunched at this time.
Type A2	Structural, mechanical or other defects affecting strength, seaworthiness or safety which may be repaired after the vessel is relaunched but MUST be repaired before the vessel is taken to sea.
Type B	Defects not affecting strength, seaworthiness or safety but which, by their nature, should be dealt with before putting the vessel afloat.
Type C	Structural, mechanical or other defects NOT requiring immediate attention but are to be dealt with within a specified time period.
Type D	Non-essential or cosmetic defects whose repair may be left to the Owner's convenience. All suggestions are, unless noted otherwise, of this type.

These recommendations are intended to be only a guide to necessary rectification work. Both type A and type B recommendations cover urgent remedial work to be carried out as soon as practical. Type C recommendations cover significant remedial works to be carried out within the specified time period. It should also be noted that, in some instances, defects are noted within this report without a covering recommendation. In such cases either no action is necessary or the remedy is self-evident.

8. Abbreviations Used in This Report

a.c.	Alternating current
COLREGS	International Regulations for Preventing Collisions at Sea 1972
CQR	A design of anchor
d.c.	Direct Current
DSC	Digital Selective Calling
GRP	Glass Reinforced Plastic
HP	Horse Power
IIMS	International Institute of Marine Surveyors
LCD	Liquid Crystal Display
LPG	Liquid Petroleum Gas
PVC	Polyvinylchloride
UV	Ultra Violet
VHF	Very High Frequency
VMG	Velocity Made Good