2017

March 9, 2017

Provisional PHRF

Preliminary TCF

This form is for boats: a) New to the Fleet, b) Modified from the previous Configuration, or c) without a 2016 Rating

The Rating Committee has no responsibility for the seaworthiness or safety of yachts rated & cites US SAILING Fundamental Rule 4, "It shall be the sole responsibility of each yacht to decide whether or not to start or to continue to race".

Boat Name		Name	
Sail Number		Marina	
Boat Model		Slip Number	
Manufacturer		Year Built	

Do you want an ODR (One Design Rating)? Yes ☐ TBD No ☐

Unmodified Class Boat ☑ | Modified Class Boat ☐ | Non-Class (Custom) ☐

Source of the information Provided (Circle/check all that apply)

Class Rules ☐ | Estimate ☐ | Sailmaker ☑ | Measurement Certificate ☑

Sail Areas and the **Major Sail Dimensions** (**Luff, Foot or LP**) are needed. Please use the "**Actual Sail Area**" from the sailmaker w/supporting dimensions.

Descriptions of terms used for sails makers, sailing weight and hull measurement are on following pages. More Text Below, expand this XLS row, or see the following pages for the diagrams and explanations. Please provide drawings or pictures showing side & end views of your boat if a modified or custom boat.

	Metric	Imp.Ft
Main 109.1/309.3 RatedA		**0**
Lu.Girths MeasuredA -below H.Area	**0.00**	**0**
Luff P	1.00	3.28
Foot E	0.00	0.00
MHB (MGH) Head	0.00	0.00
7/8 MUW (MGT)	0.00	0.00
3/4 MTW (MGU)	0.00	0.00
1/2 MGM (MHW)	0.00	0.00
1/4 MQW (MGL)	0.00	0.00
LE :	0.00	0.00
Area Below H ≈	0.00	0.00

Measured SA = P/8*(E+*2MWL+2*MW/M+1.5*MWU+MWT+0.5 *HB) + (Foot Roach)

	Metric	Imp.Ft
Jib Largest x Sailmaker	**0.00**	**0**
Luff	1.00	3.28
LPG	0.00	0.00
HHB (JH) Head:	0.05	0.16
7/8 HUW (JGT):	0.00	0.00
3/4 HTW (JGU):	0.00	0.00
1/2 HHW (JGM):	0.00	0.00
1/4 HQW (JGL):	0.00	0.00
Foot :	0.00	0.00
Ft Roach	0.00	0.00
JLE Leech:	8.24	27.04

0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) ±Ft.Roach

	Metric	Imp.Ft
Screecher/Gennaker Sailmaker	**0.00**	**0**
Luff	1.00	3.28
LPG	0.00	0.00
HHB (JH) Head:	0.00	0.00
7/8 HUW (JGT):	0.00	0.00
3/4 HTW (JGU):	0.00	0.00
1/2 HHW (JGM):	0.00	0.00
1/4 HQW (JGL):	0.00	0.00
Foot	0.00	0.00
Foot.Roach	0.00	0.00
JLE Leech:	9.98	32.74

0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) ±Ft.R

	Metric
Asymmetric, Symmetric Largest x Sailmaker	
Area :	**0.00**
SLU (tape perimeter)	0.00
SLE (tape perimeter)	0.00
SHW (SMG) (half-width, mid-girth)	0.00
Ft (tape perimeter)	0.00
SMG as % SF	0%

SA = (Luff+Leech)*(Foot + 4*Mid Girth) / 12

	Metric	Imp.Ft
Jib Largest x Sailmaker	**0.21**	**2**
Luff	1.00	3.28
LP H =	0.00	0.00
HHB (JH) Head	0.05	0.16
Leech1:	8.24	27.04
Leech2	8.24	27.04
Foot:	0.00	0.00
Lu Roach ±	0.00	0.00
Le2 Roach ±	0.00	0.00
Ft Roach ±	0.00	0.00
	8.27	27.12

	Kg	Lb
Displacement		
Wt Boat as raced, with racing sails	0	0
dry, no(Gas, Water, personal gear)		
WE:		
Weight Sailing	0	0
Weight Crew Auto		
Rated Weight	0	0

ERS World Sailing and/or US Sailing methods of sail measurement apply above, not class rules. Longest Luff Lengths from Class Rules & Maximum Sail Areas will be assumed if not provided. Weight Measured will be lightest boat in Class unless weighed w/inspection.

Hull	Metric	Imp.Ft
Length Overall:	9.45	31.00
Beam	5.62	18.44
Max. Draft	1.60	5.25
FOC Fwd Overhang		
AOC Aft Overhang		

Hull - Foils	
Daggerboard (y/n)	Yes
Centerboard (y/n)	n
Ctbd Fairing (y/n=0.990)	
Keel(y/n) (y 0.995 or 0.980)	
Lifting Foils	n
(y/n, Curved, T, J)	

Other		
Masthead Spin(yes/no)	no	
Masthead Scr.(yes/no)	no	
Sprit Length		
Rigging (SS, synthetic)	Synthetic	
MastCircumference (If rotating)	0.50	1.64
Holding Tank(s) (yes/no)	no	

Engine(s)	
Inboard (hp x type)	
Outboard (hp x type)	5hp Yamaha

Propeller(s)		
1 x feather/fold (0.980)	n/a	2 x feather/fold (0.970)
1 x fixed (blades 0.975)		2 x fixed (blades 0.964)

Modifications / Notes — Describe modifications / comments / trapeze(#) or hiking straps below

03-09-17: Blank Application

I certify that my vessel conforms to the configuration indicated above and understand that the bama certificate will be issued based on this information, valid only for the indicated configuration.

Electronically

Signature of Owner: Owner.Name (electronically) Date: 03/09/17 (rating committee)

2017 **EXAMPLE**

March 3, 2017

Provisional PHRF

Preliminary TCF

This form is for boats: a) New to the Fleet, b) Modified from the previous Configuration, or c) without a 2016 Rating

The Rating Committee has no responsibility for the seaworthiness or safety of yachts rated & cites US SAILING Fundamental Rule 4, "It shall be the sole responsibility of each yacht to decide whether or not to start or to continue to race".

Boat Name		Name	
Sail Number	USA 49	Marina	Treasure Island Sailing Club
Boat Model	Pulse 600	Slip Number	Dry Storage
Manufacturer	Corsair Marine	Year Built	2016

Do you want an ODR (One Design Rating)? Yes ☐ No ☑

This is a: Unmodified Class Boat ☐ Estimate RatingsComm ☑

Source of the information Provided (Circle/check all that apply) Measurement Certificate ☐

Sail Areas and the **Major Sail Dimensions** (**Luff, Foot or LP**) are needed. Please use the "**Actual Sail Area**" from the sailmaker w/supporting dimensions.

Descriptions of terms used for sails makers, sailing weight and hull measurement are on following pages. More Text Below, expand this XLS row, or see the following pages for the diagrams and explanations. Please provide drawings or pictures showing side & end views of your boat if a modified or custom boat.

Actual Sail Area from the sailmaker makes Mainsail Widths & Jib Widths or Roach metrics, supporting items. Please give measurements in feet & decimals or metric. Mainsail Area is calculated using monohull ORC 109.1, HPR 309.3. Main LE is needed for aspect ratio and more accurate Area (see diagrams). Main Luff Girths will be used where the 7/8 MUW is above the head MHB. Jibs, Genoas, Gennakers, Screachers can use HPR/ORC 111.1 adding foot roach. Jib Area calculates below on ORC, Jibs/Gennakers can use World Sailing F18/Texel/SCHRS triangles. Jibs w/full-length battens see diagrams. Mains can use World Sailing F18/Texel/SCHRS triangles.

Sail areas are to be reported as accurately as practicable. Formulas for measurement are given for conventional sails. These procedures do not restrict the measurer from using alternative means to obtain an accurate area for any sail which is an unusual shape and is deemed to require a different measuring technique. RRS 50.2 & 50.3 are deferred for the spinnaker tack on a bowsprit, sheeted to the floats.

Main 109.1/309.3 Rated Area	**18.44**	**198**
Area Lu.Girths 18.19m² -below.H	17.74	**191**
Luff P	9.07	29.76
Foot E	2.59	8.51
MHB (MGH) Head class 1.050	1.02	3.33
7/8 MUW (MGT) class 1.255	1.26	4.13
3/4 MTW (MGU) class 1.680	1.68	5.51
1/2 MGM (MHW) class 2.125	2.14	7.02
1/4 MQW (MGL) class 2.440	2.44	8.01
LE : class 9.100	9.09	29.82
Subtract Area Below H ≈	0.45	4.86

Measured SA = PI$*(E+.2*MWL+.2*MWM+1.5*MWU+MWT+0.5 *HB) + (Foot Roach)

Asymmetric 2016 Doyle		
Area:	**31.24**	**336**
SLU	9.15	30.02
SLE	8.36	27.42
SMG	4.24	13.92
Ft	4.44	14.58
SMG as % SF	95%	

SA = (Luff+Leech)*(Foot + 4*Mid Girth) / 12

Jib 2016 Doyle x UMS	**7.73**	**83**
Luff	8.12	26.64
LP	1.93	6.35
HHB (JH) Head:	0.03	0.08
7/8 HUW (JGT):	0.24	0.79
3/4 HTW (JGU):	0.45	1.49
1/2 HHW (JGM):	0.88	2.90
1/4 HQW (JGL):	1.41	4.62
Foot :	2.11	6.92
Ft Roach	0.10	0.32
JLE Leech:	7.46	24.49

Jib 2016 Doyle x SCHRS TXL	**7.73**	**83**
Luff	8.12	26.64
LP H	1.91	6.26
HHB (JH) Head:	0.03	0.08
Leech1:	7.46	24.49
Leech2	7.46	24.49
Foot:	2.11	6.92
Luff Roach ±	0.03	0.09
Leech2 Roach ±	-0.08	-0.25
Ft Roach	0.10	0.32

7.48 24.53

Screecher/Gnkr None MOCRA.UK	28.73	309
Luff class 9.45	10.09	33.10
LP	5.45	17.88
HHB (JH) Head:	0.04	0.13
7/8 HUW (JGT):	0.74	2.42
3/4 HTW (JGU):	1.44	4.72
1/2 HHW (JGM):	2.80	9.17
1/4 HQW (JGL):	4.12	13.53
Foot class 4.53	5.84	19.16
Foot.Roach	0.20	0.66
JLE Leech: class 9.45	9.12	29.92

0.1125* JL+ (1.445* LPG + 2* JGL + 2* JGM +1.5* JGU + JGT + 0.5* JH) ±Ft.Roach

Displacement		
Wt Boat sails, outboard, anchor	555	1,224
Mast, Asym, Roller Furling Jib		
Mainsail, CG Safety, dry(gas,h2o)		
Weight Sailing	555	1,224
WCD Wt. Crew Decl. xClass.Min	160	353
Weight Crew Auto	171	377
Rated Weight	726	1,601

ISAF ERS and/or US Sailing methods of sail measurement apply above, not class rules. Longest Luff Lengths from Class Rules & Maximum Sail Areas and will be assumed if not provided. Weight Measured will be lightest boat in Class unless weighed w/inspection.

Hull		
Length Overall:	6.03	19.79
Beam	4.50	14.76
Max. Draft	1.20	3.94
FOC Fwd Overhang	0.00	0.00
AOC Aft Overhang	0.00	0.00

Hull - Foils	
Daggerboard (y/n)	Yes
Centerboard (y/n)	
Ctbd Fairing (y/n=0.990)	
Keel(y/n) (y 0.995 or 0.980)	
Lifting Foils	no
(y/n, Curved, T, J)	

Other	
Masthead Spin(yes/no)	no
Masthead Scr.(yes/no)	no
Sprit Length	tbd
Rigging (SS, synthetic)	Synthetic
MastCircumference (rotating)	0.440
Holding Tank(s) (yes/no)	no

Engine(s)	
Inboard (hp x type)	
Outboard (hp x type)	Honda 2.5

Propeller(s)		
1 x feather/fold (0.980)	n/a	2 x feather/fold (0.970)
1 x fixed (blades 0.975)		2 x fixed (blades 0.964)

Modifications / Notes — Describe modifications / comments / trapeze(#) or hiking straps below

I certify that my vessel conforms to the configuration indicated above and understand that the bama, orca, certificate will be issued based on this information, valid only for the indicated configuration.

Electronically

Signature of Owner: Owner.Name (electronically) Date: 03/03/17 rating committee

Example Measurement

	M²	Ft²
2016 Corsair Pulse Mainsail	**18.44**	**198.5**

1st: Enter **Lu**, **Le**, **Ft**

2nd: Enter Head Width with 7/8, 3/4, 1/2 and 1/4 Girths

Measured Area is calculated by the trapezoid formula below, dividing the luff in amounts of 1/4, 1/2, 3/4 and 7/8.
Rated Area is calculated with the actual heights on the luff from the tack point (or H) to points where LE girths are measured.
Area Below H is Added

Color.Code = Estimate RatingsComm, Foot.R ☑

11/03/16: Main x **web page 19.1m² 205.8ft²** = **ODR Rules**
12/19/16: **Doyle BSG SailPak Measurement Check List Gives All Data**
01/12/17: Visio.diagram LE.chk decrease Luff curve

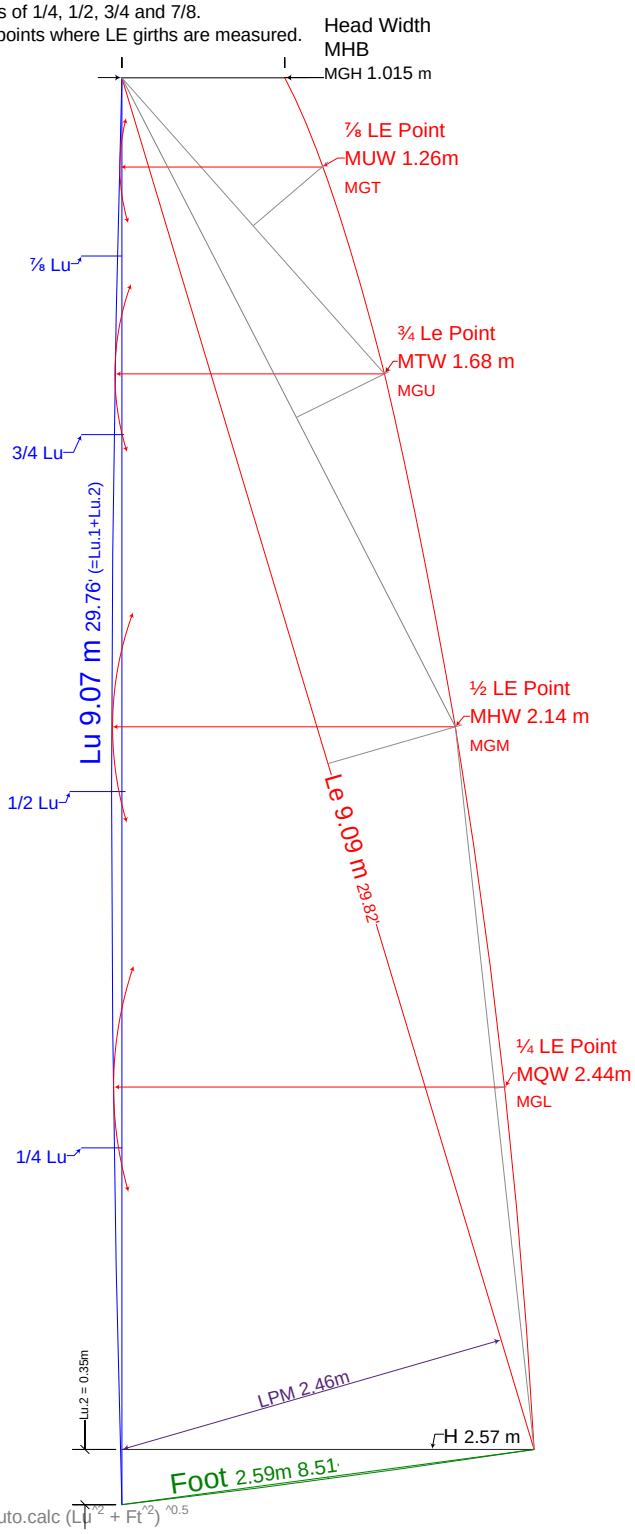
	Calc M²	Doyle Area
	18.437	**18.391**

data entry	**Pulse v.2**	**v.2**
Lu	**9.071**	**29.76**
Le class 9.100	**9.090**	**29.82**
Ft	**2.593**	**8.51**

data entry		
MHB (MGH) Head class 1.050	1.015	3.33
7/8 MUW (MGT) class 1.255	1.260	4.13
3/4 MTW (MGU) class 1.680	1.680	5.51
1/2 MHW (MGM) class 2.125	2.140	7.02
1/4 MQW (MGL) class 2.440	2.440	8.01

	M²	Ft²
109.1 / 309.3 Rated Area +below H Area, Ft.Roach	**18.44**	**198.5**
109.1 Area m² x LE Girth using LU.1 x H	17.99	194
MGMH = P/2+(MGM-E/2)/P*E	4.61	4.61
MGLH = MGMH/2+(MGL-(E+MGM)/2)*(E-MGM)/MGMH	2.31	2.31
MGUH = (MGMH+P)/2+(MGU-MGM/2)*MGM/(P-MGMH)	6.98	6.98
MGTH = (MGUH+P)/2+(MGT-MGU/2)*MGU/(P-MGUH)	8.26	7.92

109.1 / 309.3 Measured Area +below H,Ft.Roach	**17.91**	**192.8**
LU Girths Area m² using LU.1 x H	17.46	**187.9**
P use Lu.1	8.72	28.61
E foot uses **H**	2.57	8.43
MHB (MGH) Head class 1.050	1.02	
7/8 MUW (MGT) class 1.255	1.26	
3/4 MTW (MGU) class 1.680	1.68	
1/2 MHW (MGM) class 2.125	2.14	
1/4 MQW (MGL) class 2.440	2.44	
Area Below H	**0.45**	
Lu.1	**8.72**	
Lu.2	**0.35**	
Foot	**2.59**	
Ft.Roach	0.00	0.00
H = (Triangle Area.Lu.Le.Ft) / Lu*2	2.57	8.43
Triangle Area x Lu Le Ft	11.65	125.4
S = 1/2 (a + b + c) {a=Lu b=Le c=Ft}	10.38	
Triangle.Area = (s*(s-a)*(s-b)*(s-c))^0.5	11.65	
LPM	2.46	8.09
Below H1 Diff m²	**0.45**	**4.9**
Below H1 Diff ft²	**4.9**	
Le2 (leech aft)	8.891	29.17



109.1 LE Girths Correction on Trapezoid Area (ORC.2016)
309.3 LE Girths Correction on Trapezoid Area (HPR.2016)
16.7 LE Girth Corrections on Trapezoid Area (HPR 2013)
16.4 LU Girth Trapezoid Equation x Ht. =0.25, 0.50 0.75, 0.875, 1.00

Efficiency Main (EFM):
EFM uses LPM (Le.Perp to Tack @ H) to set sail efficiency.
EFM Texel.NDL x H, EFM Texel.AUS 2012 x LPM
Area Below H = (1/2 *S1.2 *H1) + Ft.Roach
LU.2 = (E^2-H1^2)^0.5
LPM = (P.1*H1)/((P.1^2+H1^2)^0.5) 9.43 30.95

Measurement Check List

***Measurement rules* Ref.: SQTOP_MAIN_BR**

[MLE] = 9.090 m [Luff] = 9.071 m [Foot] = 2.593 m Area = 18.391 m² [geo_foot] = 2.593 m
[LEECH AFT] = 8.891 m [Leech] = 8.912 m [Head] = 1.015 m [aftheadtotack] = 9.183 m [stlinehead] = 1.015 m [MUW_S] = 1.240 m [MTW_S] = 1.652 m [MHW_S] = 2.110 m [MLW_S] = 2.413 m
[BROffset] = 0.025 m MUW = 1.26 m MTW = 1.68 m MHW = 2.14 m MLW = 2.44 m

Example Measurement

	M²	Ft²
Corsair Pulse 600 Jib ≈	**7.73**	**83**

12/19/16: **Doyle BSG SailPak** Measurement **Check List Gives Data**, missing Foot.Roach
LP is an Arc to the neares point on the Luff; **H** fits from the Clew to the Luff straight line

7.594 m² x **Doyle**
7.594m² x UMS **Foot.Roach = 0**
7.73 m² x UMS **Foot.Roach = 0.01m ≈ 4 "** defined by Foot Median
Color.Code = Estimate RatingsComm ☑

US Sailing UMS (ORC HPR)

	Metric	Imperial	
Jib Pulse 2016 North	**7.73**	**83.21**	
Luff class 8.11	8.119	26.64	
LP class 1.96	1.934	6.35	
HHB (JH) Head: class 0.040	0.025	0.08	
7/8 HUW (JGT):	0.240	0.79	HGT=(HHB + HTW)/2
3/4 HTW (JGU):	0.455	1.49	HTW=(HHW+HHB)/2
1/2 HHW (JGM): class 0.900	0.884	2.90	
1/4 HQW (JGL):	1.409	4.62	HQW = (LP + HHW)/2
Foot: class 2.110	2.110	6.92	
Ft Roach (Median 7.819->Ft.R)	0.097	0.32	
JLE Leech: class 7.460	7.464	24.49	

0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) ±Ft.Roach

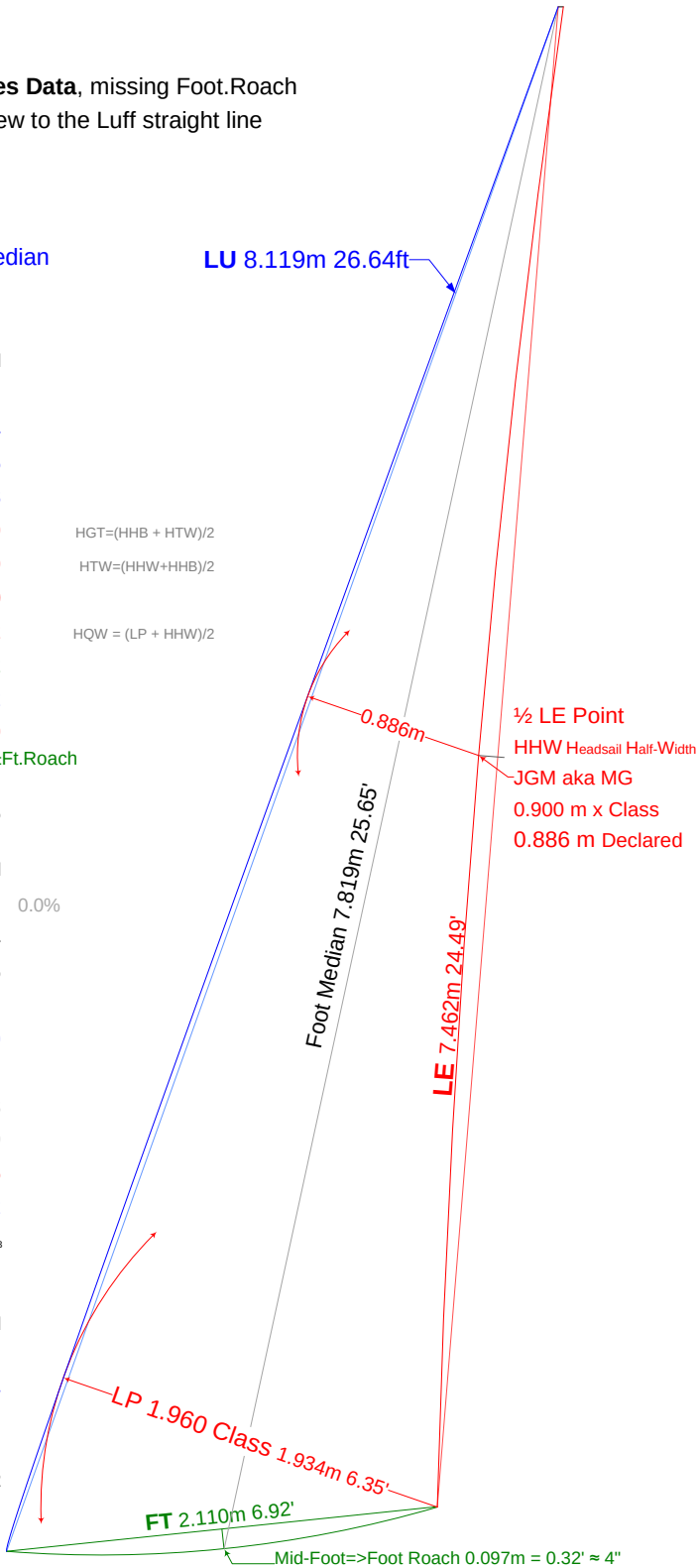
Foot Median class 7.85m	7.819	25.65

Texel.AUS, Texel.NDL, SCHRS

	Metric	Imperial	
Jib Pulse 2016 North	**7.73**	**83.21**	0.0%
Luff class 8.11	8.119	26.64	
LP class 1.96, Decl 1.934 > **H =**	1.907	6.26	
JLE Leech: class 7.46	7.464	24.49	
Leech2	7.464	24.49	
Foot: class 2.11	2.110	6.92	
HHB (JH) Head: class 0.040	0.025	0.08	
Luff Roach ±	0.026	0.09	
Leech2 Roach ±	-0.077	-0.25	
Ft Roach ± (Median 7.819->Ft.R)	0.097	0.32	
LE Triangle S = 1/2 (LE.1 + LE.2 + HHB)	7.48	24.53	

Area x Perimeter (Lu Le Ft)

	Metric	Imperial
JIB Triangle Area	**7.742**	**83.33**
Lu	8.12	26.64
Le	7.46	24.49
Ft	2.11	6.92
S = 1/2 (a + b + c)	8.8	29.02
Area = (s*(s-a)*(s-b)*(s-c))^0.5	7.74	83.33
H = (2 * Area / Lu) ≠ LP	1.907	6.26



Measurement Check List

Measurement rules **Ref.: Jib**

[Luff] = 8.119 m [Leech] = 7.462 m [Head] = 0.025 m [Foot] = 2.110 m [LP] = 1.934 m [Foot-Geo] = 2.105 m [Leech Geo] = 7.464 m [HHW] = 0.884 m Area = 7.594 m² [STCHLUFF] = 8.118 m [FOOTMEDIAN] = 7.819 m

Example Measurements

Pulse 600 : asym

Class Maximum Dimensions **367** ft^2

Measured **336** ft^2

Class Rule ½ Width (SMG) > 75% assumed therefore a Spinnaker; Sail ≠ Jib, Genoa, Gennaker, Screecher

01/14/17: measured at Treasure Island Sailing Club "on the dock" SLU 30'+, SLE 27'5" SLF 14'7" SHW 13'11"

Dims Metric x Class Rules (2 equations, same answer)

CSPI = (SLU+SLE) x .25 x ASF + (ASMG-.5ASF) x (SLU+SLE)/3

SA = (Luff+Leech)*(Foot + 4*Mid Girth) / 12

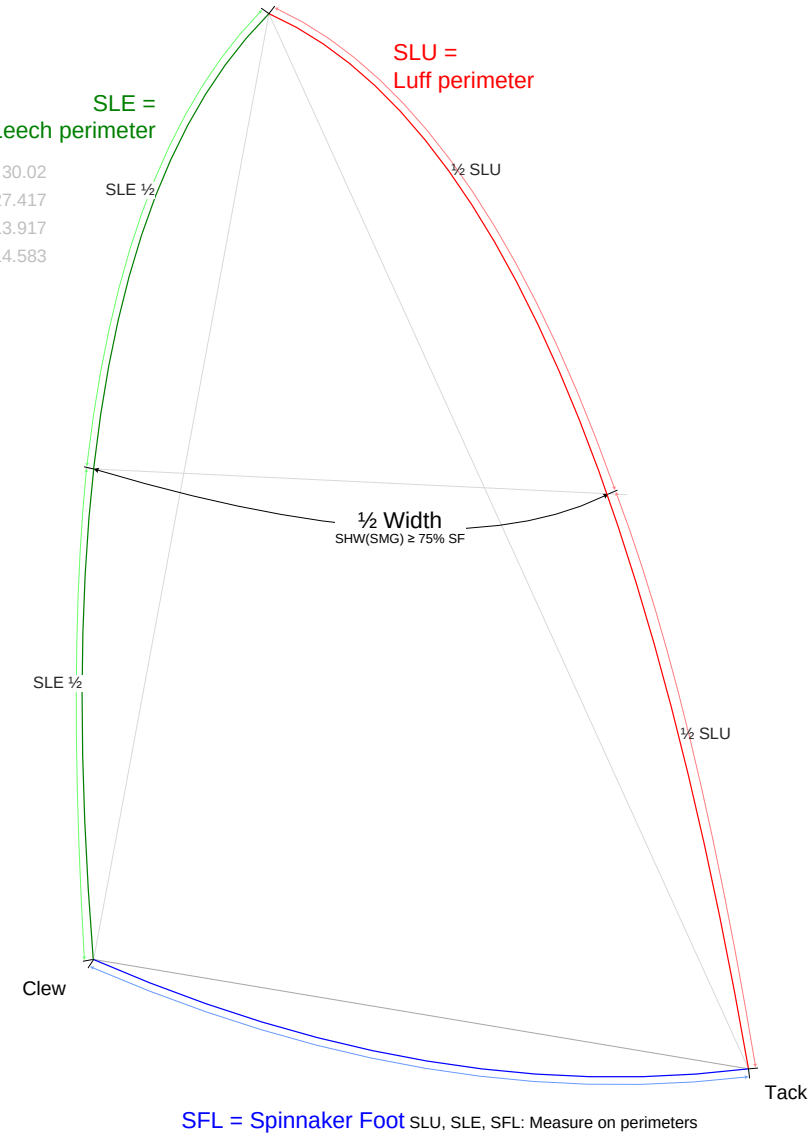
CSPI=

Pulse 600		
Area:	**31.24**	**336**
SLU class 9.45 (luff tape perimeter) 30'1/4"	9.15	30.02
SLE class 9.45 (leech perimeter) 27'5"	8.36	27.42
SHW class 4.28 () 13'11"	4.24	13.92
SF class 9.45 (foot.perimeter) 14'7"	4.44	14.58
SMG as % SF	95%	

SA=

Pulse 600		
Area:	**31.24**	**336**
SLU class 9.45 (luff tape perimeter)	9.15	30.02
SLE class 9.45 (leech perimeter)	8.36	27.42
SMG class 4.28	4.24	13.92
SF class 9.45 (foot.perimeter)	4.44	14.58
SMG as % SF	95%	

CSPI	31.24	336
Spin SA	31.24	336



SFL = Spinnaker Foot SLU, SLE, SFL: Measure on perimeters

Weight : Inventory, Equipment Declaration Form **(Texel** AUS THA DEN GER NDL NOR SWE CSA **MOCRA** BRA UK **Multi2000** FRA FIN**)**

Load-Cell Measurement	**Weight Sailing lb**	1,210
Hull ID: FRADH00061F616	**Weight Sailing kg**	549

2/16/2017

1,056 Boat: Boom
103 Mast: Mast tube; Shrouds; Forestay; Halyards
51 Sails: Racing, Main, Solent, Staysail, Gennaker, Battens, Furlers

This is to **Declare** that the yacht **Manufacturer Type, Sail.Number, Boat.Name** weighs the above, in a dry condition (no:water, gas). All equipment "Declared" is part of the "Inventory" that must remain on the boat for racing including a set of racing sails & **U.S. Coast Guard Required Equipment** applicable to the boat size. Texel Weight Equipment (WE) of individual items is waived based on inclusion of same in Sailing Weight.

Equipment	Description	Equipment	Description	WE items (list)	
Engine/s	Outboard	Mainsails	One (1)	Offshore	
Outboard(hp)	electric torqueedo 3hp	Headsails	One (1) Roller Furl	NCORC	2017
Battery #1 Amp/Hrs	minimal,	Headsails			
Battery #2 Amp/Hrs	n/a	Spinnaker #1			
Tools / Spares	None	Gennaker / Screecher	One (1) Roller Furl		
Fenders	Two (2) hull-float	Shrouds	Synthetic	Item.Desc	Kg
Moorings	no dock lines	Other	bucket, velocitek speedpuk		
Safety YRA	Inshore 2017	Spare sheets	minimal		
2.5.3 Bilge Pump		Roller Furlers	One (2) jib, gnkr		
3.1.3 Life Jackets		Winch Handles	None		
3.3.1 Running Lights		Tiller Extension	2		
3.4 Fire Extinguisher		Auto-Pilot	n/a		
3.5 Air Horn	One (1)	Stove (fuel type)	n/a		
3.6.4 Flares day/night		Refrigerator	n/a		
3.7.3 Heaving line 50′		Ice Maker	n/a		
3.8 CG Type IV throwable		Solar Panels	n/a		
3.9 VHF portable		Seat cushions	n/a		
3.11 GPS / charts		Bunk Cushions	n/a		
3.19.1 Compass magnetic		Porta-Potty	n/a		
3.23 Anchor 1	Yes Britany [8kg]lb/kg	Water Tank	n/a		
3.23 a. Chain (size/m)	Yes[8mm]link.dia. [4.3]m	Enlclosed Head	n/a		
3.23 b. Rode (dia/m)	Yes [8mm] dia. [22]m	Black Water Tank	n/a		
3.25 First Aid Kit		Pressure H/C Water	n/a		

Where it is simpler to weigh items such as tools and spares, use kgs, where it is simpler to count items, use numbers etc. For example [Tools - 10kg], [Mattresses - 4], [Chain 8mm - 50 metres]. Otherwise describe, [Engine - 9.8 hp Yamaha outboard 27hp Yanmar Diesel] or mark to show it is carried [Video - X]. **WE** may be used for **Offshore Races** requiring Category X **NCORC** equip.

WM	549	Offshore	**WE**	**0**
	549	Inshore	WS: (Wt.Measured + Wt.Equipment)	

SIGNED:
MEASURER slackwater_sf.electronic **OWNER**

1,210 Gross:
0 Lifting Bridle, Tared to Zero (0)
0 NIST test deviation @ 1,000 lbs
0 Sail Covers, main, jib
0.0 Del. 0.3 gal 1.1 Liter Gas integrated tank @ 6.43 lb / gal 0.3 6.33 Merc.Ref.Link
1,210 Net:

Weight Measured:

Weight Measured is the "Empty Weight" of the boat taken by a load-cell in the following dry condition (no water/gas):

1 Fully rigged with all spars, standing rigging, runners-checkstays, halyards and sheets.
2 Main engine installed, or outboard engine aboard in stowed position.
3 Trampolines and netting.
4 Sails, not more than 1 mainsail, 1 jib, 1 reacher, 1 or 2 spinnakers, or as equipped to race (size dependent).
5 Headsail and spinnaker sheets.
6 Batteries & fitted berth cushions on board in their normal positions if carried while racing (noted above).
7 Anchor, chain, rode, mooring lines.
8 Safety equipment, life jackets.
9 All permanent fixtures detachable or not, including hatchboards & table in the normal positions.
10 Fenders etc. (qty noted above).
11 Cooking facilities (items noted above).
12 Holding Tanks (black water) will be empty for weighing.

All items included in "Weight Measured" will be carried while racing.

The following items shall not be on board for weighing:

1 Spare standing and running rigging.
2 Fuel, water and the contents of any other tanks. Fluids will cause a full-tank weight deduction.
3 Food.
4 Clothing, bedding and personal effects.
5 Spare Tools and large spare parts inventory.
6 Loose gear.
7 Crew.

Example Measurement

	M²	Ft²
2017 Diam24 North.FR Main	**24.26**	**261**

1st: Enter **Lu**, **Le**, **Ft**

2nd: Enter Head Width with 7/8, 3/4, 1/2 and 1/4 Girths

Measured Area is calculated by the trapezoid formula below, dividing the luff in amounts of 1/4, 1/2, 3/4 and 7/8.
Rated Area is calculated with the actual heights on the luff from the tack point (or H) to points where LE girths are measured.

11/24/16 : AUS Multihull Nationals GR 207 Wilparina2 Texel.AUS main dims 24.15m, not ORC/HPR UMS LE.Girths
02/14/17 : trial run, MOCRA LE.Girths fail, MHB.calc.aus
02/15/17 : **Visio MHB AUS,** LE.2 radius above P Increases Vertical Luff Main, MHB New 1.36
02/18/17 : Visio **DEL MHB.AUS Area** above Head x Le2, Dims North.Fr/ADH Inotec 02/16/17,

data entry

Lu	**10.78**	**35.37**
Le	**10.70**	**35.10**
Ft	**2.95**	**9.68**

data entry

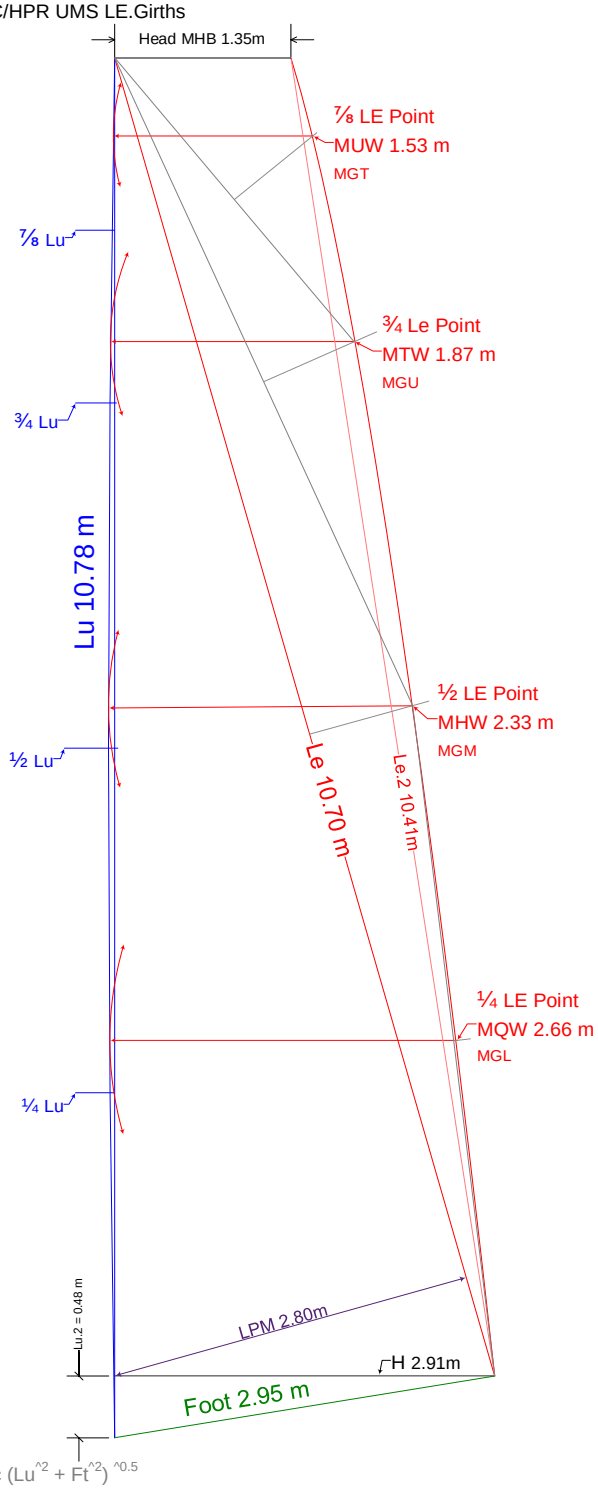
MHB (MGH) Head class x.xxx	1.35	4.43
7/8 MUW (MGT) class x.xxx	1.53	5.02
3/4 MTW (MGU) class x.xxx	1.87	6.14
1/2 MHW (MGM) class x.xxx	2.33	7.64
1/4 MQW (MGL) class x.xxx	2.66	8.73

	M²	Ft²
109.1 / 309.3 Rated Area +below H Area, Ft.Roach	**24.26**	**261**
109.1 Area m² x LE Girth using LU.1 x H	23.55	254
MGMH = P/2+(MGM-E/2)/P*E	5.40	5.40
MGLH = MGMH/2+(MGL-(E+MGM)/2)*(E-MGM)/MGMH	2.70	2.70
MGUH = (MGMH+P)/2+(MGU-MGM/2)*MGM/(P-MGMH)	8.18	8.18
MGTH = (MGUH+P)/2+(MGT-MGU/2)*MGU/(P-MGUH)	9.76	9.31

109.1 / 309.3 Measured Area -below H,Ft.Roach	**22.34**	**240**
LU Girths Area m² using LU.1 x H	23.04	**248.0**
P use Lu.1	10.30	33.78
E foot uses **H**	2.91	9.55
MHB (MGH) Head	1.35	
7/8 MUW (MGT)	1.53	
3/4 MTW (MGU)	1.87	
1/2 MHW (MGM)	2.33	
1/4 MQW (MGL)	2.66	
Area Below H	**0.70**	
Lu.1	**10.30**	
Lu.2	**0.48**	
Foot	**2.95**	
Ft.Roach	0.00	0.00
H = (Triangle Area.Lu.Le.Ft) / Lu*2	2.91	9.55
Triangle Area x Lu Le Ft	15.69	168.8
S = 1/2 (a + b + c) {a=Lu b=Le c=Ft}	12.22	
Triangle.Area = (s*(s-a)*(s-b)*(s-c))^0.5	15.69	
LPM	2.80	9.19
Below H1 Diff m²	**0.70**	**7.6**
Below H1 Diff ft²	**7.6**	
Le2 (leech aft)	10.41	34.16

109.1 LE Girths Correction on Trapezoid Area (ORC.2016)
309.3 LE Girths Correction on Trapezoid Area (HPR.2016)
16.7 LE Girth Corrections on Trapezoid Area (HPR 2013)
16.4 LU Girth Trapezoid Equation x Ht. =0.25, 0.50 0.75, 0.875, 1.00

Efficiency Main (EFM):
EFM uses LPM (Le.Perp to Tack @ H) to set sail efficiency.
EFM Texel.NDL x H, EFM Texel.AUS 2012 x LPM
Area Below H = (1/2 *S1.2 *H1) + Ft.Roach
LU.2 = (E^2-H1^2)^0.5
LPM = (P.1*H1)/((P.1^2+H1^2)^0.5) 11.18 36.67 LE auto.calc (Lu^2 + Ft^2) ^0.5



Examples

C/F-31 Jib Areas

Leech Girths, Class dimensions, Example Diagram

269 ft² actual area > CTOA 218 ft² assumption. 30%+ > 206 ft² Triangle

LP is an Arc nearest point of the Luff; **H or H1** is from the Clew to Luff straight li

C-31R North Dims x UMS, not Diagram

	Imperial	Metric
Jib	**269**	**24.96**
Luff S1 par 5.9.2a 411.6" 34.3'	34.28	10.45
LPG par 5.9.2b 144" 12'	12.01	3.66
JH Head	0.33	0.10
JGT 7/8:	2.82	0.86
JGU 3/4:	5.25	1.60
JGM 1/2: par 5.9.2c 90" 7.5'	8.69	2.65
JGL 1/4:	11.27	3.44
Foot	13.38	4.08
Foot.Roach	0.65	0.20

0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) ±Ft.Roach

C-31 Class Example Diagram MaxDims

	Imperial	Metric	
Jib	**251**	**23.33**	
Luff S1 par 5.9.2a 411.6" 34.3'	34.30	10.45	
LPG par 5.9.2b 144" 12'	12.00	3.66	
JH Head	0.17	0.05	
JGT 7/8:	2.75	0.84	0.17
JGU 3/4:	5.00	1.52	1.17
JGM 1/2: par 5.9.2c 90" 7.5'	7.50	2.29	
JGL 1/4:	10.03	3.06	0.28
Foot	13.64	4.16	
Foot.Roach 12" w/batten	1.00	0.30	

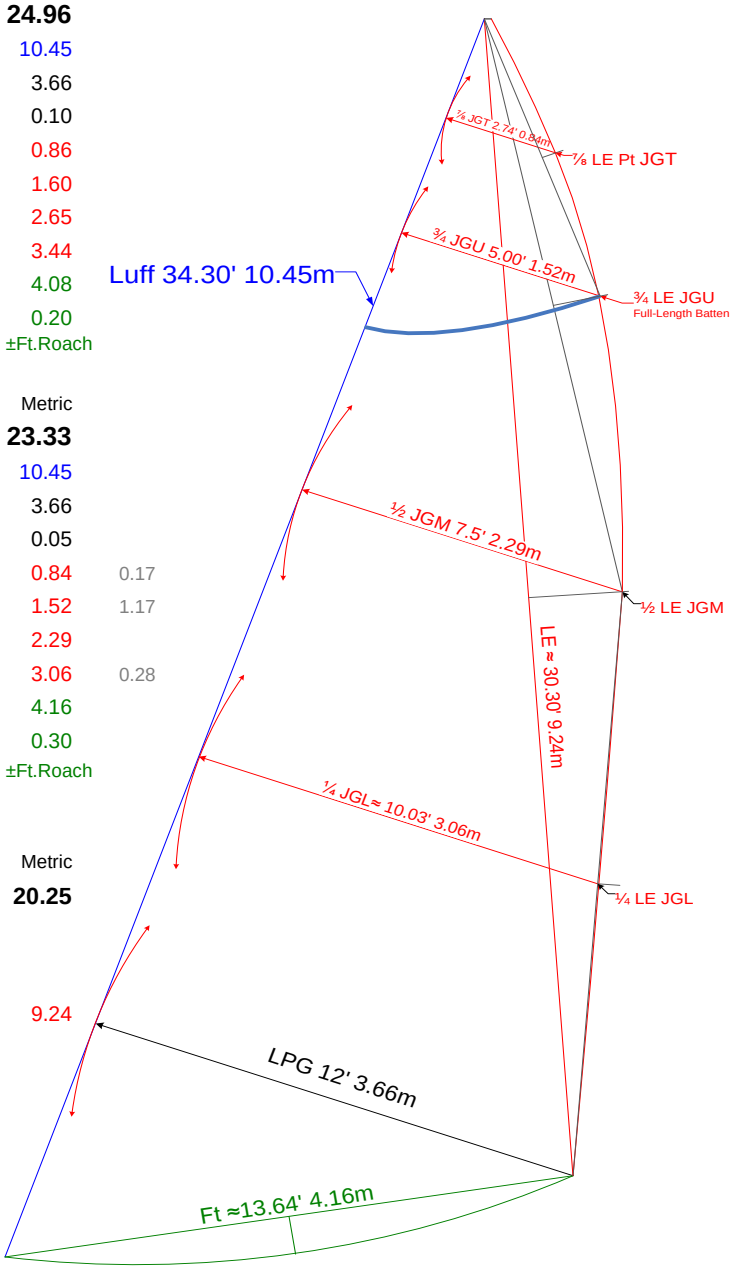
0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) ±Ft.Roach

CTOA Rule: Maximum allowable PHRF sail area in square feet

	Imperial	Metric
Jib	**218**	**20.25**

Triangle Area(Lu,Le,Ft)	**206**	
Lu	34.30	
Le.calc	30.30	9.24
Ft	13.64	
s = 1/2 (a + b + c)	39.1	
Area = (s*(s-a)*(s-b)*(s-c))^0.5	206	
H = 2 * TriangleArea / Lu	12.0	

(C-31 North / Triangle) -1	31%
(C-31 Class / Triangle) -1	22%
(C-31 CTOA / Triangle) -1	6%



Jib Area - Headboard

Area = (0.5*LL*LPG)+((2/3)*LL*LLRG)+((2/3)*FG*FRG)+(0.5*LG1*HG)+(IF((HG > 0),((2/3)*LG2*LRG),((2/3)*LG1*LRG)))

F-31: Class Luff, LP, batten @ Head

19.12	**S9 = LL** a **x LPG / 2** (Triangle)
1.05	**S10 = 2/3 FG** b **x FRG** h10 (Foot)
2.94	**S11 = 1/2 HG x LG2**
-0.12	**S12 = 2/3 LL** a **x LLRG** h12 (Luff)
1.32	**S13 = 2/3 LG2 x LRG** h11

OMR Txl.AUS	ISAF Txl.NDL	ORC HPR	Metric	Imp
LL	a luff	JL	10.45	34.30
LPG	h lpg	LPG	3.66	12.00
FG	b foot		4.15	13.60
FRG	h10		0.38	1.25
LG1	C1 leech		9.22	30.25
LG2	C2 leech		9.39	30.80
HG	hw	JH	0.47	1.54
LRG	h11 Le.R		0.28	0.92
LLRG	h12		-0.02	-0.06
	Le.mg 1/2	JGM	2.29	7.50

24.32 **Jib m^2** = S9 +/- (S10 S11 S12 S13 S14)

127% (ISAF ~ Texel) / Triangle

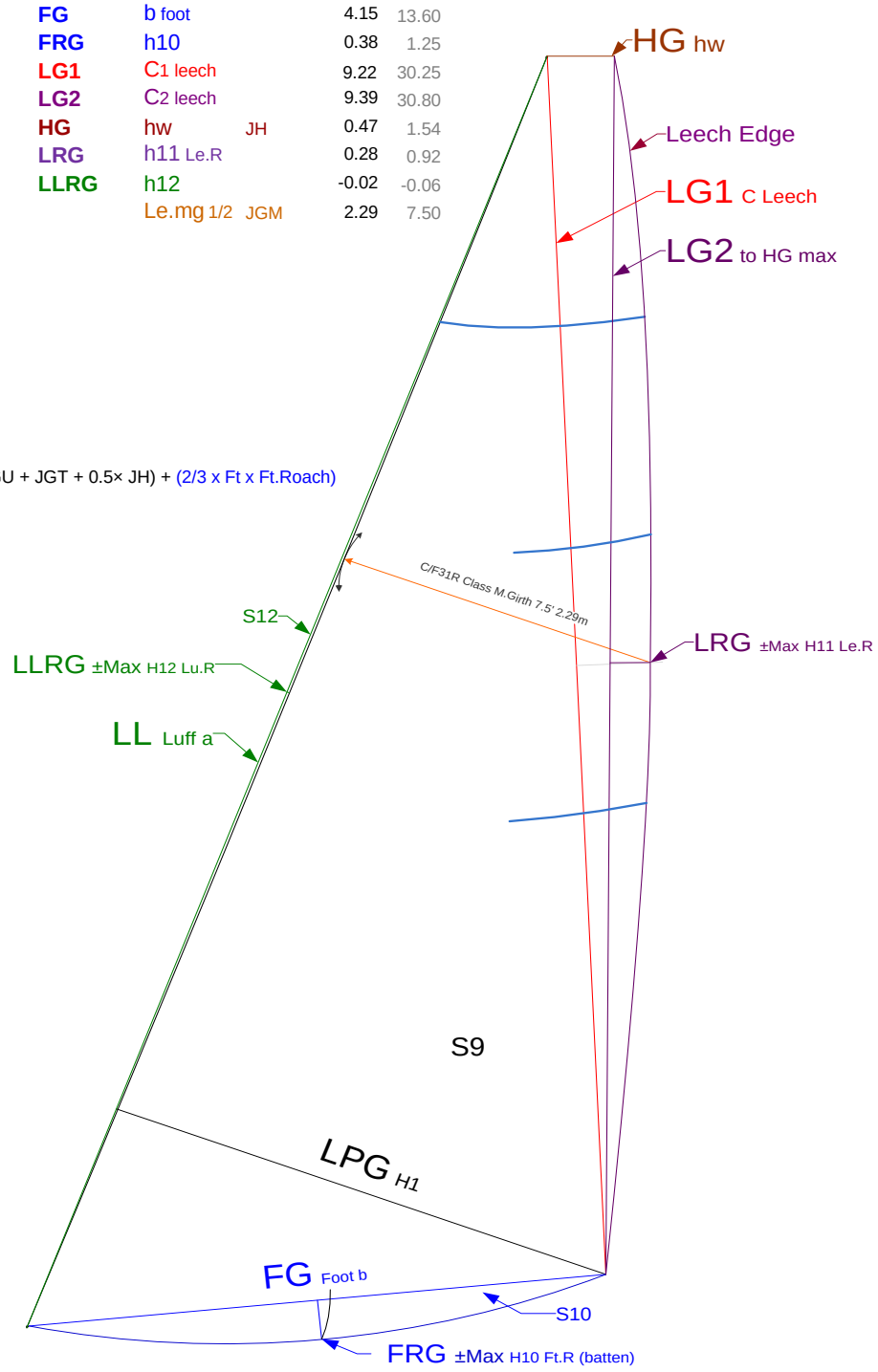
262 **Jib ft^2**

206 Triangle

90" JGM, Le.mg Class Rule US

ORC 111.1 Jib/Genoa/Code0/Gennaker **(HPR)**

Area = 0.1125× JL× (1.445× LPG + 2× JGL + 2× JGM +1.5× JGU + JGT + 0.5× JH) + (2/3 x Ft x Ft.Roach)



Mast Circumference

MC := Rotating Masts Only - tape or paper around mast above boom and measure from tick marks. Please report on the Rating Application in metric or inches.

Boat	MC		Date	Comments
Orion	1.830	c	05/28/13	C. Ogletree
Vamonos!	0.940	c	06/25/12	M.Park
Native, Newick Tri	0.908	w	08/20/09	Blue Tape, taper above spin.halyard (img_0060...)
Antrim 30	0.865	t	04/05/10	TB.verified, Erin #28910
Extreme 40, Smart Recruiters	0.745	c	01/27/13	Texel Denmark MC, Extreme40 #4, SEB
Humdinger, Acapella Tri	0.800	w	03/20/10	Owner TB.Verified
Formula 40 Tuki	0.760	c	07/28/09	Blue Tape
Formula 40 Shadow	0.719	a	04/04/09	Blue tape, 1st pass, taper above hounds
Seacart 30 Wegwezen	0.700	c	03/09/17	Texel.NDL 82
D-Class Cat Adrenaline Marstrom	0.700	c	05/30/09	Assumption, not measured pre-Delta.Ditch @RichmondYC
SL-33 #4	0.665	c	12/23/11	Blue Tape, Alameda Marina
C-37R, Miss Saigon	0.620	a	12/01/11	P.Harper THA
C-37R, Zhuka	0.600	a	07/12/10	P.Harper THA
Viva 27 Cat Sass	0.600	a	05/30/09	Estimate, w/o measure pre-Delta.Ditch @RichmondYC
Seacart 30, Thor	0.600	c	12/01/10	M.Pescott/THA
Contour 34SC	0.585	a	01/08/10	Blue.Tape, measured by owner
Marstrom32	0.577	c	08/21/13	preliminary
Corsair 31RS Leneman	0.554	a	05/30/09	Blue Tape, C-31RS #28543 Prime Directive
Seacart 26	0.530	c	11/28/11	M.Pescott/THA
Diam 24	0.510	c	11/16/16	P. Boyed / AUS for Nationals.AUS
Diam 24	0.500	c	02/16/17	ADH Inotec x F. Bouju
Dash 750.AUS	0.500	a	11/10/10	S.Barton/G.Scott AUS
Dash 750.THA	0.480	a	04/11/11	P.Herning/M.Pescott THA
D-Class Cat Rocket88	0.495	a	07/15/10	Wet, 1st pass
D-Class Cat Beowulf V Marstrom	0.483	c	06/01/10	Corsair 28R Section
Corsair 28R Marstrom	0.483	c	03/31/10	Blue Tape C-28R, Alameda Marina
Corsair 31R Marstrom	0.483	c	04/22/09	Blue Tape C-31R #135 Roshambo, Alameda Marina
Corsair Sprint 750	0.481	a	05/02/09	Blue Tape Sprint 750 #70 Afterburner, Alameda Marina
Corsair Pulse 600	0.440	a	11/03/16	Blue Tape Pulse 600 Origami II Treasure Island Sailing Center
Corsair 24 Mk II	0.397	a	08/01/09	Blue tape C-24MkII #006 Emma Jean, Alameda Marina
Multi23	0.356	c	04/07/09	Blue tape M. Leneman, US Tri.Nationals, standard section

Mast Area added to mainsail area, **IF and ONLY IF**, the mast rotates
Mast Area = 1/2 * Mast Circumference* P (mainsail luff, Vertical Luff Mainsail)
No Correction Factor (CF) on airfoil shape, carbon, weight difference vs. aluminum, …
CF-Carbon Mast may be added later (ref: Multi2000 (FRA), MOCRA (UK))
a: aluminum

Example Mainsail Measurements: Extreme 20

Texel/ISAF Extreme 20

		m^2	ft^2
	Area	**20.52**	221
10.07	S1 VLM1 Lu		
2.44	H1		
	mtr1	12.29	
0.11	P1		
	segm1	0.70	
2.47	S2 Foot		
0.05	P2		
	segm2	0.08	
9.76	S3 Le		
0.88	H3		
	mtr3	4.29	
5.14	S4		
0.73	H4		
	tr4	1.88	
4.78	S5		
0.03	P5		
	segm5	0.10	
2.77	S6		
0.04	P6		
	segm6	0.07	
2.58	S7		
0.81	P7		
	tr7	1.04	
2.01	S8		
0.05	P8		
	segm8	0.07