



MASS AND BALANCE REPORT

AIRBUS HELICOPTER EC120B 9M-HFA MASS AND BALANCE REPORT

IMPORTANT NOTE

This report is to be placed at the front of the section 6 of the flight manual




This report contains Mass and Balance Report

This Mass and Balance Report is prepared MYCAS, approved by CAAM and can be used for flight operation.

The superseded report shall be removed from the flight manual prior to insert the latest Mass and Balance Report.

The information contained herein supersedes the information given in the previous Mass and Balance Report.

The effectivity of the report at the latest revision is specified on the List of Effective Pages

	NAME AND SIGNATURE	DATE	DESIGNATION
PREPARED	MOHD FIRDAUS ZAMHURY 	17/07/2021	TECHNICAL SERVICE ENGINEER
VERIFIED	SYED ANSAR MOHAMED KALIK 	17/07/2021	TECHNICAL SERVICE MANAGER
APPROVED BY	SYED ANSAR MOHAMED KALIK 	17/07/2021	WEIGHING ENGINEER



MASS AND BALANCE REPORT

LIST OF EFFECTIVE PAGES

REF NO	PAGE	REV	REF NO	PAGE	REV
MYCAS/MBR/1487/07/21	1	0	MYCAS/MBR/1487/07/21	7	0
MYCAS/MBR/1487/07/21	2	0	MYCAS/MBR/1487/07/21	8	0
MYCAS/MBR/1487/07/21	3	0	MYCAS/MBR/1487/07/21	9	0
MYCAS/MBR/1487/07/21	4	0	MYCAS/MBR/1487/07/21	10	0
MYCAS/MBR/1487/07/21	5	0	MYCAS/MBR/1487/07/21	11	0
MYCAS/MBR/1487/07/21	6	0			

RECORD OF REVISIONS

Rev	Affected Page (s)	Date	Description of Revision
0	All	17/07/2021	Initial Issue (Creation of report)



MASS AND BALANCE REPORT

GENERAL DATA / INFORMATION

Reference	: MYCAS/MBR/1487/07/21 Rev 0
Produced By	: Mycopter Aviation Services Sdn. Bhd.
Aircraft Designation	: Airbus Helicopter EC120B
Registration Number	: 9M- HFA
Aircraft Manufacturer	: Airbus Helicopter
Aircraft Serial Number	: 1487
Aircraft Operator	: Helang Flying Academy
CAAM CAMO Approval Number	: CAMO/2016/03
Mass Limitation-maximum authorised weight in flight <i>Ref: Flight Manual EC120B , Rev 7 pg 2-2</i>	: 1715 kg
Mass Limitation-minimum authorised weight in flight <i>Ref: Flight Manual EC120B , Rev 7 pg 2-2</i>	: 1035 kg

Centre of Gravity Limits

For Longitudinal Forward and Aft CG Limit at various gross weight, refer CAAM approved flight manual Section 2.2 (Weight and Balance Limitation)

Lateral Left Hand Limit: 0.09 m

Lateral Right Hand Limit: 0.08 m

Ref: Flight Manual EC120B , Rev 12 pg 2-3

Datum Reference

Longitudinal datum is located 4.00 m, forward of main rotor head centre line

Lateral datum is the aircraft symmetry plane.

Ref: Flight Manual EC120B , Rev 7 pg 2-2

Note

The Mass and Balance Report Ref: MYCAS/MBR/1487/07/21 supersedes all the previous report.

Note

It is the requirement that the Commander of the aircraft is to satisfy himself the load is of such mass and is so distributed and secured, that it may be safely carried in the intended flight.

Note

For the purpose of this report mass is equal to weight



MASS AND BALANCE REPORT

Part A – Empty Mass

The aircraft was weighed on (date)	17/07/2021	
Empty Mass	1150.20 kg	
C.G of the aircraft in the same condition at this weight is	Longitudinal	4.220 m
	Lateral	-0.0077 m
Total moment about the datum in this condition is	Longitudinal	4853.272 kg.m
	Lateral	-8.836 kg.m

The Empty Mass includes the weight of total quantity of unusable fuel, oil and fluids in normal condition and the list of equipment as specified in the Basic Equipment List

Declaration

1. Aircraft 9M-HFA is reweighed due to the schedule of weighing for every 4 years and for application of COA renewal to comply with Malaysia Civil Aviation Regulation (MCA 2016) Regulation 43 together with Notice and the CAD of Mass and Balance Programme. This Report consist of mass control calculation to determine Empty Mass and the C.G location from datum.

2. Aircraft was weighed at Mycopter Hangar, Subang Airport on 17/07/2021 as a weighing configuration of 5 seaters including flight crew. The aircraft was clean and weighing activity was done in calm weather where there is no rainy and windy condition. Fuel inside of the aircraft is totally drained. All weighing procedure is conducted as per AMM 08-00-00,6-2 Rev 6 Dated:13/04/2020

3. The weighing platform is rotated for the second weighing.

4. Basic Equipment list (**Ref: MYCAS/MBR/BEL/1487/7/21**), provide basis of the equipment installed on aircraft and cross checked before weighing activity. This activity is assisted by CAAM LAE Mr Ariff bin Saidi rated EC120B.

5. Weighing platform (Model: OP-902) is in good condition. Certificate of calibration of the weighing platform is due on 13/07/2022.

6. The aircraft was weight together with the skid. Landing gear position for this mass control calculation would not have any effect.

7. Definition of BEW, DOW and Total Loaded Weight for the Mass and Balance Report.

a. Empty Mass (EM)

Empty Mass includes the weight of structure, power plant, furnishing, system and other items of equipment that are considered an integral part of the

configuration as per Equipment Checklist together with total quantity of unusable fuel, oil and fluids in the normal condition.

b. Dry Operating Mass (DOM)

DOM is not shown in this report. DOM is the EM plus the Variable Load. Variable load includes the items that are necessary for a particular operation, and are not included in the EM

Note: Refer Mass and Centre of Gravity Schedule Document No **MYCAS/MBS/1487/07/21** for the Variable Load information.

c. Total Loaded Mass

Total Loaded Mass = DOM+ Variable Load + Disposable Load (as carried for the particular role of the aircraft for the intended flight)

Note: Refer Mass and Centre of Gravity Schedule Document No **MYCAS/MBS/1487/07/21** for the Disposable Load information.

8. Final reading is taken when:

- I. The aircraft is level longitudinal and lateral
- II. The rotor blade is at the correct position where 1 blade will be parallel with the tail boom axis.
- III. All aircraft doors are closed.

9. Aircraft condition during weighing

- a. Fuel is totally drained
- b. All fluid for the aircraft system services as for flight operating condition
- c. Aircraft Documents are on board.

CAMO/Operator Declaration

1. Galaxy Aerospace has confirmed items listed in the Basic Equipment list as per **MYCAS/MBR/BEL/1487/7/21**
2. Galaxy Aerospace has confirmed the weight mentioned for items to be added and items to be subtracted are correct.
3. CAMO of this aircraft is responsible to record the latest data of this Empty Mass and CG accordingly as per CAAM requirement



MASS AND BALANCE REPORT

Mass Control Calculation

First Weighing (All units in kg)

Jack Point		Platform Reading	Calibration	Actual Mass
LH FWD	(2305) Red	374	0	374
RH FWD	(2306) Yellow	357	+1	358
AFT	(2304) Blue	392	0	392

Second Weighing (All units in kg)

Jack Point		Platform Reading	Calibration	Actual Mass
LH FWD	(2304) Blue	379	0	379
RH FWD	(2305) Red	348	0	348
AFT	(2306) Yellow	396	+1	397

Average Aircraft Mass (All units in kg and m)

Ref: Flight Manual EC120B Rev12, pg 6-20
 Flight Manual EC120B Rev7, pg 2-2

All station arms measured from datum, 4.00m forward of the main rotor centreline.
 Distance from datum point to forward jack point is 3.048m. (0.376m LH & RH).
 Distance from datum point to aft jack point is 6.148m. (BL 0)
 In lateral calculation: Left is negative (-) and Right is positive (+).
 Weight of fuel: 1 litre @ 0.795kg.

Jack Point	Average Mass (kg)	Arm (m)		Moment (kg.m)	
		Long	Lat	Long	Lat
LH FWD	376.50	3.048	-0.376	1147.572	-141.564
RH FWD	353.00	3.048	0.376	1075.944	132.728
AFT	394.50	6.148	0.000	2425.386	0.000
TOTAL	1124.00	4.136	-0.0079	4648.902	-8.836



MASS AND BALANCE REPORT

Appendix A – Add the following item

Item	Description	Mass (kg)	Arm (m)		Moment (kg.m)	
			Long	Lat	Long	Lat
1	Ballast plate on the fenestron QTY 6 (2.1kg ea) Ref: AMM 08-00-00,6-2 Rev 6	12.60	10.21	0.000	128.646	0.000
2	Ballast plate under the battery QTY 4 (2.5kg ea) Ref: AMM 08-00-00,6-2 Rev 6	10.00	6.100	0.000	61.000	0.000
3	Unusable fuel (Ref: TCDS and Flight Manual Rev5 pg 6-8)	3.60	4.09	0.000	14.724	0.000
TOTAL		26.20	7.800	0.000	204.370	0.000

Appendix B – Subtract the following item

Item	Description	Mass (kg)	Arm (m)		Moment (kg.m)	
			Long	Lat	Long	Lat
-	-	-	-	-	-	-
TOTAL		-	-	-	-	-

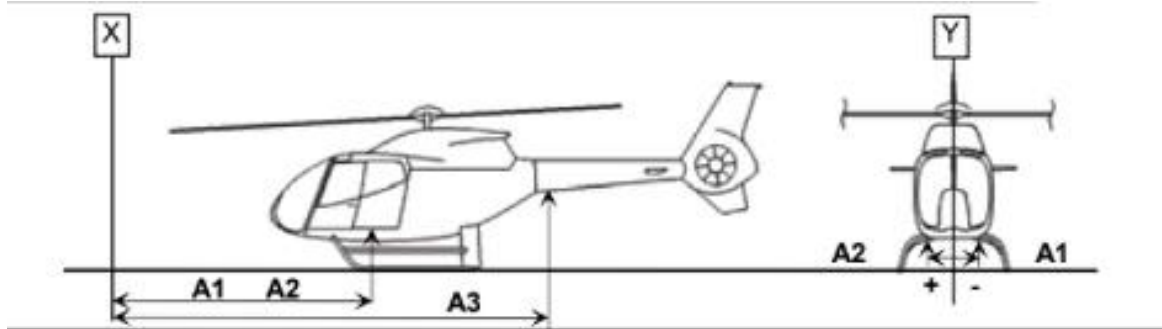
Corrected CG location with respect to datum line

Item Added and Subtracted	Mass (kg)	Arm (m)		Moment (kg.m)	
		Long	Lat	Long	Lat
Average Aircraft Mass	1124.00	4.136	-0.0079	4648.902	-8.836
Plus – Appendix A	26.20	7.800	0.00	204.370	0.00
Minus – Appendix B	-	-	-	-	-
Corrected Empty Mass (EM)	1150.20	4.220	-0.0077	4853.272	-8.836

Basic Aircraft Weighing Dimension

Ref: Flight Manual EC120B Rev12, pg 6-20

Flight Manual EC120B Rev7, pg 2-2



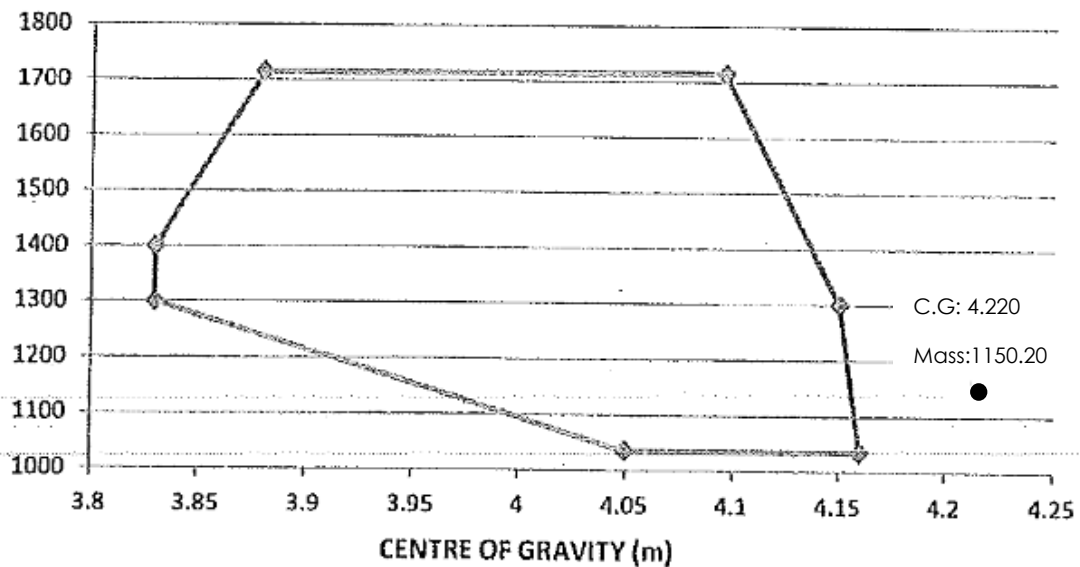
A1=A2=3.048 m

A1= -0.376 m

A3=6.148 m

A2= 0.376 m

WEIGHT (kg)





MASS AND BALANCE REPORT

Basic Equipment List

(Document Ref No:
MYCAS/MBR/BEL/1487/7/21)

Ref: Flight Manual EC120B Rev12, pg 6-21

Flight Manual EC120B Rev14, pg 6-15, 6-16, 6-17

Legend

Availability	To be ensured by Type-rated LAE. Identify as follows: /= Available 0= Not Available
Non Basic Equipment	All item to be basic equipment unless those specified by #
Verified	Verification of Equipment availability by Weighing Engineer

ITEM	DESCRIPTION	QTY	AVAILABILITY	NON BASIC EQUIPT	VERIFIED
A. BASIC AIRCRAFT					
1.	3 MAIN BLADES	1	/		/
2.	BASIC PAINT	1	/		/
3.	OIL	1	/		/
4.	UNUSEABLE FUEL	1	0		/
B. FURNISHINGS					
5.	AIRCRAFT TOOL KIT	1	/		/
6.	FIRST AID KIT	1	/		/
7.	FLIGHT MANUAL	1	/		/
8.	FIRE EXTINGUISHER	1	/		/
C. INSTRUMENTS					
9.	AIRSPPEED INDICATOR	1	/		/
10.	ALTIMETER	1	/		/
11.	STANBY MAGNETIC COMPASS	1	/		/
12.	STANBY HORIZON	1	/		/
13.	VEMD	1	/		/
14.	NR/NF DUAL TACHOMETER INDICATOR	1	/		/
15.	CENTRAL WARNING PANEL	1	/		/
16.	CHRONOMETER (HeliDax Mod.ref.10027227 Rev.2)	1	/		/
D. AVIONICS					

MYCAS/MBR/1487/07/21
REVISION 0



MASS AND BALANCE REPORT

17.	ICS GARMIN GMA 340	1	/		/
18.	VHF 1/VOR/ILS/GPS GARMIN GNS 430 (Babcock Mod ref 385SB-2)	1	/		/
19.	TRANSPONDER GARMIN GTX 330 (Babcock Mod ref 385SB-2)	1	/		/
20.	DME BENDIX KING KN 63 (Babcock Mod ref 385SB-2)	1	/		/
21.	VHF 2 , 8.33KHz ROCKWELL COLLINS VHF-4000 (Babcock Mod ref 386SB-2 Rev 6)	1	/		/
22.	ADF BENDIX KING KR 87 (HeliDax Mod.ref.10027255 Rev.1)	1	/		/
23.	RADIO ALTIMETER KRA 405B (HeliDax Mod.ref.10027255 Rev.1)	1	/		/
24.	INTEGRATED COCKPIT DISPLAY SYSTEM SAGEM ICDS-8A (EASA STC ref.EASA.IM.R.S.01527 Rev. 3)	2	/		/
25.	UMS BRITE SAVER 2 (EASA STC ref.EASA.R.S.01417 Rev. 4)	1	/		/
26.	AVIONICS MASTER SWITCH & EMERGENCY SWITCH (Babcock Mod ref SB 3948B-1)	1	/		/
27.	ELT KANNAD	1	/		/
E. INTERNAL CABIN LAYOUT					
28.	CABIN TRIMMING	1	0	/	/
29.	CABIN CARPET	1	/		/
F. OPTIONAL EQUIPMENT					
30.	TWO AXIS AUTOPILOT SYSTEM SAGEM PA85 (EASA STC ref.EASA.IM.R.S.01056 Rev 4)	1	/		/
31.	EXTENDED CENTER CONSOLE (Aerotec Mod ref. SB AE17034SB Rev 2)	1	/		/
32.	CABIN HEATING SYSTEM	1	/		/
33.	SWIVELING LANDING LIGHTS	1	0	/	/
34.	WIRE STRIPE PROTECTION SYSTEM	1	0	/	/

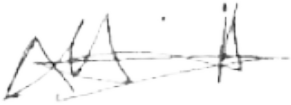


MASS AND BALANCE REPORT

35.	WINDSHIELD WIPERS	1	/		/
36.	SAND FILTERS (RP)	1	0	/	/
37.	DUAL FLIGHT CONTROLS (RP)	1	/		/
38.	GROUND POWER RECEPTACLE	1	/		/
39.	2 ND BATTERY	1	0	/	/
40.	STOWING INSTALLATION	1	0		/
41.	SLIDING DOOR (LH)	1	/		/
42.	AIR CONDITIONING SYSTEM	1	/		/
43.	EMERGENCY FLOATATION GEAR (FP)	1	/		/
44.	EMERGENCY FLOATATION GEAT (RP)	1	0	/	/
45.	CARGO SLING (FP)	1	0	/	/
46.	CARGO SLING (RP)	1	0	/	/
47.	EXTERNAL ELECTRIC MIRROR (RP)	1	0	/	/
48.	SHORT PROTECTIVE SKID SHOES	1	0	/	/
49.	LONG PROTECTIVE SKID SHOES	1	/		/
50.	SKIIS (RP)	1	0	/	/
51.	ENGINE WASHING INSTALLATION	1	0	/	/
52.	FUEL FLOW METER	1	/		/
G. BALLAST					
53.	BALLAST PLATES IN FENESTRON (FP)	3	/		/
54.	BALLAST PLATES IN FENESTRON (RP)	6	0		/
	<i>Remark: These item is part of Empty mass. During weighing. 6 ballast plates need to be removed as required by AMM 08-00-00,6-2. List of items to be added for these plates must be listed</i>				
55.	BALLAST PLATES UNDER THE BATTERY (RP)	4	0		/
	<i>Remark: These item is part of Empty mass. During weighing. 4 ballast plates need to be removed as required by AMM 08-00-00,6-2. List of items to be added for these plates must be listed</i>				



MASS AND BALANCE REPORT

Licenced Aircraft Engineer	Weighing Engineer
Name: Ariff bin Saidi	Name: Syed Ansar Mohamed Kalik
Date: 17/07/2021	Date: 17/07/2021
Signature: 	Signature: 