

AIRCRAFT WEIGHT & BALANCE

AIRCRAFT WEIGHT AND C.G DETERMINATION

REPORT NO : 02/WB/IX/2020
DATE : 10 SEPTEMBER 2020

AIRCRAFT REGISTRATION : PK-SNX
AIRCRAFT TYPE : EC 130 T2
AIRCRAFT SERIAL NUMBER : 8829
PROPERTY OF : PT. SMART CAKRWALA AVIATION
PLACE OF WEIGHING : N/A
REASON OF WEIGHING : RECALCULATION FOR CARGO CONFIGURATION
CONFIGURATION : **CARGO**
PERFORMED BY : YANUAR ABDUL FATAH
SIGNED:  DATE: 10/09/2020
CHECKED BY : ANDREAS HERYANSYAH
SIGNED: DATE: 10/09/2020

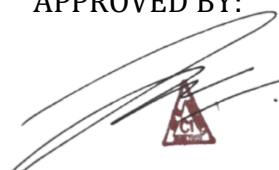
RESULTS

EMPTY WEIGHT	: 1506.76 KG
CG ARM LONGITUDINAL	: 3.753 M
CG ARM LATERAL	: 0.011 M
VALID UNTIL	: 25 MARCH 2025

WEIGHING EQUIPMENT

PART NUMBER	: N/A
SERIAL NUMBER	: N/A
VALIDATION	: N/A

APPROVED BY:


YANUAR ABDUL FATAH
CHIEF INSPECTOR

SECTION 1 – WEIGHT AND CENTRE OF GRAVITY SCHEDULE

Aircraft designation	: EC130 T2
Nationality	: INDONESIA
Registration number	: PK-SNX
Aircraft manufacturer / constructor	: AIRBUS HELICOPTERS
Aircraft serial number	: 8829
<u>Weight limitations</u> - Maximum authorized weight in flight (Take-off & Landing) : 2500 kg (5512 lb) - Baggage Compartment Load Limitation - RH cargo compartment : 130 kg (287 lb) - LH cargo compartment : 155 kg (342 lb) - Rear cargo compartment : 80 kg (176 lb) - Cabin Compartment Load Limitation - Rear cabin floor : 495 kg (1091 lb) - Forward left cabin floor : 405 kg (893 lb) Note: Refer Airbus Helicopters EC130 T2 Aircraft Flight Manual Issue Dated 13/03/2019 Section 2.2 & 2.5	
CENTRE OF GRAVITY LIMITATIONS For Longitudinal Forward and Aft CG Limit at various gross weight, refer CAAM approved flight manual Sec. 2.2. Lateral Left Hand Limit : 0.1 m Lateral Right Hand Limit : 0.1 m	
DATUM REFERENCE Longitudinal datum is located 3.40 m, of the main rotor head center line. Lateral datum is the aircraft symmetry plane.	

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PART A – BASIC EMPTY WEIGHT

The aircraft was weighed on (date)

: 26 March 2020

The Basic Weight of the aircraft as calculated in Section 2 is

1549.08 Kgs

The C.G of the aircraft in the same condition at this weight is

Longitudinal	3.592 m
Lateral	0.11 m

The total moment about the datum in this condition is

Longitudinal	5564.142 kg.m
Lateral	17.135 kg.m

NOTES

1. This Weight and Balance Report consist of:

Section 1: Weight and Centre of Gravity schedule

Part A Basic Empty Weight (BEW)

Part B Variable Load

Part C Loading Information (Disposable Load)

Section 2: Weighing Record

Section 3: Basic Equipment List

Section 4: Aircraft Basic Weight and Balance Record

2. Aircraft was previously weighed in production (factory) by Airbus Helicopters on 23 Jan 2020 during official delivery without paint (Section 4 is referred)
3. Aircraft was then weighed on 26 March 2020 by Airbus Helicopters Malaysia in Subang due to aircraft livery painting.
4. Aircraft is operating with 7 seats configuration operate by Pilot and co-pilot (2 dual controls) with 5 passengers' on-board (1 in the front and 4 in the rear).
5. Airbus Helicopters EC130 T2 Aircraft Flight Manual Issue Dated 13/03/2019 (Section 6 – Weight & Balance) and EC130 T2 Aircraft Maintenance Manual Rev 15 Dated 09/09/2019 are used as a reference.
6. AHM Aircraft Equipment Check List for EC130 T2 provide basis of the equipment installed on aircraft and aircraft loose equipment list.
7. Loading Chart for EC130 T2 is refer to Airbus Helicopters EC130 T2 Aircraft Flight Manual Issue Dated 13/03/2019 (Section 6.2 Figure 4)
8. The Basic Empty Weight includes the weight of total quantity of unusable fuel, oil & fluids in the normal condition and the list of equipment as specified in Section 3 – Basic Equipment List.
9. Definitions of BEW, DOW and Total Loaded Weight.

a. Basic Empty Weight (BEW)

BEW includes the weight of the structure, power plant, furnishings, system and other items of equipment that are considered an integral part of the aircraft configuration.

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It includes aircraft system fully serviced as for normal flight condition (such as engine oil and toilet fluid) except fuel. Only unusable fuel is included in the BEW.

b. Dry Operating Weight (DOW)

DOW is not shown in this report. DOW is the BEW plus the Variable Load (BEW + Variable Load). Variable Load includes the items that are necessary for a particular operation, and are not included in the BEW.

Note: Refer W&B Report WR/8829/20/05 Rev 0 dated 26 March 2020 for the latest Variable Load

c. Total Loaded Weight = DOW + Fuel + Disposable Load (as carried for the particular role of the aircraft for the intended flight).

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PART B – VARIABLE LOAD

The Weights, Lever Arms (Measured Forward or Aft of the Datum Defined in Part A) of the Variable Load, which includes the weight of crew and those items of equipment including usable fluids other than fuel, which do not form part of the Basic Equipment are shown below. The Variable Load depends upon the equipment carried for the particular role.

I. Variable Load

Item	Description	Weight kg	Longitudinal		Lateral	
			Arm m	Moment kg.m	Arm m	Moment kg.m
1	PILOT	ACTUAL	1.54		-0.60	
2	CO-PILOT	ACTUAL	1.54		0.02	
TOTAL						

II. Dry Operating Load

Item	Description	Weight kg	Longitudinal		Lateral	
			Arm m	Moment kg.m	Arm m	Moment kg.m
1	BASIC EMPTY WEIGHT (BEW)	1549.08	3.592	5564.142	0.011	17.135
2	VARIABLE LOAD (I)					
TOTAL						

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PART C – LOADING INFORMATION (DISPOSABLE LOAD)

Information below is given to enable Disposable Load (Fuel and Pay-Load) to be distributed so that the Maximum Weight and Centre of Gravity Limitations given in the Flight Manual are NOT exceeded. To obtain the total loaded weight of aircraft, add to the basic weight, the weights of the items of variable and disposable load to be carried for the particular role.

Description	Weight (kg)	Arm (m)	Moment (kg.m)
Dry Operating Weight (DOW)			
Payload (Table I)			
Zero Fuel Weight (ZFW)			

Description	Weight (kg)	Arm (m)	Moment (kg.m)
Zero Fuel Weight (ZFW)			
Fuel (Refer to EC130 T2 AFM)			
Total Loaded Weight			

Table 1 - The appropriate Lever Arms of the Disposable Loads are :

Item	Miscellaneous Loading Data	Max. weight (kg)	Arm (m)	
			Long.	Lateral
1	<u>FUEL IN TANKS</u> Maximum Total Usable Capacity of fuel tanks is 540 ltrs. Weight of this quantity of fuel at 0.79kg / litre is 427kg.	-	3.475	0.00
2	<u>PASSENGER SEATING – 7 SEAT CONFIGURATIONS</u> 1. One place passenger seat – RH Front 2. One place passenger seat – LH Rear Outboard 3. One place passenger seat – LH Rear Inboard 4. One place passenger seat – RH Rear Inboard 5. One place passenger seat – RH Rear Outboard	- - - - -	1.54 2.42 2.42 2.42 2.42	0.60 -0.735 -0.245 0.245 0.735
3	<u>CABIN FLOOR LOADING</u>			
A	On right hand forward cabin floor Maximum distributed load (Co-pilot and passenger seats removed)	405.0	1.55	0.60
B	On rear cabin floor Maximum distributed load (passenger seats all removed)	495.0	2.25	0.00
4	<u>BAGGAGE COMPARTMENT LOADING</u>			
A	Left hand cargo compartment Maximum Load	155.0	3.20	-0.60

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B	Right hand cargo compartment	Maximum Load	130.0	3.20	0.60
C	Rear cargo compartment	Maximum Load	80.0	4.60	0.00

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SECTION 2 – WEIGHING RECORD

Location	: Airbus Helicopters Malaysia, Subang
Equipment	: JACKSON AIRCRAFT WEIGHING SCALE – Electronic Weighing Kit (3 load cells)
Model / Part number	: M2000-3-10RDC
Serial number	: 15-10729
Calibration due date	: 14 May 2020
MEASUREMENT (See Basic Aircraft Weighing Dimensions) All station arms measured from datum, 3.40m forward of the main rotor centre line. Distance from datum point to forward jack point is 1.302m. (0.460m LH & RH) Distance from datum point to aft jack point is 5.067m. (BL 0) In lateral calculations: Left is negative (-), Right is positive (+). Weight of fuel: 1litre @ 0.79 kg	

A. 7 SEATS CONFIGURATION (ALL UNITS IN KG)

FIRST WEIGHING

JACK POINT		CELL READING	ZERO RTN.	CALIBRATION	ACTUAL WEIGHT
LHD	FWD	285.5	0.0	0.0	285.5
RHD	FWD	319.5	0.0	0.0	319.5
	AFT	942.0	0.0	0.0	942.0
				TOTAL	1547.0

SECOND WEIGHING

JACK POINT		CELL READING	ZERO RTN.	CALIBRATION	ACTUAL WEIGHT
LHD	FWD	283.5	0.0	0.0	283.5
RHD	FWD	324.0	0.0	0.0	324.0
	AFT	940.5	0.0	0.0	940.5
				TOTAL	1548.0

DIFFERENCE BETWEEN WEIGHING
(Expressed in Percentage of 1st Weighing)

0.06%
(Tolerance To be within 1%)

AVERAGE AIRCRAFT WEIGHT

JACK POINT		AVERAGE CELL READING (kg)	ARM (m)		MOMENT (kg.m)	
			LONG.	LAT.	LONG.	LAT.
LHD	FWD	284.5	1.302	-0.46	370.419	-130.87
RHD	FWD	321.75	1.302	0.46	418.919	148.005
	AFT	941.25	5.067	0	4769.314	0
TOTAL		1547.5	3.592	0.011	5558.651	17.135

AVERAGE AIRCRAFT WEIGHT

JACK POINT		AVERAGE CELL READING (kg)	ARM (m)		MOMENT (kg.m)	
			LONG.	LAT.	LONG.	LAT.
LHD	FWD	303.00	1.302	-0.46	394.506	-139.38
RHD	FWD	318.25	1.302	0.46	414.362	146.395
	AFT	943.50	5.067	0.00	4780.715	0.00
TOTAL		1564.75	3.592	0.004	5589.582	7.015

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APPENDIX A – ADD THE FOLLOWING ITEM

ITEM	DESCRIPTION OF ITEM	WEIGHT (KG)	ARM (m)		MOMENT	
			LONG.	LAT.	LONG.	LAT.
1	UNUSEABLE FUEL	1.58	3.475	0.000	5.491	0.000
2						
	TOTAL	1.58	3.475	0.000	5.491	0.000

APPENDIX B – SUBSTRACT THE FOLLOWING ITEM

ITEM	DESCRIPTION OF ITEM	WEIGHT (KG)	ARM (m)		MOMENT	
			LONG.	LAT.	LONG.	LAT.
1	PAX SEAT-LH REAR OUTBOARD	10.58	2.42	-0.735	25.603	-7.776
2	PAX SEAT-LH REAR INBOARD	10.58	2.42	-0.245	25.603	-2.592
3	PAX SEAT-RH REAR INBOARD	10.58	2.42	0.245	25.603	2.592
4	PAX SEAT-RH REAR OUTBOARD	10.58	2.42	0.735	25.603	7.776
	TOTAL	42.32	2.419	0	102.412	0

CORRECTED CG LOCATION WITH RESPECT TO

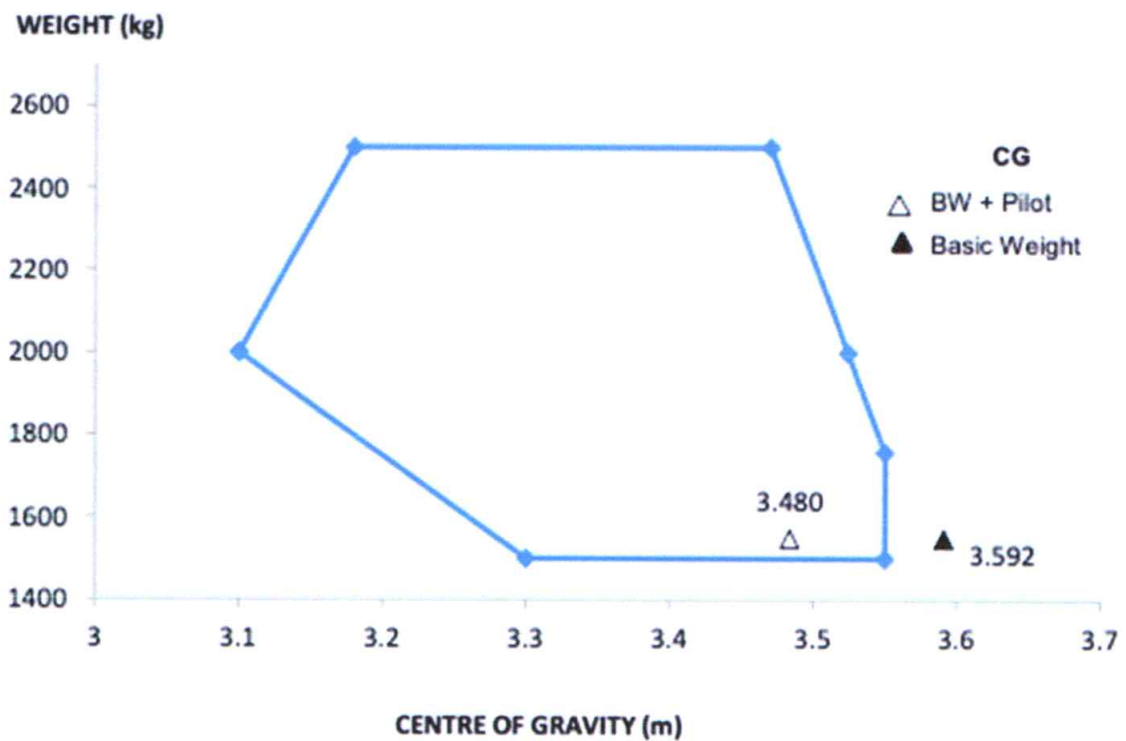
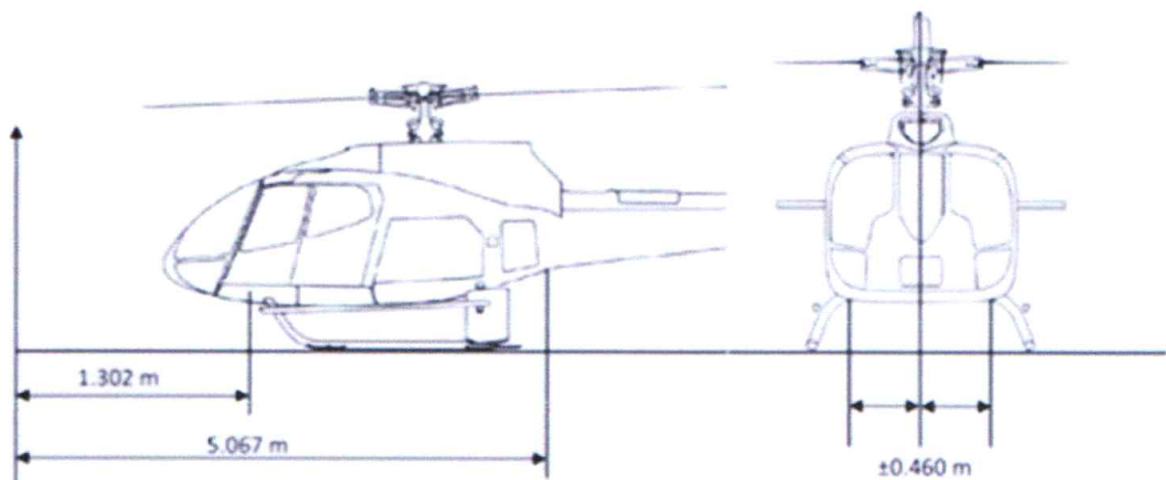
ITEM ADDED AND SUBTRACTED	WEIGHT (KG)	ARM (m)		MOMENT	
		LONG.	LAT.	LONG.	LAT.
AIRCRAFT BASIC	1547.5	3.592	0.011	5558.651	17.135
WEIGHT PLUS – APPENDIX A	1.58	3.475	0.000	5.491	0.000
SUB TOTAL	1549.08	3.584	0.011	5553.16	17.135
MINUS – APPENDIX B	42.32	2.419	0	102.412	0
CORRECTED BASIC WEIGHT (BASIC EMPTY WEIGHT)	1506.76	3.753	0.011	5655.572	17.135

REMARKS:

Reason for Recalculation	: 4 pax rear seat removal
Configuration	: Cargo Configuration

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BASIC AIRCRAFT WEIGHING DIMENSIONS



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SECTION 3 – BASIC EQUIPMENT LIST

ITEM	DESCRIPTION	QTY
1	MAIN BLADES	3
2	7 SEATS (PILOT, CO-PILOT & PAX)	7
3	MAIN BATTERY	1
4	BACKSEAT SEAT AND BACK (FOAMS)	1
5	DUAL CONTROLS	1
6	G500H	1
7	ALTITUDE ENCODER - TRANSCAL SSD120	1
8	EMERGENCY LOCATOR TRANSMITTER - INTEGRA (MP)	1
9	GYRO-HORIZON H321EGM	1
10	GYRO-COMPASS KCS55A + HIS KI525	1
11	ICS - GMA35H	1
12	TRANSPONDER GTX 33H	1
13	VHF/VOR/LOC/GS - GNC255	1
14	VHF/VOR/LOC/GS/GPS - GTN750H	1
15	ENHANCED EXTERIOR PAINTING	1
16	CUSTOMIZED EXTERIOR PAINTING	1
17	EXTERIOR PAINTING MODIFICATIONS	1
18	FIRST AID KIT	1
19	ENGINE FLUSHING DEVICE WITHOUT REMOVAL OF COWLINGS	1
20	TINTED WINDOWS FOR FRONT WINDSCREENS	1
21	SUN PROTECTED UPPER WINDOWS	1
22	SLIDING WINDOW ON RH FRONT DOOR	1
23	ENHANCED AIR CONDITIONING SYSTEM	1
24	CARGO SLING (1500kg) - FIXED PARTS	1
25	CARGO SLING (1500kg) - REMOVABLE PARTS	0
26	EMERGENCY FLOATATION GEAR - FIXED PARTS	1
27	EMERGENCY FLOATATION GEAR - REMOVABLE PARTS	0
28	BOSE HEADSET	7



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SECTION 4 – AIRCRAFT BASIC WEIGHT & BALANCE RECORD

(CONTINUOUS HISTORY OF CHANGE IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT & BALANCE)

A/C TYPE	EC 130 T2	SERIAL NUMBER				8829			REGISTRATION		PK-SNX
DATE	DESCRIPTION OF ARTICLE OR MODIFICATION		ADDED (+)			REMOVED (-)			RUNNING TOTAL BASIC AIRCRAFT		
			WEIGHT KG	ARM M	MOMENT KG.M	WEIGHT KG	ARM M	MOMENT KG.M	WEIGHT KG	ARM M	WEIGHT KG
15 Jan 20	<u>BASIC WEIGHT</u> Without paint (factory)	LONGITUDINAL	-	-	-	-	-	-	1562.3	3.570	5578
		LATERAL	-	-	-	-	-	-	1562.3	-0.017	-24
26 Mar 20	<u>BASIC WEIGHT</u> Aircraft Weighed due to livery painting.	LONGITUDINAL	-	-	-	-	-	-	1549.08	3.592	5564.142
		LATERAL	-	-	-	-	-	-	1549.08	0.011	17.135
10 Sept 20	<u>BASIC WEIGHT</u> Cargo Configuration	LONGITUDINAL	-	-	-	42.32	2.419	102.412	1506.76	3.624	5461.77
		LATERAL	-	-	-	42.32	0	0	1506.76	0.011	17.135
		LONGITUDINAL									
		LATERAL									