



SPORT CAMPER
Technical Report
Model: LoCamp

Report N°: 57-005
Rev: 03
Date: Jul. 2012

WEIGHT and CG RANGE CALCULATIONS

57-005

Prepared by

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References

1. F 2245-04-06 Standard Specifications for Design and Performance of a Light Sport Airplane
2. CS VLA – PART B -

Location of the file: ftp.aerolab.biz/Release/57-005_R1.doc

1. General

This report is dealing with the weight and center of gravity (CG) calculation for the LoCamp 600 aircraft.

Empty weight calculation was performed for ROTEC R2800 engine configuration.

The CG Range calculation was done for minimum weight 472kg and for maximum weight 600kg, for different combination of loading.

The CG rang was calculated also for LOM engine configuration and for both configuration to extend the stability margin to the 10%.

All the obtained data respect also the following norms:

- CS VLA – PART B- 21 (a) (2);
- CS VLA – PART B- 21 (a) (2);
- CS VLA – PART B- 25 (a);
- CS VLA – PART B- 25 (b);
- CS VLA – PART B- 29.



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2. LoCamp engine ROTEC R2800 configuration – Useful Load calculation

Minimum useful load requirement (acc. To ASTM 4.2.1.2):

$$W_U = 380 + 110/2 = 435 \text{ lb} = 197.5 \text{ kg}$$



3. LoCamp engine ROTEC R2800 configuration CG Range Calculation

2.LoCamp engine ROTEC R2800 configuration

Empty Weight Calculation

	Arm	Weight	Momentum
	(mm)	(kg)	(kg*mm)
ENGINE			
01 Wet engine	-1.191	102,00	-121.482
02 Firewall (inox)	-755	1,60	-1.208
03 Bolts, silentblocks	-1.025	1,10	-1.128
04 Oil tank, hoses	-828	1,50	-1.242
05 Oil	-755	4,50	-3.398
06 Prop with spinner	-1.523	5,50	-8.377
07 Engine bed	-942	2,80	-2.638
08 Engine cowling	-849	3,00	-2.547
09 Battery	-800	6,60	-5.280
10 Exhaust	-1.091	3,00	-3.273
On the engine mount		111,40	
TOTAL Engine	-1.144	131,60	-150.571
WING			
11 Wing Tip	472	4,00	1.888
12 Trailing edge	1.192	2,30	2.742
13 Leading edge	172	3,60	619
14 Rib (22)	500	10,60	5.300
15 Fwd Spar	266	10,60	2.820
16 Aft Spar(+4 brak.assy)	1.102	7,90	8.706
17 Root shell (2)	678	2,20	1.492
Total 1 WING	572	41,20	23.566
	36,81%	% CMA	



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18	Flaps	1.300	3,10	4.030
19	Aileron	1.300	1,60	2.080
20	FWD CW Panel/ 0.5	266	4,10	1.091
21	AFT CW Panel /0.5	186	3,80	707
		628	12,60	7.907
	Total WING + CW Panel	585	53,80	31.473
		37,65%	% CMA	
	Paint+ Fabric	600	9	5.400
	TOTAL Wing	544	125,60	68.346
		35,02%	% CMA	
	TAIL			
22	Stabilizer	4.093	4,70	19.237
23	Elevator (2)	4.377	4,80	21.010
	Total HT	4.236	9,50	40.247
24	Fin	4.115	1,60	6.584
25	Rudder	4.463	2,50	11.158
	Total V T	4.327	4,10	17.742
	TOTAL HT & VT	4.264	13,60	57.988
	FUEL TANK			
25	Shell Assy.	548	4,70	2.576
26	Tube	628	0,50	314
27	Support (3)	564	4,50	2.538
	TOTAL Fuel Tank 1/2	580	9,70	5.626
	TOTAL Fuel Tank	580	19,40	11.252
28	FLIGHT CTRL	900	13,6	12.240



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FUSELAGE				
29	Pax panel	172	1,50	258
30	Pilot panel	1.014	3,50	3.549
31	Radio rack	704	3,70	2.605
32	Paint	1.174	7,00	8.218
33	Fuselage (complete)	1.174	58,70	68.914
	TOTAL Fuselage	848	74,40	63.061
LANDING GEAR				
34	Shock absorber (2)	-64	2,40	-154
35	Complete wheel (2)	-64	10,20	-653
36	Steel tubes	-22	5,90	-130
37	Tail Wheel	4.587	3,50	16.055
	TOTAL Landing Gear	687	22,00	15.118
	TOTAL Weight of A/C	193	400,20	77.435
		12,45%	% CMA	
	Useful Load		199,80	



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ITEM	Std	Weight	Arm L	D Mom
MAX AFT CG - MAX Weight				
Empty		400	193	77.435
Pilot	100	90	1.471	132.390
Pax	100	75	651	48.825
FWD Lug	15	0	368	0
AFT Lug	15	10	2.048	20.480
Fuel		25	548	13.700
TOTAL	31,40%	600	488	292.830
MAX AFT CG - INTER. Weight				
Empty		400	193	77.435
Pilot	65	65	1471	95.615
Pax	65	65	651	42.315
FWD Lug	15	0	368	0
AFT Lug	15	5	2048	10.240
Fuel		30	548	16.440
TOTAL	27,56%	565	428	242.045
MAX FWD CG - MAX Weight				
Empty		400	193	77.435
Pilot	100	55	1.471	80.905
Pax	100	100	651	65.100
FWD Lug	15	15	368	5.520
AFT Lug	15	0	2.048	0
Fuel		30	548	16.440
TOTAL	26,31%	600	409	245.400



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ITEM	Std	Weight	Arm L	D Mom
MAX AFT CG - LOW Weight				
Empty		400	193	77.435
Pilot	100	60	1471	88.260
Pax	100	0	651	0
FWD Lug	15	0	368	0
AFT Lug	15	15	2048	30.720
Fuel	1/2 h	9	548	4.932
TOTAL	26,76%	484	416	201.347
MAX FWD CG - LOW Weight				
Empty		400	193	77.435
Pilot	100	60	1.471	88.260
Pax	100	0	651	0
FWD Lug	15	0	368	0
AFT Lug	15	3	2.048	6.144
Fuel	1/2 h	9	548	4.932
TOTAL	24,09%	472	374	176.771

The limits of CG (% of MAC) are for 472kg configuration:

24.09 % , and for

600kg configuration:

26.31% - 31.4%.

The location of aircraft aerodynamic center is 36.9% MAC, so the aircraft LoCamp is stable with a stability margin of 5%.



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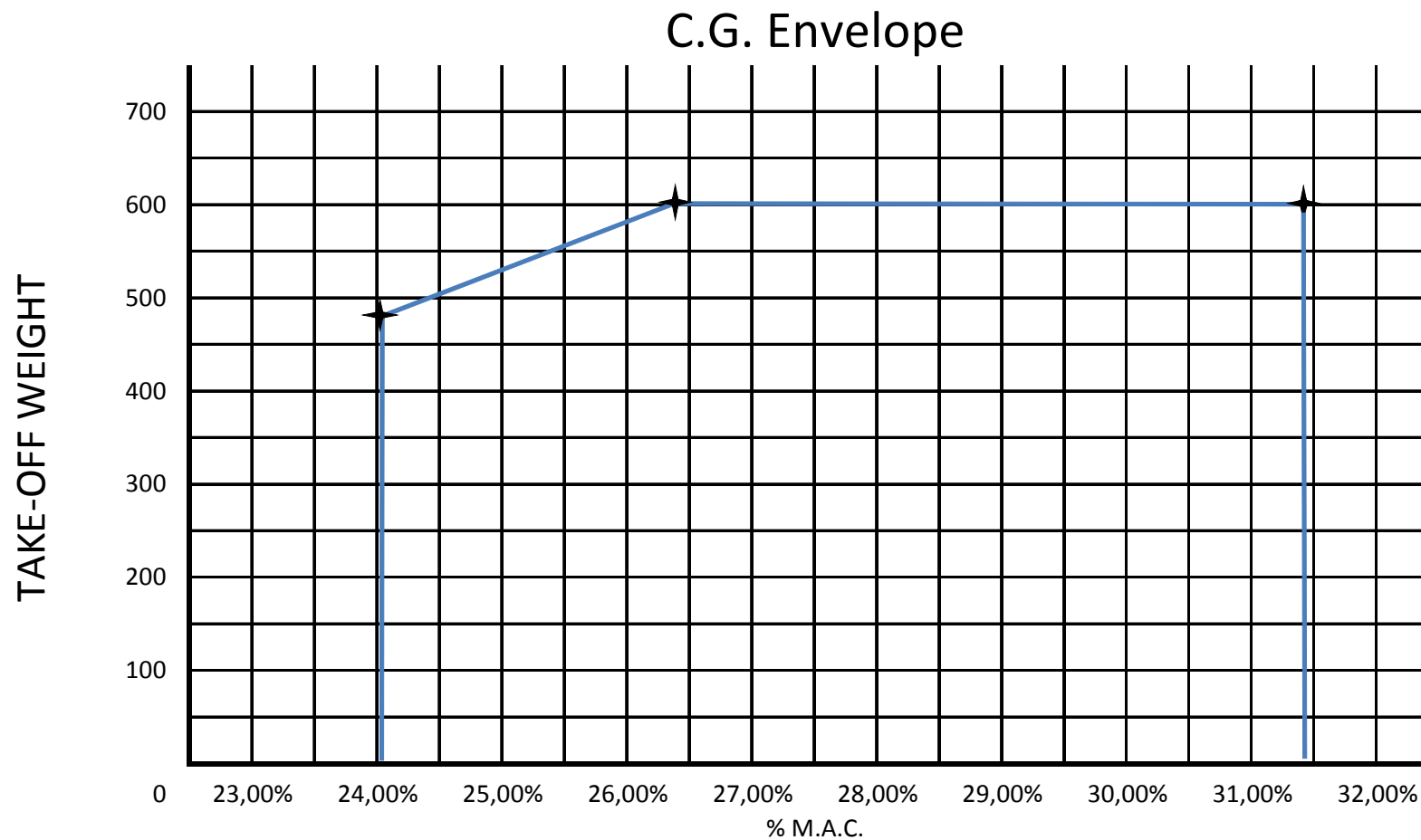
Datum line dwg



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5. Weight & Balance CHART





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6. Aircraft Loading

For aircraft loading consider the following arms:

- Pilot: 1.471 mm;
- Passenger: 651 mm;
- Fuel: 548 mm;
- Fwd Lugg.: 368 mm;
- Aft Lugg.: 2.048 mm;