EUROPEAN AVIATION SAFETY AGENCY

EXPERT DEPARTMENT / CERTIFICATION DIRECTORATE

Operational Evaluation Board Report

Final Report dated : 16 05 2012

Manufacturer: EUROCOPTER

EC 120B

European Aviation Safety Agency
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EC 120B

Revision Record

Revision No.	Section	Pages No.	Date

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Operational Evaluation Board – OPS / FCL Subgroup

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Eurocopter Experts involved in the process

Name	Position	Office / Branch	Remarks
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Executive Summary

1. Manufacturer Application

Eurocopter Manufacturer has made a formal application to EASA, Certification Directorate to an OEB catch up process for the evaluation of initial and additional Type Ratings of the EC 120B

2. OEB recommendations

The OEB recommends for approval by NAAs

- Update Type Rating List & Licence Endorsement List
- Pilot Initial Type Rating Training minimum syllabus
- Pilot Additional Type Rating Training minimum syllabus
- Specifications for particular emphasis during training

3. Procedures, requirements and associated AMC references

The EASA /OEB Section Rotorcraft Manager “Jean-Marc Sacazes” and Eurocopter Helicopter experts have participated actively to this evaluation *(Refer to the list page 6).*

EASA has conducted this catch up process in accordance with JAR-OPS 3, Part FCL and JAR-FSTDs’ requirements. This evaluation was based on JOEB Handbook and Common procedures Document (CPD) and the processes detailed in the JAA Administrative and Guidance Material, Section One, Part Two, Chapter 5 and Part FCL including associated appendices, AMC and IEM.

Note on references and reference texts:
Where references are made to requirements and where extracts of reference texts are provided, these are at the amendment state at the date of publication of the report. Readers should take note that it is impractical to update these references to take account of subsequent amendments to the source documents.

Jean-Marc SACAZES
EASA – Section Manager Operational Suitability
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Expert department - Certification Directorate

Acronyms

General

AMC	Acceptable Means of Compliance
AOC	Air Operator Certificate
ASU	Ancillary System Unit
ATPL	Airline Transport Pilot Licence
ATO	Approved Training Organisation
ATR	Additional Type Rating
CPD	Common Procedures Document (for FAA-TCCA-FAA)
CPL	Commercial Pilot Licence
CWP	Caution and Warning Panel
DC	Direct Current (electrical)
DECU	Digital Engine Control Unit
DGAC	Direction Générale de l'Aviation Civile (French Civil Aviation Authority)
EASA	European Aviation Safety Agency
EC	Eurocopter
EMB	Electrical Master Box
EPU	External Power Unit
ETS	Eurocopter Training Services
EU-OPS	EU-Commercial Air Transportation (*Aeroplane*)
FADEC	Full Authority Digital Engine Control
FLI	First Limitation Instrument
FTD	Flight Training Device
FNPT	Flight and Navigation and Procedure Trainer
FSTD	Flight Simulation Training Device
FTO	Flight Training Organisation
GPU	Ground Power Unit
HIP	High Increase Power
IEM	Interpretative and Explanatory Material
IFR	Instrument Flight Rules
IR	Instrument Rating
ITR	Initial Type Rating
JAA	Joint Aviation Authorities
JAR-FCL 1	Joint Aviation Requirements Flight Crew Licensing (Aeroplane)
JAR-FCL 2	Joint Aviation Requirements Flight Crew Licensing (Helicopter)
JAR-OPS 3	Joint Aviation Requirements Operations 3 (Commercial Air Transportation-Helicopter)
JOEB	Joint Operational Evaluation Board
MDR	Master Difference Requirements
MEL	Minimum Equipment List
MET	Multi Engine Turbine
MMEL	Master Minimum Equipment List
MP	Multi pilot
NAAs	National Aviation Authorities
N/A	Not Applicable
ODR	Operator Differences Requirements
OEI	One Engine Inoperative
OEB	Operational Evaluation Board

PPL (A)	Private Pilot Licence (Aeroplane)
PPL (H)	Private Pilot Licence (Helicopter)
RFM	Rotorcraft Flight Manual
SCU	System Control Unit
SEP (H)	Single Engine Piston (Helicopter)
SET (H)	Single Engine Turbine (Helicopter)
TRI	Type Rating Instructor
T/R	Tail Rotor
TRTC	Type Rating Training Course
TRTO	Type Rating Training Organisation
VEMD	Vehicle and Engine Multi-functions Display
VNE	Velocity Never Exceed
Vy	Optimum Climbing Speed
VFR	Visual Flight Rules

Helicopter Model designators along historic evolution within EADS group

EC : Eurocopter
AS : Aérospatiale
SA : Sud Aviation
SE : Société Nationale de Constructions Aéronautique du Sud-Est
SO : Société Nationale de Constructions Aéronautique du Sud-Ouest
BO : Messerschmidt-Bölkow-Blohm (MBB)
BK : MBB-Kawasaki

I. Purpose and applicability

Data is being submitted by Eurocopter in support of the EC 120B catch up OEB process.

This report is the result of a catch up process evaluation which has been made by analysis and comparison, based on **Pilot Initial Type Rating Training syllabus for** the EC 120B provided by Eurocopter Training Services and FTOs' already approved by DGAC France and by other NAA's.

This document:

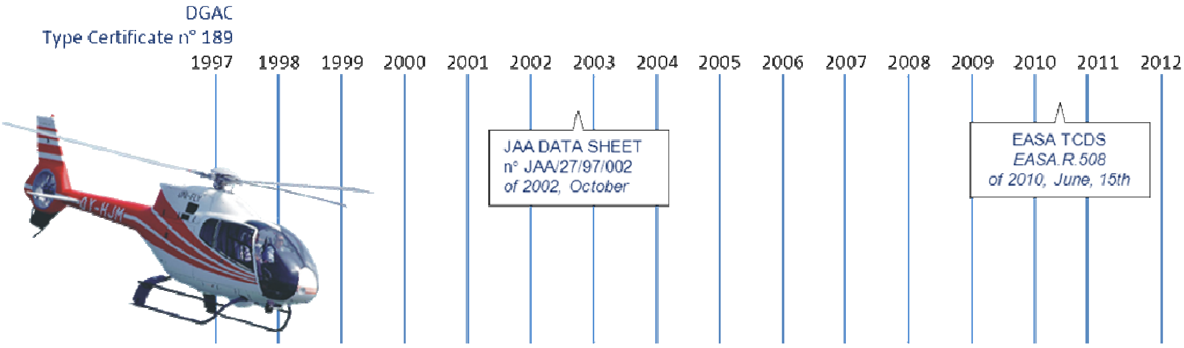
- Provides a general description of the EC 120B
- Updates the Type Rating List and Licence Endorsement List
- Makes recommendations for minimum training syllabus to:
  - initial type rating
  - additional type training
  - Specifications for particular emphasis during training

Note:
The EC 120B is in the Type Certificate Data Sheet delivered by EASA under Type Certificate Data Sheet EASA.R.508, corresponding to JAA DATA SHEET N° JAA/ 27/97/002 (See Appendix 1).

2. General Description of the EC 120 B

EUROCOPTER Manufacturer produces the EC 120 B Single Turbine Engine Helicopter based on JAA Certification Basis: JAR 27 First Issue dated September 06, 1993 in Airworthiness category: Small rotorcraft.

This five seat helicopter is approved for VFR by day and night operation and has been certificated for a minimum crew of one Pilot in right seat or one Pilot in left seat when the removable dual controls are installed on the left side.(*Refer to Rotorcraft Flight Manual*). This aircraft is powered by 1 turbo-shaft engine. Its commercial designation is: “COLIBRI”.

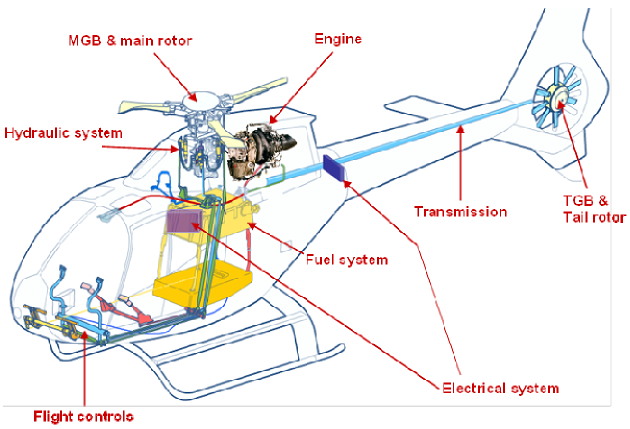


General

Powered by 1 Turboméca ***Arrius 2F*** (*with Engine Torque limit: 322 Kw at MCP / 322 Kw at MTOP), ISA sea level (without Engine Torque limit: 335 Kw at MCP / 376 Kw at MTOP*),

a) The engine governing is insured by a N2 and a N1 hydro-mechanical system,
b) The monitoring is insured with the Vehicle and Engine Multifunction Display (VEMD),
c) Main Rotor Head is a *SPHERIFLEX* 3 blades design, combining simplicity and reliability, with composite blades,
d) Tail Rotor Head is a *FENESTRON* 8 blades design (*0.75 m diameter*), integrated in the vertical fin
e) Standard fuselage:9.60 m (31.50 ft) / 11.52 m (37.79 ft) rotor spinning,

General Description



Structure

- The main structure consists of the central structure, the intermediate structure and the bottom structure
- The canopy absorbs the crash energy upon forward impact.
- The windows: All of the transparent parts include 2 roof windows, 2 windshield panels which form part of the aircraft stressed structure. They are streamlined in shape, 2 bad-weather windows.
- The tail boom is bolted to the intermediate structure and supports the Fenestron and the horizontal stabilizer.
- The horizontal stabilizer is installed through the tail-boom.
- The Fenestron assembly is bolted to the tail-boom.
- The fuselage lower fairings consist of a front lower fairing (*Removable lower centre fairing, with provisions to accommodate the anti-vibrators*), left hand lower fairing and right hand lower fairing.
- The upper cowling consists of a front cowling, a rear cowling & 2 LH and RH inspection doors made up of composite sandwich structure.

Landing Gear

The landing gear unit comprises a forward cross-tube, 2 skids, each one in the continuation of the forward cross-tube, and fixed at their rear on the rear "*reversed V form*" cross tube which is equipped with two fairings to avoid the Dutch-roll effect. The landing gear unit is also equipped with 2 cabin anti-vibrators, secured on the forward cross-tube.

Seating

In basic configuration, the cabin features two single seats forward and an assembly of 3 seats backward

Main Rotor

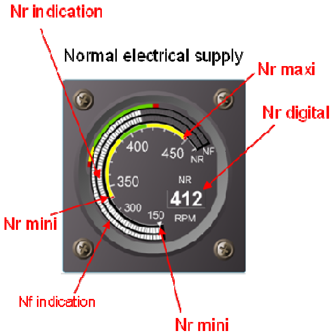
The main bearingless rotor is of SPHERIFLEX type made in titanium and allows the functions to be performed without use of bearing for flapping, lead-lag and pitch.

The blade-sleeve assembly pivots about its axis as the spherical thrust bearing is subject to elastic and torsional deformation. The blade-sleeve assembly moves downwards about the laminate Spherical Thrust Bearing, this undergoes elastic deformation. Under the action of the drag forces, the blade-sleeve assembly moves the spherical thrust bearing. The blade oscillations are damped by a Frequency Adapter.

The Main Rotor blades are made of composite material which presents the following advantages: no corrosion, slow and visible damage growth (fail-safe characteristic).The 3 composite blades are spinning clockwise

The NR monitoring

A phonic wheel on the rotor shaft delivers rotor speed data to an electro-magnetic sensor. The signal is used for the detection of MIN and MAX NR values and causes the audible warning (*HORN function operative*). Another signal allows the NR values to be displayed under analogue and digital forms.



On the NR/Nf indicator (*Bargraph*), the NR value is indicated by a graduated quadrant which lights up according to the NR value. An additional digital display indicates the rpm value.
A white triangle reminds the Pilot of the maximum NR value at which he can apply the rotor brake.

Tail Rotor

Tail power transmission

This power transmission system includes a drive shaft in 2 parts which is driven by the Main Gear Box:

- A short forward shaft located above the transmission deck.
- A long rear shaft which passes into the tail-boom. This rear shaft is reversible.

Tail Gear Box

The Tail Gear Box is splash lubricated and is secured to the stator.

The TGB casing is fitted with an electric magnetic plug (*for GB CHIP Caution light*).

The tail rotor

The tail rotor is made up of a fixed section, the stator (TGB support), a dynamic section, the tail rotor hub.

The specific asymmetrical arrangement of the 8 blades and stator optimize the performance and reduce the noise of the tail rotor.

Main Rotor Drive System

Engine-to-MGB-coupling: The Engine-to-MGB-coupling includes a coupling tube and a drive shaft that rotates at 6000 rpm.

Main Gear Box: The MGB is a reduction gear assembly (*tilted 3°forward*) made up of:

- Main reduction gear module, first stage of reduction (*inside the main and lower casing*). It includes also the free-wheel, the output bevel wheel for the hydraulic pack, the tail rotor drive power output and the engine oil cooling system fan.
- Epicyclical reduction gear module: This second stage drives the rotor shaft

MGB lubrication system & monitoring:

The MGB lubrication pump takes oil from the bottom of the casing. A pressure relief valve limits the pump discharge pressure to 8 bars.

Rotor brake

On the overhead panel, the Pilot has a control lever, fitted with a safety trigger, which gradually applies the friction linings on the floating disk driven by the MGB. The rest position of the rotor brake mobile lining is detected by a microswitch.
When the rotor brake is applied, the engine starting cannot be performed.

Flight controls

The cyclic and collective control rods travel on the left side of the aircraft, below the cockpit floor and aft the cabin, to the advantage of the baggage compartment.

The yaw control ensured, from yaw-pedals to TRH, with a flexible ball-type control on the right side of the aircraft, installed below the cockpit floor and inside the tail-boom.

Pilot's and Co-pilot sticks

The Pilot's stick is fitted with adjustable friction device which enables the Pilot to adjust his load on the control: the hydraulic assistance cancels the control loads.
The Pilot's controls are fixed; the Co-pilot's cyclic stick and collective lever are removable.

Engine

The free-wheel turbo-shaft engine type ***Turboméca Arrius 2F*** has 2 modules: the reduction gear module and the gas generator module, which comprises the air inlet, a centrifugal compressor, an annular reverse-flow combustion chamber, a single-stage generator turbine, a counter-rotating single-stage free turbine. The engine drives a generator that supplies the aircraft electrical system. The engine also provides hot P3 bleed air for the heating and demisting systems.

The Engine controls: The engine controls are composed of:

- A twist grip on the collective pitch lever, *used:*
  - *To start up and shut down the engine,*
  - *To select the "idle" and "flight" ratings,*
  - *To perform manual control in emergency mode.*
- A mechanical anticipator to reduce the static droop and the engine governor response time,
- A fuel shut-off control that shuts down the engine by cutting off the fuel supply.

Ignition system

The starting process is initiated by depressing the starting microswitch (*on the twist grip):*. Turning progressively the twist grip to the left, the Pilot begins to accelerate the gas generator, monitoring the increase of TOT and N1.

When engine reaches its self-sustained speed, around 50 % N1, the Pilot can release the sliding pushbutton to stop the starter and igniters. Turning continuously the twist grip to reach the 'Flight" notch, TWT GRIP warning light turns off and the hydro-mechanical governing system takes over control.

A mechanical Collective-to-Governor-Coupling, called "Anticipator", improves the engine response by increasing the NR when the collective pitch increases.

Fuel system

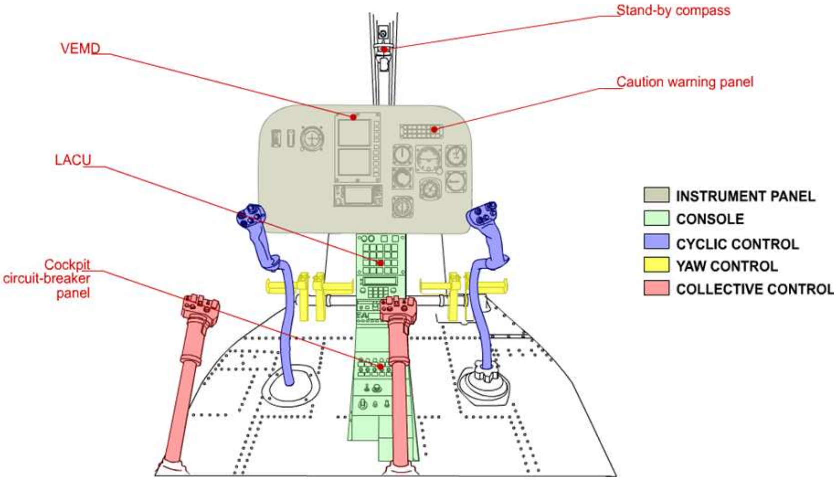
The Fuel system consists of an engine system (*following engine paragraph*) and the aircraft fuel system: Two crashworthy fuel bladders of 410.5 liters (326.3 kg) total capacity, upper bladder 212.5 liters (168.9 kg) and lower bladder 198 liters (157.4 kg). The unusable fuel quantity is 4.5 liters (3.6 kg).

The fuel distribution system includes a starting pump (inside lower tank) stopped in flight, a fuel supply line and a return line, a fuel shut-off valve, a vent system. On the overhead panel, a fuel shut-off lever is held in “valve open” position by means of a snap wire. On the LACU, a “PUMP” pushbutton switches on and off the starting pump with built in green lights.

Fuel level monitoring:

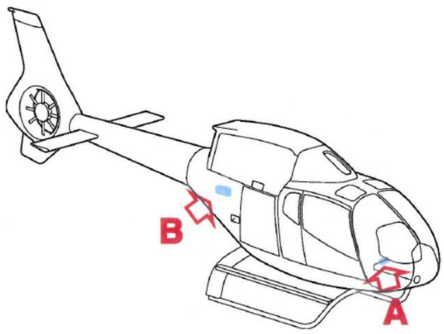
Each bladder tank is fitted with a capacitive gauge. The two level signals are added by the summing cell of the lower gauge, which transmits the total fuel quantity data signal to the VEMD. When only about 38 liters (*approximately 30 kg*) of fuel remains, a low level contact built into the lower gauge illuminates the amber FUEL light on the CWP.

Instrument panel, console and Ancillary system



The Central Computer

The LACU



A – LACU:

Lighting and Ancillary Control Unit, for electrical controls and monitoring units of the main, optional and lighting systems

B – ASU:

The two PCB’s **Ancillary System Unit** (**ASU**) processes all audible warnings, some visual warnings and some specific electric signals.

Hydraulic system

The Hydraulic system comprises the hydraulic compact unit, supported and driven by the MGB, which generates the hydraulic power, pressure and flow-rate, a distribution system which comprises flexible pressure and return hoses, supplying the three servo-controls

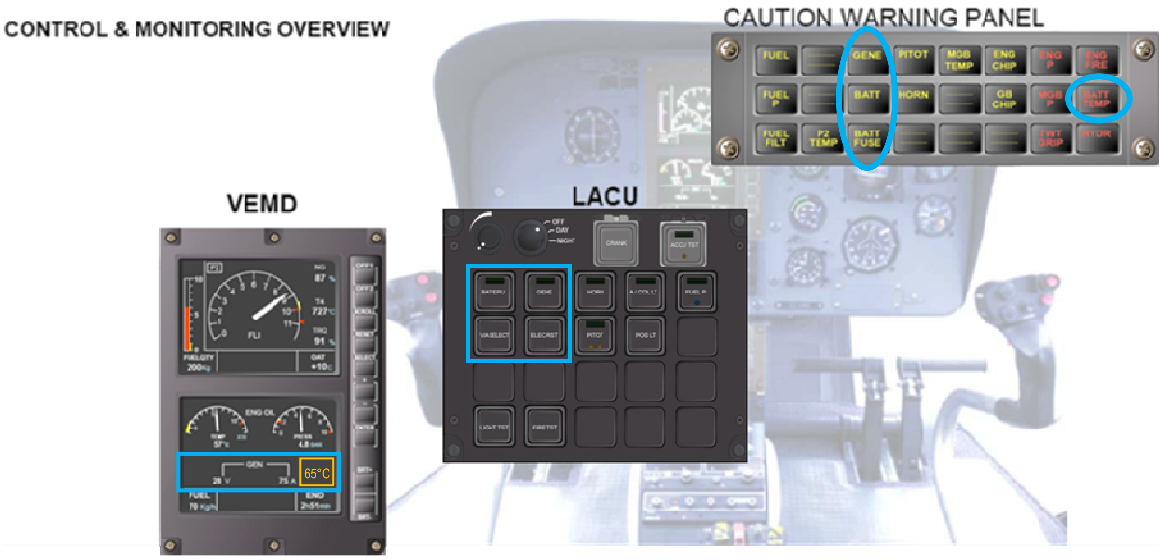
Hydraulic system monitoring

On the Caution & Warning panel

on the LACU

Electrical system

The electrical power network (28 V DC) can be supplied by a starter generator located on the engine accessory gear box, a battery located in the cargo bay at the tailboom-to-fuselage junction frame, an external power unit (*EPU*) plug (*if fitted*) on the right side of the aircraft (*400 A max*).
These power sources are connected to the Electrical Master Box (EMB) located in the RH side of the luggage compartment, which regulates, checks the current and automatically controls its distribution.



When the battery voltage rises above 60°C, an amber square appears on the VEMD with an indication of the temperature value. At 71°C and above, the square turns red and the BATT TEMP light illuminates on the CWP. The **DC distribution system** includes the Electrical Master Box (EMB), a cargo compartment Circuit Breaker Panel, a Cockpit Circuit Breaker panel (CCBP).

Radio-communication and Radio-navigation system

The aircraft is fitted with the intercom system GMA 340H, a VHF-AM/VOR-LOC-GLIDE/GPS GARMIN GNS 430 transceiver system, and a VHF Radio-com & Navigation transceiver system KX 165

Transponder

The EC 120 B is fitted with a GARMIN GTX 327 Transponder.

Emergency Locator Transmitter

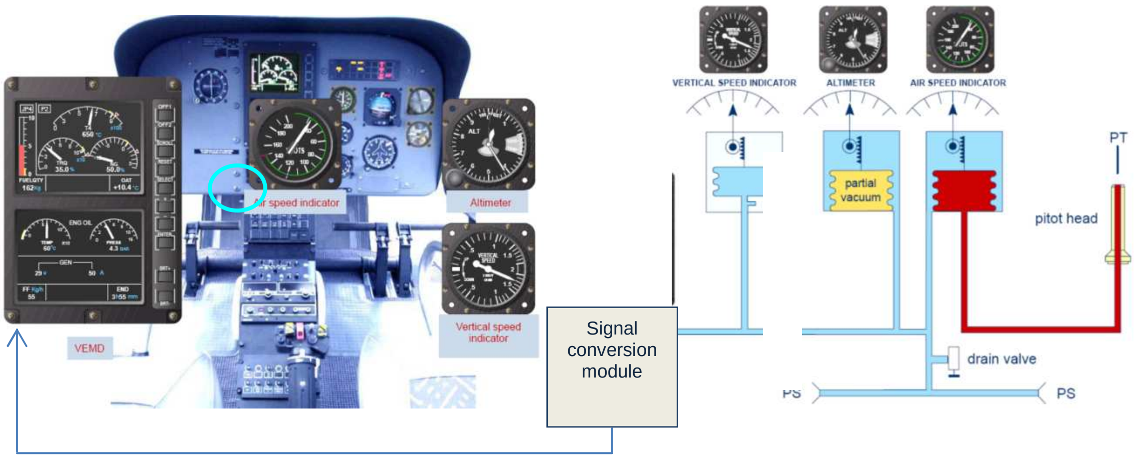
The ELT installed is the model of the choice of the customer. Very often, the ELT KANNAD 406 AF-H is installed on this aircraft.

Air Data System

The air data system has two types of circuit:

- The total pressure circuit connected from the Pitot head to the airspeed indicator,
- The static pressure circuit connected from static pressure ports to the airspeed indicator, the altimeter, the vertical speed indicator and to the VEMD.

The drain valve is located at the lowest point of the static pressure circuit.



An independent system indicates the outside air temperature (OAT) on the VEMD.

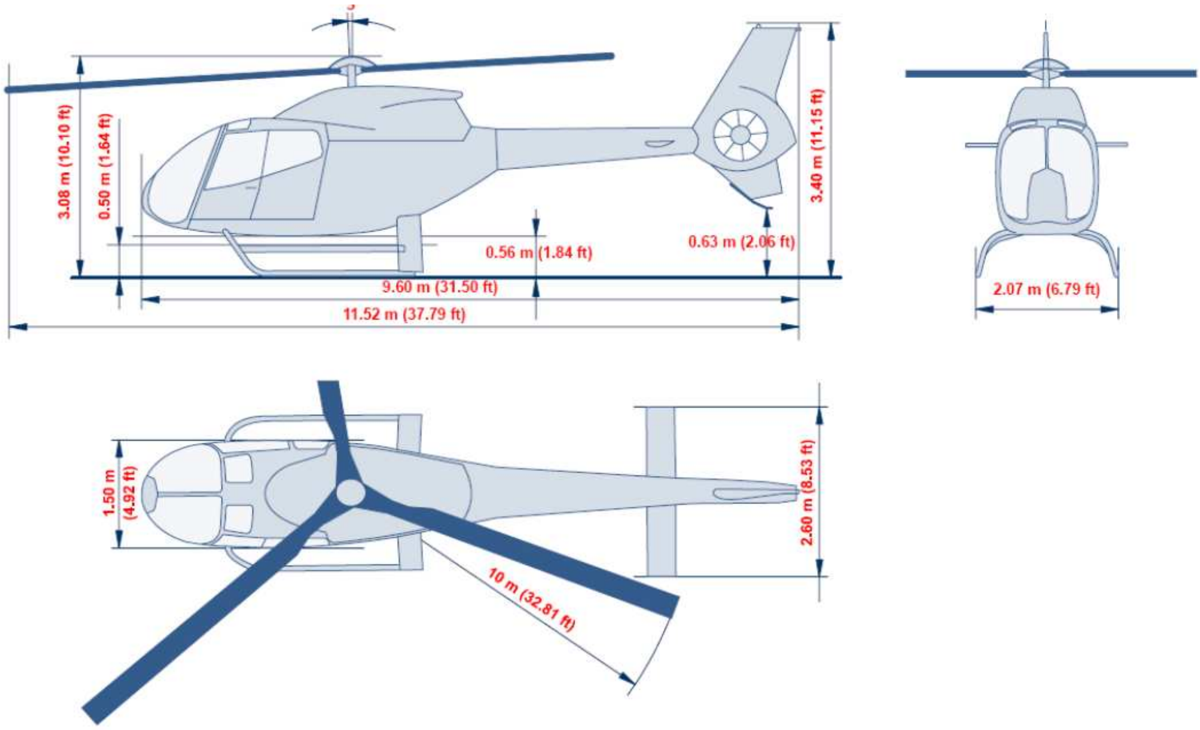
3. Helicopter main characteristics

3.1 Sum up of main characteristics of EC 120B

Dimensions	Fuselage	Length	9.60 m (*31.50 ft*)
		Width	1.50 m (*4.92 ft*)
		Height	3.40 m (*11.15 ft*)
	Main rotor	Diameter	10 m (*32.81 ft*)
	Tail rotor		0.75 m (*2.46 ft*)
Engine			Arrius 2F
Fuel tanks			410,5 l (326.3 Kg) (*in 2 fuel cells*)
Air Speed	Power ON	Absolute VNE	150 kt (*278 km/h*)
	Power OFF		120 kt (*222 km/h*)
Rotor Speed	Power ON		390 to 415 rpm
	Autorotation		340 to 447 rpm
Maximum Operating		Pressure Altitude	20000 ft
MTOW with Internal load			1715 kg
MTOW with External load			1800 kg

Table 1

3.2 External helicopter dimensions



4. Operator Difference Requirement (ODR) Tables

Not Applicable

5. Optional specific equipment

Not Applicable

6. Master Difference Requirement (MDR) Tables

Not Applicable

7. Type Rating List and Licence Endorsement List

7.1 Type Rating List

The proposal of this OEB is to up dated Type Rating List as following:

- Table 9 / Type Rating List (Helicopters)

Manufacturer	Helicopter		Licence endorsement
Eurocopter			
SE Turbine	EC 120 B		EC 120B
	AS 350 (B, D, B1, B2, BA, BB)	(D)	AS 350 / B3 / EC 130 B4
	AS 350 B3		
	AS 350 B3 Arriel 2B1		
	EC 130 B4		

This table 9 matrix contains only Helicopters that have been evaluated through a JOEB, an OEB or a Catch-Up process. Associated reports are published on the EASA –Expert Department / Certification Directorate Website and Pilot Training courses are available from the Manufacturers

7.2 Licence Endorsement List

- Table 18 / Licence Endorsement List – Type Ratings (Helicopters)

The Licence Endorsement List – Type Rating List (Helicopters), table 18 does not content anymore the EC 120B, it has being transferred into Table 9 *(See paragraph 7.1 above).*

8. Specification for Training

8.1 General

The Type Rating Training course proposed by Eurocopter Training Services (ETS) for the EC 120B fulfils the minimum requirements of Part-FCL – Subpart H. (See Appendix 3).

The assessment is based on the Pilot Initial Type and Additional Rating Training syllabus proposed by EurocopterTraining Services approved by DGAC France and on other approved training Syllabus from Other European ATOs already approved by their national Authorities.

OEB recommend that pilot training syllabii are divided into the following phases for approval in Approved Training Organisations, like FTO and TRTO and also for operator specific training, provided the operator specific documentation is used throughout the course.

- Theoretical knowledge instruction and test summary
- Helicopter Flight training courses for Initial and Additional Type Ratings
- Skill test(s) when required
- VEMD Multimedia Based Trainer or equivalent (Aided instruction) when applicable

8.2 Course pre-entry requirements

All students must fulfil the requirements of f Part-FCL – Subpart H : FCL 725 for an initial single-engine, single-Pilot helicopter Type Rating Training course.

8.3 Licensing requirements

All students must fulfil the requirements of Part-FCL – Subpart H for Type Ratings – Knowledge and Flight instruction and Theoretical knowledge instruction requirements for skill test/proficiency checking for type ratings .

The amount of flight instruction will depend on:

- Complexity of the helicopter type, handling characteristics, level of technology,
- Previous experience of the applicant,
- Category of helicopter (*SEP,SET helicopter, MET & MP helicopter*),
- The availability of FSTDs.

8.4 Initial, Additional Type Rating for Single-engine helicopter

The following VFR, Single pilot Type Rating training courses are considered:

Initial Type Rating (ITR)

Candidates for an Initial EC 120 B Type Rating must:

- Hold a valid Pilot license,
- Comply with the requirements set out in Part-FCL – Subpart H.

Additional Type Rating (ATR)

Candidates for an Additional EC 120 B Type Rating must:

- Hold a valid Pilot license,
- Hold a Single Engine Turbine Pilot Type Rating
- Comply with the requirements set out in Part-FCL – Subpart H.

8.5 Initial, Additional Type Rating Minimum Training Syllabus summary

Applying on : **EC 120 B**	**ITR**	**ATR**
Theoretical course program	15h30	13h30
VEMD course *(see note 1)*	03h00	03h00
+ Theoretical exam	1h30	1h30
In-flight training	05h00	03h00
+ Skill test	required	required

8.6 Theoretical knowledge syllabus

Theoretical instruction for both Initial and Additional Type Rating should be provided in accordance with Part-FCL – Subpart H. The following sections present a summary of the material for an Initial Type Rating training program should consider. Whilst based on the ETS program, training providers should ensure their type specific courses cover the pertinent material.

Type Rating theoretical knowledge syllabus	ITR	ATR
1. Turbine engine knowledge course [AMC JAR-FCL 2.470].	02h00	N/A
2. Helicopter structure, transmissions, rotors and equipment, normal and abnormal operation of the systems	07h30	07h30
3. Limitations	01h00	01h00
4. Performance, preparation and flight control	01h30	01h30
5. Weight and Balance, Operation	01h00	01h00
6. Emergency procedures	02h30	02h30
7. Special conditions required for helicopters equipped with electronic flight instrumentation systems or Vehicle & Engine Multifunction Display (VEMD): *(see Note 1)*	03h00	03h00
8. Optional equipment	In addition	In addition
Total Theoretical Knowledge Syllabus (Including Additional VEMD Training)	18h30	16h30
Theoretical exam	01h30	01h30
Total	**20h00**	**18h00**

Note 1:
Not require when a trainee is already qualified on Eurocopter helicopter fitted with VEMD, (e.g. EC 130 B4 or AS 350 B2 & B3). In that case, item 7 disappears.

On completion of the theoretical phase, the trainee is assessed via a multiple-choice questionnaire (*a minimum of 50 questions is recommended*) covering the entire program. To obtain the type rating, the threshold for passing is 75% of correct answers in the written examination on a range of multiple-choice or computerized questions.

8.7 Flight training course summary

For Initial and Additional Type Rating training

Flight Training course	ITR	ATR
1. Pre-flight, cockpit, engine start, Basic air work, General Handling	1h15	1h00
2. Circuits and Various touch-downs	1h15	/
3. Systems and Emergency Procedures,	1h15	1h00
4. Normal and Emergency Procedures / Advanced autorotation.	1h15	1h00
Total Flight Training	**5h00**	**3h00**
Skill Test *(In accordance with Part-FCL - Appendix 9).*	Required	Required

During the flight "1", the Type Rating Instructor will evaluate the trainee level.

The flight training course corresponds to the basic aircraft certification and satisfies the conditions of Part-FCL – Subpart H, taking into account the type of license held and the experience of the candidate.

Each flight session could be extended or reduced by 15 minutes at the discretion of the instructor; but the total time will remain 5h00 for Initial Type Rating and 3h00 for Additional Type Rating as bare minimum.

Additional flight could be necessary at the discretion of the instructor if the trainee has not successfully demonstrated the ability to perform all manoeuvres with a high degree of proficiency.

Depending on the configuration of the helicopter used and on customer's request, additional flights may also be performed to enhance basic initial type rating training (minimum syllabus).

8.8 Training Areas of Specific Emphasis (TASE)

The following procedures for training should receive special attention. This lead to separate but connected issues, Pilot Training methodology and demonstration methodology to Flight Instructors and Type Rating Instructors for the EC 120 B.

OEB supports the manufacturer recommendations and training providers should consider the following elements.

8.8.1 Pilots training methodology:

- **Autorotation / Engine off landing**

Autorotation training shall be performed with a Trainee and an Instructor only.
Autorotation training as mentioned in the RFM shall be conducted within gliding distance of a running landing suitable area.
The engine reduction to idle position shall be completed when the helicopter is in autorotative descent and established on the glide path for the appropriate suitable area:
- Perform first attempt Power on (twist grip on flight position), execute the flare then go around then,
- Perform the autorotation training / Engine off landing (twist grip on idle position).
- Check engine rating.
- Use sufficient anti-torque pedal travel when power is reduced,
- Do not lower the nose too abruptly when power is reduced, to avoid a dive,
- Maintain proper NR during the descent,
- Wait to apply the collective pitch at a correct height to avoid hard landing, loss of heading control, and possible damage to the tail rotor and to the main rotor blade stops,
- Keep in mind that a higher All Up Weight increases the risk of NR overspeed and hard landing.

Note:
If necessary, it is possible to quickly switch back to the flight detent of the twist grip, at any time and for any NR value. However, it is better if the NR value is in the green range.

Pay attention to the following:
- Engine off landing: Collective pitch to be fully lowered ONLY ONCE the aircraft has stopped.
- After the engine off landing, return the twist grip progressively to FLIGHT detent, maintaining Torque below 40%.
- For go-around maneuver, anticipate the decision process

- **Simulated Hydraulic Failure**

- In steady flight conditions, simulate the hydraulic failure by depressing ACCU TST protected push button on the Light and Ancillary Control Unit: HYD + Gong sounds while the student adjusts speed to obtain Vy.
- In "HYD OFF" configuration, control loads increase with speed. As control loads increase, be careful not to inadvertently move twist grip out of FLIGHT detent,
- If necessary during the training exercise, hydraulic assistance can be recovered immediately by setting the ACCU TST protected push button to the UP position or by resetting the hydraulic cut off switch to ON.
- If the ACCU TST protected pushbutton is not reset on the LACU, no hydraulic assistance can be restored.
- Anticipate performing a shallow approach,
- Keep in mind that higher All Up Weight increases the risk of aircraft loss of control at low speed,

Pay attention to the following:
- Pressure in the hydraulic accumulators allows enough time to secure the flight.
- When hydraulic pressure is restored in flight, the forces disappear, which can lead to an abrupt left roll movement.
- In short final, anticipate the power application to avoid induced increase in nose-up attitude.

- **Twist Grip Condition of use :**

- When in simulated hydraulic failure training, control loads increase with speed. As control loads increase, be careful not to inadvertently move twist grip out of FLIGHT detent

- Before engine start up, take time to identify the direction of the twist grip to increase or decrease the fuel flow.

8.8.2 Demonstration methodology for Flight Instructors and Type Rating Instructors

- **Servo-Transparency** (called also servo-reversibility)

The servo-transparency training could be performed in the following way:
- Complete procedure should be performed above 1000 ft *(AGL),*
- Achieve airspeed between 130 and VNE (with a rate of descend),
- Perform a 30° left turn,
- Slowly increase the load factor by a backwards cyclic action,
- When the servo-transparency is achieved, the tendency of the aircraft is to pitch up and slightly turn to the right,
- As soon as the load decreases, servo-transparency disappears
- Due to control loads linked to servo-transparency, the collective pitch tendency is to decrease. The collective pitch decrease and the pitch up may lead to rpm increase.
- The procedure should not be done too aggressively
- The exercise is easier when high All Up Weight and/or high density altitude.

- **Fenestron**

- Differences between conventional rotor and Fenestron: conventional tail rotors work more in cruising flight, as the fins surfaces are smaller. For the Fenestron, in cruise flight, the fins are designed to release anti-torque.
- For a clockwise main rotor, maximum tail rotor thrust is required with a left crosswind.
- Fenestron requires greater pedal travel entering hover, but is not less efficient once in hovering.
- Avoid high rate of turn during ground maneuvers (e.g. 360°), particularly to the left, since you would need a great pedal travel, and therefore a big amount of power to stop the motion, leading to a risk of over-torque.

9. Specification for Testing & Checking & Recent Experience

9.1 Skill test

As required by Part-FCL – Subpart H and Appendix 9

Note: When skill test is required, the duration shall be not less than 1h00.

9.2 Proficiency Checks

As required by Part-FCL – Subpart H and Appendix 9

9. 3 Recent experience

Applicants must meet the requirements as required by JAR-OPS 3.970 (Recent Experience)

10. Specification for Flight Simulation Training Devices

When this report has been finalized no Flight Simulation Training Devices qualified in accordance with JAR-FSTD (H) and compliant with EASA requirements were available for EC 120B.

11. Application of OEB report

This OEB report applies to commercial operations. However, the OEB also recommends private or corporate operations to follow the findings of this report.

12. Appendices

- Appendix 0 : EC 120B - Cover
- Appendix 1 : EASA – TCDS R.508
- Appendix 2 : Part – FCL- AMC2 FCL.725(a) / Requirements for the issue of class and type ratings
- Appendix 3 : Eurocopter Training Services (ETS) : EC 120B Type Rating Training course

Notes:
Appendices are available for NAA's by request to EASA Expert department / Certification Directorate or to Eurocopter Manufacturer.