

YACHTING VICTORIA YARDSTICKS – CATAMARANS

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INTRODUCTION

Yachting Victoria Catamaran yardsticks are prepared to provide the fairest possible calculation of results for mixed fleet “Off the Beach” catamaran racing. The yardsticks have been comprehensively reviewed for the 2014/15 season.

Yardsticks published over the past 2 seasons for the more popular classes, with reliable high quality race results data, were predominantly derived using a “performance” based system, with data sourced and statistically analyzed from published results of major mixed fleet regattas, mixed “Class Championships” and to a lesser extent mixed fleet club racing. This methodology or “Performance” based analysis for these “popular” classes has been maintained for the current review. However, an additional check or validation against the ISAF Small Catamaran Handicap Rating System (SCHRS – refer following Heading) was undertaken on all classes. Yardsticks for less popular classes, where reliable race data was unavailable or limited, have been determined largely from SCHRS ratings.

Regrettably though, with the exception of several well supported and popular classes, reliable and good quality race results data continues to be difficult to source (with some notable exceptions) and/or assessing the quality of various competing crews has been challenging. Furthermore, under a strictly performance based system only, new and/or modified classes cannot realistically be allocated a yardstick (even tentatively) in a timely manner, until club/regatta race results from at least several boats with well performed crews are assessed. This has frustrated many owners of new and/or modified classes where, in some instances, such classes have been refused entry to one or more major regattas. A classic Catch-22 situation.

The solution to this predicament is to, in the first instance; determine Yachting Victoria Catamaran Yardsticks based on the SCHRS rating for all classes. Consequently, through a lack of quality race results data for a majority of listed classes (refer above), many class yardsticks have been determined entirely from, and others with a considerable weighting to, SCHRS ratings. However, SCHRS formulae have been somewhat modified to reflect, amongst others, optimal crew weights of Australian classes, given typical wind/wave conditions on Australian coastal or estuary waters and an increased performance differential attributed to spinnakers. However, raw SCHRS ratings (when converted to YV yardsticks) have been “adjusted” where there is overwhelming and statistically valid data from recent (up to the past 5 years) regatta results. Notwithstanding the above, most yardsticks have remained identical to or moved very little from those published over the previous 2 seasons, a testament to the statistical validity of Yachting Victoria Catamaran yardsticks.

The “base” class for conversion of SCHRS ratings to Yachting Victoria Yardsticks remains the F18. The F18 class is well represented in large numbers with reliable, validated mixed fleet race data across Europe, USA, UK and Australia. The F18 therefore represents an ideal class to standardize on for conversion between various yardstick systems. However, the F18 class continues to evolve, both from a design perspective as well as through the ability of experienced crews to drive the boat harder and faster than in previous seasons. To reflect these developments, and to maintain relativity with Yachting Victoria dinghy class yardsticks, the F18 yardstick has been adjusted downwards by 1 yardstick point to 66.5. All other catamaran yardsticks have not moved as a result of this re-alignment of the F18 yardstick, unless determined otherwise by recent performance data or measurement data updated as a result of class specifications/rules revisions.

An innovation introduced in the 2013/14 review, and maintained in the current review, was the addition of a table to adjust yardsticks based on a defined range of increases to total Crew Weight. This is made possible through the use of the SCHRS ratings formulae and is provided primarily for racing at Club Level. **The table is not recommended for use at open mixed fleet regattas or National/State Class Championships.**

SMALL CATAMARAN HANDICAP RATING SYSTEM (SCHRS)

The ISAF has adopted the SCHRS (Australia is represented on the World Council of the SCHRS) as the preferred system of rating (or allocating yardsticks) for small “off the beach” (OTB) racing catamarans. This system has significant merit in simplifying, improving and reducing the time and effort required in the calculation/validation of yardsticks for small OTB catamarans. However, the earlier 2012 formulae and class measurement system had several problematic anomalies when calculating ratings (yardsticks) for some popular Australian classes, especially for smaller, light weight cat rigged versions of some popular classes, as well as problems assessing the performance differential of spinnaker boats and lifting foils. Indications are that the generally greater average wind strengths on Australian coastal waters (compared to Europe/UK) may be a prime driver behind some of these anomalies, as well as “average” crew weights adopted across all classes, irrespective of boat size/design. The SCHRS ratings formulae were extensively reviewed for 2013, and again in 2014, to address these and other issues identified during debate by the SCHRS World Council. Some of the anomalies regarding Australian classes were addressed, in whole or part, by the adopted 2013 and 2014 amendments. However, there are, at time of publication, several issues in respect of some variants of Australian classes and questions surrounding the performance benefits of spinnakers, not to mention foiling, preventing full adoption of the SCHRS ratings system in Australia. Although the 2014/15 Yachting Victoria Catamaran yardsticks are largely calculated/validated with a significant weighting to SCHRS ratings for many classes, it is anticipated that a “hybrid” SCHRS/YV yardsticks system will remain the predominant yardstick system for use in Australian waters, at least into the immediate future.

Further information is available at www.schrs.com

USE OF THE YV YARDSTICKS

A club intending to conduct a race series or event under the Yachting Victoria Yardstick system should include in the Notice of Race, and/or Sailing Instructions, clauses based on the following:

1 The version# of the YV Yardsticks that is used in calculating the mixed catamaran class/fleet racing results.

2 The YV Yardstick used for each class, adjusted as per Notice of Race and/or Sailing Instructions for variations from optimal design crew weights (refer crew weight adjustment table below).

- or

2 The YV Yardstick numbers will be those published by the Race Committee 'n' minutes prior to the start of the first*/each* race. (* choose one)

- or

2 YV Yardstick numbers will be those listed hereunder or published on Club Notice board etc:

3 Class entries without a YV Yardstick published in the current listing will be allocated an estimated "tentative" Yardstick.

- or

3 Class entries without a YV Yardstick published in the current listing will not be included in yardstick adjusted results.

4 Whether or not YV Yardstick numbers may/will be adjusted during the series.

ONGOING VALIDITY OF YARDSTICKS

In order to assure the continued validity of yardsticks, mixed fleet race result returns (especially for major regattas and/or mixed class State/National Championships) must be submitted to the Yardsticks Coordinator. Electronic submission of race results containing the information set out below is encouraged and preferred.

Yachting Administrators/Race Officers are asked to submit race results as soon as possible and are reminded of their responsibility to ensure that sufficient data is provided to validate the yardsticks of various classes. To ensure the ongoing reliability of Yachting Victoria yardsticks for all forms of interclass racing at club and regatta level, a consistent and steady supply of results is required.

Race Officers are encouraged to submit data to the Yachting Victoria Yardsticks Coordinator electronically via: otbyardsticks@yachtingvictoria.com.au

Sailwave files may be attached "as is". Results from other race results programmes such as Top Yacht etc may be submitted as csv files, together with a pdf or doc/docx format results file. In all cases, a copy of the Sailing Instructions in pdf or doc/docx format must also accompany the results files.

The following relevant data should be included, where not already defined in the Sailing Instructions or Sailwave file:

Date and location of the event.

Contact details of results officers.

Event Status:

- National/State/Club Championships or open interclass regatta.
- Whether crews are current/past National, State or Club champions.

Conditions:

- Wind strength/variability (gusty, shifty, etc.)

Course sailed by each Division (mandatory). This needs to include:

- Course angles (relative to wind direction)
- Course configuration – Mandatory (W-L; Triangle, W-L; etc.)
- Number of legs sailed

Race results for each entry, including:

- Class
- Sail number, boat name, skipper's name
- Elapsed times (or start times and finish times) or code (DNC, DNF etc) for all competitors

Other information:

- Suggested review of ratings for specific classes.

Enquires with regard to new classes or classes not listed should be directed to the Yardstick Co-Ordinator c/o YACHTING VICTORIA at:
otbyardsticks@yachtingvictoria.com.au.

REVISION OF RATINGS

Class Associations/Manufacturers wishing to query "Reliable and/or Probable" class yardstick(s) must ensure that Yachting Victoria receives sufficient quality race data to undertake a review. This involves ensuring that clubs organising multi class OTB catamaran events (in particular Regattas and Class Championships), where several

classes sail the same course, forward the results to the Yachting Victoria Yardstick Co-Coordinator in the required formats.

Class Associations may also request a review of "Tentative" yardsticks should they believe that SCHRS measurement data is in error. Class measurement data must be provided by reference to Class measurement rules and restrictions (which take priority) or by measurement of an existing class example that has been sailed at or near the top of the national fleet. Generally, such measurements taken from an existing boat refer to measurements not covered by Class rules/restrictions. Typically: all up sailing weight or sail area measurements (including mast area and supported by a written/signed confirmation from a recognized sailmaker). Weight measurements must be provided by and signed by the current respective National/State measurer. The total "all up ready to sail" weight must be given to the nearest kg. Measurement of the respective components: rigging, sails, mast, rudders etc, may be calculated individually to the closest 0.1kg, then totaled and rounded to the nearest kg. Class Associations are responsible for providing adequate data to allow any review to be undertaken.

USE OF THE YARDSTICK

The aim of the yardstick is to provide a basis for various classes of catamarans to compete fairly when sailed well. The yardstick is not intended to compensate for differences in skills, competence or talent of individual crews (that is a handicap). The yardstick is calculated and maintained on a measurement and/or performance based statistical basis and, within broad limits, remains valid for a variety of wind strengths and courses sailed. Comparison of catamarans of various classes sailing different courses is outside the scope of the current yardstick system.

Yardsticks are based on the current design of a class or class variants, unless noted otherwise. Where recent design changes have occurred within class rules/restrictions, the Class Association/Manufacturer should inform the Yardstick Coordinator of these changes and provide the necessary rules/restrictions and/or measurement data to enable a review of the Class yardstick to be undertaken in a timely manner.

DEFINITIONS

Elapsed Time (ET) is the time taken (in minutes and decimal minutes or seconds) for a boat to sail a proper course.

Corrected Time (CT) is the elapsed time divided by the boat's class yardstick (YS) and multiplied by 100

Standard Boat Time (SBT) is the corrected time for the first boat on corrected times to sail a proper course. Alternatively, a consistently sailed boat finishing in the top five of the fleet, on corrected time, can be taken as the standard boat

Back Calculated Yardstick (BCYS) is the corrected time divided by the standard boat time and multiplied by its own yardstick.

Performance Factor (PF) is the BCYS divided by the boat's class yardstick. This is used to rate the class yardstick

$$CT = \frac{ET \times 100}{YS}$$

$$\text{BCYS} = \frac{\text{CT} \times \text{YS}}{\text{SBT}}$$

$$\text{PF} = \frac{\text{BCYS}}{\text{YS}}$$

FURTHER HANDICAPPING

Further assistance with regard to handicapping on a club basis may be obtained by contacting the Yardstick Co-Ordinator c/o YACHTING VICTORIA or via Email at otbyardsticks@yachtingvictoria.com.au

NEW OTB CATAMARAN CLASSES - PROVISIONAL RATINGS

For new OTB Catamaran Classes, a rating under SCHRS is calculated, based on published class rules/restrictions and/or supplemented by measurements taken from available prototype (or preferably production) boats for input to SCHRS. The SCHRS rating is then converted to a "Tentative" Yachting Victoria yardstick. Existing validated class measurement data from International SCHRS measurers is used where available (provided the International class is demonstrably the same as the Australian variant – this is not always the case).

Similarly, where an existing class modifies class rules/restrictions, and these changes potentially have an effect on performance (and can be readily input under SCHRS), a revised (or additional) Yachting Victoria yardstick has or can be calculated. Square top or big head mainsails for instance.

Note: All such new and/or modified yardsticks are regarded as "Tentative" until verified and/or amended by subsequent consistent and extensive mixed fleet regatta race data.

Manufacturers and/or Australian distributors and/or Class Associations of new and/or modified catamaran classes are encouraged to submit relevant measurement data to Yachting Victoria for consideration. Please refer to www.schrs.com for measurement data required and/or email queries to otbyardsticks@yachtingvictoria.com.au.

APPLICABILITY OF CATAMARAN YARDSTICKS

Yardsticks for OTB Catamarans have been determined, for most popular or more common classes, based on results of mixed fleet racing at major regattas and/or club racing, generally over a wide range of wind/wave/tidal conditions, but predominately in moderate to fresh winds on coastal and/or estuary waters (i.e. - typical average conditions at most Australian sailing venues/waters). Under these wind/wave conditions (say consistently 12/15 knots+), sloop rigged (2 up) variants of some classes (e.g. Taipan 4.9, Mosquito et al) typically outperform the cat rigged (1 up) variant, whereas in light/moderate conditions (say consistently under 10 knots) the 2 variants are much closer or equal in performance. Race Officers at inland waters clubs and/or sailing venues where conditions are protected from the elements, with smooth waters and generally light/moderate winds, may wish to modify Yachting Victoria yardsticks for these or other classes, based on observed performances between racing crews of similar skills across various classes. All such "locally derived" yardsticks are not to be referred to

as Yachting Victoria yardsticks but “Club” yardsticks or some other similar term. Race Officers should be alert for and not permit regatta/club entrants “cherry picking” race conditions and sailing cat and/or sloop rigged to suit conditions vs yardstick, with results then aggregated under 1 entrant. Sailing Instructions should be worded to prohibit such actions.

CATAMARAN YARDSTICKS 2014 - 2015					
	RELIABLE *	PROBABLE *	TENTATIVE *	Design Crew Weight (kgs)	NOTES
<u>A</u> Class (Foiling) Θ			65.5	75	*** Generally post 2012 designs, but includes all <u>A</u> Class catamarans, with a current valid measurement certificate, that do not comply with the restrictions of the International Division immediately below
<u>A</u> Class (International)	67.5			75	*** Generally post 2010 designs – as for “Standard” but can include constant curvature “C” foils but not “J” or “L” shaped foils
<u>A</u> Class (Standard)		70		75	*** Generally post 2004 designs - carbon spars permissible but with straight foils, no curved, canted or lifting foils of any design
<u>A</u> Class (Classic)		71.5		75	*** Generally pre 2004 designs – carbon spars permissible but with straight, non canted, low aspect foils (0.7m max projection below hull).
Arafura			108	62	1 up trap (+2 no trap)
Arrow		89.5		73	1 up trap (Class approved Square Top Main, +1.5 for Pin Head Main)
Capricorn (AHPC) Φ		67.5		150	Sloop - 2 up trap (F18 compliant)
Cobra Cat			85.5	75	1 up trap (Class approved Pin Head main, -1.5 for Square Top Main of same area)
Cobra Sloop			82.5	130	2 up trap (Class approved Pin Head main, -1.5 for Square Top Main of same area)
Dolphin			85	75	1 up trap
F16 Cat			69	80	(F16 Box Rules)
F16 Sloop			67	141	(F16 Box Rules)
F18	66.5			150	Standard Class for SCHRS/YV conversions (F18 Box Rules)
Flying Phantom			55	160	Sloop - 2 up trap (“J/L” foils and “T” rudders)
Hobie Tiger Φ			68	150	Sloop - 2 up trap (F18 compliant)
Hobie 14			95.5	67	1 up
Hobie 14 Turbo			91	72	1 up trap
Hobie 16		82.5		133	Sloop - 2 up trap
Hobie 16 Spin			78	143	Sloop - 2 up trap (Spin of 17.5 m ²)
Hobie 17			81	75	SE – 1 up trap: cat rigged with “wings”
Hobie 18			77	148	Sloop - 2 up trap
Hydra 16			82.5	132	Sloop - 2 up trap
Maricat 4.3 Cat		94.5		68	1 up (+2 for pre Foam Sandwich Hulls **)
Maricat 4.3 Sloop		90		119	2 up (+2 for pre Foam Sandwich Hulls **)
Maricat 4.3 Super Sloop		86.5		73	1 up trap (+2 for pre Foam Sandwich Hulls **)
Maricat 5.0			80	133	Sloop - 2 up trap
Mosquito Cat (Mk1)	83.5			75	1 up trap
Mosquito Cat Spin	78.5			80	1 up trap – (Spin of 14.1m ²)

CATAMARAN YARDSTICKS 2014 - 2015

	RELIABLE *	PROBABLE *	TENTATIVE *	Design Crew Weight (kgs)	NOTES
Mosquito Sloop (Mk11)		81.5		128	2 up trap
Mosquito Sloop Spin			77	138	2 up trap – (Spin of 14.1 m ²)
Nacra 14 sq		85		71	Class approved Pin Head main (-1 for Square Top Main of same area)
Nacra 16 sq			80	75	(Class approved Square Top Main, +1 for Pin Head main)
Nacra 17			64.5	140	(IOC Olympic Class)
Nacra F20 FCS			53.5	160	Nacra 20 Carbon with “J/L” foils and ”T” rudders (Flight Control System)
Nacra 350 Sloop			109	101	2 up – 1 trap
Nacra 350 Super Sloop			105	63	1 up trap
Nacra 430 Super Sloop			92	72	1 up trap
Nacra 430 Super Sloop Spin			86	77	1 up trap
Nacra 4.5 Super Sloop			87	75	1 up trap
Nacra 4.5 Super Sloop Spin			81	80	1 up trap
Nacra 5.0			81	133	Sloop - 2 up trap
Nacra 5.2			78.5	140	Sloop - 2 up trap
Nacra 5.8			75	157	Sloop - 2 up trap (Small jib/no foil bridle)
Nacra 5.8NA		72		157	Sloop - 2 up trap (Large jib/foil bridle)
Nacra 5.8NA Spin			67	157	Sloop - 2 up trap (Large jib/foil bridle - Spin of 24m ²)
Paper Tiger	92.5			68	1 up trap
Prindle 15			89.5	71	1 up trap
Prindle 16			83.5	128	Sloop - 2 up trap
Prindle 18			79.5	148	Sloop - 2 up trap
Stingray Mk11			71.5	149	Sloop - 2 up trap with wing mast + Sq top main (+2.5 Mk1 rig)
Taipan 4.9 Cat	77			75	1 up trap
Taipan 4.9 Cat Spin			72	80	1 up trap - (Spin of 17.5 m ²)
Taipan 4.9 Sloop	73			130	2 up trap
Taipan 4.9 Sloop Spin			69.5	140	2 up trap - (Spin of 17.5 m ²)
Taipan 5.7			70	154	Sloop - 2 up trap
Taipan 5.7 Spin			65.5	154	Sloop - 2 up trap (Spin of 23 m ²)
Tornado International			64.5	160	*** Post 2001 Class Rules Amendments
Tornado Standard			65	160	*** As above but no carbon spars
Tornado Classic		73		160	*** Pre 2001 – No spin, Pin Head main, 1 trap
Viper Cat			70.5	80	1 up trap (F16 Compliant)
Viper Sloop		68.5		141	2 up trap (F16 Compliant)
Windrush 4.3 Cat		93.5		68	1 up (Class approved Square Top Main, +1 for Pin Head main)
Windrush 4.3 Sloop		89.5		119	2 up (Class approved Square Top Main, +1 for Pin Head main)
Windrush 4.3 Super Sloop		86.5		73	1 up trap (Class approved Square Top Main, +1 for Pin Head main)
Yvonne 20			79.5	160	2 up 1 trap

- * The validity of yardsticks is divided into three categories, which are of statistical and/or historical significance only. Yardsticks within any category should not be altered by Club Race Officials without reference to the Yardsticks Coordinator and submission of all relevant data, accompanied by a reasoned fact based argument in support of any suggested alteration(s).

RELIABLE: At least several years of extensive, good quality race data is available from major regattas over a wide range of wind/wave conditions and the raw SCHRS rating is within $\pm 1.5\%$ of assessed race data.

PROBABLE: As for "RELIABLE", but the race data may be of lesser quality/quantity and/or there is a significant discrepancy between the raw SCHRS rating and assessed race data.

TENTATIVE: The class is new/revised and/or race data is nonexistent and/or unreliable or of questionable quality. The yardstick is largely determined based on SCHRS measurement data.

- ** Where there is any doubt, Foam Sandwich Hulls are assumed.

- *** The A Class and Tornado classes have been divided into multiple divisions, as defined in the respective notes. This has been provided primarily for racing at Club level, to reflect that many older examples of these classes, uncompetitive with contemporary designs, or made so as a result of changes to class rules/restrictions, are sailing at some clubs in significant numbers. These Class Divisions are advisory only. However, should Race Officers elect to treat these class divisions as one single class, the lowest yardstick applies.

- Φ Refers to one of 2 recognised, "vintage" F18 designs (generally uncompetitive with more contemporary F18 designs) which have been rated separately under SCHRS as a "one design" class. Race Officers may enter these classes as an F18 for club or open mixed fleet regatta racing, at their discretion.

- Θ The International A-Division Catamaran Association (IACA) is presiding over a major "development" design phase, following the introduction of "Foiling" designs at the 2014 World Championships. These designs comply with a strict interpretation of IACA rule 8, but circumvent the primary objective of the rule, ie to prevent "foiling". As an interim measure, pending a final resolution of this issue, an additional division of A Class Catamaran (foiling) has been introduced, with a yardstick adjusted from the "International" as per the "full foiling" adjustment under SCHRS.

CREW WEIGHT ADJUSTMENT TABLE

The following table of adjustments is provided for the guidance of Race Officers for mixed fleet racing at Club level only. Yachting Victoria does not support adoption of the Crew Weight Adjustment Table for National/State/Regatta level Championships/events. The total weight of crew(s) refers to the “ready to sail” weight, including all mandated and typical (at Race Committee’s discretion) sailing equipment including, but not necessarily limited to, wetsuit, buoyancy vest, trapeze harness, gloves, booties, spray jacket. Adjustments are in multiples of 0.5 yardstick points. The adjustment refers to the total (1 or 2 up) crew weight. The table has been prepared based on the adjustment provided by the SCHRS ratings formulae, for the stated increase in the design or optimal total crew weight, as shown in the YV yardstick table above. Adjustments may be extrapolated above the ranges in the table. There is no adjustment for total crew weights under the stated design or optimal crew weight.

Class LOA/Configuration/Crew #	Total Crew Weight Increase over Design Weight	Yardstick Points Adjustment
Up to 4.8 metre Cat or Sloop rigged/1 or 2 crew	Up to 4 kg	zero
	Up to 8 kg	0.5
	Up to 12 kg	1
	Up to 16 kg	1.5
	Up to 20 kg	2
4.9 – 5.5 metre Cat rigged - 1 crew	Up to 5 kg	zero
	Up to 10 kg	0.5
	Up to 15 kg	1
	Up to 20 kg	1.5
4.9 – 5.2 metre Sloop rigged – 2 crew	Up to 7 kg	zero
	Up to 15 kg	0.5
	Up to 22 kg	1
Greater than 5.2 metre Sloop rigged – 2 crew	Up to 10 kg	Zero
	Up to 20 kg	0.5
	Up to 30 kg	1

ARCHIVAL YARDSTICKS

The Nacra 5.0 Cat Rig has been archived during this review. However, the Yvonne 20 has been re-included (following archiving after the previous review), as the Yvonne 20 Class Association has recently provided comprehensive revised class rules/restrictions and results of several mixed fleet regattas, which included several Yvonne 20s, to enable a “tentative” yardstick to be established.

Should Club Race Officers and/or Class Associations or individual boat owners be aware of a class formerly listed that is currently raced actively at club or regatta level, please contact the Yachting Victoria Yardstick Coordinator at:

otbyardsticks@yachtingvictoria.com.au