CHECK FLIGHT CERTIFICATE

Civil Aviation Authority

Single Piston Engine Helicopters Under 2730kg (6000lb) Maximum Weight **CFS 162 issue 1**

Date:	Crew:	Observer:	Registration:

Performance Climb #1

Average Weight			
Average Altitude			ft
Average Temp.			°C
Speed			KIAS
Achieved Rate			fpm
Scheduled Rate			fpm
Margin			fpm
Permitted Margin	-70		fpm

Airfield:

Start Weight Kg/Lbs*:

Takeoff cg:

Performance:

SATIS/UNSATIS/NOT APPLICABLE*

*(delete as applicable)**

Defects

No.	Defect	-/R/FT	Action?

(use a continuation sheet as necessary)

Conclusions/Comments

I CERTIFY that I have tested the above aircraft and have detailed the deficiencies and unsatisfactory features above. Those items annotated R or FT must be dealt with as shown in the notes on the reverse side.

Name:	Signed:	Date:	Licence No.:
For CAA Use only	Report Logged by:	Date:	Report No.:

General

Only CAA personnel or pilots specifically briefed to carry out CAA airtests may conduct the test.
General notes on test conduct can be found in the CAA Handbook for Airworthiness Flight Testing.
This sheet replaces any flight test certificate given in the schedule.
Registration: If the aircraft is not on the UK register, add the manufacturers serial number and expected UK registration (if known).
Crew: Captain, co-pilot, Flight engineer (where applicable).
Airfield: Departure airfield.
Start Weight: Actual all up weight at first engine start. Also delete Kg or Lbs as appropriate.
Takeoff cg: Actual cg at lift-off, preferably as a % of the Mean Aerodynamic Chord.

Performance

A full description of climb analysis is given in the CAA Handbook for Airworthiness Flight Testing.
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 re-checking in-flight following rectification (such as inadequate climb performance) should be marked 'FT'. Items requiring both should be marked 'R/FT'.
Action?: This column should be left blank unless further information is required from the engineers or the item is considered to be of sufficient import that CAA 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.

Conclusions/Comments

Any conclusions, notes or comments useful for tracking defects may be entered.
Name: Only the pilot who carried out the test may sign this sheet

CAA Check Flight Schedules

All CAA Check Flight Schedules (CFSs) are prepared based on a design standard which, before September 2003, was the UK Type Certificate. Following the creation of EASA there may be different design standards in service within the European Union (EU) - this may include modifications approved in any EU country.

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.

CAA policy is that pilots who conduct airtests 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 an airtest within the last 4 years.

The CAA does not accept responsibility for the use of a CAA CFS on a test flight not directly under their control.

CHECK FLIGHT SCHEDULE

Single Piston Engine Helicopters Under 2730kg (6000lb) Maximum Weight CFS 162 Issue 1

Aircraft Type/Variant		Engine	
Registration		Test Date	

1. **INTRODUCTION**

This scheduled is applicable to single engine helicopters under 2730kg (6000 lb) maximum weight, where a dedicated schedule for the type does not exist. It is based on the assumption that the every day operation of the helicopter serves as a continuous check on the correct functioning of all normal services.

The Flight Test must be carried out by an experienced pilot acceptable to the CAA. 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.

WARNING

1. It is illegal to carry passengers on a test flight made without a valid Certificate of Airworthiness except passengers performing duties in the aircraft in connection with the flight. Although it may be legal to carry passengers on a test flight with a C of A in force, it is strongly recommended, for Airworthiness Flight Tests and other tests entailing greater risk than normal flight, that:

   a) It is preferable to use ballast, and

   b) Before accepting any passengers on a test flight the pilot in command should inform them that the risk is greater than on an ordinary flight.

2. Under no circumstances are the limitations contained in the CAA 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 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. Consideration should be given to removing the dual controls if flying with an inexperienced observer.

Should there be any query about the Flight Test or its results, the local CAA Surveyor or the Helicopter Flight Test Section of Flight Department, Aviation House, Gatwick must be consulted.

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

1. Pre-Flight Information

Aircraft Variant		Engine Variant	

Registration		Engine Nr	
Airframe Nr		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.

Take-off Weight	
Fuel	
CoG Position	

3. General Flight Information

Airfield Press. Alt.		ft	QFE/QNH	/	
Wind	/		OAT		°C
Weather					

Engine Start		Land	
Take-Off		Shut down	

4. Pre-Start Checks

		Satis.	Remarks
4.1	Carry out the normal external inspection		
4.2	Doors & windows : Condition & operation		
	Seats & harnesses		
	Placards : Legibility & accuracy		
4.3	Instrument marking : Legibility, general condition & accuracy of colour bands & marking (where fitted)		
	ASI		
	Rotor Tachometer		
	Manifold Pressure		
	Engine Tachometer		
	Fuel Pressure		
	EOP		
	EOT		
	Voltmeter		
	Ammeter		
	Other Instruments		
4.4	Freedom, range of travel, friction of :		
	Cyclic control		
	Collective control		
	Throttle		
	Freedom, range of travel & adjustment of yaw control		

5. Starting

5.1 Carry out a normal engine/rotor start. Note:

Ease of starting	Sat/Unsat	
Clutch fully engaged		Rrpm/%

5.2 Magneto check Nominal engine rpm _____ Erpm/%

Manifold pressure _____ in

	Observed Erpm Drop	Schedule
No. 1/LH Mag Deselected		rpm
No. 2/RH Mag Deselected		rpm

5.3 Freewheel check

With engine governor deselected, close throttle rapidly to idle. Note freewheel disengagement _____

	Actual	Requirement
Note rotor rpm at which Horn & Light operate.	%	%

5.4 Pre flight checks

	Sat/Unsat	Remarks
Rotor response to small cyclic inputs		
Pedal/Yaw response		
Mixture control		
Cyclic Trimmer		
Carb Heat		
Warning Systems		

5.5 With engine warm up completed and all temperatures stabilised note the following:

	Obs
Manifold Pressure	
Engine Oil Temp	
Engine Oil Press	
Carb Air Temp	
Cylinder Head Temp	
Transmission Oil Temp	
Generator Charge Rate	
Fuel Press. Pump ON (if fitted)	
Pump OFF (if fitted)	
Reselect fuel pump ON	

6. Hover Checks

Take off Time

6.1 Lift to a low hover and note satisfactory throttle correlator behaviour.

Assess the Control response, control margin and vibration level during the following manoeuvres: (see appendix 1 for test method)

		speed	remarks
Axial Turns	Left		
	Right		
Sidewards flight to 17kt(20mph)	Left		
	Right		
Rearwards flight to 17kt(20mph)			

6.2 Collective Balance

Land and adjust collective friction to fully OFF. Lift to a hover and check any tendency for collective to throw pitch either on or off.
Land and reselect collective friction as required.

6.3 Hover Performance

In a stabilised 3 ft hover, record the following parameters

Press. Alt		ft
OAT		°C/°F
Wind		kt
Fuel		lb/kg
Manifold Press.		in.
ERPM		rpm/%
RRPM		rpm/%
Carb Air Temp		°C/°F
Engine Oil Temp		°C/°F
Engine Oil Press		psi/bar
Transmission Oil Temp		°C/°F

7. Performance. En-route climb

With the altimeter set to 1013mb (29.91in hg), climb at Maximum Continuous Power at the scheduled en-route climb speed for 3 minutes.

When a stable condition has been established on a steady heading with zero yaw, and in as calm conditions as possible,

Record the following:

Fuel at start of climb ____ Time at start of climb ____

Time	***Alt***	***OAT (1)***	***IAS***	***Man Press***	***Eng Rpm(2)***	***CHT***	***Carb Air Temp***	***Trans Press***	***Eng Temp***	***Eng Press***
0										
0.30										
1.00										
1.30										
2.00										
2.30										
3.00										

Fuel at end of climb ____

After the climb, obtain an accurate OAT by flying at approx mid-climb altitude at climb speed for 1 min to allow OAT to stabilise

Alt		ft
OAT		°C

(1) If the helicopter is not equipped with an OAT gauge, the variation of OAT with altitude must be determined from Met information.

(2) On some helicopter types, it is required to set a rotor rpm for the climb, rather than engine rpm. If this is the case, record rotor rpm in this column.

NOTE The climb performance must be analysed and compared with the schedule performance. See Section 13 of this document.

8. Autorotation

8.1 Perform a gentle entry to a steady autorotative descent at the recommended IAS with the collective lever fully down.

Note: Controllability on entry

8.2 Record when stabilised:

P. Alt	OAT	IAS	Rrpm	Erpm	Fuel

Note 1: It may be necessary to reduce the engine speed to achieve a full “needles split” autorotation.

Note 2: Do not exceed power-off rotor rpm limitations.

8.3 Carry out turns left & right in autorotation

8.4 Carry out a normal recovery from autorotation.

Note: Engine response & throttle correlation.

NOTE: Autorevs must be checked against the schedule where appropriate – see section 13 of this document.

9. Handling

9.1 Cruise

At normal cruise power, trim the helicopter for level flight and record:

Note:						
	P.Alt		ft	Carb Air Temp		°C/°F
	MAP		in	Eng Oil Temp		°C/°F
	OAT		°C/°F	Eng Oil Press		psi/bar
	AUW		kg/lb	Trans Oil Temp		°C/°F
	IAS		kt/mph	Cyl Head Temp		°C/°F
	Rrpm		%/rpm	Fuel		kg/lb

Confirm no excessive mismatch between Engine and Rotor rpm indications. | |

9.2 Steep turns left & right (approx 45°)

Note:	
	Vibration level
	Control response

9.3 Hydraulic System (where fitted)

If servo flying controls are fitted, select MANUAL and check that control loads are not excessive, and control positions are normal in both straight and turning flight. | Sat/Unsat

Reselect servo controls ON

9.4 Collective Balance

With collective friction fully OFF, check collective balance for any tendency to throw pitch either on or off. |

9.5 Cyclic Trim (where relevant)

Confirm satisfactory cyclic trim operation (from each cyclic) |

Confirm satisfactory control characteristics when using small cyclic displacements without re-trimming |

9.6 Maximum speed test

9.6.1 At a safe altitude, increase speed progressively to V_{NE} max. continuous power (observe placarded V_{NE} limits)

Note:						
	P.Alt		ft	MAP		in
	OAT		°C/°F	V_{NE}		kt/mph
	Fuel		kg/lb	Rrpm		%/rpm
	AUW		kg/lb			

9.6.2 Carry out gentle turns left & right.

Note:		
	Vibration level	
	Control response	

10. Functioning

Perform functioning tests of the following, where fitted, at appropriate stages of the flight.

	Sat/Unsat	Remarks
Internal Lighting		
External Lighting		
Instrumentation ASI		
Altimeter		
VSI		
Attitude Indicator		
Turn & Slip		
Compass		
DI		
Tachometer		
Eng. Instruments		
Fuel Gauging		
Ammeter/Voltmeter		
Heating & Ventilation		

11. Landing

Check for any tendency to lateral padding or ground resonance during a light touchdown.

Landing time

12. Shut down

12.1 Close the throttle and note stabilised engine idle rpm, before engine and rotor resynchronise.

12.2 Shut down the engine and note:

Satisfactory shut down using Fuel Shut Off Control.

Satisfactory rotor brake performance

13. Post-flight Action

13.1 Performance Climb (see para 7)

Plot the data on the analysis sheet provided and determine the achieved rate of climb. The scheduled performance must be obtained from the flight manual and compared with the achieved performance.

Where no scheduled climb performance is declared by the manufacturer, the rate of climb should be compared with that achieved during the previous C of A air test.

Should the helicopter fail to achieve the scheduled RoC, or if the RoC is significantly worse (more than 20fpm) than the previous result, this must be investigated and a reflight will be necessary.

	Achieved RoC		fpm		
	Schedule RoC		fpm		
or	Previous C of A		fpm	Date	

13.2 Autorotation (see para 8)

Where appropriate, use the chart in the flight manual to determine the minimum scheduled autorevs.

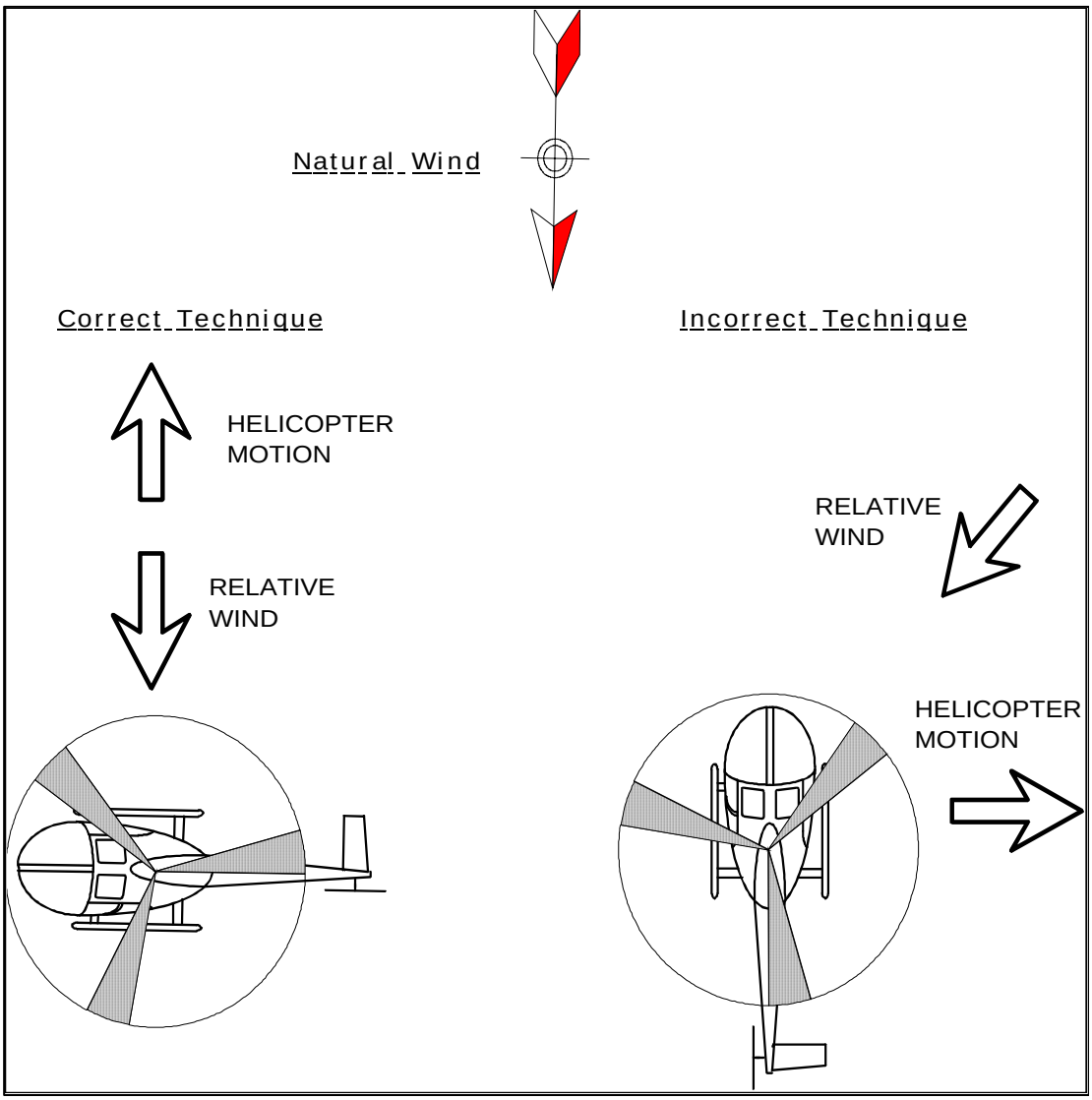
Achieved autorevs		%/rpm
Schedule autorevs		%/rpm

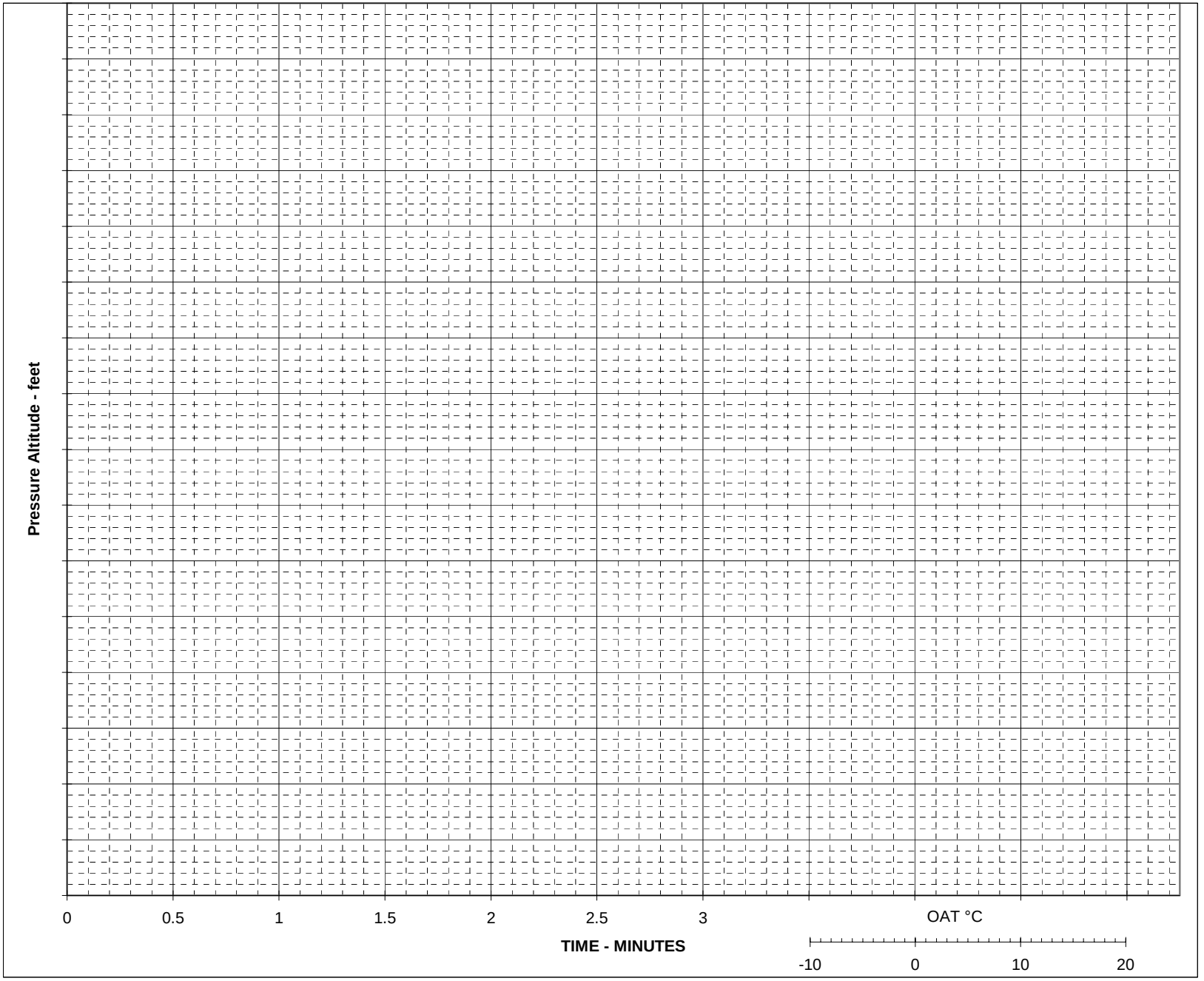
Appendix 1

Sidewards & Rearwards Flight

For the sidewards flight tests the helicopter should be rotated so that the natural wind is on the side of the aircraft. The aircraft should then be gently accelerated into the wind and stabilised. The mean natural wind should be added to the estimated ground speed to give the required relative air speed.

For rearwards flight the helicopter should be aligned tail into wind and gently accelerated rearwards to achieve the required relative airspeed.





AIRCRAFT TYPE

REGISTRATION

DATE OF TEST

Mean Weight

_____ lb

Mean Altitude

_____ feet

Mean OAT

_____ °C

SCHEDULED ROC

Basic _____ ft/min

Correction _____ ft/min
(if applicable)

Correction _____ ft/min
(if applicable)

Final SROC _____ ft/min

Observed ROC

_____ ft/min

Difference from Scheduled

_____ ft/min
(Observed ROC minus Final SROC)