

From the Experts

Nacra 5.8



LOA	19'0"
BEAM	8'0"
DSPL	410 lbs
SA	242 sq. ft. (main and jib)
BOARD	Daggerboards
HULLS	Symmetrical

Champion sailor Brad Hunter explains how to rig and race this high-performance catamaran. Illustrations by Henry Hill

Today's high-tech racing designs are evolving rapidly. Ultralight displacement, long waterline, low wetted-surface platforms are creating new excitement on the racing scene.

Speed and performance never thought possible are now realities as large-roach mains with full-length battens on bendy, highly tunable spars are becoming the norm in the high-performance arena. Having been spurned by the yacht racing establishment over the years, catamaran sailors have taken note of the enthusiastic response to these "new" trends. With a glint in their eyes and a barely perceptible smirk, they can now justifiably mutter softly to themselves, "Told you so."

In the mid-1970s, the Nacra 5.2 was at the forefront of the high-tech catamaran renaissance that has led to the new boats of the '90s. Its design was inspired by the large European ocean-racing cats and it was the first beach cat to feature plumb bows, high-aspect daggerboards, and large elliptical rudders. A decade later, the Nacra designers devised the 5.8 in an attempt to take the best attributes of the 5.2 and incorporate them into a larger platform (19 feet LOA) that could handle a wider range of crew weights (300 to 340 pounds is optimum) in a greater variety of conditions.

Because of the market demand for a high-performance racing catamaran that was production built, the 5.8 became an instant success. Large fleets were immediately established across the U.S., as well as in Australia and Europe. A strong class association governed by the members adopted a strict one-design format where all major components are restricted.

Choosing a Boat

Obviously, the best way to ensure a competitive platform is to purchase a new boat. With only one builder (Performance Catamarans in Santa Ana, Calif.), the buyer does not have to debate the merits of one builder over another. All boats are constructed using the same molds, which ensures uniformity of weight and stiffness. The sails are built by Skip Elliot Sailmakers and are computer cut to ensure that all sails are equal. Standard equipment includes all the necessary hardware for racing.

While one cannot debate the warm fuzzy feeling of confidence inspired by a new boat, used boats can also offer a very competitive platform, especially if you know what to

look for. Although the 5.8 is built under strict one-design standards, there have been class-approved changes over the years that are notable and should be taken into consideration before buying a used boat.

When purchasing a used boat, the first aspect that should be scrutinized are the hulls. The prime considerations are weight and stiffness. Boats built before 1986 were constructed of fiberglass skins reinforced with hollow stringers. Boats built after 1986 have used a vacuum-bagged, foam-sandwich construction which is significantly lighter and stiffer. This construction type also retains its stiffness much longer than the non-foam boats. A competitive 5.8 should weigh no more than 420 pounds all up and should have bow deflection of no more than two inches. You can measure bow deflection by first checking the distance between the bows with the mast up and slack shrouds (make sure the hulls are properly butted against the stops at the dolphin striker). Next, tension the shrouds to race settings, raise the main, and center the traveler. Sheet in the mainsail as hard as possible, then measure the distance between the bows again. The change should not be more than two inches.

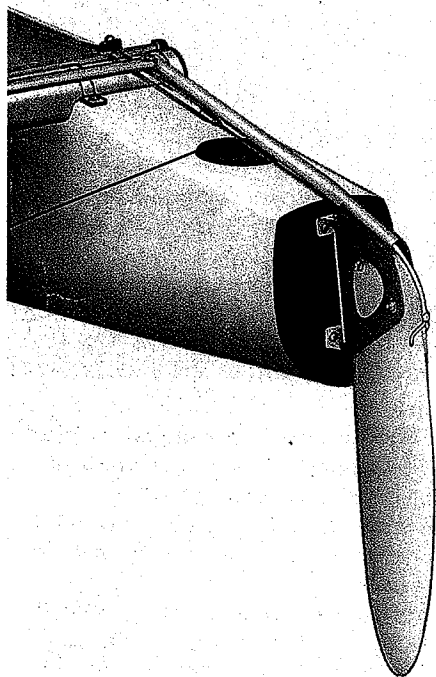
The only other significant change regarding used boats involves sail material. Prior to 1990, the 5.8 came with Dacron mainsails. Since 1990, Mylar has been used. This has resulted in a lighter sail that has reduced stretch. The Dacron sails, however, should not be considered uncompetitive. Many of these grandfathered sails are still placing well in major regattas.

The rotating spar is bendy and very tunable. The spar section itself has not changed since the boat was introduced. The primary things to look for are any obvious damage or bending above the hounds.

The control systems on the 5.8 are open, so anything else on the boat is easily replaced and can be adapted to the tastes of the sailor. A good platform with reasonably well-maintained sails will offer a competitive boat that can win on the race course.

Rigging & Tuning

Bringing a 5.8 to top racing condition is not an expensive proposition. The first item to check is hull alignment. First, measure from the inner hull gunwale to the opposite outer hull gunwale just behind the rear beam, and repeat this measurement just in front of the main beam. The measurements should be



Tuning Guide

SHORE SETTINGS

Windspeed	0-4 (max power)	5-7	8-10	10-12	12-14	14-18	18-20	20+ (depowered)
Mast Rake (forestay adjuster hole)	5	5	4	4	3-4	2-3	1-2	1
Rig Tension (pounds)	300	300	300	300	300	300	300	300
Diamond Tension ¹	340	340	340	340	340	6"	12"	12"
Spreader Rake	1 1/4"	1 1/4"	1 1/4"	1 1/2"	1 3/4"	1 7/8"	1 7/8"	1 7/8"

These settings must be set on shore and cannot be changed while racing.

¹ Diamond tension is measured using a Loos tension gauge. After 14 knots of windspeed, the diamonds are slacked, and the measurement is derived by applying moderate tension to the diamonds and measuring the point above the lower attachment where they touch the mast.

CONTROL SETTINGS - UPWIND

Windspeed	0-4 (max power)	5-7	8-10	10-12	12-14	14-18	18-20	20+ (depowered)
Main Downhaul ¹	0	0	0	0-1	1-3	3-6	6-9	10
Jib Uphaul ¹	0	0	0	1-2	2-5	5-7	7-8	7-8
Mainsheet Tension	firm	firm	very firm	very firm	tight	max tight	max tight	max tight
Main Traveler	center	center	center	center	center	2-4"	4-8"	6-12"
Clewboard Traveler	center	center	center	center	center	1" fwd	2" fwd	3" fwd
Jib Sheet ²	1"	1"	1 1/2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
Jib Lead (1=fwd, 10=aft)	2	2	4	5	5	7	9	9
Mast Rotation (degrees)	65	65	65	65	65	75	90	90

¹ On scale of 0-10, 0 is no tension, some wrinkles present; 1 is wrinkles just removed; 5 is half of full range available; 10 is pulled as hard as possible.

² Measurements indicate inches between the tip of the spreader and the jib.

CONTROL SETTINGS - DOWNWIND

Windspeed	0-4 (max power)	5-7	8-10	10-12	12-14	14-18	18-20	20+ (depowered)
Main Downhaul ¹	0	0	0	0-1	1	1	1	1
Jib Uphaul ¹	0	0	0	0-1	1	1	1	1
Mainsheet Tension ²	65-70	65-70	65-70	65-70	70-75	70-75	70-75	70-75
Main Traveler	24"	24"	24"	24"	24"	18-20"	18-20"	24-28"
Clewboard Traveler	center	7" aft	9" aft	9" aft	9" aft	9-7" aft	7-5" aft	3" fwd
Jib Sheet ³	1"	1"	1 1/2"	2"	2"	2 1/2"	2 1/2"	2 1/2"
Jib Barberhaul	full	full	full	full	3-4" off	4-6" off	6" off	6" off
Mast Rotation (degrees)	105	105	105	105	105	95-100	85-90	90

¹ On scale of 0-10, 0 is no tension, some wrinkles present; 1 is wrinkles just removed; 5 is half of full range available; 10 is pulled as hard as possible.

² Measurements indicate relative angle that the block assembly is pulled off vertical.

³ Measurements indicate inches between the tip of the spreader and the jib.

the same. If not, adjust the alignment by loosening the beam straps and sliding the hulls in or out.

Once the hulls are parallel, the next concern is that the foils are in alignment. As built, there is generally some play in the daggerboard trunks. It is a relatively simple job to fill these voids using auto body filler to eliminate almost all slop.

Rudders must also be in alignment, and are easily adjusted with a threaded tiller crossbar fitting which comes standard on new boats. Proper alignment is about 1/4-inch toed-in at the leading edge. You can measure this by comparing the distance between the leading edges at the waterline, and the trailing edges at the same height — the leading edge measure-

ment should be 1/4-inch less. Measurements should be taken at the waterline and near the tip to ensure the rudders are also plumb.

The factory boards and rudders are well made and suffer very few failures. Detailed attention to the leading and trailing edges, however, will noticeably decrease any cavitation or ventilation of the foils. The casting flash from the molds should be removed from the leading edges with a sanding block, and any resulting voids should be filled. The trailing edges should be faired to an even taper. A sharp point is not necessary; in fact, the daggerboards will benefit from a squared off trailing edge, as this provides a bearing surface at the back of the trunk which will help you raise and lower the board when under

load. Any pronounced hum can easily be cured by slightly dulling the corners of the trailing edge with a sanding block.

Class rules are very open regarding sail controls and systems, and as a result many systems have evolved over the years. You should consider the conditions in which you sail as well as the strength of the team members when choosing your systems. Experimentation with variations is one of the fun aspects of this boat, but use proven examples as a starting point for your own ideas. The primary goal is to have a layout that is efficient and dependable. The important features are ease of adjustability from the trapeze and trampoline, as well as adequate purchase to allow maximum adjustment. (See "Control Systems" sidebar.)

Tuning

There are many controls on the 5.8, and they allow an infinite number of adjustments to give optimum performance across a wide range of conditions. The best combination of adjustments will depend on many factors, so to get started this article will establish some basic settings. You can vary these according to your crew weight, the wind strength, and sea conditions. The most basic starting point is to establish settings which will give the most power, and then establish another group of settings that will most effectively depower the rig. As conditions dictate, you will gradually move from one end of the spectrum to the other. Additionally, you will have to consider the compromises that must be struck between settings that can be adjusted while sailing and those that cannot.

The primary adjustments are to the rig itself, and cannot be adjusted while racing. These include rig tension, mast rake, spreader rake, and diamond wire tension. Consider the anticipated conditions before making these selections. Downhaul and other adjustments can be used to depower a rig that is set up for less wind than encountered, while the inverse is not true, so you should set up the most powerful rig that can be handled over the range of expected conditions.

In all conditions, shrouds should be set to a racing tension of between 290 and 320 pounds using a Loos tension gauge. While a softer rig will allow more headstay sag to power up the jib, the spar of the 5.8 is flexible enough that tight rig tension, absent of high mainsheet loads, will actually allow the mast to invert slightly, which powers up the mainsail.

Mast rake has always been a controversy, as different geographic locations have adopted different theories on the most effective settings. The 5.8 is extremely well balanced, so mast rake is viewed more for its effect on airflow rather than helm balance. As a general rule, raking forward tends to achieve more power, while raking back will depower and promote greater stability. The maximum power can be achieved by joining a standard length headstay to the bridle chainplate at the fifth hole from the top. In winds over 20 knots, the mast will be raked all the way to the top hole.

Diamond wires should be tensioned firm, about 340 pounds on the Loos gauge, but not tight enough to induce any prebend. This setting should be kept until the wind puts you into a true depowering mode, at which time the diamond wires should be backed off dramatically to allow the mast to bend. (See "Shore Settings" section of "Tuning Guide" for diamond wire details.)

Responsiveness, manners, and feel are the strong points of the 5.8, and are due in large

One of the great aspects of the 5.8 class is its true one-design nature. The expensive components such as sails and foils are controlled to keep boatspeed as even as possible. Sail controls, however, are completely open, which has made for some interesting evolutions in this area. Below are some brief descriptions on what some of the top teams have adopted.

Main Downhaul: Dual-cascading, continuous 16:1 system. This offers adequate power for any team to completely depower. The cascading feature means less line, fewer blocks, and less friction. The best feature, however, is that it rigs in about 15 seconds (see illustration).

Mainsheet: Large sheave 8:1 systems are considered mandatory. The

Control Systems

factory equipped 7:1 system is inexpensively modified to 8:1 with the addition of one small block. The sheet is suspended from the clewboard traveler car by a 9-inch strap. This eliminates six feet of unnecessary line, as well as some windage.

Jib Uphaul: An 8:1 cascading system run down the headstay gives adequate power for small crews to fully tension from the wire even if the jib is fully sheeted.

Mast Rotation: State of the art systems allow an easy 120 degrees of rotation adjustable from the trapeze and skipper's station.

Jib Sheet/Barber-auler: The factory-supplied system is still the choice of the experts. The only modification is to get the blocks off the deck by

putting a strap between the jib car and the block. This facilitates uncleating on windy beats and reaches.

Clewboard Traveler: Essentially a boomless out-haul, the tension from the mainsheet deeply beds the adjustment line into the factory supplied Clamcleat. Installing a small ring with a T-handle between the cleat and the fair lead block will make blowing the traveler an easy, one-hand operation.

Rudders: The factory kick-up system works well, but most racers are adopting a 2:1 system that allows you to kick up or retract the rudders from virtually anywhere on the boat. Known as "Piggy Rudders," this simple and inexpensive system was named after its inventor, Chris "Piggy" Russell, who first used it in the 1990 Worlds.

— B.H.

The dual cascading 16:1 downhaul consists of two 4:1 systems on either side of the mast connected by a block in the center. This 8:1 purchase in turn pulls on a 2:1 cascade for 16:1 power with half the blocks, and adequate power for any crew to use from the trapeze.

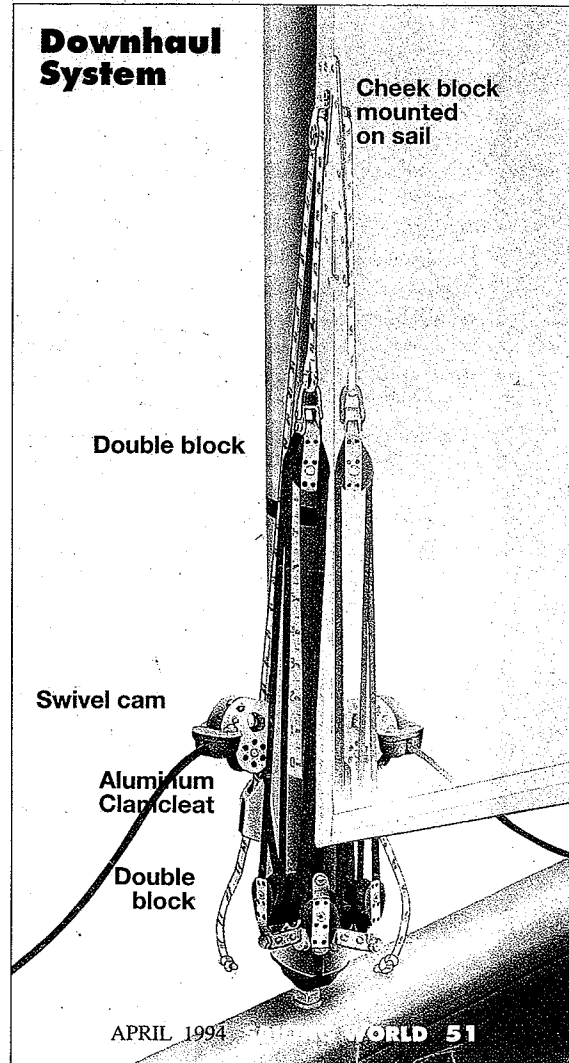
part to the large elliptical rudders. Any weather helm can be easily dialed out by backing off the adjustment screws in the rudder head to allow the rudders to rake farther forward.

Racing the 5.8

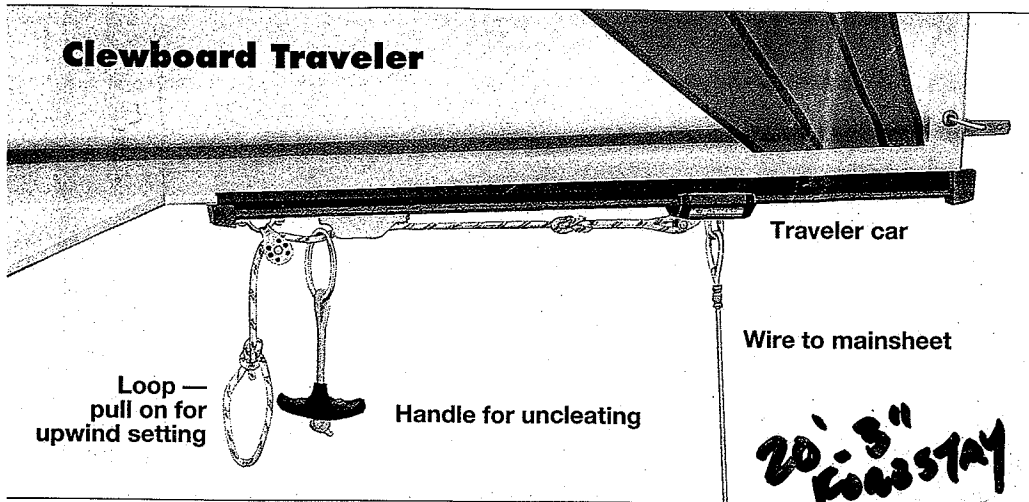
Upwind: The 5.8 has the well-deserved reputation as a stunning upwind performer. The high-aspect daggerboards and ample rocker make for a boat that allows you to steer a great deal without falling out of the groove. The 5.8 communicates very clearly when you're sailing on the numbers; when you hit the sweet spot the boat will flatten out and jet forward.

When sailing upwind in light air, the rig should be in the full powered-up mode. Weight placement will have a dramatic effect on boatspeed. In all conditions below about 14 knots, the 5.8 responds well to a slightly bow-down attitude. In light conditions the crew will be on the leeward hull at or slightly in front of the main beam, with

Downhaul System



Clewboard Traveler



The clewboard traveler is essentially an outhaul without the boom. Installing a small ring with a T-handle between the cleat and the fairlead block will make blowing the traveler an easy, one-hand operation at the windward mark.

the skipper in a corresponding position on the weather hull. The mainsheet should be played continually, as even slight puffs can promote speed gains of 2 to 4 knots. In the puffs, the main should be sheeted in firmly to bend the mast and flatten the sail, and then quickly released as the acceleration begins to subside. If you are feeling slow, chances are that the main is oversheeted. The crew should adjust his or her weight to keep the weather hull flying just above the surface whenever possible, and so that the skipper never has to ease the mainsheet in the puffs.

As the wind increases, the team will move to windward and eventually outboard onto the trapezes. In depowering conditions, the first thing to reach for is the main downhaul. Some of the top boats have installed downhauls with purchases as high as 16:1. Playing the downhaul upwind will prevent the skipper from having to ease the mainsheet to depower. This is particularly important on a boomless rig, as the mainsheet holds tension across the foot as well as up the leech, so easing has the unwanted effect of allowing the entire sail to become fuller. For this reason, in solid double-trap conditions, the main should be sheeted as hard as possible. An 8:1 mainsheet has proven a good compromise between power and ease of adjustment. Always take a wrap around your hand to allow you to sheet hard enough. The sound of metacarpal bones crushing is a good indication that you are sheeting properly.

Below 14 knots, the diamond wires will be taut, and mast bend will be limited to the fore/aft plane in a configuration known as the "hard rig." This allows the mast to stand straighter when the downhaul or sheet is eased during lulls or to power up through chop. Beyond this point it is more effective

to twist the diamonds off dramatically to allow the mast to bend on the horizontal plane, and increase the mast rotation to 90 degrees. Although not as aerodynamically efficient as the standard 60-degree setting, increasing the rotation to 90 degrees in the "soft rig" configuration will keep the mast from bending into the slot.

Reaching: "Screaming" close reaches are the quintessence of catamaran sailing, and the 5.8 is a confidence-inspiring platform. Due to the large volume and shape of the hulls, pitchpoling, the scourge of catamarans, is virtually impossible, which means that you can keep the hammer down when it gets really nasty. After rounding the top mark in double-trap conditions, the main and jib should be cracked off a few inches, as the team steps back a couple of feet. Steering down in the puffs is more effective than dumping mainsheet, and takes concentration and anticipation from the helmsman. As with upwind, the main downhaul should be adjusted so that the weather hull can be just flying without the skipper having to work too much sheet. In breezy conditions, raising the daggerboards half way will reduce heeling and allow the boat to be driven much harder. In these conditions, try to approach the top mark from near the port layline, and raise the boards during the final tack.

Downwind: Downwind can be the most challenging, yet the most fun, point of sail on the 5.8. Proper sail trim and steering to the apparent wind will pay the largest dividends. Once a downwind course has been established (apparent wind at about 90 degrees), the main traveler should be dropped, mainsheet eased, clewboard traveler released, jib barberhauled out, main and jib downhauls released, daggerboards raised, and weather

rudder kicked up. And hurry. Believe it or not, all of the tasks mentioned can be done quickly and easily if the boat is rigged so that the control lines stop at prearranged settings such that the crew need only blow the line from the cleat.

As with all catamarans, the trick is to play the apparent wind, and mastery of this art is what will really separate the experienced teams from the pack. Proper mast rotation is crucial to good downwind speed. The optimum angle is about 95 degrees, but 100 to 105 will yield a sail that, although slightly less powerful, will be more forgiving overall. The technique is to sail as low as possible without letting the apparent wind angle exceed 95 degrees. The weight placement rules for upwind apply to downwind sailing also, and in light to moderate winds the team should be as far forward as possible to promote surfing.

In windier conditions, the techniques for sailing downwind change dramatically. Depending upon the sea conditions, you will either be doing the "wild thing" (in flatter seas) or the "mild thing" (rougher seas). Since the wild thing has been explored previously (see "Art of Crewing," *Sailing World*, Dec. 1992), we will instead concentrate on the mild thing, which is very effective on the 5.8.

Bring the traveler up to an area between 16 to 20 inches off center, and ease the mainsheet to allow more twist. At the same time the barberhaulers should be released so that they are about 6 to 8 inches off the beam. The skipper and crew will be positioned close together near the middle of the boat, with the weight moving aft and outboard as the wind gains intensity and the bows begin to plow in. As the boat accelerates in a puff or on a wave, the apparent wind shifts forward. The skipper will head down as both sails are sheeted in. As the boat begins to decelerate, the sails must be eased and the boat steered back up to maintain an apparent wind angle of about 85 degrees. Using only the leeward rudder will make steering more efficient and allow greater feel.

This popular one-design offers all the tactical challenges of dinghy racing combined with the warp speed and athletic demands that appeal to true high-speed junkies. The 5.8 offers a truly modern one-design class where the level playing field concept is preserved with enough room for innovation to keep the design state of the art.

Brad Hunter is commodore of Nacra 5.8 Fleet No. 1 in Long Beach, Calif., and has won the national championship twice and the California state championship four times. Sailors interested in the Nacra 5.8 should contact Performance Catamarans Inc., 1810 E. Borchard Ave., Santa Ana, CA 92705; 714/835-6416.