CHECK FLIGHT CERTIFICATE

Bell 412EP **Pratt & Whitney PT6T-3D**	**CFS 293 Issue 2**	Registration:

Date:	Crew:	Observer:

Performance	Climb #1	Climb #2	
Average Weight			
Average Altitude			ft
Average Temp.			˚C
Speed			KIAS
Achieved Rate			fpm
Scheduled Rate			fpm
Margin			fpm
Permitted Margin	-20	-20	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.:

NOTES

General
Only CAA personnel or pilots specifically briefed to carry out CAA Check Flights may conduct the test. General notes on test conduct can be found in the CAA Check Flight Handbook.

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.

Performance
A full description of climb analysis is given in the CAA Check Flight Handbook.
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

Bell 412EP **CFS 293, Issue 2**
Pratt & Whitney PT6T-3D

Registration _____ Test Date _____

1. INTRODUCTION

This schedule is applicable to Bell 412EP helicopters. 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 D&PS Division of the CAA in accordance with this schedule and the general guidance given in the CAA Handbook for Airworthiness Flight Testing. 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. Although it may be legal to carry passengers on a test flight with a Certification of Airworthiness in force, it is strongly recommended, for Check Flights 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. 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.

Should there be any query about the Flight Test or its results, the local CAA Surveyor or the Helicopter Flight Test Section at Airworthiness Division 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.

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1. Pre-Flight Information

Aircraft Variant	Bell 412EP	Engine	Pratt & Whitney PT6T-3D

			Eng # 1	Eng # 2
Registration		Engine No		
Airframe No		Hours total		
Airframe Hrs		TSO		
Landing Gear				

Operator/Maint. Organisation	
Airfield	

Pilot(s)	
Observer	

2. Loading

Note:
1) The helicopter shall be loaded to maximum all up weight if possible. Any ballast must be securely installed
2) For aircraft equipped with 4-axis AFCS, it is recommended that the low level over water checks be conducted at a safe single engine hover weight.
3) Target weight for the check of rotor rpm in autorotation is 9000 – 9500 lb

Take-off Weight		Lb
Fuel		Lb
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		
	Check for correct functioning of external lighting		
4.2	Doors & windows : Condition & operation		
	Seats & harnesses		
	Placards : Legibility & accuracy		

4.3 Check legibility, general condition & accuracy of colour bands & marking of the following, where appropriate:

Airspeed Indicators		
Torquemeters		
Triple Tachometer		
ITT Indicators		
Engine Tachometer (N_1)		
Engine Oil Pressure		
Engine Oil Temperature		
Transmission Oil Temperature/Pressure		
C-box Oil Temperature/Pressure		
Fuel Pressure		
Hydraulic Pressure		
All other instruments		

4.4 Select battery switches ON

Test warning lamps		
Correct Caution Panel and Warning lamps for Int. or Ext. start as appropriate		

4.5 Complete pre-start checks, noting in particular:

Freedom of movement and correct friction of twistgrip throttles		
Idle Stop operation		
Fire detection system		

5. Starting & Pre Flight Checks

5.1 During engine start, note and record :

Start Time	

	Eng 1	Eng 2	
Max ITT (2 sec >960ºC, max 1090ºC)			°C
Engine out warning clear (53±2%)			%
Ground Idle N_1 (61±1%)			%

5.2 Cyclic Centre Indication

With both engines at approximately 80% N2 (range 77 – 85%), confirm CYC CTR illuminates when the cyclic is displaced approx 1¼" in each direction

WARNING: **Do not displace cyclic more than 1.5" from centre.**

5.3 Force Trim Check

Confirm flight control friction is released and collective lock is removed.

Make **small** cyclic and pedal inputs to check force gradient

Press Cyclic Force Trim Release. Confirm cyclic and yaw trims are released. Release Cyc FTR.

Press Yaw Trim Release. Confirm only yaw force trim is released.

Switch Force Trim OFF. Confirm all trims are released and FT OFF illuminates

Switch Force Trim ON

4-axis autopilot only

Press Collective trim release. Confirm, by **small** collective input, that collective trim is released.

5.4 Fuel Crossfeed and Interconnect Valve Check

Carry out a full system check in accordance with FM procedures.

5.5 Electrical System Checks

With both generators on line, Battery 1 OFF/Battery 2 ON, Emerg Load NORMAL, Non-Essential Bus NORMAL.

Confirm satisfactory functioning of all electrical systems		
Confirm DC Volts 28±1		
Deselect Gen 1. Confirm Non-ESNTL Bus 1 & 2 shed e.g. VHF Comms 2, P_2 instrument lighting.		
Select Non-Ess Switch to **MANUAL**. Confirm non-essential consumers recovered.		
Reselect Gen 1 Confirm Non-Ess switch trips to **NORMAL**		
Deselect Gen 2. Confirm Non-ESNTL Bus 1 & 2 shed as above.		
Select Non-Ess Switch to **MANUAL**. Confirm non-essential consumers recovered.		
Deselect Gen 1. Confirm non-essential consumers shed.		
Select EMERG LOAD. Confirm Essential Bus 1 & 2 consumers are shed (e.g. P_2 Pitot Heat, P_2 intercomm, Booster Pump 1 & 2, Windscreen wipers, Inv 2.)		
Confirm that Emergency Bus 1 & 2 consumers are retained (e.g. VHF Comms 1, P_1 intercomm, ITT 1 & 2, Standby AI).		
Deselect Emerg Load. Confirm Essential Bus 1 & 2 recovered. Reselect Gen 1 & 2 and select Non-Ess Switch to **NORMAL**		
Confirm AC Volts 104 – 122		
Confirm amps within limits		
Deselect INV 1. Confirm Load transfer within 2 sec. Reselect INV 1		
Deselect INV 2. Confirm CWP caption illuminates. Reselect INV 2		

5.6 AFCS

Carry out a full pre-flight check of Autopilot and Flight Director		

5.7 Hydraulic System

With both engines at idle, carry out preliminary hydraulic system checks noting and recording:

	Hyd 1	Hyd 2	
Both			psi
Hyd 1 OFF			psi
Hyd 2 OFF			psi

Confirm satisfactory changeover characteristics and no unacceptable stick jump		

5.8 Engine Fuel Control Check

Confirm both engines are at idle.

Confirm Eng 1 N_1 is approx 61% and select Eng 1 GOV to **MANUAL**		
Confirm satisfactory response to twistgrip up to 75% N_1		
Close throttle to idle and note N_1 when ENG OUT illuminates		**%**

Select Eng 1 GOV to **AUTO**

Confirm Eng 2 N_1 is approx 61% and select Eng 2 GOV to **MANUAL**		
Confirm satisfactory response to twistgrip up to 75% N_1		
Close throttle to idle and note N_1 when ENG OUT illuminates		**%**

Select Eng 2 GOV to **AUTO**

5.9 Engine Acceleration Check

Confirm both engines are at idle.

Confirm both Governors are selected to **AUTO**

Rapidly advance Eng 1 twistgrip to full open (max 0.5 sec).

As N_1 reaches 90%, immediately close twistgrip to idle.

Record time to achieve 90% N_1 (<4 sec)		sec
Repeat for Eng 2		sec
Time for each engine should be within 0.5 sec of each other		

5.10 Beep Range

Open both twistgrips to the FLIGHT position. Note and record:

	Eng 1	Both	Eng 2
Min N_2	%	%	%
Max N_2	%	%	%

Confirm max twin Engine N_2/N_R does not exceed 101.5%		%

5.11 Hydraulic System

Open both twistgrips to the FLIGHT position and set 100% N_R. Carry out a full check of the hydraulic system in accordance with FM procedures, noting and recording

	Hyd 1	Hyd 2	
Both			psi
Hyd 1 OFF			psi
Hyd 2 OFF			psi

Correct operation of interlock		
No unacceptable stick jump		
Normal response to **small** cyclic, collective and pedal inputs		
Pedals unboosted with HYD 1 deselected		

Confirm both Hydraulic systems are reselected ON

5.12 Torque Matching

Check the range of the torque matching (-2/+2) switch:

	Tq1	Tq2
-2	%	%
+2	%	%

5.13 Power Assurance

Carry out a power assurance check in accordance with FM procedures

		Eng 1	Eng 2		
P Alt	Ft				
OAT	ºC				
Tq	%			Scheduled max ITT (post flight)	
ITT	ºC				
N_R	%				
N_1	%				
Δ ITT	ºC				

Note: The power assurance must be analysed and the results recorded above and in para 13.

Rematch torques or ITT as required

5.14 Check for correct functioning :

- Intercomm		
- Radios		
- Cockpit lighting (if light conditions permit)		

5.15 Complete pre take-off checks as per FM

6. Low Speed Envelope

Take-off time	

6.1 Match torques on the ground, lift to a low hover, AFCS engaged in ATT mode, and note:

Satisfactory torque matching		

6.2 Assess the vibration level, control response and position (adequate control margin) during the following manoeuvres : (See Appendix 1 for test method) The tests should be flown at up to the Flight Manual limit (typically 35 kts at or below 3000 ft HD). If this would result in a groundspeed in excess of 20 kts, the speed may be restricted to avoid exceeding this value if desired.

Axial turns	Right		
	Left		
Sideways flight left & right			
Rearwards flight			

6.3 Carry out gentle hover manoeuvres with AFCS disengaged.		
6.4 **4-axis aircraft only** With AFCS engaged in ATT Mode, feet clear of the pedals and stabilised in a hover, increase and decrease torque by 10%. Confirm heading held within ±5°		

	Trans Oil	
6.5 Following the hover tests record the following	Temp	Press

7. Single engine en-route climbs

7.1 No. 1 Engine

With the altimeter set to 1013mb (29.91in hg), retard ENG 2 twistgrip to achieve an N_2 split of at least 5%

Carry out a climb for 4 min at single engine intermediate contingency power.

The climb should be carried out in stable, non-turbulent conditions away from cloud.

Associated conditions:

IAS	V_Y 70kt
Bleeds	OFF (unless specifically required)
N_R	97%

Do not exceed any of the following limitations:

Eng Tq	73.2%
ITT	820ºC
N_1	103.7%

When a stable condition has been established on a steady heading, slip ball centred, and in as calm conditions as possible, record the following :

								Eng Oil		
Time	***Alt***	***OAT***	***IAS***	***Tq***	***ITT***	***N_1***	***N_2/N_R***	***Temp***	***Press***	***Fuel***
0										
0.30										
1.00										
1.30										
2.00										
2.30										
3.00										
3.30										
4.00										
							Gearbox			

Advance Eng 2 Twistgrip to rematch torques

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

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

7.2 No. 2 Engine

With the altimeter set to 1013mb (29.91in hg), retard ENG 1 twistgrip to achieve an N_2 split of at least 5%

Carry out a climb for 4 min at single engine intermediate contingency power.

The climb should be carried out in stable, non-turbulent conditions away from cloud.

Associated conditions:

IAS	V_Y 70kt
Bleeds	OFF (unless specifically required)
N_R	97%

Do not exceed any of the following limitations:

Eng Tq	73.2%
ITT	820ºC
N_1	103.7%

When a stable condition has been established on a steady heading, slip ball centred, and in as calm conditions as possible, record the following :

								Eng Oil		
Time	***Alt***	***OAT***	***IAS***	***Tq***	***ITT***	***N_1***	***N_2/N_R***	***Temp***	***Press***	***Fuel***
0										
0.30										
1.00										
1.30										
2.00										
2.30										
3.00										
3.30										
4.00										
							Gearbox			

Advance Eng 1 twistgrip to rematch torques

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

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

8. Autorotation

See Appendix 2 for measurement of rotor rpm in autorotation

8.1 Perform a gentle entry to a steady autorotative descent at 65 kt.
Do not exceed power-off rotor rpm limitation (104.5%)

Close twistgrips to idle if an N_2 needle split is not achieved

WARNING: **Exercise care when closing twistgrips to idle in autorotation, particularly if any residual torque is apparent. If rotor rpm decreases significantly on closing twistgrips, this can indicate that the min pitch rigging is incorrect. Recover from autorotation and return to base for maintenance action.**

8.2 Carry out 30° banked turns left & right in autorotation

WARNING **Ensure both twistgrips are returned to the FLIGHT position**

8A Rapid Engine Acceleration

Set 60% Mast Torque and note approximate collective position. Maintain twistgrips in the FLIGHT position and descend with needles just joined at approximately 65 kt. Increase collective to give about 60% Mast Torque in not less than 3 seconds.

NOTE 1

Care must be taken not to increase collective too quickly; carry out practice collective pulls at a slow rate first and progressively increase rate. Increase collective to the approximate position noted at 60% matched torques.

Note:	Engine response & absence of surge		
	Transient rotor droop		%

9. Cruise Checks

9.1 Cruise

At max. continuous power, in level flight, or V_{NO} if less, AFCS engaged, check and record the following items :

9.1.1 Stabilised level flight.

Note:

P. Alt	OAT	IAS

Vibration level		
Control response		

Reduce collective friction to zero

9.1.2 Turns left & right (approx 30°)

Note:

Vibration level		
Control response		
Collective balance		

Reset collective friction as required

9.1.3 Steep turns left and right (RFM Limit 50°)

9.2 V_{NE}

9.2.1 Increase speed progressively to V_{NE} using max. continuous power

Note:

P. Alt		Ft	AUW		lb
OAT		°C	V_{NE} (Placard)		kt
Fuel		lb	Achieved.V_{NE}		kt

9.2.2 Carry out gentle turns (<20°) left & right.

Note:

Vibration level		
Control response		

9.3 Mast Torque

At 80 to 90 kts, match Engine torques to approx 45% (speed must be less than 105 kts).

Confirm total engine torque is 2 -9% higher than mast torque

Eng 1	Eng 2	Mast Tq

10. AFCS

10.1 Basic Stabilisation

At 100 kt, level flight, engage AP 1 & 2 in ATT mode

a) Without retrimming, displace the cyclic to alter pitch angle by 5° nose up. Release cyclic and check pitch attitude returns to datum ±1° with minimal overshoot.

b) Repeat a) for 5° nose-down.

c) Repeat a) for 10° left roll

d) Repeat a) for 10° right roll

e) Confirm satisfactory yaw axis behaviour during roll inputs

10.2 Basic Stabilisation (AP 1 only)

At 100 kt, level flight, disengage AP 2

a) Without retrimming, displace the cyclic to alter pitch angle by 5° nose up. Release cyclic and check pitch attitude returns to datum ±1° with minimal overshoot.

b) Repeat a) for 5° nose-down.

c) Repeat a) for 10° left roll

d) Repeat a) for 10° right roll

e) Confirm satisfactory yaw axis behaviour during roll inputs

Re-engage AP 2

10.3 Basic Stabilisation (AP 2 only)

At 100 kt, level flight, disengage AP 1

a) Without retrimming, displace the cyclic to alter pitch angle by 5° nose up. Release cyclic and check pitch attitude returns to datum ±1° with minimal overshoot.

b) Repeat a) for 5° nose-down.

c) Repeat a) for 10° left roll

d) Repeat a) for 10° right roll

e) Confirm satisfactory yaw axis behaviour during roll inputs

Re-engage AP 1

10.4 Basic Stabilisation (SAS Mode)

At 100 kt, level flight, engage AP 1 & 2 in SAS mode

a) Without retrimming, displace the cyclic to alter pitch angle by 5° nose up. Release. cyclic and confirm that pitch attitude behaviour is well damped

c) Repeat a) for 10° left roll

Re-engage ATT mode if required

10.5 AP Deselected

At 100 kt, level flight, disengage AP 1 & 2

Confirm satisfactory handling characteristics in gentle manoeuvres

Re-engage AP in ATT or SAS mode as required

10.6 Fly-Through

At 100 kt, level flight, engage AP 1 & 2 in ATT mode Confirm satisfactory fly-through by manoeuvring the aircraft without using beep or trim release. Check for acceptable stick forces.

10.7 Beep Trim

Confirm correct functioning of P1 & P2 Beep Trim

10.8 Collective trim releases

Confirm satisfactory functioning of collective (4-axis only) and yaw trim releases on both collectives

The following checks are to be performed with FD2 selected, AP1&2 engaged in ATT Mode

10.9 Basic Heading Hold

Trim the aircraft at 100 kt, level flight. Make ±20% torque changes, feet off pedals and confirm heading is maintained ±5°

10.10 Heading select

Trim the aircraft at 100 kt, level flight and engage HDG. Rotate the heading index on the HSI to change heading by 90° right.

Confirm aircraft rolls onto commanded heading

Repeat for a 90° left heading change

Disengage HDG mode

10.11 Bar Alt Hold

In a descent at 90kt, ROD < 500 fpm, engage ALT HOLD

a) Confirm overshoot <100ft and aircraft recovers to engagement height ±50ft. Increase power to regain 90 kt

b) Reduce power by 10% Tq
Confirm height maintained ±20ft

c) Increase power by 10% Tq
Confirm height maintained ±20ft

d) At 110 kt, deselect CPL on the AP controller. Descend 300ft (collective) and reengage CPL (reapply power as required)
Confirm aircraft recovers to original height ±20ft.

10.12 Airspeed Hold

At 90 kt, level flight, disengage Bar Alt Hold and engage Airspeed Hold

a) Confirm airspeed is held ± 5 kt

b) Without retrimming, pull back on cyclic to reduce airspeed to 70kt.
Release cyclic and confirm airspeed recovers smoothly to 90kt

c) Deselect CPL on the AP controller. Increase IAS to 110kt (beep trim) and reengage CPL
Confirm aircraft recovers to 90±5kt

e) Use the cyclic beep trim to change the reference airspeed. Confirm demand changes 10kt/3 sec beep input.

10.13 FD 1

Select FD 1 and confirm satisfactory engagement and functioning of coupled FD modes from the P_2 station

Reselect FD1 or 2 as required.

10.14 Bar Alt/Airspeed Hold (4 axis aircraft only)

At 90 kt, level flight, engage Bar Alt Hold and Airspeed Hold

a) Confirm IAS and Alt maintained within ±5kt and ±20ft

b) Increase airspeed demand to 110kt. Confirm aircraft accelerates smoothly
and Alt maintained within ±20ft

c) Select V/S and command a descent rate of 500fpm.
Confirm aircraft stabilises in the descent and airspeed maintained within ±5kt

d) Select ALT. Confirm aircraft levels at selected altitude ±50ft

`

10.15 Power Limiting (4 axis aircraft only)

At 90 kt, level flight, engage Bar Alt Hold and Airspeed Hold

a) Increase airspeed demand to V_{NO} As airspeed approaches V_{NO}, select V/S and demand a rate of climb of 1000fpm.

Confirm power limits at 77-81% Mast Tq/ 777-810°C ITT	
Confirm altitude has priority over airspeed	

Select ALT and reduce IAS demand to 90kt.

b) Achieve safe single engine flight conditions. Reduce one engine to idle and confirm N_2 split and correct response of driving engine.

Increase airspeed demand to V_{NO} Confirm power limiting at 777-810ºC ITT. **Do not allow Eng Tq to exceed 73.2%**	

Deselect IAS Hold and return the idle engine to flight position

10.16 Yaw Trim (4-axis aircraft only)

At 90 kt, level flight, engage Bar Alt Hold and Airspeed Hold

Use the yaw beep trim to make ***small*** changes to sideslip	

Use the yaw trim to return the sideslip ball to central

Note: **It is strongly recommended that the following tests be conducted at an aircraft weight which will permit single engine OGE hover.**

10.17 Rad Alt/Airspeed Hold (4-axis aircraft only)

Confirm Doppler is selected to SEA

Engage Bar Alt and Airspeed Holds at 90kt over a suitable area of water. Allow the aircraft to stabilise, then use V/S mode to descend to 500ft AGL at approx 500fpm.

a) Engage Rad Alt and confirm height is maintained within ± 10 ft.	
b) Using collective beep, reduce the Rad Alt demand to 190ft. Confirm aircraft stabilises at 190ft ±10ft	
c) Centre the heading index and engage HDG Change heading demand by 90° Confirm height is maintained within ±10 ft in the turn.	
d) Reduce airspeed to 60 kt. Confirm height is maintained within ±10 ft.	
e) Using collective beep, reduce the Rad Alt demand to 150ft. Confirm aircraft stabilises at 150ft ±10ft	
f) Increase airspeed demand to 90kt. Confirm height is maintained ±10ft	
g) Confirm that it is not possible to reduce Rad Alt demand below 150ft	
h) Using collective beep, increase the Rad Alt demand to 160ft. Confirm aircraft stabilises at 160ft ±10ft	

10.18 Hover (4 axis aircraft only)

Disengage Rad Alt and IAS holds. Descend to a 60 ft hover over a suitable area of water. When stabilised with good visual references, confirm groundspeed <20kt and engage Rad Alt and VELHLD.

a) Confirm aircraft stabilises in the hover at 60ft ±10ft

b) Using the cyclic trim increase groundspeed to 20kt fwd, 10kt sidewards and rearwards in turn. Use the Push-to-null on beep trim to return to the hover each time.

c) In the above test, confirm satisfactory functioning of both cyclic beep trim switches

d) Select Doppler OFF Confirm satisfactory indication and loss of LVI

e) Use cyclic beep trim to increase groundspeed to approx 10kt in each axis in turn. Confirm "Push-to-null" ineffective and beep trim must be used to return to hover.

Reselect Doppler

f) Deselect P_2 RadAlt. Confirm correct annunciations and loss of P_2 Rad Alt Indications

Confirm Rad Alt hold remains engaged. Use P_1 collective trim to increase hover height to 80ft

Reselect P_2 RadAlt

g) Deselect P_1 RadAlt Confirm correct annunciations and loss of P_1 Rad Alt Indications

Confirm Rad Alt hold inoperative

Reselect P_1 RadAlt

h) Confirm Rad Alt hold is operative. Use collective trim to increase RadAlt to 90ft.

i) Confirm RadAlt cannot be reduced using collective trim.

Disengage Rad Alt and VELHLD and fly away from the hover

10.19 ILS

10.19.1 Go-around

- Engage Airspeed hold at 90kt
- In 4 axis aircraft, engage V/S mode and demand a descent of 300fpm
- In 3-axis aircraft, adjust power to give a rate of descent of 300fpm
- Engage heading hold and turn heading bug through 90º
- When the aircraft is stabilised in the turn and descent, press go-around.

Confirm the aircraft rolls wings level and decelerates to 75kt approx.		
In 4 axis aircraft, the aircraft will climb at approx 750 fpm		
In 3 axis aircraft, it will be necessary to adjust power to maintain airspeed in the climb		

10.19.2 Carry out a coupled ILS if possible		

11. Landing

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

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

Landing time	

12. Shut down

Carry out an engine shut down using the "T-handles". Confirm satisfactory rotor brake performance from 40% N_R.		

(Note that shut down may take some time at low power.)

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.

	Eng 1	Eng 2		
Achieved RoC			fpm	
Scheduled RoC			fpm	
Delta ROC			fpm	Tolerance = -20fpm

13.2 Power Assurance (see para 5.11

	Eng 1	Eng 2	
Achieved ITT			ºC
Scheduled ITT			ºC
Δ ITT			ºC

13.3 Autorotative rrpm (See Appendix 2)

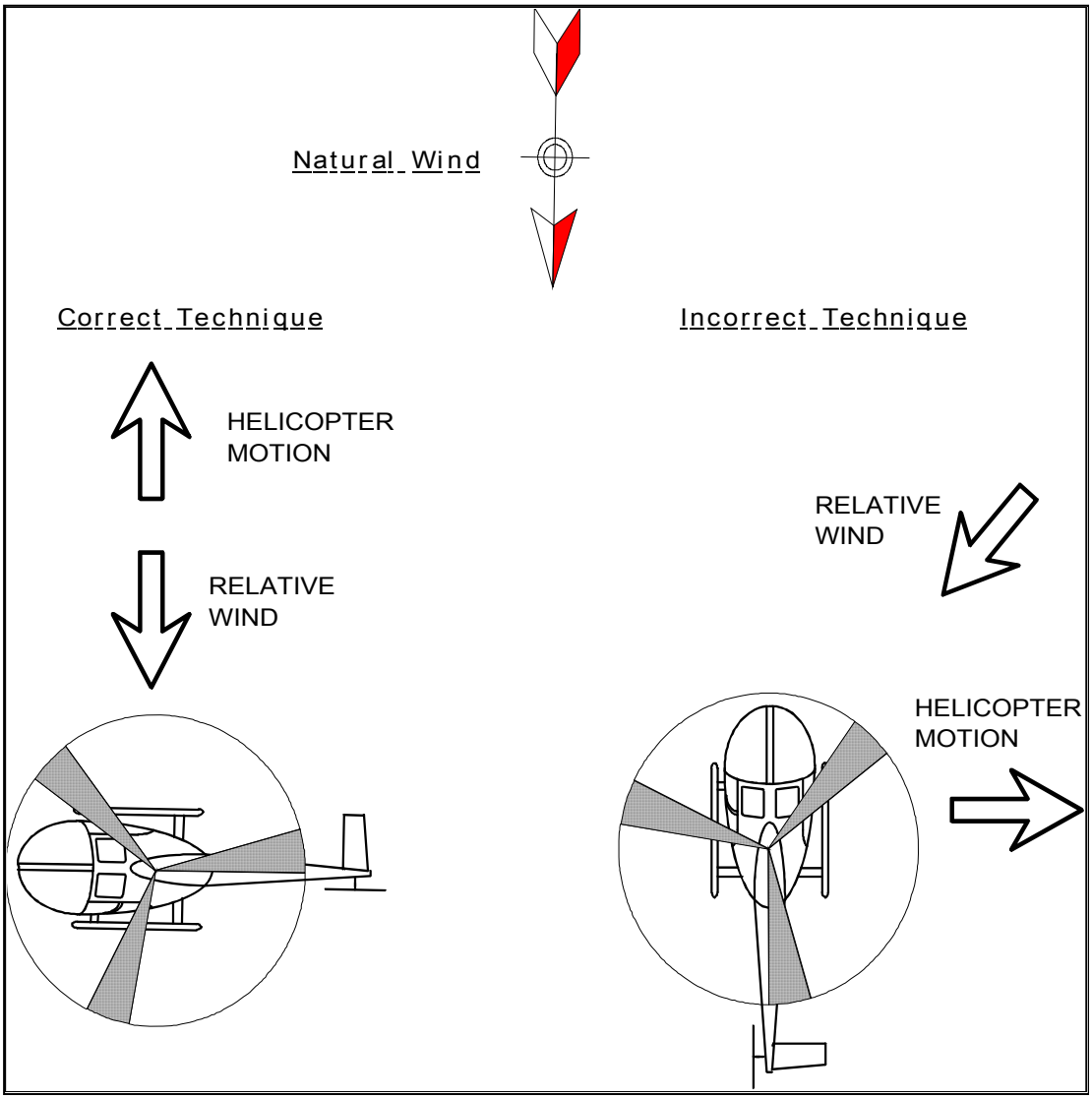
Schedule N_R		%	
Observed N_R		%	
N_R margin		%	Tolerance = ±3%

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.



Appendix 2

Rotor rpm in Autorotation

Target weight for autorotation is 9000 - 9500lb.

Perform a gentle entry to a steady autorotative descent at 65 kt.
Do not exceed power-off rotor rpm limitation (104.5%)
Allow to stabilise and record:

Alt	OAT	IAS	N_R	Fuel	AUW
Ft	°C	Kt	%	lb	lb

NOTE The rotor rpm in autorotation must be analysed and compared with the relevant maintenance manual chart. See Section 13 of this document.

Amendment List Issue 1 to 2

Para 5.2 Change cyclic centre test to align with RFM (80% N2).

Para 5.13 Minor change to Power Assurance table to include scheduled ITT and Δ ITT.

Para 6.2 20 kt groundspeed limit removed.

Para 8A Separate rapid engine acceleration test from autorotation test and add additional text.

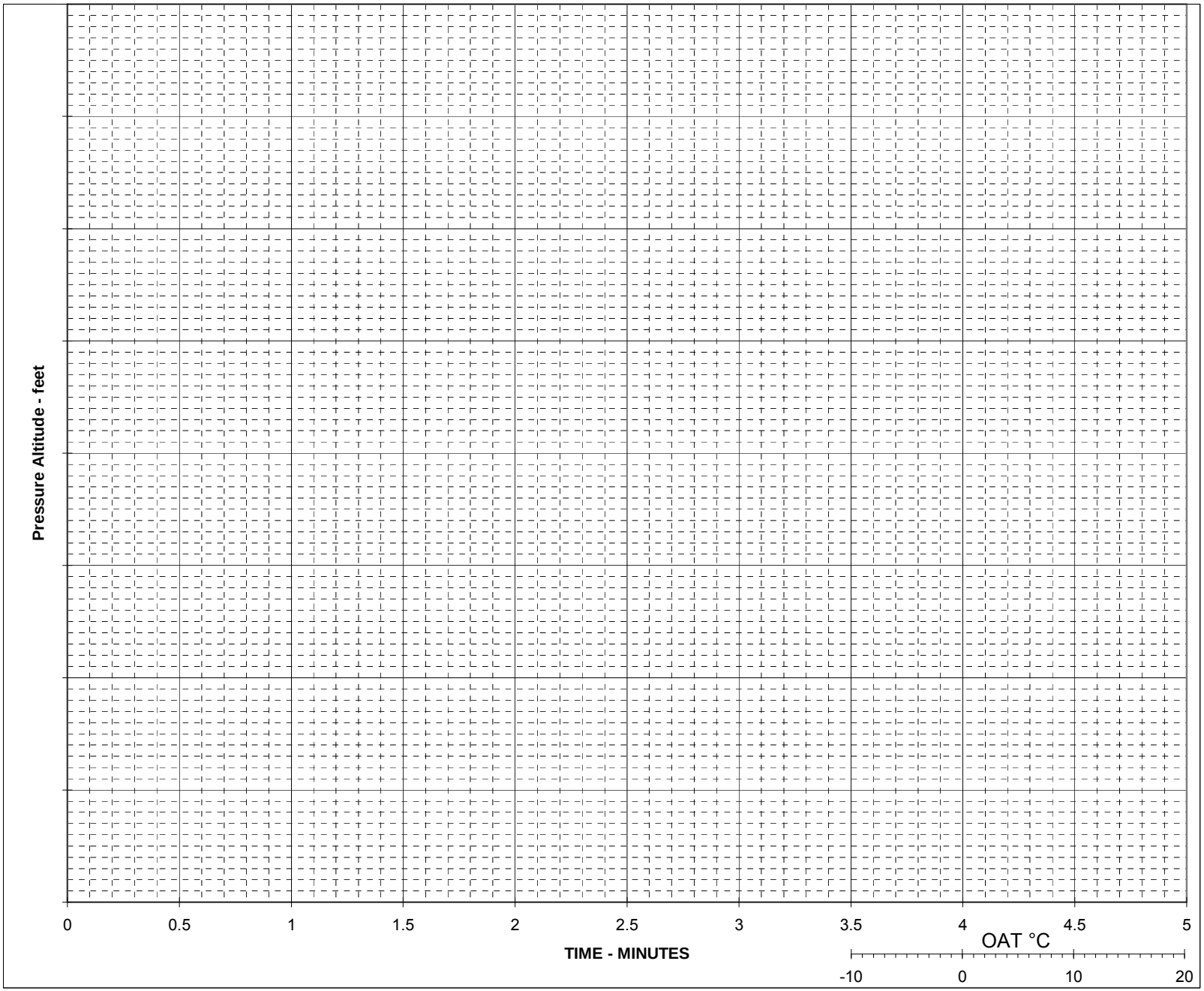
Para 9 Add 9.1.3 for steep turns.

Para 9.3 Add speed for test to respect FM limitation.

Para 10.11 a) Add instruction to increase power. d) Amend instructions to avoid aircraft getting too slow.

Para 10,12 c) Add instruction to use beep trim.

Para 12 Add statement that shutdown may be slow.



AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight
No 1 _____ Kg
No 2 _____ Kg

Mean Altitude
No 1 _____ feet
No 2 _____ feet

Mean OAT
No 1 _____ °C
No 2 _____ °C

ACHIEVED ROC
No 1 _____ ft/min
No 2 _____ ft/min

SCHEDULED ROC
No 1 _____ ft/min
No 2 _____ ft/min

DELTA ROC
No 1 _____ ft/min
No 2 _____ ft/min