

Weight and Balance

Chapter 6

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GENERAL

Proper CG is absolutely critical to safe flight. This is where NO exceptions can be considered - you must verify that the center of weight is in the correct position and if it is not; you MUST correct it before flight.

The allowable Center of Gravity range is 629 mm to 740 mm.

Airplane Weighting

The Airplane will be weighted with follow condition.

Wing tanks	Empty
Header Tank	Empty
Engine	8 Quarts Oil
Baggage Area	Empty but with AFM & Log book

Reference Definitions

The reference of all the measurements is the aft side of the Firewall. Lancair in Redmond gives the CG envelope values.

For all the measurements, the plane was in "flying condition" e.g longeron in the leveled (horizontal) position.

In the following calculation-tables CENTER OF GRAVITY [mm] means always the positioning mentioned above.

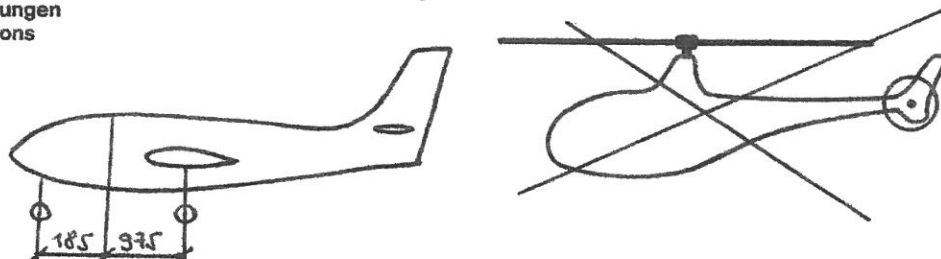
J.-M. Deluce did the weight and balance on January 26th 2007. The scales were from Hartmann, calibrated 7.02.2006.

HB- YFR Muster Type Lancair 320 Ort und Datum / Lieu et date Sion, le 26.1.07

Bezugsebene gemäss Geräte-Kennblatt / Plan de référence selon la fiche de navigabilité Face arrière de la cloison pare-feu

Horizontallage gemäss Geräte-Kennblatt / Référence horizontale selon la fiche de navigabilité Bord de cabine

Grund der Wägung / Raison de la pesée Réparation Fuselage

Abmessungen
DimensionsAlle Masse sowie Bezugsebene in die Figur eintragen
Reporter le plan de référence et les cotes des points de pesée sur le croquis approprié

mm / kg

Verwendete Waagen
Balances utilisées

	Hersteller Constructeur	Werknummer No. de série	Eichdatum Date de calibr.
Links / A gauche	Hartmann	1 rouge	7.2.06
Rechts / A droite	Hartmann	2 bleu	7.2.06
Vorne/Hinten / En avant/En arrière	Hartmann	3 vert	7.2.06

Wägung
Peséemit Ausrüstung gemäss Ausrüstungsliste des Luftfahrzeug-Flughandbuchs (AFM)
avec l'équipement installé selon la liste du manuel de vol de l'aéronef (AFM)Wägung Nr.
Pesée no.
1

Wägepunkt Point de pesée	Masse brutto Masse brute	Tara	Masse netto Masse net
Links / A gauche			150,5
Rechts / A droite			153
Vorne/Hinten / En avant/En arrière			167
Total			470,5

Wägung Nr.
Pesée no.
2

Links / A gauche			149,5
Rechts / A droite			153
Vorne/Hinten / En avant/En arrière			168
Total			470,5

Hinweis / Note

Ist die Abweichung in den Ergebnissen 1 und 2 grösser als 1%, ist eine 3. Wägung durchzuführen.
Au cas où la différence entre les résultats 1 et 2 est supérieure à 1%, effectuer une 3ème pesée.Wägung Nr.
Pesée no.
3

Links / A gauche			
Rechts / A droite			
Vorne/Hinten / En avant/En arrière			
Total			

Schwerpunktbestimmung
Détermination du centrage

Durchschnittswerte aus den Wägungen / Valeurs moyennes des pesées	Masse	Arm/Bras	Moment
Wägepunkt links / Point de pesée gauche	150	975	146250
Wägepunkt rechts / Point de pesée droit	153	975	149175
Wägepunkt vorn/hinten / Point de pesée AV/AR	167,5	185	30987,5
Für die Auswertung massgebend / Valeurs à utiliser pour le dépouillement	470,5	562,03	264437,5
Übertragen auf Blatt 2 A reporter sur la feuille 2			

Verteilung: BAZL/OFAC weiss/blanc
Distribution: Halter/Expl. gelb/jaune

Gewogen durch:

Part 145.A.50 Release to Service
Datum: 1.11.15 / FAS N° 1382 DM

EMPTY WEIGHT

Wheel	Weight (kg)	Arm (mm)	Moment (kg*mm)
Nose	167.5	-185	-30987.5
Left	150	975	146250.0
Right	153	975	149175.0
Total	470.5		264437.5
C/G		562.03	

arm calculation

The arm of the new empty weight corresponds with the latest Weight and Balance Record (Nov 2009) and a new basic empty weight of 472.5 kg.

Moment arm: 268270.5 kg*mm

CG: 567.77 mm

ARMS TO BE USED FOR C/G CALCULATION

Empty plane: 567.77 mm

Pilot & Pax: 1174 mm

Forward tank: 242 mm

Wing tanks: 911 mm

Baggage: 1880 mm

These values were calculated during the first weighing of the YFR, by the RSA on July 6th 1993.

CALCULATION OF EXTREME C/G POSITIONS.

1.- EXTREME FORWARD: 1 Pilot and full forward tank (40 l)

	Masse (kg)	Bras (mm.)	Litres
vide	470	562	
pilote	80	1174	
copilote	0	1174	
fuel avant (40 L)	28.8	241.6	40
fuel ailes (120 L max)	0	911	0
Bagages	0	1880	
Centrage et poids:			
Masse totale	578.80	Max: 764	
Centre de gravité	630.65	min=629; max=740	

2.- MAX T/O WEIGHT : Pilot (90 kg) + Pax (80 kg) + full tanks + 8 kg baggage :

	Masse (kg)	Bras (mm.)	Litres
vide	470	562	
pilote	90	1174	
copilote	80	1174	
fuel avant (40 L)	28.8	241.6	40
fuel ailes (120 L max)	86.4	911	120
Bagages	8	1880	
Centrage et poids :			
Masse totale	763.20	Max: 764	
Centre de gravité	739.56	min=629; max=740	

3.- NO FUEL CALCULATION: 1 pilot and no fuel left.

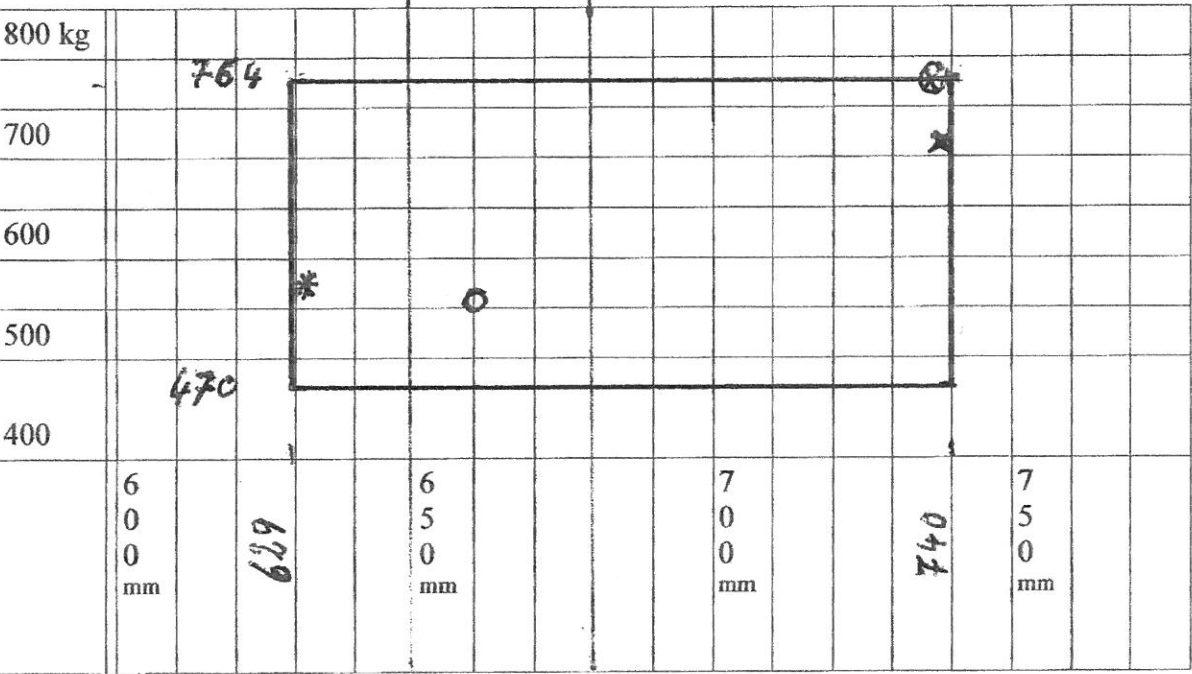
	Masse (kg)	Bras (mm.)	Litres
vide	470	562	
pilote	90	1174	
copilote	0	1174	
fuel avant (40 L)	0	241.6	0
fuel ailes (120 L max)	0	911	0
Bagages	0	1880	
Centrage et poids:			
Masse totale	560.00	Max: 764	
Centre de gravité	660.36	min=629; max=740	

4.- MAX BAGGAGE WEIGHT WITH 1 PILOT:

	Masse (kg)	Bras (mm.)	Litres
vide	470	562	
pilote	90	1174	
copilote	0	1174	
fuel avant (40 L)	28.8	241.6	40
fuel ailes (120 L max)	86.4	911	120
Bagages	38	1880	
Centrage et poids:			
Masse totale	713.20	Max: 764	
Centre de gravité	738.79	min=629; max=740	

The max mass in the baggage compartment is 40 lbs / 18 kg , which is a structural limitation.

C/G ENVELOPE



* Example 1

ox Example 2

x Example 3

o Example 4

EQUIPMENT LIST

Item / Description	Manufacturer	Type
A/ Powerplant & Accessories		
Engine 150 hp	Lycoming	O-320-E2A
Carburetor	Marvel-Schebler	MA-4SPA
Starter	Honda	12 V
Alternator	B & C	L-40, 40 ah – 14 V.
C/S 2 blades propeller electrical	MT-Propeller	MTV-17-C
Propeller control unit	MT-Propeller	P-120-U (12 V)
Spinner	MT-Propeller	P-290
Muffler	MECANAIR	
Oil Cooler	Stewart	
Ignition	Bendix	10-51360
B / Landing gear & Accessories		
Nose gear strut	Lancair	GM014-3
Nose wheel	Cleveland	5.00-5
Main gear	Lancair	
Main wheel	Cleveland	5.00-5
Gear retract mechanism, Hydraulic pump	Oildyne Systems	
Brakes hydraulic	Matco	MS-system
Damper	TK-5 Air-oil damper	
Ldg. gear position indic.	3 green lights	When "down & locked"
Ldg. gear in transit	1 white light	When in transit

C / Electrical System (12 V)		
Item	Manufacturer	Type
Voltage Regulator	ACS	
Battery	Triple-Amp	BB-40 (28 Ah)
Battery relay	Cole Hersee	24115
Starter relay	Cole Hersee	24021
Flaps electric servo	SKF	
Aileron/Elevator trim servo	Mac-Trim-System	4A
Fuses	AGC-Type	
Breakers	Klixon	
Ignition switch	ACS	A-510-2
D / Instruments		
Air speed indicator	UMA	300 MPHD
Altimeter	United Instruments	Lancair type
Vertical speed indicator	United Instruments	Lancair type
Artificial horizon	SIGMATEK	5000B
Compass	Airpath	C2400- L4P
EFIS	Dynon	EFIS D10A
Slip indicator	Winter	
Tachometer	Mitchell	300 - 3500
Manifold Pressure	UMA	10" - 50"
Oil temperature	Rochester gage	100° - 250° F
Oil pressure	Rochester gage	3050 - 3060
Cylinder head temperature	Rochester gage	200° - 600° F
EGT	UMA	700° - 1700° F
Ammeter	VDO	-50 - +50
Voltmeter	Dynon	EFIS D10 A
Fuel pressure	Amber light if low	
Fuel quantity indication	Westach	2 indicator, wing tanks
Fuel quantity indication	Fuel line	Visual

Item	Manufacturer	Type
E / Cabin accommodation		
Pilot & passenger seat	Lancair	
Seat belt	Davis	4 points
Fresh air vent (left and right)	Lancair	2133
Singel control, single brake (L)	Lancair	300-0018A
F / Placards, Warnings and		
Manuals		
AFM V1.0	Claude Mollet	
Placard	EXPERIMENTAL	On the tail
Placard for speed	VA = 170 Mph	On panel
Placard for ident	HB-YFR	On panel
G / Auxiliary equipment		
Tow bar	Borgeaud	
H / Avionics		
VHF-COM	Dittel	FSG 70
VHF antenna	INC	Dynamic antenna
Intercom	Dittel	FSG 70
GPS	Garmin	150 XL
GPS antenna	Aeronav	
Transponder	Garmin	GTX-328
Encoder	ACK	30.8
Trans. antenna	Narco	
ELT	ARTEX	G406-4

Item	Manufacturer	Type
J / Fuel system		
Wing tanks (2 x 60 L)	Lancair	Epoxy in wings
Main tank (40 L)	Lancair	Epoxy in fuselage
Fuel probes (1 in each wing)	Westach	
2 x transfer pumps	Facet	40108
Boost pump	Facet	40108
Fuel shut-off valve		OFF or OPEN
Fuel gascolator	Lancair	504-A
Primer manual pump		C291502-0106

