REVEALED! The Spinnaker Halyard Pump System

tech

By Stergios Papadakis

Imagine rounding the windward mark and hoisting your spinnaker without moving your butt off the windward tank, and without hand-over-handing the halyard. The halyard pump system allows this to be done. It is called a pump system because the motion bears some resemblance to operating a hand-pump; you grab the handle and move your hand up and down. The fitting that makes the system work is the rocking cleat (a brand name is the Northfix Pump Cleat). If the halyard passing through the rocking cleat is under tension and not in-line with the hole through the cleat, the halyard is clamped. If the tension is released or if the halyard lines up with the hole, the halyard is released. After passing through the rocking cleat, the halyard goes through a 1:4 or 1:5 purchase which is connected to a shock cord. This takes up slack in the halyard. So, when you grab the handle and pull up, the rocking cleat locks the halyard, so the spinnaker is pulled up. When you reach the top of your pull, the cam cleat holds onto your halyard. When you lower the handle again, the shock cord pulls the slack out of the halyard through the rocking cleat, so that you are immediately ready to pull again.

Figure One shows a diagram of the system. A big advantage of the pump halyard system is its variable purchase. When the handle is far above the cleat (H is much bigger than L), the purchase is 1:2, so the halyard gets pulled 2 feet for every foot the handle moves. When the handle is low, you can get a mechanical advantage greater than 1. When you install the system, you can tailor the mechanical advantage to you application by setting the length L between the rocking cleat and the turning block. For example, I have a bag boat, so there is very little friction hoisting the chute. In my boat, L is only a few inches. If because of a crowded mark rounding I don't hoist the chute all the way before it fills, I can easily get it the last few inches because the first few inches of handle travel give me a mechanical advantage. If you are installing the pump in a launcher boat, you will probably want to make L larger, to give you a greater mechanical advantage while you are pulling the spinnaker out of the tube, or into the tube if you want a pump-takedown. One detail to note is that the rocking cleat needs the halyard to be at an angle of about 15 degrees to lock, so you don't want the rocking cleat too far from where handle-pull will start. It is not a problem to have the turning block far from this point. For the long-luff spinnaker, a 1:4 shock cord take-up just barely fits between the rear thwart and the forward bulkhead on a Lindsay or Waterat. With the old spinnaker, I had the blocks a few inches forward of the rear thwart, so simply going to 1:5 was easier, and it works fine.

In my experience there are no disadvantages to the using a pump halyard in a bag boat. I suspect that the same would be true in a launcher, so I expect to see one out on the water really *soon (Ed—Mike Martin rigged one on 505 8714*).

505

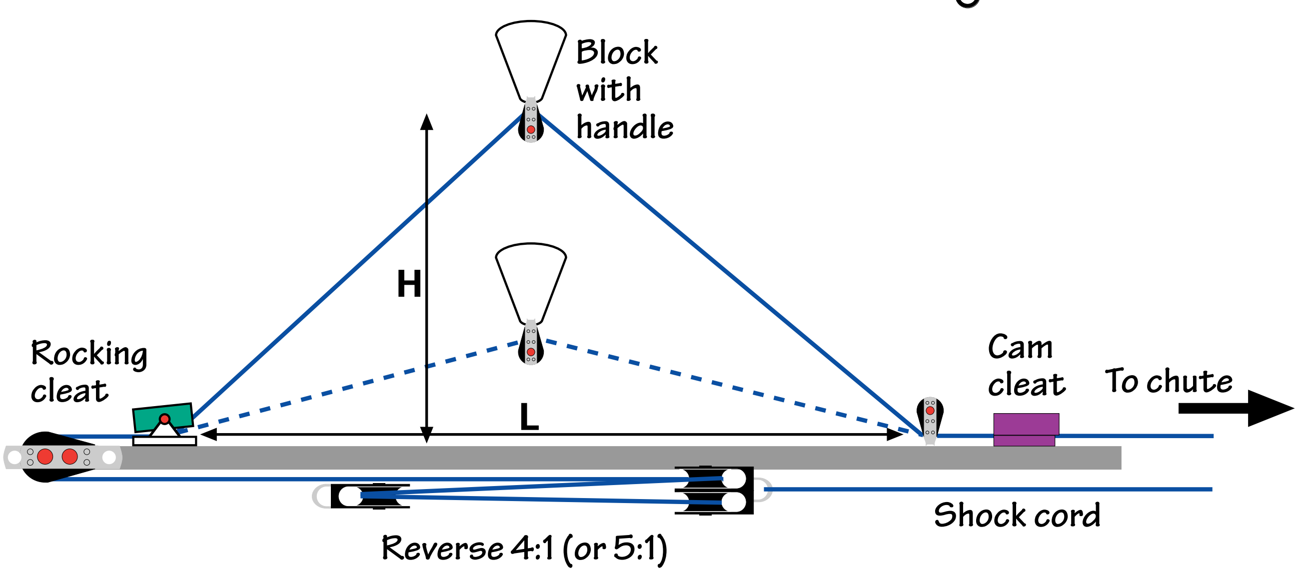


Figure 1.
The Spinnaker Pump System

Lost in the Crowd
Manage Your Risk in Big Fleets

By Jesse Falsone

All contending teams in major championships are fast, have great crew work, and are well prepared. However, what often separates the champions from the contenders in big fleets is the ability to effectively manage risk for an entire regatta. Champions always know the risks, and have that almost uncanny ability to leverage acceptable risks while avoiding and/or mitigating the unacceptable ones. Contenders are often the teams that let an isolated high-risk decision make a large negative impact on their results. The product of poor risk management can usually be seen on the results page from a competitive regatta. Often times we find one or two teams with a string of top finishes punctuated with one or two horrible races (or DSQs, DNFs, etc.) that they must count in their score. Then, at the regatta party, you may hear people saying things like "we would've won if; we hadn't hit that mark; fouled that boat; or if we had repaired that fitting."

RISK ASHORE VS. RISK AFLOAT

In sailing, we are confronted with situations that should involve risk assessment both ashore and on the water. Ashore, we may have to decide what sails to use or whether to check all the fittings before the race. You may reason that the wind will be light for the start, but is predicted to build, so you decide to go with the heavy air kite. Or, you may decide to replace a jib cleat that is not functioning well rather than wait for it to fail. On the water, we may have to decide whether to try and win a crowded pin end start, or whether we should try and lee-bow a starboard tack boat on the layline. The big difference between risk assessment ashore and afloat is that the ones made ashore are often pre-meditated, while the assessments made on the water may be last-minute decisions. It's these last-minute decisions that often plague most competitors, and often set them back in the standings.

SCRIPT HIGH-RISK SITUATIONS

Risk assessment on the water does not have to be minimized to a snap judgement. The fact is that the same situations come up time and time again in sailing, and we can mentally prepare for these events by scripting them in our minds. For instance, at the beginning of series regatta, you might want to minimize your risk by starting towards the middle of the line so that you reduce the chances of hitting a starting mark or fouling on a crowded portion of the line. If this is your strategy, make it your plan. If you are sailing single-handed, state this plan aloud to yourself. If you are sailing with a teammate, state the plan to them. Scripting in this way solidifies the plan for everyone on the team and helps you execute.

In other instances you might have less time to devise a plan of action. One of the best examples is the situation of whether to lee-bow the pack of starboard tackers on the layline, cross them, or duck them. An effective lee-bow will put you ahead, while a poor lee-bow can be a disaster (the consequence may be fouling, piling up on mark, or not laying the mark). Ducking may put you behind, but in a safe position. In these situations, it may be best to script it by understanding your strengths and weaknesses, and the prevailing conditions. If you have the best boat handling in the fleet, you virtually eliminate the risk of making a poor tack, so you might be inclined to try the lee-bow. Conversely, if you are new to the class and your tacks are not superb, you may want to decide that close maneuvers are too risky for you at this time. Another consideration might be current. If the current is ripping downwind, you might decide a cross (if you can make it) or a duck is best despite your other skills. If the current is pushing you upwind, a lee bow may be a less risky. If you are cognizant of your skill level and the environment, you can avoid those snap decisions that usually lead to a poor result.

LEARNING RISK MANAGEMENT

Risk management is the art of extracting the greatest gain from calculated, acceptable risks. Risk management skills are usually learned through experience. The odds are that the teams winning your championships have already made high-risk maneuvers in numerous situations. These teams have a very keen understanding of what the likelihood and consequence of success and failure are for each maneuver. Many of us don't have the luxury of experience, but we can compensate for that by identifying those situations that pose the greatest risk. In doing so, we build a mental database that gets augmented as we become more experienced.

With high-risk situations reoccurring in every race, it's pretty easy to typify the most common situations. You can start your own mental database by reading through this brief list of common high-risk situations. As you do, try drawing from your own experience by recalling a time you may have been in this situation, and then how it was resolved. Here's a brief list of these common high-risk situations:

BEFORE THE START:

- Going out to the racecourse without the right sails and gear. People take big risks in the spring when they first start sailing. It was warm on shore so you wore your "shorty" wetsuit, but it's 20 degrees colder on the water, with water temperatures in the 50's! You've risked your performance and your health by not wearing the right gear.
- Knowingly sailing with faulty or near-faulty gear. Will that damaged jib cleat hold all day in 20 knots? Don't risk a failure. Fix or replace the hardware.
- Arriving at the starting area late. Why risk your performance by not giving yourself the time to tune-up, check the wind and current, and check in with the RC?
- Sailing too far from the starting line when a start is imminent. We've all done it. The starting gun sounds and you're 100 yards from the line. This is even a larger risk now with a 5-minute sequence. Don't stray too far!

AT THE START:

- Trying to win an end. A big crowd at the favored end usually means that only a small number of boats will get decent starts, if any at all. Most of the time it's best to start one-third of the way down from the favored end to avoid the mess.
- Port tack approach on a crowded line. As the time to the gun winds down, boats (especially small dinghies) tend to converge on the line leaving less and less room for a port tack approach, especially near the favored end. The risks of fouling while trying to squeeze in somewhere or being pinned out entirely are great.
- Port tacking the fleet at the pin. A big left shift just before the start might make this a great maneuver, but there are bound to be many starboard boats very close, and it only takes one nearby to spoil your best laid plans.

WHILE SAILING

- Tacking off the heavily lifted or favored tack because of bad air. This is a particularly high-risk maneuver in an oscillating breeze. Hang in there on the lifted tack, or perhaps foot or pinch a bit to clear your air. Resist the temptation to tack because the gains are usually short-lived when you do.
- Allowing a right-of-way boat to dictate your tactics. You are lifted and convinced you are in phase and going the right way. Why then would you risk spoiling your strategy because you refuse to duck a starboard tack boat? Execute a perfect duck and continue with your plan.
- Sailing to laylines. Generally speaking, risk increases as you approach the laylines. Not only do you stand to lose in any shift while on or near the layline, boats will camp on your air as you get closer to the mark.
- Lee-bow a pack on the starboard layline. Can you make the mark after the tack? Will you foul during the turn? Know how well you turn the boat.
- Jibing around the windward mark with a tight pack of boats directly behind you. A jibe here can put you in a big zone of dead air, plus tight turns are really slow. You need to have a very good reason for jibing in this situation.
- Assuming you aren't required to give room to a boat close astern while in the two-length zone. Once you reach the zone, it's best to clearly state to the boat that they don't have room. Communication can really reduce your risk here.
- Not covering your competition, especially while leading to the finish. As you approach the finish, you should consider reducing your opponent's opportunity to pass you by placing yourself between them and the finish mark. The opportunity for gain and loss always increases as boats separate, as does the inherent risk of such a move.
- Not exonerating yourself when someone protests you and you have the slightest inclination that you fouled. In reality, very few regattas are won in the protest room.

WHEN IS RISK ACCEPTABLE?

Big risks can also mean big rewards. There are times when it's appropriate to take bigger risks, so long as you understand the consequences. Here's a list of situations when it might be appropriate to assume a greater risk in the hopes of achieving the desired result:

- When a gain in a race has a large net effect on your result. For instance, you may want to take greater risks at the end of a short series or in a one-race regatta if in doing so you have a shot at a substantial gain.
- When one side of the course is heavily favored. You absolutely need to get to that side by any means necessary.
- On the last race of a series, you are sailing deep in the pack for the first time, and a poor finish will be dropped from your score. Maybe it's time to roll the dice.
- You need to gain a few points to move up in the standings at the end of the regatta. You might decide to drop a cover on one pack of boats in order to try and pass another larger pack.

Ultimately, good risk management manifests itself in good decision making, and good decisions get you around the course faster. A good indication that you aren't managing your risk well is if your results are inconsistent. Are you taking unnecessary chances for a short-term gain? Are you well prepared and on time for every race? If the answer is no, take a closer look at how you're managing risk on and off the water, and take steps to improve this process. Sailing in big fleets as often as possible will improve your learning curve. Of course, the best way to limit risk is to just be faster!

Men At Work Down Under

VanMunster 505 Innovations

By Brett Van Munster

NEW HULL SHAPE

Van Munster completed a new female hull mold two years ago. This new mold is constructed of a low-shrink Reichhold “Polylite“ profile tooling system that enables elevated temperature curing during boat construction. This tooling system also produces beautifully fair hulls, and its low movement and shrinkage allow accurate reproduction of a hull shape that takes full advantage of class tolerances.

Alterations to the hull shape were made to the original plug during the construction of the new tooling. This original plug was based on the highly successful Kyrwood hull shape. The alterations to the hull shape included straightening the stem and flattening the rocker. This has produced a finer entry to the bow section of the boat. The aft end has also undergone subtle modifications. Straightening the buttock lines has provided a flatter run aft and a softer turn at the bilge. These changes have effectively reduce the wetted surface area and maximized the waterline length. In a further effort to reduce drag, the keel band has been shaped to its minimum allowable size in the aft section of the hull between station nine and the transom (station 11).

Hull Mold

CONSTRUCTION

The new hull shape has proven to be very popular in Australia, and fifteen boats have already been constructed from the new mold. Fourteen of these new boats are of a

Bar and Turning Pads

high-tech vacuum-bagged carbon composite construction. The carbon boats have proven to be extremely stiff, light in the ends, and fast. A fully fitted deck with spinnaker chute, all structural components, and bulkheads weighs less than 30% of the boats finished sailing weight (about 75 lb.). All the bulkheads are of the same composite construction as the deck and hull to give a high strength to weight ratio. The composite bulkheads also help with torsional stiffness and resistance to rig and slamming loads. The hull and centerboard trunk is a monocoque laminate (i.e one continuous laminate with no joints). This ensures maximum strength, a flat parallel surface, and no troublesome joints that may damage the centerboard. The centerboard slot was shortened and the volume minimized in an effort to increase the buoyancy of the hull. This case design allows the latest generation of high-aspect gybing boards to fit in a compact trunk. Due to demand from Europe, we have a new trunk mold that locates the front edge of the case back to the same measurements as the Waterat and Rondar.

Cockpit Layout

COCKPIT LAYOUT

The centerboard case console and thwart is an innovative improvement in design and construction. Our design gives the boat a modern appearance while providing the crew with a simple, clean layout with maximum working room for efficient racing. It also delivers vital rigging controls directly to the crew in normal hiking positions.

Mounts for the rig controls have been optimized for maximum efficiency and ease of use. Individual rigging preferences can also be easily accommodated. Controls such as the boom vang and shroud adjusters are typically lead to the port and starboard side tanks, and the molding has been designed to automatically engage the cleats from any position in the boat.

FUTURE DEVELOPMENT

Van Munster plans to dedicate energy in two developmental areas. The most obvious has been generated by the implementation of larger spinnakers to the class. The other is in hull construction. We are currently developing a pre-preg construction method that will reduce weight in the ends and should increase the overall strength of our hulls. We have just completed a custom-made oven facility that allows us to elevate the temperature to over 187 degrees Fahrenheit. The temperature is controlled with a gas fired heating system through a custom fabricated ducting network controlled through a digital device. The first boat is scheduled for lamination mid February so a full report on this new construction will be available for the next issue of Tank Talk

See http://home.bip.net/505sweden/vanmunster505.htm for more details on recent changes to the Van Munster 505.

Does Size Really Matter?

Long Luff Spinnaker Developments

By Mark Angliss and Jesse Falsone

About this time 2 years ago, our 505 message boards were teeming with hot debates as to whether or not we should adopt a six-meter luff chute. Speculations and opinions about required rigging changes, speed gains, and structural integrity abounded. After the ballot passing the international vote with a 2:1 margin, we now have substantially more downwind sail area, and we need to figure out how to make it work best. Prior to the vote, prototype Long Luff Spinnakers (LLS) appeared during a class sanctioned trials period that lasted approximately 2 years. Most trials simply involved raising the hoist and extending the halyard. Numerous photos, reports, and even some videos appeared of 505s under sail with the LLS. Tom Böjland of Denmark produced a nice video that clearly demonstrated how a 505 with the LLS was much faster than one with the standard five-meter spinnaker.

The LLS will make its world championship debut this December in Perth, Australia. With 14 months of development time between the October, 2001 rules change and the December, 2002 Worlds, we can expect refinements in both rigging and sail design. These developments are promulgated in North America, Europe, the UK, and Australia. Currently, there are at least 6 different mast sections in use with the LLS, and numerous rigging modifications. New spinnaker designs are being tested regularly to explore the bounds of the design envelope.

Most of the preliminary experiments are being carried out by the professionals and serious sailors within the 505 ranks. It's crucial that this information get passed down to all 505 sailors so that people can start making the necessary modifications to get out on the water with the LLS. This article is simply intended to report on what LLS rigging and sail design solutions are currently being tested around the globe. While most tests are inconclusive at this time, some recommendations are given to assist our readers.

Jean-Baptiste Dupont and crew

THE LLS DEFINED

The rules change that brings us the LLS seems fairly straightforward. The maximum luff length is extended 1 meter from 5 to 6 meters. The maximum foot median (head point to mid foot point) has also been extended 1 meter from 6096mm to 7096mm. The maximum foot length and half width are unchanged at 4500mm. The maximum sheave height has been increased to 5955mm, or 850mm higher than the previous location. Finally, the "75% rule" has been deleted. This is the rule that previously governed the minimum width of the spinnaker at its half height. The old rule stipulated that the width at the half height (or half width) be at least 75% of the foot width. This effectively limited how "triangular" the spinnaker could be, supposedly to prevent upwind spinnakers, like the "Code 0" developed for Volvo

Ocean Race boats. While nobody is reported to be developing a radically narrow spinnaker, optimizing such a sail for upwind use would be nearly impossible because of the rules requirement for the shape to be symmetrical.

LLS FLAWED BY DESIGN?

The current LLS specifications came about as the result of significant testing and debate. Luff lengths as long as 6.5 meters were tested by the likes of five-time World Champion, Krister Bergström, with very low pole fittings and very high sheave heights. Increasing fears of gear failure, equipment geometry problems, and poor visibility ultimately dictated that we could not be overly radical with this change. The opinions of our international class officers were unanimous in the thinking that the final changes must reflect logical, systematic thinking and testing. Others, most notably a majority of the voting 505 public in France, were staunchly against the change. Two noteworthy opinion pieces lobbying for and against the change appeared in the Summer and Fall 2000 issues of *Tank Talk*.

It's very clear that we are not out of the woods with respect to the design parameters of the LLS. Larger teams have had a distinct advantage in heavy air in recent years, and the LLS may continue this trend. To offset this possibility, the Worlds course has been modified to include two runs and one triangle, with one less upwind leg (original course had 2 reaches, one run, and four beats). Additionally, broader reach legs were introduced to reduce the requirement for righting moment off the wind. However, Ethan Bixby (North Sails Gulf Coast) wonders whether an additional LLS rules change was necessary. Bixby theorizes that by adding length to the spinnaker, more optimum aspect ratios can be achieved, and longer foot lengths, as compared with the 5-meter spinnaker, can be used to good effect. It was well known that the best 5-meter luff spinnaker designs were shy of the class maximum foot length (most were about 3.6 to 4 meters). Bixby wonders if a more defined box should've been placed on the spinnaker rules by limiting the foot and half-width dimensions to something smaller than 4.5 meters. In fact, we're now seeing these maximum size spinnakers (sometimes called "Whompers" by those of us with an affinity for the Hollywood film, *Wind*). Another possible detraction is that the latitude in spinnaker design may dictate that three spinnakers are needed at the world championship level (you can only measure in two however). Bixby is quick to point out that he just doesn't know how this will all pan out when the dust clears, and that his theories may not come to be true at all. In fact, he still feels that the LLS and course changes might offer more flexibility for smaller teams to optimize the spinnaker size to suit their weight.


A modified Pinnell, Bixby North and a new Le Bihan side by side

The possibility of rig failures with the LLS looms ominously on the minds of many sailors. A combination of more horsepower and the force exerting itself at a point well into the tapered section of the mast are certainly valid reasons for concern. Additionally, many teams will be sailing with modified rigs. The extra holes put in these spars for the new sheave and new pole position will weaken the mast. If these spars are old, the risks are higher still. With significant latitude on the location of the spinnaker sheave, owners can weigh the trade-off of height and structural reliability.


Proctor D mast inversion on a tight reach.

At press time nobody has lost a rig as a direct result of added stress from the LLS, but it may not come as a surprise if and when a failure happens. TEAM Spot recently lost an old rig sailing with the LLS due to the failure of 20-year-old shroud tackle. Paul VonGrey discovered a mysterious kink in his brand-new "D" which Larry Tuttle believes is due to a section flaw rather than the LLS.

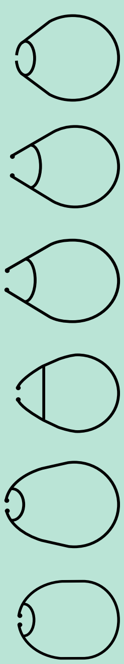
THE OPTIMUM MAST SECTION

A lot is required of a 505 rig, especially now with the LLS. It must have the proper flexural characteristics to keep the main fully powered in light to moderate conditions, yet de-power quickly as the wind strengthens. It also must be strong enough to withstand high forces, like during the rare occasion when the 505 stuffs its bow in a wave causing rapid deceleration, or during a high-speed capsize.

Something that is often overlooked is the fact that the mast and sails must work together as a system. Both components need to complement each other for maximum performance. Great sails on the wrong mast will not perform well, and vice-versa. This systems engineering approach to the problem is best exemplified by the number of different mast sections used by recent World Champions. The Hunger/Jess team won in 2001 with a SuperSpar M2, Bergstrom/Moss won in 2000 with a Proctor Cumulus, and Hamlin/Martin won in 1999 with a Proctor D. The Proctor D is significantly softer than a Superspar M2, yet both the 2001 and 1999 worlds were sailed in light air. Both systems were obviously working well.

What's wrong with the standard Proctor D rig? In light to moderate air, there's nothing wrong with the Proctor D as far as most people are concerned. The problem with the standard D rig is the excessive bend above the hounds in heavy air that causes the main to distort. This distortion seemingly causes a loss of power in the sail that upsets the balance of the boat. Additional rigging with upper mast support can correct this problem.

So, it can be concluded that there is no optimum mast section for the 505, and there won't be until we all start using the same sails, blades, boats, crew weights, and sailing styles. Most top sailors view the new "optimum" mast section as one that will maintain the upwind bend characteristics they are accustomed to while providing enough stiffness downwind to keep the main from distorting and the mast from failing. Clearly, this is a compromise that must be reconciled, and most top sailors have not ruled out the possibility of slight modifications to their sails to suit a stiffer mast.



	Stiffness fore/aft	Stiffness athw
Cumulus	19.5	14.0
"D"	19.5	12.0
"D" Plus	19.5	14.0
"E"	19.0	14.0
Epsilon	20.0	15.5
Stratus	19.5	15.0

Proctor Mast Sections
Courtesy of Selden/Proctor

INTERNATIONAL RIG DEVELOPMENTS

Most people don't have the time to develop a new rig or new rigging systems. The majority of sailors rely on the professionals and keen competitors in our ranks for this development. The "no secrets" policy in the class seems to be working, and the results of rig testing are now being publicized. While nobody is exactly offering up every bit of information, *Tank Talk* has been able to get a few details from around the world.

THE UNITED KINGDOM

Paul Young (Rondar Raceboats) and Chips Howarth (Selden/Proctor Spars) suggest that the trend toward heavier crews (190-240 pounds in the UK) has caused the Proctor D to fall out of favor a bit with those teams buying new masts. Recently, sailors using the Holt Antares and the SuperSpar M2 have won the UK Nationals. Both of these sections are reportedly stiffer than the Proctor D and the Cumulus, but no data was available at press time for either. SuperSpar declined to provide us with bending data because they feel that Proctor's published numbers are inaccurate, so comparisons would be misleading. There is obviously a "Spar War" going on here. The Cumulus has developed a following lately in the UK, and Ian Pinnell (Pinnell & Bax Sails) has determined that his main and jib design, initially suited to the D, do not have to be re-designed to fit the Cumulus. Additionally, some people including Pinnell and Young are rigging the Cumulus with "Trap Twings" that allow for greater support of the upper portion of the mast with the crew on the wire. Other sections in use in the UK include the Proctor Stratos which, according to Proctor, is slightly stiffer than the Cumulus sideways and the same stiffness fore and aft.

Paul Young believes that the Cumulus is better than the D with the LLS, but the rigging may need to be refined for compatibility with sails cut for the D despite what Pinnell has suggested. Young also believes that the M2 and the Antares are stiff enough that they don't require additional rigging to support the upper mast. Young has been sailing with a Stratos, but has also started sailing with a Cumulus rigged identically to Krister Bergström's with trap line twings (see Trap Line Twings section for details).

Chips Howarth states that Proctor is working closely with Paul Young, Krister Bergström, and Ian Pinnell, all of whom are having similar ideas using the Cumulus with trap line twings. Chips also feels that the Cumulus will be a better mast in the fully powered 8-12 knot range because the mast won't bend off as much at the top in small puffs. The consensus in the UK on spinnaker sheave height is that maximum height is the best option with mast sections stiffer than the D.

1995 World Champion, Bill Masterman, is reportedly rigging a Cumulus based on sail testing in the UK. Masterman has been sailing with an M2 for 10 years. This report comes from Howarth at Proctor.

Young sums up by saying; "All of (the mast sections) them have the potential to be winners, properly rigged."

FRANCE

A report from Jean-Baptiste DuPont detailing tests with a Holt Antares is available on the International 505 Web Site. The Antares performed well with the LLS in 15 knots of wind. The picture shows only slight side bend in this rig. The mast is rigged as per US spec, the spinnaker halyard is at maximum height, and the pole was lowered to approximately 24 inches above the boom band. Apparently, testing with the Antares was also done in very heavy winds of up to 30 knots with good results. Jean-Baptiste feels that a stiffer mast section is not absolutely necessary for the LLS, but is a good idea.

GERMANY

The SuperSpar M2 has become the dominant mast section in Germany. The Wolfgang Hunger/Holger Jess team used an M2 to win the 2001 Cascais World Championships. Jess feels that both the D and the Cumulus are too soft for the LLS. Jess is of the opinion that moving the trap wires higher on the mast is a good bend compensator for the LLS without requirement for any other rig strengthening on the M2. Perhaps it's worth noting that Jess is a distributor for SuperSpar. Chips Howarth claims that Wolfgang Hunger is interested in trying the Cumulus, so perhaps there's a bit of gamesmanship going on here. We wonder if Hunger has told his crew!

AUSTRALIA

Based on the results of the Australian Nationals, it seems that the Aussies have been trying the broadest range of mast and rigging combinations. The top two boats at the nationals used Cumulus sections. Proctor Ds, Proctor Epsilons, and Goldspars were also being used to good effect, and at least two boats had double spreader rigs (see "Floppy Spreader Rig" below). The fact that 6 different rig configurations were in the top 10 at the Australian Nationals is a reoccurring theme.

THE UNITED STATES

The Proctor D has dominated in the USA for over a decade. Sails developed by Ullman and North are well suited to the bend characteristics of the D, and many top sailors are looking for ways to stay with this rig. It is apparent to many that the D with standard rigging is too soft for heavy air reaching and running. The excessive bend above the hounds cause the main to distort and take on a less efficient shape. Again, there have been no documented failures of a standard D using the LLS, but there has been at least one bent rig as of press time. This rig was straightened successfully off the water.

Two possible rigging solutions have been tested on the Proctor D in the US–the "Tuttle System" and the "Floppy Spreader System". These are relatively simple retrofits to a standard Proctor D. A few others in the US are experimenting with a Proctor Cumulus section, the SuperSpar M2, and the Proctor Epsilon.

NEW RIGGING SYSTEMS

LLS detractors might call this section the "Arms Race". LLS proponents might be more inclined to call this necessary 505 evolution to avoid becoming a victim of Darwinism. Whatever your opinion is, if you're in this game for the long haul, it's worthwhile to take a good look at these systems and make your own conclusions. All of these systems should be viewed as prototypes. They are all being refined. New and better systems that we don't yet know about may be under development right now in someone's garage.

THE TUTTLE SYSTEM

This system is being developed by Larry Tuttle at Waterat Sailing Equipment in Santa Cruz, California. It consists of an upper shroud and spreader extenders to prevent excessive side-bend and mast inversion. This system uses thin 1 by 19 wire with the bottom connected to a pin rack adjuster at the shroud pin above the turning block on the side tank. The upper shroud runs through the spreader extenders that extend approximately 4 inches aft and a bit outboard. The uppers terminate on the mast approximately 4 inches above the new spinnaker sheave location. The theory is that the uppers are basically slack upwind when sailing with a bent mast. The first prototype is pictured here and was tested by Ethan Bixby. It was determined that this arrangement was not very effective because the angle the upper shroud made with the mast was too acute. The second prototype used spreader tip extensions that pointed out to the side more, and this was reported to be much more effective at stabilizing the rig. Several 505s in Santa Cruz are using this system on the Proctor D.

The Tuttle System - used by Ethan Bixby

THE "FLOPPY SPREADER RIG"

This rig reportedly first appeared on Australian 505s, and was used by Dave Porter at the Australian Nationals in January with a Proctor D. As with the Tuttle system, Porter attaches the bottom of his upper shrouds to the shroud pin. When the mast is bent sailing upwind, the floppy spreaders are unloaded and simply fold back. When the mast is loaded up downwind, the spreaders rotate out to the side as the uppers take on enough tension to support the upper mast. Dave Porter reports; "Our mast was as straight as a gun barrel. Yesterday we sailed in a 22-knot sea breeze and the mast was standing up perfectly." Howard Hamlin/Mike Martin are also experimenting with a floppy spreader rig. Howie Hamlin reports that his floppy spreader rig has been performing admirably on his Proctor D with it set loose for upwind sailing, although they have not completed tests in heavy winds. Howie's system uses stock 14-inch Proctor spreaders, with both the upper and lower (regular) shrouds going to a Ronstan shroud adjuster (part RF 2331). The lower shrouds attach to the shroud adjuster in one of the lowest holes, and the uppers attach approximately in the middle so there is room for adjustment. Howie was wary of drilling extra holes in the mast for the new spreader bracket. He crafted a custom stainless steel bracket that uses the lower shroud T-terminal rivet holes. Howie and Mike prefer not to have the extra rigging, but still feel that the Proctor D is the best mast for the Ullman sails.

Australian Floppy Spreader Rig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