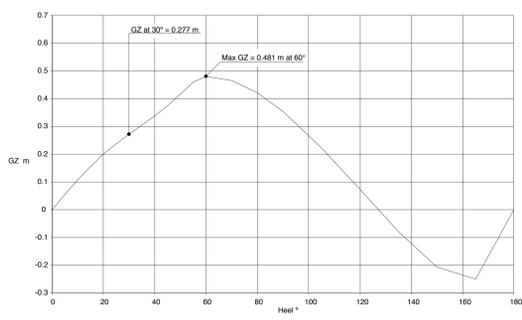


DESIGN 152 WISHBONE CAT-KETCH RIG

Principal Characteristics

LOA	6.781 m
LWL	6.191 m
Beam	2.231 m
WL Beam	1.804 m
Displacement	1460 kg
Ballast	520 kg
Draught	0.850 m
Mainmast	21.000 sq m
Mizzen	3.500 sq m
Total Working	24.500 sq m
Yankee	6.520 sq m
Mainmast:	
Luff	8.700 m
Foot	3.550 m
Leach	7.100 m
Head	1.900 m
Roach	0.260 m
Mizzen:	
Luff	3.320 m
Foot	1.650 m
Leach	2.740 m
Head	0.725 m
Roach	0.125 m
Yankee:	
Luff	6.970 m
Foot	2.710 m
Leach	5.350 m
LP	1.870 m

Preliminary GZ Curve at Full Load Displacement, vsg at dwt = 100, Flat Water



Spar Data

GZ at 30°	0.277 m
GZ max at 60°	0.481 m
RM at 30°	4048 Nm
RM max	7031 Nm

Mainmast total length	10.300 m
Mainmast above deck	9.200 m
Clarens main to luff	6.090 m
Clarens main to deck	3.985 m
Clarens yankee to deck	3.140 m
Mizzen total length	4.680 m
Mizzen above deck	3.980 m
Clarens mizzen to luff	2.555 m
Clarens mizzen to deck	1.920 m

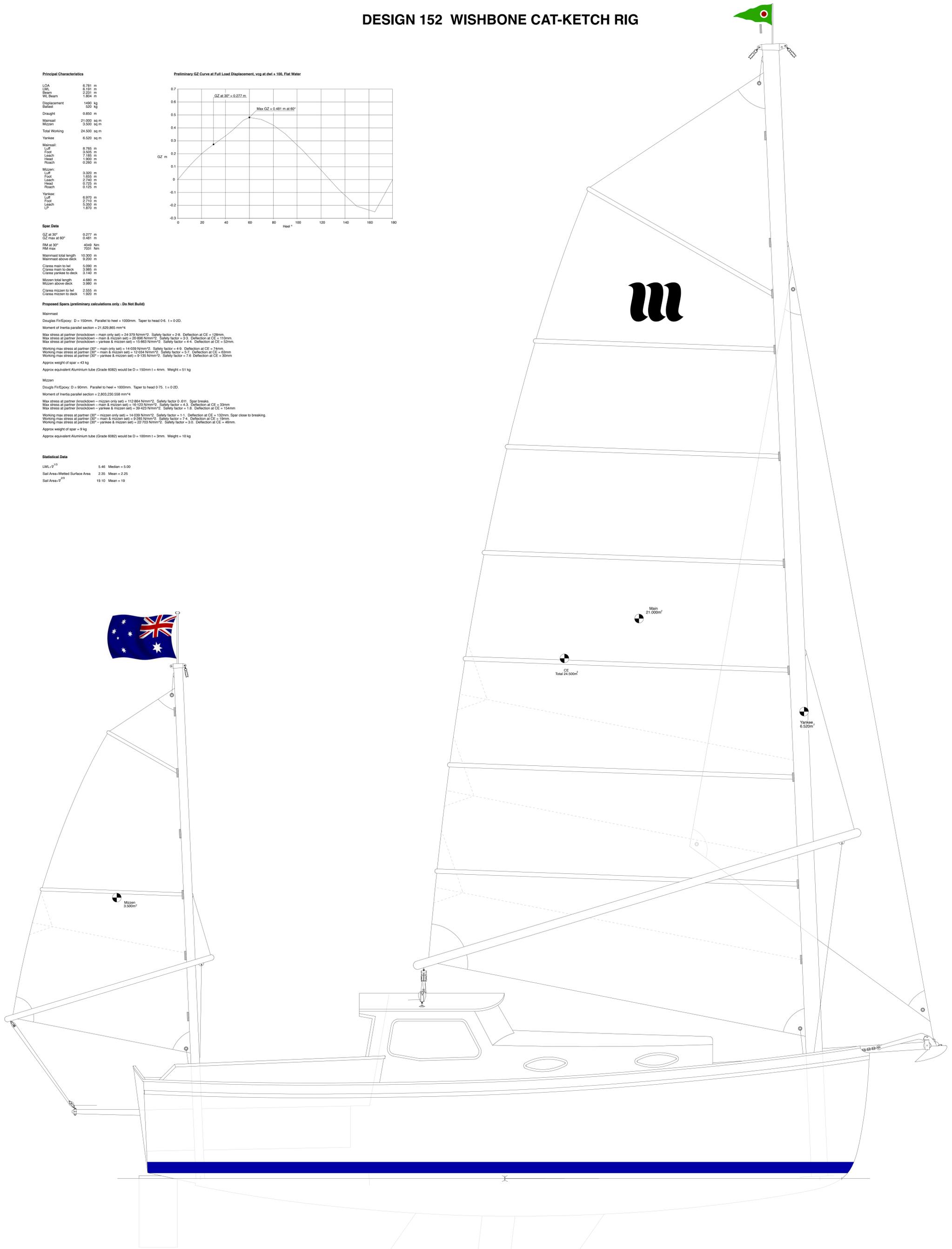
Proposed Spars (preliminary calculations only - Do Not Build)

Mainmast
 Douglas Fir/Epoxy: D = 150mm. Parallel to heel = 1000mm. Taper to head 0.6. I = 0.20.
 Moment of inertia parallel section = 21,629,865 mm⁴
 Max stress at partner (knockdown - main only set) = 24,079 N/mm². Safety factor = 2.6. Deflection at CE = 130mm.
 Max stress at partner (knockdown - main & mizzen set) = 20,898 N/mm². Safety factor = 3.3. Deflection at CE = 110mm.
 Max stress at partner (knockdown - yankee & mizzen set) = 15,983 N/mm². Safety factor = 4.4. Deflection at CE = 52mm.
 Working max stress at partner (30° - main only set) = 14,029 N/mm². Safety factor = 4.9. Deflection at CE = 74mm.
 Working max stress at partner (30° - main & mizzen set) = 12,024 N/mm². Safety factor = 5.7. Deflection at CE = 63mm.
 Working max stress at partner (30° - yankee & mizzen set) = 9,155 N/mm². Safety factor = 7.6. Deflection at CE = 30mm.
 Approx weight of spar = 43 kg
 Approx equivalent Aluminium tube (Grade 6082) would be D = 150mm t = 4mm. Weight = 51 kg

Mizzen
 Dougle Fir/Epoxy: D = 90mm. Parallel to heel = 1000mm. Taper to head 0.75. I = 0.20.
 Moment of inertia parallel section = 2,953,230,550 mm⁴
 Max stress at partner (knockdown - mizzen only set) = 112,864 N/mm². Safety factor 0.611. Spar breaks.
 Max stress at partner (knockdown - main & mizzen set) = 16,123 N/mm². Safety factor = 4.3. Deflection at CE = 53mm.
 Max stress at partner (knockdown - yankee & mizzen set) = 39,423 N/mm². Safety factor = 1.8. Deflection at CE = 154mm.
 Working max stress at partner (30° - mizzen only set) = 14,029 N/mm². Safety factor = 1.1. Deflection at CE = 132mm. Spar close to breaking.
 Working max stress at partner (30° - main & mizzen set) = 9,285 N/mm². Safety factor = 7.4. Deflection at CE = 19mm.
 Working max stress at partner (30° - yankee & mizzen set) = 22,703 N/mm². Safety factor = 3.0. Deflection at CE = 46mm.
 Approx weight of spar = 9 kg
 Approx equivalent Aluminium tube (Grade 6082) would be D = 100mm t = 3mm. Weight = 10 kg

Statistical Data

LWL ^{1/3}	5.46	Median = 5.00
Sail Area/Wetted Surface Area	2.35	Mean = 2.25
Sail Area ^{1/3}	19.10	Mean = 19



15/02/2011	Original
01	

Whisstock
 boats and boat gear
 support@whisstock.com

Scale: 1/10
 Date: 15/02/2011
 Plan No.: 152/01/03/07
 Issue No.: 01

Design 152 Sail Plan
Cat-Ketch
(Small Mizzen + Yankee)

All dimensions in millimeters unless otherwise noted.
 © Whisstock Ltd 2011. All Rights Reserved.