DoubleWave Marine Sales, Service & Technology	**Bits and Pieces for the Classic Lido 14**

Introduction

The Lido 14 sailboat is a derivation of the Lehman 14 sailboat. The Lehman series of sailing dinghies were designed and manufactured by Plastaglass Company of Newport Beach, California. Barney Lehman, the owner of Plastaglass, had been successfully building his fiberglass dinghies thru the 1950s, with fleets of them sailing as far away as Wisconsin. The Lehman 10, 12, and 14 are cat rigged dinghies with open cockpits (no deck), virtually no added flotation, and scant accommodations for sitting down. They have rounded-bottoms and narrow beams, making them tippy and easy to capsize – and hard to recover. The Lehman 14 was last member of the Lehman series of dinghies. It used some of the same components of the Lehman 12 – such as the dagger board. Though a few hundred were built, they were not well received.

W.D. "Bill" Schock had been in the business of hand building popular one-design dinghies out of wood starting shortly after World War II. Setting up shop in Newport Beach, he built sailboats such as the Naples Sabot, International 14, Thistle, Finn, and other popular one-designs. All the boats were built from wood and his business became well know nationally known for its products. In 1955, Bill Schock acquired Plastaglass Co.

For a while, W.D. Schock continued to offer the Lehman series of boats. Feedback from Lehman 14 sailors led W.D. “Bill” Schock to make a friendlier boat. His design added comfortable seats, wider gunwales, a fore deck, buoyancy tanks, a deck stepped mast (the Lehman masts were stepped on the hull), rubber rub rail, a rotating centerboard to permit easier setup, and much more. The resulting boat, called the Lido 14, was brought to market in very early in 1958. Hull number 1, named “Wee Pot”, was purchased by Mr. Les Littlejohn, a resident of Lido Isle in Newport Beach. It’s maiden voyage was on February 27, 1958.

The market exploded almost instantly with about 200 boats being produced in 1958 and almost 400 in 1959.

With so many boats, all virtually identical, sailing around, it was inevitable that people would start racing them. The story goes that serious sailors where taken aback at the idea of racing the Lido 14. Put another way, real racers didn’t race Lido 14’s, they were to race Stars, Thistles, Snipes, International 14’s, etc. Thus, in 1958, the Lido 14 Class Association was born to oversee maintaining the purity of Lido 14 racing. The first fleet was formed in the same year – Newport Harbor Lido 14 Fleet 1.

By 1997, approximately 6000 of the venerable craft, with only the slightest of modifications from the original design, had been produced (the Lido 14 strictly adheres to the Lido 14 One Design rules set forth the Lido 14 Class Association). The first 6000 Lido 14s were mostly manufactured in the W.D. Schock Corp. facilities in Southern California however production facilities were established in Florida as well. The Florida facility no longer exists with all W.D. Schock Corporation manufacturing now occurring in their Corona, California factory. Note that the last official Classic Lido 14 was given hull number 5148. There were, according to Tom Schock, several hundreds of Lido 14’s built for use in Mexico that were not numbered, thus the 6000 total.

Long before 1997, the demand for the Lido 14, as well as all other boats, plummeted. Common factors in included the U.S. recession of the 1980s, a steady decline in sailing (in general), and escalating manufacturing costs. For example, the period from 1990 to 1995 saw less than 50 new Lido 14’s. The Lido 14 International Class Association, wishing to continue the fine Lido 14 tradition pushed and prodded Tom Schock to revitalize the Lido 14 in order to revitalize sales YET maintain conformance to the strict one design rules for the Lido 14.

In the fall of 1995, W.D. Schock introduced the updated Lido 14 (a.k.a. 6000 series or post 6000 series). By the end of 1999, about 175 will have been made. Certainly not at the production rates of the 60’s and 70’s but consistently improving.

What one should respect the most about the Lido 14 is that the design has been preserved so closely that old and new boats are equal in performance, thus preserving the use of older boats for generations to come. The fact that the classic Lido 14 is so enduring (in our hearts and in it’s ability to last for decades) leads me to publish and maintain this document to aid newcomers to the Lido 14 with their efforts to bring stock Classic Lido 14’s (i.e. pre-6000 hulls) up to par with what’s out on the racecourse. Fortunately, one can side step the majority of this issue of "upgrading" by simply purchasing a brand new Lido 14 because a majority of the issues we will address herein are non issues on the new Lido 14. So the choice is yours, learn from this guide to refresh/restore/update a Classic Lido 14 or get a new one and have a greatly reduced list of tasks to be competitive in Lido 14 races.

The style that I've chosen to write this document is on the loose side so just dive in and read it all and take what from it you can.

Before we get started, one last comment needs to be made. The Lido 14 is enduring to race because there has been virtually no changes to the Lido 14 sloop that obsolete older boats. This occurred, and continues to occur because the Lido 14 International Class Association, in conjunction with W.D. Schock Corporation have worked very hard to keep things the same, despite intense pressure from the marketplace and, to some degree, the racers of Lido 14s, to "improve" the boat. If you come to appreciate one-design boats (i.e. one's where there is only 1design that rarely or never changes), then we ask you to be considerate of those that maintain that status on your behalf.

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A Safety Message

Given the age of the average Classic Lido 14, equipment failure is **VERY** likely to occur, making equipment maintenance the highest ranking reason for safety problems and, accordingly, poor performance while racing. The vast majority of equipment failures on the Lido 14 are due to corrosion and rot, both of which are easily avoidable. Be certain of the condition of your vessel at all times.

Comments on Oxidization

Aluminum, the primary metal aboard a Lido 14, oxidizes very readily in salt-water environments. Electrolytic corrosion (i.e. corrosion between dissimilar metals such as aluminum and steel) will occur readily in all environments. The primary symptom of oxidization is a white powdery or scaly buildup similar to hard water deposits on faucets. The oxidization process consumes the metal and thus represents weakening of the material and joints.

The primary remedy to reduce oxidization and electrolytic corrosion is to keep salt and other contaminants out of the works and to apply corrosion inhibiting compounds (e.g. Duralac™ anti-corrosive jointing compound) to metal-metal joints. Separation of the metals with Nylon washers works in some applications; silicone rubber works very well too.

Rigging

From a safety point of view, the most critical rigging components are the forestay (the wire line from the bow of the boat to a point about 2/3rds the way up the mast), shrouds (gunwales to mast), and diamond stays (mast to mast via spreaders) because they cooperate to support the mast in its proper position and they bear the brunt of forces created by the wind. Failure of any one of these components is likely to result in a dramatic failure such as a dismasting (mast falling down), bent mast, bent tabernacle (a.k.a. mast hinge), snapped shrouds, cracked decking, broken bowplate, etc. Foremost, it is dangerous; secondly, it can be expensive to repair.

As will be repeated throughout this document, these items are all readily available and should properly maintained and, when in disrepair, replaced with a professionally produced equivalent. Murphy's Law of Boating dictates that the failure will occur at the most inopportune time… such as when you are in the lead rounding the last mark or a few feet before the finish line so it is well advised to pay close attention to these items.

Forestay Specifics

The forestay serves two purposes. First, it is used as a means to suspend the luff (i.e. leading edge) of the jib. Second, it controls the mast rake (i.e. fore/aft lean of mast). When sailing to windward, the mast is naturally pushed aft by the wind in virtually all conditions except, perhaps, in the lightest of winds where the mast might bob around due to swells. The rake of the mast greatly influences the behavior of the boat as it impacts: the amount of weather helm (i.e. the tendency for the boat turn to windward by itself), the shape of the main and jib, and the shape and size of the slot between the two sails.

Long ago, it was determined (principal credit goes to Dave Ullman) that the fasted all-around rigging of the forestay was to leave it pretty loose. A loose rig allowed the mast to rake aft when going upwind for the optimal weather helm and to rake more vertically when going down wind, to give more projected sail area, etc. Thus, a loose rig provides two optimized rig positions rather than the one that would result from a tight rig. On other types of boats, the problem of optimizing the rig for up versus down wind is handled by bending the mast aft using a backstay and/or the boom vang.

As always, what is a benefit at one point is a problem at another. In this case, the problem is that the loose rig permits the mast to bob around while sailing. This, in turn puts high shock loads (i.e. high strength, short lived) on the forestay and shroud attachments to the mast. Most materials that are otherwise healthy (i.e. not rotted or severely rusted) can sustain constant loads for very long but will fail rapidly under shock loads.

Reducing Forestay Shock Loads

The first plan of action to address potential forestay failure is to reduce the stresses on the forestay during excessive mast rocking. You can do this by either tightening the vang (if the resulting sail shape is appropriate), pressing the mast forward (a crew duty), pressing the shrouds fore or aft or athwartships (similar effect as pushing the mast). All of these actions either eliminate much of the bobbing motion of the mast and some of the techniques also tension up the forestay so that there is less slack to be snapped tight. Typically these actions are the duty of the crew however the skipper, from time to time, can help out too. This will serve to protect the integrity of your boat with the added benefit of preserving smooth airflow across the sails and thus keeping your boat "powered up".

Rigging for Shock Loads

First, make sure your forestay is in top condition. It must be free of burrs, nicks, corrosion, and loose strands to be considered safe for repeated shock loading. Any sign of these should be taken as a sign to replace them.

Corrosion within the strands of a forestay line or within the fittings is not obvious. By untwisting the wire line while simultaneously bending it, one can view the interior stands to see if the corrosion has permeated to the inner strands or if it is limited to the outer surface. On occasion, broken strands will pop up as the line is bent; replace the line immediately if this occurs.

Setting Upwind Mast Rake

The forestay is to be adjusted to provide the optimal mast rake when heading up wind. Mast rake is typically specified by a 20’ 3 ½" to 20’ 4 ½" measurement (for Classic boats) or 20’ 7 ¼" to 20’ 8 ¼" (for post 6000 boats) from the upper rear outer edge of the transom at the centerline of the boat to the top of the mast (assuming the use of a ¾" shackle).

Where does the upwind rake setting come from? It represents the most aft one can rake the mast aft before the leach (trailing edge) of the jib twists outward and spills air prematurely; robbing the Lido 14 of energy. In fact, there are several variables that control the twisting of the jib, all of which must be optimized along with the rake setting. These include: mast position aft from the bow and jib fairlead position (fore/aft) with respect to the bow.

To better visualize what is happening with the jib, assume that the mast is straight up and down and that the jib is hoisted and trimmed as through you were sailing close hauled to windward. The jib is (roughly) a triangle between the bow, the taut jib sheet (passing through the jib fairlead), and a point up the mast. If you move the mast forward to a new position on the deck (keeping it vertical), this triangle will pivot (i.e. tilt) forward respectively. Doing so will alter the tension along the sides of the triangle too. For all practical purposes, all Lido 14 masts are located in the same spot so we’ll ignore this as an adjustment to worry about (for now).

Moving the fairlead forward won’t move the triangle, per se, but it will cause the angle of the jib sheet tension to point more along the along the foot (bottom edge) or more along the leach (aft edge). As tension increases along one edge or the other, that edge will become straighter (i.e. no sag). In the extreme, a big wrinkle along the line of the tension will result. You can see this wrinkle effect by tugging on two corners of a piece of an otherwise taut piece of cloth (try it on your clothing).

The leach is critical to the function of a sail because it greatly influences the airflow past the sail. As in most wings, the greater the curvature that the airflow must "bend" around, the more lift that will be created. [The theoretical extreme being a semicircular arc. As in all aspects of nature, there are tradeoffs. In this case, as the curvature is accentuated, so too is the drag (i.e. friction). It is the skill of the wing or sail designer to chose a compromise between lift and drag.]

If the jib leach tension is too light, the jib will "twist" or sag away from the boat. This reduces the front to rear (luff to leach) curvature of the jib which means less lift. Taken to the extreme, the sail simply "spills" air out, gaining little if any lift. If the jib leach tension is too great, the leach will hook inward (toward the middle of the boat) and cause too much curvature, causing turbulent air to exit from the jib. This too means greatly reduces lift. Furthermore, a too tight leach will direct the airflow into the back of (rather than parallel with) the main sail (because they are overlapped), which ruins the airflow along the main sail too.

As you move the fairlead aft, proportionally more of the tension created by pulling on the jib sheet applies between the jib tack and clew points. Conversely, as you move the jib fairlead forward, more tension is applied to the edge of the triangle between the head and the clew.

Ideally, a boat should be designed such that that the jib fairlead can be moved through a wide range (forward/aft) to allow either too much foot tension or too much leach tension as the crew desires. As it turns out, the Lido 14 was designed with the jib fairlead too far aft and we're not allowed to correct for this deficiency due to the strict one-design rules. Thus, on the Lido 14 there is a shortage of ability to move the fairlead as far forward as one would desire to get the optimal leach tensions.

Referring back to mast rake, if we want to maximize tension in the leach over that along the jib foot, we need to change the angle of the jib sheet as it approaches the jib. Tilting the triangle and moving the jib fairlead, together, control this jib "sheeting angle". Given that the forward maximum position of the jib fairlead is limited, raking the mast any more than the recommended settings is of decreasing benefit; the leach tension would start to decrease from the maximum attainable.

Note that we don't want to increase leach tension merely by application of brute force on the jib sheet. Doing so will not change the proportion of tension along the leach versus that along the foot. Furthermore, the natural curvature built into the sail will be overcome as the sail cloth is stretched, leaving an increasingly flatter and flatter sail (i.e. less and less lift).

Because the Lido 14 Class Association dictates that you race a Lido 14 with the jib sheets outside the shrouds, the shroud nearest the jib needs to be out of the way of the jib to avoid distorting the triangle. Making the shroud loose keeps it out of the way (more on this later).

Shrouds

The port and starboard mast shrouds provide lateral stability and control the maximum forward position of the mast when on very broad reach or running points of sail. As was explained earlier in the section on the forestay, the very loose rig causes shock loading on the shroud connections.

Shroud to Mast Connection

For maximum protection against shock load failure, the shrouds should be held to the mast with a single stainless steel bolt and a Nylon locking nut (a.k.a. aircraft nut or Nylock nut). Nylon washers placed over the bolt, between the mast and the shroud fittings, help reduce chafing and bimetallic corrosion and allow the shroud fitting to more easily spin fore and aft in concert with the bobbing of the mast.

If using the more traditional "aircraft eye" fittings (they are basically flattened rod material with a hole drilled in the end) on the shrouds, the mast end of the shrouds should be pre-bent to an angle near the natural angle assumed by the shroud when under load.

An alternate, and superior, solution is to use the "ball strap" type of fitting that allows for the shroud to rotate and swivel with less binding.

Shroud Coating Protection

The shrouds are vinyl coated (required by class rules). For classic Lido's, each shroud passes through the deck, via a shroud fairlead, on their way to the chainplates located on the front of the seats. The shroud chafes on the shroud fairlead and quickly breaks through the vinyl protective coating. This produces electrolytic corrosion and the line will very quickly saw into the fairlead, further damaging the boat and rigging. Left unattended, the line will rapidly deteriorate. Plastic tubing or plastic shroud protector material is well advised for this section of the shrouds.

Shroud to Chainplate Connection

The shrouds are traditionally attached to their respective chainplates with a clevis pin or a quick release (Fast Pin) pin. Though the Classic Lido 14 came with cast aluminum chain plates, the higher numbered Classics used stainless steel shroud adjusters in their place. These new plates are a bit on the small side and often don't provided enough clearance for the end of the aircraft eye end of the shroud when you try to connect the shroud to the chainplate. Rather than modifying or replacing the chainplate, modify the aircraft eye fitting to fit by grinding or filing the part of the eye that rubs too tightly against the chainplate. On an unrelated note, spring loaded/plunger activated quick release clevis pins are very attractive and handy (no more ring dings) but they are risky to use because they can accidentally release or fail to lock in the first place. I recommend never using them on a Lido 14.

Downwind Mast Rake

The shrouds should limit the forward rake of the mast. A distance of 20' 11" to 21" (Classic Lido 14) or 21' 1 ½" to 21 2 ¼" (Post 6000 Series) is recommended between the outer edge of the transom and the main halyard shackle when it is fully raised. A quick spot-check measurement technique is to clutch the forestay (after having set the upwind rake) in a hand and to twist it horizontally. There should be about one palm width of slack.

Ideally, the forward rake should be set for each shroud individually. This is more difficult to achieve because the mast will likely fall over if only one shroud is being measured at a time. In addition, the side to side lean of the mast should be made to be equal on opposite tacks. You can measure this by measuring from the top of the mast to the jib fairlead (a fairly accurate location) for both sides to see if the distances are equal. If not, adjust the shrouds accordingly (a difficult proposition because the granularity of positioning via the chainplate is so coarse that you probably can't adjust for the port/starboard lean without ruining your forward rake setting too.)

How was the downwind mast rake number derived? There are two factors: clearance to sheet the jib inward while sailing close hauled upwind, the collapsing point of the rig while sailing down wind. When sailing close hauled upwind, the leeward shroud becomes slack (the windward shroud supplies all the strength to hold the mast up in that point of sail).

The minimum setting for the shroud length is that length such that the leeward shroud is slack enough so that it doesn't interfere with sheeting the jib all the way inboard when sailing in light air conditions. The maximum length setting for the shrouds (note that Lido 14 Class Association rules do not permit adjustment of the shroud lengths while sailing) is based upon the following fact: non-spinnaker boats go faster downwind when leaning the sails forward. Little science has been done to quantify this however historical evidence shows that increasing angles of forward rake equates to increasing downwind speed. The limit (typically) is the collapsing point of the rig. The estimated maximum safe rake angle, in 15 knots of wind, is achieved with the recommended setting.

Shroud Soot

In Southern California (and presumably in most any metropolitan environment), airborne particulate (i.e. soot) will quickly build up to a black soot on the shrouds, mast, etc. This soot is one major source of the dirt that will very frequently show up on your brand new jib and main. The soot is purportedly the residue from all the socks that have disappeared and gone to laundry heaven.

Diamond stays and spreaders

The diamond stays work in conjunction with the spreaders to stiffen the mast laterally. The very first Lidos did not have these and the mast bent quite easily. The stays are composed of single (solid) strand stainless steel wire that is riveted to the mast. The junctions with the mast are chronically corroded and must be kept clean and in good condition.

Diamond Stay Comments

A test was made on an otherwise healthy looking stay with a few minor spots of corrosion that resembled slight nicks. When bent on a clear section, the wire flexed much as a metal coat hanger would, requiring many bending motions to cause failure. When the wire was bent, gently, at a nick, the line snapped in two!

The stays should be riveted with stainless or Monel type rivets to ensure maximum strength. Note that there will be bimetallic corrosion on the inside of the mast where the rivet touches the extrusion. Older masts that have lots of corrosion on the outside probably have some corrosion on the inside too, making for a worse stay to mast connection than appears to the eye.

For older masts with significant corrosion at the diamond stay rivets, I recommend removing the rivets and replacing them with a single stainless bolt (like that used to hold the shrouds to the mast to hold the diamond stays to the mast.)

Spread Tube Details

The spreaders are typically fabricated from aluminum tubes (6061-T6 grade, 3/8" O.D., 0.056" wall thickness) that insert into cast aluminum mast mounts that are riveted to the mast (very early masts had mounts embedded into inside the mast extrusion). To control the diamond stay tension as well as provide a guide for the stays, a ¼" diameter stainless steel bolt with a round (slotted) head is inserted into the outboard end of tubes with the stay line passing through the slot of the bolt. A nut, placed at the head end of the bolt is backed off from the bolt head to force the stay outwards from the end of the tube. The proper tension is established when the mast, when suspended horizontally from its ends, remains straight.

The stays should be taped to the spreaders to prevent the stay from accidental slipping out of the bolt’s slot. I recommend using electrical tape.

The bolt/spreader tube junction is also a problem spot for corrosion. The bolt should be coated with an anti-seize compound or silicone rubber to thwart the bimetallic corrosion.

Stainless steel tubing is sometimes used in place of the aluminum tubing because of the desire to increase strength and reduce the corrosion with the bolt. Beware that the variation in strength of the most common stainless steel alloys is a very large (+/- 25%) whereas the 6061-T6 aluminum has a negligible variation. Though the steel has substantially greater maximum strength, it may also have a substantially lower minimum as compared to the 6061-T6 aluminum. Know your steel before you sail it.

Main Halyard

The metal component of the main halyard suffers from the same corrosive problems as the forestay. Though the result of a halyard failure is not likely to cause additional damage or disable the vessel, it is a problem to be avoided. Some professionals recommend that the metal line be waxed with paraffin (not bee’s wax) to reduce the friction. The wax should be applied periodically (e.g. biannually). Personally, I have never done this.

The main halyard shackle should be as very short to allow the main sail to be hoisted as high as possible. The post 6000 series of Lido 14s do away with the shackle by having a line that one ties to the sail head. Shackles that are 3/4" tall are popular but, unfortunately, they are difficult to find in marine supply stores. Furthermore, the shackle should be of the type where the halyard line feeds through a small hole in the shackle top after which a nicro pressed ball is placed, again to increase the height of the sail.

Jib Halyard

What is true for the main halyard is generally true for the jib halyard except the size of the shackle isn't critical, though the smaller size shackles have an advantage in that they can be clipped to the whisker pole thrombkin on the front of the mast.

More importantly, the jib halyard should have a 2:1 purchase to allow easier and finer adjustment of the jib luff tension when under sail.

A system of marks to keep track of the jib halyard setting is recommended so that past settings can be readily repeated. Most marine stores catering to small boats will stock numbered label strips for this purpose.

Vang

The vang should be arranged to be easily adjustable while racing. The best solutions consist of bringing the vang line to a cleat system near the main sheet block so that the skipper can adjust the vang when sailing downwind. Make sure that whatever system you employ doesn't interfere with the crew.

Downhaul

The downhaul serves the purpose of directly pulling the luff (via the tack) of the mainsail down to help adjust the fore/aft position of the draft of the main sail. Historically, the tack of the main sail was hooked to the gooseneck which, in turn, held up the boom. The downhaul was used to pull the gooseneck down. This arrangement is no longer used. The downhaul can also benefit from having a system of marks to note favorable settings.

Jib Tracks

The jib fairlead tracks are now (legally) removable. As they are quite uncomfortable to sit on, a minimum suggested "fix" is to shorten the tracks down to just the amount needed to hold the fairlead. In doing so, you eliminate the majority of the irritation as well as the complexity and/or cost in attaching the fairleads and jib sheet cleat to the gunwales without. Be sure to use plenty of bolts to hold the remaining track on. It is not necessary to fill the holes once used to secure the full length of the jib fairlead track.

Also note that the Lido 14 class rules specify a 95" minimum from the forestay pin at the bow plate to the center of the leading screw of fairlead (this measurement is likely to be revised to measure to the forward inside edge of the fairlead). The racing sails made for the Lido 14 expect the fairlead to be in this position. If the fairlead can't be put at this location, take this opportunity to adjust the fairlead and/or fairlead track to achieve the class minimum.

As of early 1999, the Lido 14 Class Association has specified a minimum distance between the jib port and starboard fairlead. The specification was based upon the locations that the W.D. Schock Corporation has been mounting jib fairleads on the post 6000 series Lido 14. This location is inboard of that used for the Classic Lido 14. As moving the fairleads inboard is a definite advantage to sailing upwind, it is now recommended that you modify the location of your jib fairleads to match the minimum distance. The minimum distance is 64.75" from the points on the outer edges of the fairleads where the jib sheets bear on them.

Main Sheet Traveler

There are two traveler systems approved by the Lido 14 Class Association. The first, used only on the Classic Lido 14, consists of a track and car system mounted on the upper surface of the transom. To adjust the traveler, one has to move two traveler car stops outwards towards the transom corners to "ease" the traveler. The second, used originally on the New Lido 14 and found occasionally on updated Classic Lido 14s, consists of a Crosby style rope traveler that terminates on the centerboard trunk. The following describes the rigging of the Crosby system.

Crosby Traveler Rigging

First, one must acquire a split main sheet. An ideal slit main has a splice of a thin (i.e. 3/16") line to the main sheet. The splice shall be located such that it never crosses over the main sheet turning block located on the boom above the centerboard trunk when sheeted for closed hauled sailing. The thin line is passed through the block at the outboard end of the boom. When maximum tension is put on the main sheet, a location 22" inches up from the bottom of the transom (outside edge), the another thin line shall be sewn to the first one, making a "Y" split mainsheet. Each small line section is passed through cheek mounted turning blocks mounted on the inboard surface of the transom near the gunwales. The lines are then brought back towards the centerline of the boat and tied together, thereby making a triangle shape between the two knots. From this second junction, one of the split sheets is passed forward to the centerboard trunk. This typically requires the use of additional turning blocks mounted at the base of the transom and the base of the centerboard trunk. Finally, the terminal end of this setup is cleated on top of the centerboard trunk.

There are several advantages to the Crosby system that cannot be ignored. First, the traveler can now be safely and accurately adjusted while racing. Second, the weight of the system is much less. Third, there can be fewer pieced to maintain, and lastly, the weakening of the transom due to dry rot is no longer of great concern because the tension on the traveler is moved to the inboard surface of the transom rather than the (weak) upper surface.

Note that the "new" Lido 14 uses a Crosby traveler because its tiller comes over the transom. The Classic traveler (more precisely, the main sheet attaching to the traveler) would get in the way of an over the transom tiller.

Foils

The Lido 14 uses two foils, the centerboard and the rudder. Both foils serve the purpose of providing lift (to counteract the leeway or sideways slippage of the boat) and directional control. However, for the moment, we'll consider that the rudder is only used for directional control and the centerboard for its lift.

Every part of the boat immersed in water produces drag which, in turn, slows the boat down. Reducing drag is one of the key areas to work on and the steps involved are quite straight forward. First, a brief explanation of the flow of water around the foils. Foils, in general, have a convex shape, meaning pointed ends and a fatter mid section. This shape, when set to a slight angle to the oncoming flow of water, causes lift, exactly in the same manner as a slightly canted airplane wing produces lift. As the water passes along the foil, it can be "tripped up" into a turbulent flow which looks more like water spilling over a dam than the smooth "laminar" flow we imagine to be the case. The turbulence is energy robbing, just as riding a bicycle with a flapping jacket slows one down. Turbulence is inevitable…but it is well worth the effort to avoid it as long as possible (i.e. make it happen as far aft along the foil as possible).

There are two issues with regards to reducing the turbulence: create hydrodynamically smooth surfaces, create a fair surface. Hydrodynamically smooth relates to the size of the imperfections on the foil surface than can cause laminar flow to trip into turbulent flow. At a few miles an hour, imperfections (e.g. scratches, dirt, marine growth, etc.) on the order of 3 or 4 mils (about the thickness of a strand of hair) will do the job. As the flow speed increases, the size gets even smaller! In other words, if you can feel the imperfection with your finger, it's probably a problem. 400 grit sandpaper will not get a smooth enough surface. Go to higher grits and finish of the job with a good buffing to get the surface mirror smooth.

Fairness is the overall conformance of the surface to the intended design. Fiberglass will become wavy or warped, leaving gentle hills and valleys, which may cause the flow of water to become turbulent too.

Aside from these issues, the foils must be strong, lightweight, and stiff. The strength is needed to take all the lumps and abuse of hard sailing and not give up the ghost just when you're at your best. Reduced weight is desired because it makes for more nimble tacks and gybes. Stiffness eliminates side to side distortion of the foils when under heavy load (i.e. when the wind is really blowing or when roll tacking). The specific goals of a championship quality centerboard are:

- Minimum weight (11 lb.)
- Maximum Stiffness (wood boards are typically stiffer than fiberglass boards)
- Maximize gybe (allowable centerboard "twist". The more the gybe, the more one sails to windward. Set to maximum of 1/4 inch. Refer to class rules for details)

- Maximize depth (48" +/- 1/2")
- Hydrodynamically smooth. Polish (don't leave any residue) to a high sheen to get into the minimum drag "bucket" zone.

- Fair shape. Fill valleys and reduce hills so that the foil shape is consistent along its entire length.

There are very good foils available that meet all of the above criteria. They are composed of fiberglass reinforced wood and are professionally hand crafted to very high standards. Though very expensive (e.g. between $600 and $1000 for a centerboard), they are significantly superior to production boards that cost just a few hundred dollars less. These boards are available on a custom order basis from WATERAT

The goals of an ideal rudder foil are similar, but not exactly equal, to those for the centerboard.

- Protect the rudder casting, as it is somewhat fragile. Don't sit on tiller.
- Minimum weight (no class limits!)
- Minimum surface area to reduce drag
- Leading edge as vertical as allowed
- Bottom edge parallel with water surface. Any additional foil surface at the tip just adds drag
- Non-kick-up. Prevents accidental kick-up. Eliminates weight of the handle too.
- Tiller & extension should be easy to use when hiking and tacking. Install a plastic clip on the tiller to hold the extension when not in use.

Other Areas

Hull

As with the foils, smoothness, of the hull is very important. As the water flow is not going to stay laminar for very long, focus on keeping the front half of the boat at a high degree of smoothness and cleanliness, leaving the remainder to be "just" hydrodynamically smooth. Fair out the hills and valleys as well. The gelcoat will absorb water and impurities, resulting in stains.

Bow Line Thru Deck

I recommend that a plastic thru deck fitting be placed near the tip of the bow so that you can pass a bow line through the deck and tie it off on the main deck beam or onto the wood tray. Note that there is a piece of plywood in the forward section of the bow that you should make sure the thru deck fitting is placed. Be sure to tie stopper knots into the bow line so that you don't retract the line completely into the boat.

Removing Stains in Gelcoat

Oxalic acid, which is readily available at marine hardware stores, will remove these stains however there is no reasonable solution to keeping them away forever.

Centerboard Trunk

Braces

All centerboard trunk of the Classic Lido 14 will twist and flex when under load. Doing so weakens its connection to the hull, causes loss of energy, and degrades some of the benefit of the gybing centerboard. In addition, there is a need to terminate the forward edge of hiking straps on something other than the leading edge of the centerboard. The Lido 14 International Class Association permits the installation of braces between the front edge of the seats and the centerboard trunk. Stiffeners are typically 1"x1" wood which are screwed onto the front of the seat and connected to the trunk with furniture angle brackets or the like. When installing the braces, be sure that any port/starboard lean in the trunk is corrected for by the braces.

Knees

The centerboard trunk is typically supported in its upright/vertical position by two aluminum angle brackets (a.k.a. knees) that are fiberglassed to the sole of the boat and the sides of the trunk. These experience heavy corrosion with the aluminum oxide flaking off and building up pressure against the fiberglass. This invariably results in blisters on the bottom of the hull and a gradual weakening of support. The remedy, which was implemented by the factory in the later years, involves using wood in place of the aluminum.

Testing for the corrosion consists of banging on the knees with a hammer and observing if any oxide particulates fall out from under the fiberglass holding the knees. If blistering is evident on the gelcoat directly under the knees, then one can be assured that they are corroded.

Knee Surgery

The cure is to remove the knees and replace them with wood equivalents. One starts by grinding off the fiberglass that holds the knees, removing the knees, cleaning the surfaces (sanding, etc.), (optionally) bonding the wood knees to the hull and trunk, and lastly, fiber-glassing the knees in place. The wood is typically ¾" plywood which has been lacquered to retard water absorption.

In many cases, much of the blistering will recede as a result of removing the pressure of the oxide. One must be prepared, however, to go to greater measures to eliminate the blisters (if so desired). This may entail grinding out the blisters and re-fiberglassing and Gelcoating.

Main Deck Beam

The main deck beam is a plank of wood that supports the main deck, the mast, and provides stiffness laterally. It is what the wood tray hangs from. Each end of this bean is supported by two deck beam knees made of aluminum. As in the case with the Centerboard Trunk Knees, these too will corrode. Since the location of these knees is quite visible, the assessment of corrosion is quite trivial. Very few Lidos don't have corrosion and the resulting gelcoat blisters.

The cure is the same as described earlier except that a solid piece of wood is used, roughly triangular in shape, in place of plywood.

Transom

The Classic Lido 14 transom is a sandwich of the plywood between the outer hull and a layer of fiberglass which on the interior of the transom. Since the top edge of the transom and the tiller opening expose this wood to the elements, it is prone to dry rot. In addition, the plywood often has a slight gap separating it from the hull, leaving a space for moisture to collect.

Symptoms of dry rot include a dried out surface that splits/breaks easily, wood "dust" in screw holes, etc. The traveler attached to the top of the transom will start to work loose as will the pintle around which the rudder casting fits. Eventually, these parts will be pulled off by the forces applied in sailing. This is not good.

The cure is to grind out the bad wood and let the transom dry out thoroughly. Note that water trapped along the bottom of the transom will only escape if the boat is turned on its side or upside down. One way to test for this is to drill small holes near the bottom of the transom (from the inside of the boat) and look for traces of moisture.

Once the wood is thoroughly dried, grind out the offending wood and fill the voids with wood and/or marine epoxy/bonding putty. Next, soak thinned resin into the affected wood to seal it up to avoid further damage.

If the screws holding the traveler are in rotted wood, you can put horizontal plugs made from wood dowel material an inch or so below the transom top edge so that the screws will tap into them at right angles (screws penetrating the "side" of the dowel plug). Otherwise, toothpicks epoxied into the screw holes may suffice.

Rub Rails

Use stainless steel machine screws every foot or so to attach the rub rail to the hull/deck. Screw into the bottom of the rail so that the screws are not visible.

Rub rails can be, within reasonable limits, spliced together. It's expensive material so make the best use of what you have available when making repairs.

Bow Plate

The bow plate has one fundamental weakness: the "tab" to which one attaches the forestay and jib tack shackle breaks quite easily. It is advisable to pre-empt its failure by one of several methods.

First, if the holes in the tab have not yet elongated, consider placing bushings into the holes to prevent the elongation of the holes in the casting. Aluminum tubing should suffice but steel will provide more protection. This will necessarily mean drilling the original holes to a larger diameter for the bushing.

Otherwise, cut off the stock tab and replace it with a stainless steel equivalent or perhaps stainless eyestraps. Be careful to secure these with quality stainless bolts/nuts. I chose to use aircraft locking nuts (i.e. with nylon inserts) to avoid corrosion and to help ensure their staying in place.

Gooseneck

The classic Gooseneck slide discussed below is long out of production. It has been customary to replace the gooseneck system on a Classic Lido 14 with the gooseneck assembly used on the 6000 Series Lido 14. Please contact DoubleWave to learn more about the retrofitting. The 6000 series gooseneck assembly consists of a universal joint with a base to be attached permanently to the mast on one end and a metal pin several inches in length on the other that inserts into a mating plug inside the forward end of the boom. It is clean, strong, and simple.

Early edition 6000 series goosenecks allowed the boom to slide off the pin. A nice enhancement to the new gooseneck, now standard, is to keep the boom from sliding off the gooseneck pin unintentionally. The solution involves installing a cotter pin and washer on the aft side of the plastic fitting in the boom. To learn more about this upgrade, contact DoubleWave.

For those still using the classic gooseneck slide, consider the following ideas.

Use a wood dowel inside the sail track to support the gooseneck rather than using a set screw in the mast. Inserting the dowel may require removal of the mast foot.

Cut off the top and bottom gooseneck hooks so that jib sheets don't get caught on them during tacks. Unfortunately, as a result of this change, the boom can more easily "launch" off the gooseneck. Adding a pin to keep the boom "trapped" is a good idea.

Maintenance Review & Misc. Tid Bits

Single most common and deadly problem associated with Lido maintenance is corrosion.

Corrosion spots to be wary of include the following:

- forestay connection
- shroud connections
- diamond stay connections
- boom bails
- inboard and outboard boom fittings
- shroud and forestay corrosion
- spreader corrosion
- main beam angle brackets and centerboard trunk knees (as evidenced by Gelcoat/fiberglass blistering at those locations)

Solutions: The anodized layer on the spars is aluminum's principal protection against corrosion. Keep all other metal surfaces free of salt and airborne pollutants by washing frequently with fresh water and ensuring that they have an opportunity to dry thoroughly. Drain boat thoroughly. Apply a sealant (**except to the wetted surfaces of the boat)**, such as polishing wax or lightweight oil, to retard oxidation. Avoid scarring anodized surfaces. Secure halyards to avoid contact w/ mast when in dry storage. When adding fixtures to mast or boom, utilize anti seize compound if contact area is large to help reduce bimetallic corrosion. Avoid using steel rivets on spars, as corrosion will occur from within the spar. Use aluminum rivets on aluminum parts where possible. Lightly coat fittings with Silicone rubber.

Exposure to sunlight is a killer to gelcoat, wood, and any synthetic materials including lines, Personal Flotation Devices (PFDs), etc. Keep it covered.

Keep it dry. Especially during winter months, check for water accumulation. Not just in the cockpit but in the seat and bow tanks. Shake boat while on hoist or tip back and forth when on trailer and listen for sloshing. Some boats have leaks along seats or bow tank.

Check corks to see that they are in place and in good condition

It has been recommended that forestays should be waxed with paraffin but I have been told to the contrary and to use copper? wool if oxidation is prevalent. Personally, I use acetone to keep them clean and occasionally wipe the forestay with a rag sprayed with liquid silicone.

Trailer/Trailering:

- Remove the centerboard for long distance trips, otherwise secure it from wobbling by jamming rags or rubber wedges between the board and the trunk
- Remove drainage and flotation tank stoppers when travelling up or down any significant elevations to avoid pressure buildup or vacuums.
- Let bearings cool off after long distance trailering before immersing in water; water is more likely to penetrate into hot bearings and cause rust.
- Keep bearings out of salt water as much as possible
- Use Bearing Buddies (a commercial product that fits over the end of the trailer axle) to keep the bearings fully greased
- Maintain recommended fore/aft weight balance
- Use Lido 14 specific bunks or pads on the trailer. W.D. Schock Corp. makes a set that may be adaptable to your trailer. The W.D. Schock bunks are approximately 6 square feet for the aft bunk and two square feet for the bunk just forward of the centerboard trunk.

- If the hull has been sanded or buffed in the area resting on the trailer pads, **it is essential that the pads drain water and self-dry rapidly. Indoor/Outdoor carpeting, especially on large aft bunks, will cause severe blisters in the Gelcoat in a matter of days.**
- Place padding between tie down straps and the hull to reduce chafing
- Slacken tie down straps when the boat is in storage to avoid permanent distortion of the hull

About DoubleWave and John Papadopoulos

DoubleWave, the leading independent supplier of parts and service in the Lido 14 community, is owned and operated by John Papadopoulos.

DoubleWave is an authorized dealer for W.D. Schock Corp., the builder of the Lido 14 but extends service and parts well beyond those of a traditional boat dealer. In many cases, DoubleWave innovates solutions to problems in both the classic and 6000 series boats and has, in several cases, become a preferred supplier of parts and technology to W.D. Schock Corporation.

Outside of DoubleWave, John is very active in many dimensions of the sport of sailboat racing – from organizing local racing to serving as an International Measurer at world championships to writing on various topics of one-design sailing.

To learn more about DoubleWave, please visit www.doublewave.com