MEDUSA
MARINE

S1147 – Hull Condition Survey Report on:

Gibbs 40 TSDY [redacted]

For

[redacted]

Surveyed at [redacted]

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Nominated Coding Surveyor for small commercial vessels

Member Royal Institution of Naval Architects

Accredited Member Yacht Designers & Surveyors Association

Tonnage Measurer for all Red Ensign Flag States

Hull Condition Survey Report on MotorYacht [redacted]

This survey was carried out on the instructions of:

[redacted]
99 Lovell Road
Cambridge
CB42QW

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1) General notes.

a) Responsibility

Any responsibility is to the above client only and their insurers, and not to any subsequent owner of the vessel under survey or holder of this report. Copyright is retained by Medusa Marine and copies must not be made or distributed except to the vessels insurers or repairers without permission of the copyright holder.

b) Location

The vessel was ashore at [redacted] SS3 0DA [redacted].

c) Purpose and scope of survey

Survey was carried out under Medusa Marine terms and conditions. These are YDSA standard terms of engagement and are available on our website: www.medusamarine.co.uk/index.php/terms-and-conditions/

This survey was commissioned by the owner for the purpose of establishing the condition of the vessels hull prior to transportation by road. Unless otherwise stated, the vessel was not surveyed for compliance with any build standards (RCD) or operational codes of practice or local licenses. The vessel has also not been surveyed for suitability for any particular purpose or location. This survey report is a factual statement of the surveyor's examination as carried out and his opinion given in good faith as to the relevance of disclosed facts and defects so far as seen. It implies no guarantee against faulty design or latent defects.

d) Limitations

Areas inspected were limited to openings and access available during normal operations and maintenance of the vessel. No fastenings or skin fittings were removed, keel bolts drawn or joinery or head linings removed. Closed compartments were visually inspected by means of a Ridgid CA100 endoscopic camera. Materials used in the construction were tested as far as was possible by industry standard Non Destructive Test (NDT) test equipment.

Unless the vessel was afloat, the mechanical condition of the engine was not covered by survey, only the installation and components normally available to routine maintenance could be assessed. If afloat, only assessment of the engines no load running condition was possible unless a full sea trial was undertaken. Sails where present, were examined for general condition. The

sails were not set, so no assessment of shape or stretch could be made. Spars where stepped were examined from deck and ashore only.

Navigational equipment, electrical installations and domestic appliances were assessed subject to limitations if battery charge or shore power was available. If there was no opportunity for sea trialling the vessel, no assessment of the vessel and her equipment under seaway conditions was possible. No opinion could be made or responsibility undertaken for condition or defect of those aspects of the vessel not accessible or evident due to the above limitations.

e) Recommendations

Recommendations have been subdivided into three categories. All Recommendations are annotated thus and are summarised at the end of the report

Category 1 (Cat 1) Recommendations are safety related or below waterline defects which should be corrected before the vessel is put into commission.

Category 2 (Cat 2) Recommendations relate to defects which are non critical or affect the efficient operation of the vessel in normal use and should be attended to at the owners convenience.

2) The Vessel specifications and description

Note: Dimensions and measurements given have been derived from published data, and have not been verified by survey.

Dimensions:	
LOA:	39 ft 9 ins
LWL:	35 ft 6 ins
Beam:	11 ft 6 ins
Draft:	3 ft 11 ins
Air Draft	8 ft 6 ins
Displacement	not known
Manufacturer:	H Gibbs & Co, Teddington
Model or Type:	Gibbs 40
Year of Build:	[redacted]
Official No (part one):	
Registered Tonnage:	
Port of registry:	
Construction:	Carvel planked mahogany on oak framing
Engines:	2 x Ford FSD diesels on shafts

This vessel was built before16th June1998 and therefore is not subject to the requirements of the Recreational Craft Regulations (SI 1996/1353), as amended in 2005 (Directive 2003/44/EC) to include environmental emission limits.

Vessels that were built before 1st January 1985 and within the EU prior to 1992 are considered VAT paid. This boat was built in the EU before those dates so proof of VAT paid status does not need to be obtained.

The vessel has a UK Flag (Part One) registration mark. This registration needs to be renewed every five years. If allowed to lapse re-registration will require re-measuring for tonnage. This is a calculation of the theoretical cargo carrying capacity and used to calculate port and bouyage dues where applicable. It is not a measure of weight or displacement. There is no statutory requirement for vessels to be registered unless voyaging outside UK waters.

Touchwood is a Gibbs 40 Twin Screw Diesel Yacht (TSDY) motor cruiser built by H Gibbs & Sons of Teddington. Harry Gibbs started his boat building business on Trowlock Island on the upper reaches of the Thames in 1910. Commercial pleasure cruisers, motor yachts, open river launches and admiralty launches were built by the company until it ceased trading in 1972.

The Gibbs 40 was one of the most popular designs. It features a raked stem and rounded forefoot, which gives way to a long straight keel. The keel section deepens aft to a cut away before the rudder, The rudder lower hanging is on a heel shoe which is an extension of the keel.

There is a distinctive break to the foredeck with a stepped sheerline, which had been a feature of previous Gibbs motoryachts. The raised topsides to the break has portlights to give light to the forward accommodation. There is a moderate flare to the bows which gives way to vertical flanks amidships and a rolled tumblehome to the aft quarters.

The fine entry forward gives way to a moderate deadrise amidships and a flat canoe body run aft in way of the stern gear. There are bolted on bilge runners at the turn of the bilge. The stem and the bilge runners are shod with steel banding and the keel incorporates a shallow cast iron ballast section over most of its length.

The accommodation consists of a forepeak with twin berths against the hull sides with storage beneath. Moving aft is a shower and heads compartment to starboard with a hanging locker opposite. This gives access to the reverse of the helm gear and electrical switch and fuse gear. The whole forward accommodation is under a flush foredeck.

The wheelhouse has a helm station to port and the engineering space is all under the wheelhouse sole. A companionway from the wheelhouse gives access to the saloon with twin settee berths and storage beneath and behind. Aft is a small galley with sink cooker and refrigerator. Through an aft companionway is a deep cockpit with a ladder to a small boarding platform.

3) Survey details

a) Hull general

Hull construction is of a skeletal framework of 1 ½" x ¾" moulded steam bent oak timbers. These are supported by one full length and one part length stringer of doubled sections of 4" x 1" oak. The framing timbers are pitched at 8" spacing and there is no additional framing to the hull sides internally in the forward sections.

Within the engine space there are four deep solid 3" oak longitudinal engine beds which extend aft to alongside the shaft logs. In way of these beds are partial frames of 3" moulded x 5" sided sawn oak, pitched at every five timbers. These terminate at the turn of the bilges.

The centre spine structure is all of oak. The stem and stemson are scarf jointed sawn sections of 3" x 3" and 3" x 5" respectively with the stem shaped to a cutwater and shod with a stem band. These sections are scarfed into the keel and keelson which are 5" x 3" and 8" x 3" respectively. The keel has fore and aft deadwoods either end of a shallow cast iron ballast keel.

The transom is fabricated from horizontal mahogany planking fastened to a substantial stern knee which is bolted through the keel structure. This knee extends forward to a compression strut. This strut is fastened under the keel within the cutaway, and is landed on the keel extension. It could not be established whether this is an original detail or added later to correct a design weakness.

There are 6 non-structural and non-watertight bulkheads of tongue and groove panelling on hardwood framing. The wheelhouse and upperworks generally are all constructed of mahogany veneered plywoods and solid moulded hardwoods.

The construction and scantlings are typically of a lightly built vessel for operating within restricted waters. This is exemplified by the relatively slack bilge sections aft to reduce draught and the bilge runners and keel extensions which serve to enable the vessel to take the ground regularly. There are no indications that the vessel has been designed to, or built to, any of the recognised classification societies guidelines.

b) Bottom and keelson internal

The hull bottom was surveyed internally where accessible. This was limited by the construction of fixed joinery and installed engineering. All accessible internal hull structure was tested for condition by hammer sounding and spike testing. Oak, when kept in a continuous state of either dry or wet conditions can remain sound and unaffected by fungal decay. High concentration of salt in wood can act as a preservative provided it is not flushed out by fresh water.

Moisture readings were taken with a Tramex Marine Moisture meter. This meter is a capacitance type tester equipped with a scale for hardwood as a percentage scale of 0% to 30%. The following moisture content levels are given as a guide.

11% to18% Normal for hardwood at 60% to 80% relative humidity.
19% - 26% Timber may support mould and biological growth.
26% - 29% Timber is susceptible to developing wet rot.
30% plus Moisture content has reached fibre saturation point

Moisture levels were not considered representative due to the retention of bilge water and the saturation of the planking caused by the antifouling coating externally as detailed later.

Soundings can identify attack from wood boring infestation. No evidence was found in the internal areas that could be accessed. Borers are only found the mid to the low intertidal range. This vessel has apparently been recently laid up in a mud berth close to high water mark and away from any immersed wooden structures, so it has not been in a high risk area.

The internal hull bottom and keelson was mostly covered in a depth of bilge water with a surface film of oil. Where sounded the centre spine structure was sound and firm. The framing timber heels are butted into the keelson in the forefoot sections and carried over the keelson in the hull bottom. There are wedges inserted to create limbers for the passage of bilge water.

There are transverse floors of 2” wide oak pitched every three timbers. Alternate floors are flitched, meaning that they are composite or wood and galvanised iron, through bolted to the keelson and hull planking. The iron is quite heavily corroded but there does not appear to be a significant loss of strength or thickness. Iron expands between 7 and 11 times when it oxidises, so a 1mm flake of oxide represents a loss of approximately 0.1mm of parent material.

To the after sections it was evident that some deflection had taken place in the centre spine in way of the cut away to the keel. The centre structure at this point is very shallow with an inherent design weakness. This is due to the requirements of the deep aft cockpit and companionway coinciding with the same point as the keel cut away. There is inadequate depth in the centreline to resist the weight of the transom and after sections

The keel cutaway is designed to ensure effective propeller wash over the single central rudder for low speed manoeuvring. The design attempted to overcome the weakness by extending the transom knee unusually far forward. There is also a compression strut located under the forward end of the knee.

It is understood that the vessel had been laid up for an extended period in a mud berth at the river margin. It is probable that the after hull of the vessel was inadequately supported by the centre spine and that the transom has dropped by about 2” leaving a hogging in the aft hull bottom sections.

This damage is evidently after the vessel was last in commission as this hogging has resulted in the rudder becoming wedged under the transom and immoveable. In the hull bottom internally, the framing timber heels are morticed into the stern knee and these joints have opened up.

The first timber that spans the keelson has cracked in the centre. The next transverse member forward is a flitched oak floor with an iron capping which has prevented damage. The remaining floor and timber structure appears to have deflected permanently without damage.

When wood is bent out of shape and then endures many cycles of changes in humidity, it will adopt the new shape permanently, This is the basic process used to steam bending. Such timber cannot be easily returned to its original shape. Reversing the process requires either a very extended time period, or the application of steam. The latter is not practical in this instance.

The hull appears to have reached a stasis limited by the rudder. The intention should be to, at least, prevent any further deformation. At best, some shape can be recovered if the transom were to be supported with increasing gentle upward pressure using acrojacks or similar.

Recommendation

(Cat 1) Provide support for the transom with gentle upward pressure to attempt to recover some of the after hull shape. This should not be too extreme so as to avoid damage. The shape should be monitored and pressure adjusted as shape recovers.

No additional support should be added to the hull structure in this area until the recovered shape is deemed acceptable and the rudder operates properly. At that point additional longitudinal members can be inserted and the cracked framing timber doubled. Ultimately, when the vessel can be returned to the water, the hull will be supported uniformly by water pressure.

Recommendation

(Cat 1) Add additional longitudinal structural members to the after hull sections. Double the cracked framing timber in way of the forward end of the transom knee. This should span at least three planks either side of the keelson.

c) Bottom and keel external

The hull skin is planked with mahogany planking of an average 5” width and ¾” sided. This is laid fore and aft with a wider 6” garboard strake landed onto the rebate formed by the keelson. Planking is fastened to the timbers by copper nails clenched internally. Planks are secured into the sawn frames and transverse floors by bronze screws.

There is a visible upward deflection in the hull bottom aft of the keel cut away. The garboard strakes remain fastened to the rebate in the keelson at this point and the planks have been creased along the grain at the edge of the rebate. This endangers the plank by weakening along the weakest dimension.

The garboard seam generally is well sealed as there are no tracking stains of leakage of the retained bilgewater. Where the garboard stakes are creased by the hogging there is no bilge water internally so there are no clear signs of the condition at this point. The bilges should be cleaned out internally and the antifouling removed externally to examine for evidence of cracking of the planks along the grain.

Recommendation

(Cat 1) Clean the bilges internally and remove the antifouling externally to the garboard strakes in way of the hogging. The planks should be observed to cracking or failure.

Installed at the turn of the bilges are bilge runners. These are bolted through the hull to large backing pads internally. They are also through bolted to the partial sawn oak frames. This internal support enables the bilge runners to take some of the vessels weight when laid up ashore.

The hull bottom planking was examined by hammer and spike and a number of defects were noted.

On the port side:

The 1st plank from the garboard strake by the propeller is damaged by rot which extends to most of the planking thickness.

The 2nd plank from the garboard strake by the propeller is damaged by rot at the butt joint.

The 5th plank from the garboard strake by the shaft log is damaged by rot at the butt joint.

The 5th plank from the garboard strake by the forward end of the bilge runner has sprung at the butt joint.

The 5th plank from the garboard strake between the runners and the bow is damaged by rot at the butt joint.

The 6th plank from the garboard strake at the bows is sprung and damaged by rot at the butt joint. There is a second failure by rot a short way forward at another butt. This plank should be treated as a single defect and the plank replaced.

On the starboard side:

The 3rd plank from the garboard strake by the bows is leaking bilge water and damaged by rot at the butt joint.

The 4th plank from the garboard strake forward of the bilge runner is damaged by rot at the butt joint.

The 6th plank from the garboard strake at the bows is not laying fair to the adjoining plank.

The 8th plank from the garboard strake aft of the bilge runner is not laying fair to the adjoining plank.

The planks not laying fair are not defects in themselves provided there is sufficient engagement to ensure effective caulking. They can be indications of failure on the framing internally. These areas should be kept under observation.

All the other areas of damage require repair. Where the damage extends to more than 40% of the plank thickness the plank should be replaced with the repair section extending at least three timbers either side of the damaged section.

Where damage is less than 40% of the thickness the plank can be repaired by the insertion of a graving piece or the hardening of the wood fibres with a saturating epoxy. The correct method individually can only be established after the antifoulings are removed and the wood dried thoroughly.

The whole hull bottom was covered with a recent coating of antifouling. This has been applied over saturated wood and there are extensive areas of water filled blisters. The antifouling should all be removed to allow the wood to be dried. The bilges should also be thoroughly dried. The eight identified defects should all be repaired, including other defects which may be uncovered after the coatings are removed.

Recommendation

(Cat 1) Remove all the antifouling to the hull bottom. Closely inspect and repair all the defects noted

There are a number of steel fastener heads visible in the hull bottom with accompanying signs of hydroxide deposits. Metal hydroxide can lead to delignification damage in the wood. These heads must be covered to prevent oxidisation in seawater. *(See explanatory note 14)*

Recommendation

(Cat 1) Seal all the exposed iron or steel fastenings in the hull bottom.

The keel externally was seen to be in a good and sound structural condition. The ballast keel is through bolted to the transverse wooden floors and flitched wooden floors internally. There were no obvious signs of tracking stains of rusty water from the landing seam or the bolt fastenings externally. All had been recently antifouled but there was water still retained in the bilges.

d) Topsides internal

The topsides construction was surveyed where accessible, being limited by some internal joinery and hull lining panels. The topsides planking internally was seen to be in generally good condition. Most of it was bare and unpainted which allows the dissipation of moisture.

River cruisers are particularly prone to impacts through frequent contact with quaysides, locks and other vessels. There was significant past doubling, and even trebling of timbers where they have cracked. There were also fresh cracks which have not been attended to.

On the port side, when counting from the stem, there are cracks to timbers 9 and 12. On the starboard side there are cracks to 11, 12, 13 and 14. These on the starboard side are in way of the 8th plank from the garboard strake which is not laying fair to the adjoining plank. It can also be seen that the timbers internally have sprung away from the stringer.

These timbers, which are all in the forward accommodation, should be doubled with sisters which span at least three planks either side of the crack. The new timbers should also be refastened to the stringer where they have sprung.

Recommendation

(Cat 2) Double all the cracked timbers to the forward accommodation and re-fasten the timbers to the longitudinal stringer on the starboard side.

The heads and shower compartment and engine space internal topsides could not be examined due to installed joinery and sole boards. The structure was examined by sight from a distance in the areas that could be seen when illuminated by torchlight.

The internal topsides could be accessed in the after accommodation. There was a cracked timber on the port side forward of the aft accommodation bulkhead. There was also a timber on the starboard side, 3rd from the forward bulkhead, which had been replaced with a butt jointed timber. Both these should be doubled.

Recommendation

(Cat 2) Double the cracked timber and the butt jointed timber to the aft accommodation

The after galley area, cockpit and steering flat had limited access and the internal topsides structure appeared to be sound where it could be viewed from a distance by torchlight.

e) Topsides external

The topsides were viewed from all angles and seen to be quite fair and true. There were no obvious signs of distortions from failed frameworks internally. The sheerline was difficult to view due to the forward break. Despite the hogging in the hull bottom aft, there was negligible apparent loss of shape at the sheerline in the aft quarters.

Externally the topsides are finished in a white paint. This is assumed to be a single component polyurethane. The paint is fairly well adhered over most of its surface with some flaking and peeling where moisture retained by fungal decay has caused the adhesion to fail.

The whole topsides was tested for moisture using the Tramex meter. Readings generally were in the range of 17% to 20% which, allowing for some influence from the paint layer, were acceptable for dry wood. There were many areas which read at levels up to 29% and these generally were confirmed by hammer and spike testing as suffering wet rot.

The whole hull topsides were also tested by hammer sounding, and then spike testing where soundings were poor. Due to the forward break in the sheerline, the rubbing band was taken as a reference point. On the port side the following defects were noted:

The 3rd plank below the rubbing band in way of the third portlight was softened at the butt joint.

The 1st plank above the rubbing band in way of the third portlight was softened at the butt joint

The 2nd plank below the rubbing band in way of the first saloon window was softened at the butt joint.

The 1st plank below the rubbing band in way of the third saloon window was softened at the butt joint.

On the starboard side:

The 4th plank below the rubbing band in way of the first saloon window was softened at the butt joint.

The 4th plank below the rubbing band in way of the third saloon window was softened at the butt joint.

The 1st plank below the rubbing band in way of the third saloon window was softened at the butt joint.

The 2nd plank below the rubbing band in way of the first saloon window was softened at the plank edge.

The 7th plank below the rubbing band in way of the aft cockpit was softened at the butt joint.

The 6th plank below the rubbing band where it is landed on the transom edge is softened at the plank end.

All these areas of damage require repair. Where the damage extends to more than 40% of the plank thickness the plank should be replaced with the repair section extending at least three timbers either side of the damaged section.

Where damage is less than 40% of the thickness the plank can be repaired by the insertion of a graving piece or the hardening of the wood fibres with a saturating epoxy. The correct method individually can only be established after the antifoulings are removed and the wood dried thoroughly. It would also be beneficial to treat the sound wood local to the repair with a fungicide glycol or borate solution.

Many of the damaged areas are at the butt joints. These can be repaired and reinforced by adding larger butt straps internally at the joint. These can be as wide as allowed between the framing timbers and should extend at least 50% overlap to the adjoining planks. This would allow a larger landing area and therefore allow the damaged plank ends to be repaired with graving pieces.

Recommendation

(Cat 2) Remove the topsides paint locally to the repair areas. Thoroughly dry out, inspect and repair all the defects noted.

f) Sheerline and deck construction

The hull planking continues up to the sheer where it is screw fastened through the sheer clamp and 4” x 1” doubled oak beam shelves. On the outboard edge at the sheerline is a 2” x 1 ½” oak rubbing band with a 5” x 1 ½” harpin above. This rubbing band continues beyond the forward break and terminates at the turn of the bows.

To the forward break, above the raised topsides is a similar rubbing band. The deck edge construction is in generally good condition, although the heavy section harpin, which is probably not original, is heavily bruised on the starboard side. This indicates that the vessel has probably been moored against piles or mooring dolphins at some point.

The original deck construction is of plywood laid on 2” x 2 ½” moulded sawn oak deck beams pitched at 14”. This would have been originally laid with a nylon Cascover sheathing carried over the deck edge and sealed under the rubbing bands.

This deck has been subsequently laid with a cosmetic deck covering of 1 ½” wide and ½” thick teak with black polysulphide caulking seams. This has been bonded down onto the old deck covering. The bonding has mostly failed and the majority of the planks are loose allowing water to penetrate the bond.

This is a cosmetic deck and is non-structural and non-water resistant to the watertight integrity of the deck. This decking can be removed and reinstated. The planking is in generally good condition as it is probably recently installed. The planks can be cleaned, stripped of old caulking and re-bonded and secured by screws capped by dowel plugs.

Recommendation

(Cat 2) Remove all the teak cosmetic decking. Clean of old caulkings and bondings and re-lay. Bond the planks with adhesive sealant and screw fasten.

g) Transom

The transom is constructed of horizontal mahogany planking over vertical internal framing and the stern knee. Hull planking is landed onto the transom planking edge and sawn oak quarter frames. All is in fairly sound condition except for the defects already noted.

The plank ends have been covered below the waterline by a copper tingle which has been secured by sealant and nails. This has probably been applied as a waterproofing covering but it is not evident whether it was intended to be a preventative or a curative application.

4) Summary of recommendations

Category 1 (Cat 1) Recommendations are safety related or below waterline defects which should be corrected before the vessel is put into commission.

(p7) Provide support for the transom with gentle upward pressure to attempt to recover some of the after hull shape

(p7) Add additional longitudinal structural members to the after hull sections and double the cracked framing timber in way of the transom knee

(p8) Clean the bilges internally and remove the antifouling. Inspect the after garboard planks for cracking or failure

(p9) Remove all the antifouling to the hull bottom. Closely inspect and repair all the defects noted

(p9) Seal all the exposed iron or steel fastenings in the hull bottom

Category 2 (Cat 2) Recommendations relate to defects which are non critical or affect the efficient operation of the vessel in normal use and should be attended to at the owners convenience.

(p10) Double all the cracked timbers to the forward accommodation and re-fasten the timbers to the longitudinal stringer on the starboard side

(p10) Double the cracked timber and the butt jointed timber to the aft accommodation

(p12) Remove the topsides paint locally to the repair areas. Thoroughly dry out, inspect and repair all the defects noted

(p13) Remove all the teak cosmetic decking. Clean of old caulkings and bondings and re-lay. Bond the planks with adhesive sealant and screw fasten.

5) Conclusions

[redacted] is a surviving example of a popular class of river cruiser built by Gibbs on the upper reaches of the Thames. Although she is one of the later built models her general condition is poor with minor defects to the hull fabric and structure.

Her internal fittings are in a fair but restorable condition. There is water damage to the forward wheelhouse bulkheads on both sides. These are non-watertight and non-structural members and can be repaired over time after the critical issues are addressed.

The one significant defect is the hogging to the after hull sections. There is a fundamental design weakness at this point due to the inadequate depth in the hull bottom structure. This is a result of the deep cockpit sole coinciding with the keel cut away. The attempts to counter this with the addition of the compression strut has not been successful.

In the normal condition of the vessel afloat, this would not be a problem as the hull would be supported by water pressure over its whole surface. When laid up the hull should be supported with shores under both the bilge runners and the transom. When the vessel is laying in a mud berth the transom is completely unsupported.

It is at least essential that this is fully supported when the vessel is out of the water. Ideally some upward pressure should be used to attempt to correct the shape. During transport the weight of the hull should be taken mostly on the level keel. There should be shores under the bilge runners and props under the hull bottom at the aft quarters and directly under the transom edge on both sides of the rudder.

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[redacted]

6) Illustrations

The rudder jammed under the hull bottom and the hogging in the keel cutaway

General arrangement for shoring of keel and bilge runners