CIVIL AVIATION AUTHORITY OF FIJI
ISO 9001:2015 Certified

Airworthiness Flight Test Report

AW 109N

EC130 B4				Registration: DQ-	
Date:		**Crew:**		**Engineer**	

Performance

Average Weight		**Airfield:**		
Average Temp.		**ºC**	**AUM Kg/Lbs*:**	
Average Altitude		**ft**	**Takeoff cg:**	
Speed		**KIAS**	**Performance:**	
Achieved Rate		**fpm**		
Scheduled Rate		**fpm**	**SATISFACTORY* UNSATISFACTORY* NOT APPLICABLE* * *(delete as applicable)***	
Margin		**fpm**		
Permitted Margin -70		**fpm**		

Note: The provision of false information, or failure to disclose information, relevant to the grant of an aviation document constitutes an offence under Section 17A(5)(b) of the Civil Aviation Authority Act 1979, and Regulation 128 of the Air Navigation Regulations 1981. The applicant will be subject to prosecution as well as the revocation, suspension or cancellation, of their aviation document, or in the event of initial issue, the rejection of the application.

ENGINEER'S DECLARATION

I certify that all the Check Flight Test results are within the specified allowable tolerances, and that the achieved climb rate was above*/ below* scheduled. If below, complete box X:

Name:	**Signed:**	**Date:**	**Licence No:**

Box X: The climb rate was below scheduled but was accepted for the following reason: **Note**: Aircraft with climb shortfalls more than 70 fpm must not be accepted.

Airworthiness Check Flight Test Report (continued)		**DQ-**	
No.	**Defect**	**-/R/FT**	**Action?**

Conclusions and comments:

Note: The provision of false information, or failure to disclose information, relevant to the grant of an aviation document constitutes an offence under Section 17A(5)(b) of the Civil Aviation Authority Act 1979, and Regulation 128 of the Air Navigation Regulations 1981. The applicant will be subject to prosecution as well as the revocation, suspension or cancellation, of their aviation document, or in the event of initial issue, the rejection of the application.

PILOT-IN-COMMAND'S DECLARATION

I CERTIFY that I have tested the above aircraft, in accordance with this Check Flight Test Schedule, and have detailed the deficiencies and unsatisfactory features above.

Name:	Signed:	Date:	Licence No.:

For CAAF Use only

	Appointment:	Date:	Sign:	Comments:
Report Logged by:	AA - AW			
Report seen by:	AEI			
	FOI - RW			
	SAMEI			
	SFOI - D			

General

Only CAAF personnel and pilots specifically accepted and briefed to carry out CAAF Airworthiness Check Flight Schedules Flight Tests may conduct the test.

Crew: Captain, co-pilot (if applicable), Flight engineer.

Airfield: Departure airfield.

AUM: The aircraft shall be loaded to maximum all up weight if possible, and record the weight at first engine start. Also delete Kg or Lbs as appropriate. *Take-off cg:* Actual C of G at lift-off.

Climb#1 / Climb#2: Enter in these columns data from the first and second climbs.

Average Weight: The aircraft all up weight at the midpoint of the measured climb.

***Average Altitude**:*	The altitude at which the line drawn to average the measured points passes through at the mid time.
***Average Temp**:*	The temperature at which the line drawn to average the measured points passes through at the mid time.
***Speed**:*	The target climb speed (Indicated Airspeed.)
***Achieved Rate**:*	The climb rate as given by the slope of the line drawn to average the measured altitude points in feet per minute.
***Scheduled Rate**:*	The expected gross rate of climb read from the appropriate graph in the Flight Manual with any adjustments for configuration differences. For large aircraft, the basic gross data are normally to be found in a separate supplement labelled 'Additional Flight Test Data'.
***Margin**:*	The difference between the Scheduled and Achieved rates of climb (negative if achieved is lower than scheduled).
Defects	Enter all defects from the flight. All defects must also be entered in the Technical Log. Procedural items entered in the Technical Log (such as re- stowing oxygen masks) need not be entered here. Items affecting flight safety which were known before the flight, whether or not they were deferred should be entered. In the latter case, the defect should be annotated accordingly after the details.
***No**:*	The first column is to allow the items to be numbered.
***Defect**:*	Enter details of the defect.
***-/R/FT**:*	Classify each defect according to its impact on safety, regardless of whether it can be deferred according to the MEL. Any deferrals should be dealt with in the normal way in the Technical Log. Items requiring rectification (or deferral under the MEL) before further flight for hire or reward or before the issue of the CofA should be marked 'R'. Additionally, items that require rechecking in-flight following rectification (such as inadequate climb performance) should be marked 'FT'. Items requiring both should be marked 'R/FT'.
***Action?**:* **Conclusions/**	This column should be left blank unless further information is required from the engineers or the item is considered to be of sufficient importance that CAAF action is considered necessary, then the person/department/agency from whom further action is required should be noted in this column. Annotate accordingly if an MOR or similar report is to be raised.
Comments:	Any conclusions, notes or comments useful for tracking defects.
***Name**:*	Only the pilot who carried out the test may certify and sign this sheet.

GENERAL NOTES AND GUIDANCE.

1. **CAAF Check Flight Schedules (CFS)**

This schedule is applicable to Airbus Helicopters EC130 B4 helicopters. It assumes that the everyday operation of the helicopter serves as a continuous check on the correct functioning of all normal services.

It is the responsibility of the flight crew to ensure that the exercises and limitations in the CFS are correct for the aircraft under test. The prime source of information will be the aircraft flight manual and in the event of conflict the flight manual should be taken as overriding. CAAF policy is that pilots who conduct Check Flight Schedules flight tests on the behalf of the Authority must be acceptable to the Authority, must have been briefed on techniques and safety considerations before carrying out the tests in these schedules and must have carried out a flight test within the last 4 years. The Authority does not accept responsibility for the use of a CAAF CFS on a test flight not directly under their control.

WARNING

1. Although it may be legal to carry passengers on a check flight test with a Certification of Airworthiness in force, it is strongly recommended, for Airworthiness Check Flight Schedules Flight Tests and other tests which entail a greater risk than normal flight, that:

a) If passengers are being carried for weight and balance purposes, it is preferable to use ballast; and

b) Before accepting any passengers on a check flight test the Pilot-in-Command must inform them that the risk is greater than on an ordinary flight; and

c) Adequately insured; "Aircraft Insurance" to ensure that the check flight is covered under their Insurance, including the carriage of passengers, and that any passengers are briefed on emergency procedures and use of safety equipment.

2. Under no circumstances are the limitations contained in the CAAF approved Flight Manual to be exceeded.

3. If a clipboard or kneeboard is used to record the results there is a possibility of fouling the controls especially the duals, if fitted. To reduce this possibility, the pilot must have briefed the Engineer observer on the need to ensure that the clipboard is well clear of the controls especially during manoeuvres requiring large control deflections such as low speed envelope and autorotation. The pilot should monitor the position of the clipboard during the flight to ensure that it is not in a potentially hazardous position. Whenever possible, flexible, rather than rigid, clipboards should be used. Dual controls should be removed if flying with an inexperienced Engineer observer.

2. **After the Flight Test**

All defects should be recorded on the Check Flight Certificate even if the necessary rectification action may seem trivial. These lists enable the CAAF to identify problems with other rotorcraft of a particular type and so initiate the necessary corrective actions.

The Check Flight results should be compared with the Flight Manual or others designated on the C of A, and special note should be made of any features that would make the rotorcraft dangerous or unsafe. Generally speaking these include, but are not limited to:

Inadequate climb performance;

a. Engine power assurance below scheduled minimum;
b. Engine power limiter set too high or too low;
c. Autorotation RPM too low;
d. Failure within Engine Anticipator system;
e. Any other functional items that bring with them special risks for a particular helicopter, having due regard to the work for which the helicopter is certificated.

Where the observed performance of helicopter is outside the specified limits, the Operator should ensure that such inspections or repair work as are considered necessary to restore it to an acceptable level are carried out. A further Check Flight should be carried out as necessary.

3. **Interpretation of Results**

The data against which the results must be assessed shall be that contained in the Manual designated on the C of A of the helicopter.

4. **Performance Climb**

The achieved rate of climb is determined from the Check Flight results. A graph of the height climb must be plotted and the best line drawn through the points. This line is then used to calculate the average rate of climb. For some rotorcraft in certain conditions the height versus speed time graph should be a curve, i.e. rate of climb reduces with height. In these cases a tangent to the curve could be drawn at the midclimb point and used to calculate the rate of climb. The achieved rate must be compared with the scheduled rate of climb extracted from the designated Manual, appropriate to the actual aircraft weight, the mean performance climb check altitude and the average outside air temperature at that altitude. The achieved and scheduled rate of climb must be recorded on the Check Flight Report.

5. **Common causes of inadequate climb performance**

Where the achieved climb performance is not at an acceptable level, the following checklist, which is not necessarily definitive, may be considered when seeking a remedy:

a. General

- Pilot out of practice;
- Weather: turbulence, waves, and temperature inversion.

b. Instruments

- Incorrect reading of IAS (it is easy to confuse, or to substitute, CAS for IAS, or knots for mph);
- Faulty ASI (e.g. leaks, blockages including water, instrument unserviceable);
- Faulty altimeter (including static system);
- Faulty Outside Air Temperature Indicator;
- Faulty torque meter (including calibration errors);
- Faulty gas generator tachometer or turbine inlet temperature gauge;
- Faulty rotor rpm gauge;
- Faulty fuel gauge.

c. Weight

- Unrecorded growth of empty weight
- Miscalculation of check weight

d. Engine

(1). Turbine engines:

A turbine engine that is not producing its rated power will have a poor power assurance value. This is only relevant to the performance climb if the climb was carried out on an engine limit as opposed to a transmission limit, e.g. turbine temperature limit compared with a torque limit. The causes of torque indicating system inaccuracies must be considered. An overreading torque meter will result in the power assurance being better than expected but climb performance will be poorer than expected if the climb is performed on the torque limit. An under-reading torque meter will have the opposite effects but bear in mind that in this case, the torque limit for the climb will have been exceeded and maintenance action may be required; it is therefore very important that the issue be accurately reported.

6. Autorotation check

The primary purpose of the autorotation check is to ensure that the collective rigging is correct; i.e. the scheduled rotor rpm is achieved with the collective fully down and the needles split. The stabilised rotor rpm at a given altitude, weight and OAT must be compared with the scheduled data in the Flight Manual.

It is recommended that the tests are performed in the sequence given. The results are to be written in ink in the spaces provided.

The crew are expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition to completing all the tests in this schedule any characteristics which are considered to be unsafe or undesirable must be recorded.

Should there be any query about the Flight Test and or its results, the Authority's Airworthiness Section, or the Flight Operations Inspector – Rotary Wing, must be consulted.

AIRWORTHINESS CHECK FLIGHT SCHEDULE

1. PRE-FLIGHT INFORMATION

Aircraft Variant		**Engine**	
Registration		**Engine No.**	
Airframe No.		**Hours total**	
Airframe Hrs		**TSO**	
Landing Gear			
Operator/Maint. Organisation			
Airfield			
Pilot(s)			
Observer			

2. LOADING

Note:
The helicopter shall be loaded to maximum all up weight if possible. Any ballast must be securely installed.

In addition, it will be necessary to perform one flight at less than 1900kg to permit the measurement of rotor rpm in autorotation (see Appendix 3).

Take-off Weight		Kg
Fuel		Kg
CoG Position		

ENERAL FLIGHT INFORMATION

Airfield Press. Alt.		ft.	**QFE / QNH**	
Wind			**OAT**		°C
Weather				
Engine Start		**Land**		
Take-Off		**Shut down**		

2. PRE – START CHECKS

		Sat	Unsat	Remarks
4.1	Carry out the normal external inspection	☐	☐	
	Check for correct functioning of external lighting	☐	☐	
4.2	Doors & windows, condition & operation	☐	☐	
	Seats & harnesses	☐	☐	
	Placards: Legibility & accuracy	☐	☐	
4.3	Instrument marking: confirm legibility, general condition & accuracy of colour band marking			
	ASI	☐	☐	
	Altimeter	☐	☐	
	Attitude Indicator	☐	☐	
	NR/NF tachometer	☐	☐	
4.4	Freedom & range of travel of:			
	Collective control	☐	☐	

	Yaw control	☐	☐	
	Fuel Flow Twist Grip (**Note: Electrical Power Must be ON**)	☐	☐	
	Select main battery on Note:			
	VEMD Self-Test complete	☐	☐	
	DECU Self-test complete, Red and amber GOV lights both off	☐	☐	
	Battery Voltage	☐	☐	
	Test warning lamps	☐	☐	
	Complete pre-start checks as per FM	☐	☐	

5. STARTING

5.1	During engine start, note and record:		
	Residual T4		°C
	Max T4		°C
	NF at start of Rotor rotation		%

5.2	**FUEL P** and **GENE** lights out, **FLI** displayed on VEMD, **ENG P** light out, Select flight on Twist Grip.			
	MGB P light out <110 NR (cold oil), or <200 NR (warm oil)	☐	☐	
	Low NR warning sounds for 250 to 360 NR	☐	☐	rpm
	Check Nf = NR stabilized at 376 +/- 2 RPM	☐	☐	rpm

5.3	With Collective down, check		
	Correct disc response to small cyclic inputs, no diverging oscillations: convergence between 3 to 4 cycles	☐	☐
	All indications in normal range	☐	☐
	All warning lights extinguished	☐	☐

5.4	**EBCAU Check.** Plastic guard up, press **EBCAU TST.** Confirm		
	Gong sounds	☐	☐
	Red **GOV** comes on	☐	☐

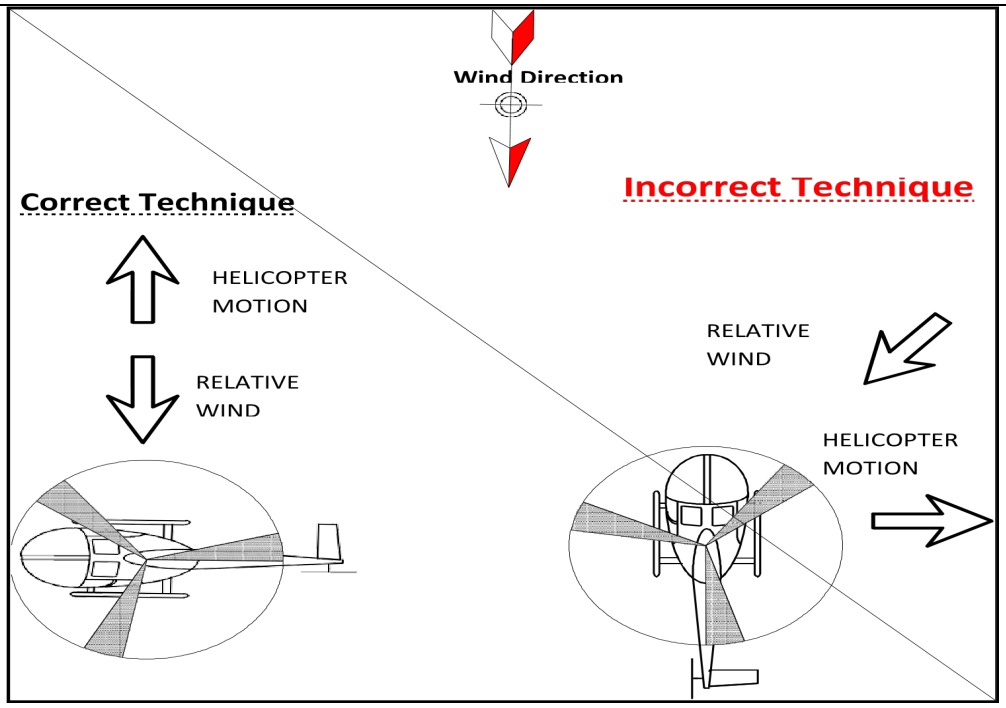
	Amber **GOV** comes on	☐	☐
	NR increases to 390 +/- 3 RPM	☐	☐
	Press **EBCAU TST**, **GOV** lights out, NR Decrease back to 376 +/- 2 RPM	☐	☐
5.5	Check for correct functioning:		
	Intercom	☐	☐
	Radio	☐	☐
	Cockpit lighting	☐	☐
5.6	Complete pre take-off checks as pe r FM		

6. LOW SPEED ENVELOPE

Take off time:

6.1	Lift to a hover at 5 ft in 2 sec. The rotor speed decay must be weak, and followed by a smooth NR increase. Ensure no low NR aural warning.		

Axial turns	Sat	Unsat
Right	☐	☐
Left	☐	☐
Sideways flight left & right up to an estimated 17 kt (20 mph)	☐	☐
Rearwards flight up to an estimated 17 kt (20 mph)	☐	☐



7. MAXIMUM TAKEOFF POWER CHECK

7.1	Check that all P2 bleed air consumers are off, note and record

With IAS < 40 kt, increase collective pitch to obtain TOP limit. Record data.

PAlt	OAT	
		°C

CAUTION
10<Max. FLI <10.4. with t< 5 seconds
Max power Audio warning sounds for FLI>10 for more than 1.5 sec

FLI		
NG		%
T4		°C
Tq		%
☐	☐	

Decrease collective and return to normal climb out.

8. CRUISE CHECKS

8.1	In Flight Engine Condition Check

Trim the aircraft in a cruise at MCP
Confirm all P2 bleed air consumers are OFF.

Confirm Airconditioning is OFF.
Stabilize for at least 2 minutes before switching to ENGINE POWER CHECK page on VEMD

IAS	NR	NG	NF	T4	Alt	Tq	OAT	T4 Margin	Tq Margin
Kts	RPM	%	RPM	°C	ft	%	Deg C	°C	%

Reselect Airconditioning and P2 Air consumers as required
Confirm results using the flight manual engine power check diagrams SECTION 5.

8.2	Cruise		
	At max. continuous power, check and record the following items:	P. Altitude	OAT

8.2.1	Stabilized level flight.					
	Note	Vibration level	Sat	☐	Unsat	☐
		Control response	Sat	☐	Unsat	☐

8.2.2	Steep turns left & right (approx. 45°)					
	Note	Vibration level	Sat	☐	Unsat	☐
		Control response	Sat	☐	Unsat	☐

8.3	Helicopter Climb performance at MCP

Set IAS kt = Vy = 70kt at 0 ft Palt – (1kt per 100 ft)

Fuel at Start of climb: | **Engine**

Time	Alt	OAT	IAS	T_q	N_G	T_4	N_f / Nr	Temp	Press
0									
0.30									
1.00									
2.00									
2.30									
3.00									
3.30									
4.00									

Fuel at End of Climb:
After the climb, obtain an accurate OAT by flying at approx. mid-climb altitude at climb Speed for 1 minute to allow OAT to stabilize.

The climb performance must be analysed and compared with the schedule performance. See Section 13 of this document.	**Altitude**	ft
	OAT	°C

8.4	Maximum speed test
8.4.1	Increase speed progressively to V_{NE} using max. continuous power. (155kt – 3kts per 1000 ft PAlt.)

Note					
P.Alt		Ft	**AUW**		Kg
OAT		°C	**VNE (Placard)**		kt
Fuel		Kg	**Achieved IAS**		

8.4.2	Carry out gentle turns (approx. 10° AoB) left & right.

Note					
Vibration level	**Sat**	☐	**Unsat**	☐
Control response	**Sat**	☐	**Unsat**	☐

WARNING

It will be necessary to reduce aircraft weight to less than 1900kg for the check of rotor rpm in autorotation.
This test will normally be performed as a separate flight.
The aircraft weight MUST be less than 1900Kg.

9. AUTOROTATION

9.1	Perform a gentle entry to a steady autorotative descent at 65 kt. Do not exceed power-off rotor rpm limitation (430rpm).				
9.2	Carry out 30° banked turns left & right in autorotation	**Sat**	☐	**Unsat**	☐
9.3	Carry out a rapid recovery from autorotation (NR/NF needles just joined to 60% Torque in not less than 3 sec).				

Note					
Engine response & absence of surge	**Sat**	☐	**Unsat**	☐	
Transient rotor droop					rpm

9.4	At an acceptable altitude, lower the collective lever to enter autorotation at 65Kts =. Allow to stabilize with the collective fully lowered and record the following:

P. Alt - Ft	OAT - °C	IAS - Kts	NR - RPM	Fuel - Kgs	AUW - Kg

Note: Autorevs must be checked against the schedule and the results recorded in section 13.

10. LANDING

Confirm no tendency to lateral padding or ground resonance during a smooth touchdown with a slow gentle collective lowering.

Sat	☐	Unsat	☐

Note
Should any divergent oscillations be noted, lift off immediately, reposition the aircraft and carry out a normal landing

Landing time	

12. SHUT DOWN
Shut down the engines and confirm satisfactory rotor brake performance

Sat	☐	Unsat	☐

13. Post Flight Action

13.1 Performance Climb (see para 7)
Plot the data on the analysis sheet provided and determined the achieved rate of climb. The scheduled performance must be obtained from the Flight Manual and compared with the achieved performance and results recorded on the front sheet.

13.2 Engine Condition in Flight Check (para 8.1)
Use the power check chart in the Flight Manual to analyse the engine condition

☐ SAT	☐ UNSAT

13.4 Autorotation (see para 9.4)
Use the chart in Section 8 of the Flight Manual to determine the minimum scheduled autorevs.

Achieved Autorevs		%	Tolerance = 0 / + 10 Rpm (-10/0 when stowed emergency floats are installed)
Scheduled Autorev		%	

AIRCRAFT TYPE	
REGISTRATION	
DATE OF TEST	
Mean Weight	
Mean Altitude	
Mean OAT	
SCHEDULED ROC	
Basic **ft/min**	
Correction ft/min	
Correction ft/min	
Final SROC ft/min	
Observed ROC ft/min	
Difference from Scheduled. **(Observed ROC minus Final SROC**	
ft/min	