CHECK FLIGHT CERTIFICATE

Sikorsky S-92A

CFS 350 issue 1

Registration:

Date:	Crew:	Observer:

Performance	Climb #1	Climb #2 (If required)	
Average Weight			
Average Altitude			ft
Average Temp.			°C
Speed			KI S
A hieved 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.:

Defects continued

No.	Defect	-/R/FT	Action?

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.
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 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

Sikorsky S-92A **CFS 350 Issue 1**

Registration

Test Dates

1. INTRODUCTION

This scheduled is applicable only to the Sikorsky S-92A helicopter. It is based on the assumption that the every day operation of the helicopter services as a continuous check on the functioning of all normal services.

The Flight Test must be carried out by an experienced pilot acceptable to the Airworthiness Division of the CAA in accordance with this schedule and the general guidance given in the CAA Check Flight Handbook. 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.

The minimum crew for this flight is to be increased by a flight observer.

WARNING

1. Although it may be legal to carry passengers on a Check 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:

   1) It is preferable to use ballast, and

   2) 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 Flight Manual to be exceeded.

Should there be any query about the Flight Test or its results, the local CAA Surveyor or the Helicopter Flight Test Section at Airworthiness |Evaluation & Surveillance, Aviation House, Gatwick must be consulted.

It is permissible for this Schedule to be completed on separate flights and dates provided the loading for each flight is clearly stated. All defects from all flights must be recorded on the Flight Test Certificate even if rectification work has been carried out between flights.

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

Operator/Maintenance Organisation		Registration	
Aerodrome		Flight Dates	
		Pilot	
		Co-pilot	
		Observer	

Weather	

Aerodrome altitude			QFE/QNH	
Wind velocity/direction			Ground Temp	
Take-off time(s)			Landing Time(s)	

2. LOADING

The aircraft is to be loaded to a weight limit of 26,500 lbs or to the highest AUW as is practicable. A lower weight to comply with the Operator's company policy is also permitted. The CG should be approximately in the neutral position.

Take-off weight (actual)	
Fuel contents	
C.G. position	

3. PRE-FLIGHT INFORMATION

Aircraft Serial No.	
Total airframe hours	

	No.1	No.2
Engine Serial No.		
Hours run since new		
Hours run since overhaul		

4. BEFORE APU START CHECKS

4.1 Carry out the normal external inspection

Doors and transparencies: Condition and Operation

Seats and harnesses

Placarding: Legibility and accuracy

Instruments: General condition.

Seat adjustment.

Verify that the pedals travel full range. Verify that the lock holds the pedals at different positions. With feet off the pedals verify that the pilot pedals travel to full aft position when the PED ADJ is pulled due to spring action. Repeat for co-pilot's pedals

Fuel Selectors: With BATT – OFF place fuel selector switch for No 1 engine in DIRECT and XFD. Verify that the switch activates by listening for the valve to move. Verify each position has a positive lock Repeat for No 2

Throttle quadrant: Move the No 1 throttle through full range verify smooth movement with some friction but no binding. Verify IDLE and FLY detents engage positively. Repeat for No 2 throttle.

Standby Attitude Indicator: With BATT – OFF push the EMR PWR pushbutton next to the standby attitude indicator. Verify that the ARM and EMER PWR lights illuminate, the beeping tone is heard and BATTERY TEST light illuminates. Push the EMER PWR pushbutton, lights extinguish, tone silent..

Place power switch to ARMED and check that gyro may be manually erected.

4.2 <u>Battery Only Checks</u>

a) With BATT-ON, external DC power OFF, confirm the following:

Pilot inboard and outboard MFDs are powered.
Internal communications functional.
#1 radio functional

b) TEST FIRE DET rotary switch on overhead console-rotate to INBD position
Master FIRE lights illuminated (a slight delay is acceptable).
APU and both ENG FIRE buttons illuminate. TEST FIRE DET switch-NORM

4.3 APU ON Checks (or AC EXT PWR if preferred)

If AC EXT PWR is used in preference to APU the checks will need to be modified, see RFM Normal Procedures.

a) With APU Gen ON verify advisory lights:
APU GEN ON, APU ACCUM LOW (until charged), PRIME PUMP ON, HYD GRD PUMP ON, HYD 3 HI MODE. No 3 hyd pressure in green range.

4.3.1 Software Verification

a) AMS
Press the UTIL bezel key on the MFD.
Select the CONFIG bezel key on the MFD, select ACFT bezel key
Verify the CONFIG page represents the actual configuration of the helicopter.

EGPWS version? Note that -24 or higher required for JAR-OPS 3.660 compliance.

b) Flight Displays
Confirm the slip ball is centred with the helicopter level.

Press the LUM control switch, adjust to full bright and full dark.

Ensure all pages are available on each MFD and PFD using hard and soft bezels.
Ensure cursor on the NAV page of the MFD moves in the commanded direction.

4.4 Reversion Modes

a) Place AHRS switch from NORM to 1, confirm AHRS 1 displayed in yellow on the pilot PFD and white on copilot PFD, each within a yellow box.

Place AHRS switch to 2, confirm AHRS 2 displayed in yellow on the copilot PFD and white on pilot PFD, each within a yellow box. Select NORM.

b) Place ADC switch from NORM to 1, confirm ADC 1 displayed in yellow on the pilot PFD and white on copilot PFD, each within a yellow box. AFCS DGRD displayed

Place ADC switch to 2, confirm ADC 2 displayed in yellow on the copilot PFD and white on pilot PFD, each within a yellow box. Select NORM.

c) Place DCU switch from NORM to 1, confirm DCU 1 displayed in yellow on the pilot PFD and white on copilot PFD, each within a yellow box.

Place DCU switch to 2, confirm DCU 2 displayed in yellow on the copilot PFD and white on pilot PFD, each within a yellow box. Select NORM.

d) Select PFD on outboard MFD's and non-PFD pages on inboard MFD's.
Turn off outboard MFD's (pull CB's PLT MFD OBD – BAT HOLD-UP bus on overhead CB panel and PLT OBD MFD – DC Essential bus on pilot CB panel). Confirm inboard MFD's automatically change over to PFD.

4.5 Warning/Caution/Advisory Check

Select EICAS page, select SHOW OBE soft bezel key. Verify the following lights are illuminated:

a)

AC GEN 1 FAIL	MGB OIL PRES	AC GEN 2 FAIL
HYD 1 PUMP FAIL		HYD 2 PUMP FAIL
ENG 1 OIL PRES		ENG 2 OIL PRES
ENG 1 FUEL PRES		ENG 2 FUEL PRES

If the Ground Pump is not activated, verify the following additional cautions are illuminated:

SAS 1 PRES	BOOST PRES	HYD 3 PUMP FAIL
	MR 1 SVO PRES	SAS 2 PRES
	MR 2 SVO PRES	
	TR SVO 1 PRES	
	TR SVO 2 PRES	

b) P/B LAMP switch. P/B DIMMER to OFF hold the P/B LAMP switch to TEST. Verify the following illuminate, all bulbs working and markings clearly visible.

All pushbuttons on the AFCS control panel.
All 4 landing gear control panel lights (2 filaments per light).
All lights on both master warning panels
The 3 ARMED lights on the engine fire control panel.

The IAS, ALT,HDG, and STBY lights on both mode select panels.
The ARMED, TEST and 2 L/R lights on the flotation panel (if installed).
The ARMED, TEST and L/R lights on the life raft panel (if installed).
The ARMED, OFF, EXT PWR, GOOD and BATTERY TEST lights on the standby attitude indicator control.

Release the P/B LAMP switch, lights extinguish, “DECOUPLE” on ICS.
Rotate the P/B DIMMER from OFF to BRT, verify that the above lights dim and brighten. Rotate to OFF.

4.6 Aircraft Weight

Press UTIL hard bezel, select AGW.
Confirm the correct basic weight is listed.
Confirm fuel weight corresponds with fuel gauges.
Input crew and ballast weight.

4.7 Fire Detection System Test

a) Rotate the FIRE DET switch from NORM to INBD.

Check pilot and copilot FIRE warning lights, main engine FIRE button lights and APU pushbutton lights illuminate.
“FIRE ENGINE ONE”, “FIRE ENGINE TWO” and “FIRE APU” audio alerts active.
Cancel audio alerts with pilot’s cyclic audio alert cancel button.

b) Rotate the FIRE DET switch from INBD to NORM, pause to allow lights to reset then, to OUTBD

Check pilot and copilot FIRE warning lights and main engine FIRE button lights ON.
“FIRE ENGINE ONE” and “FIRE ENGINE TWO” audio alerts active.
Cancel audio alerts with co-pilot’s cyclic audio alert cancel button.

c) Rotate the FIRE DET switch from OUTBD to NORM to SMOKE.
Check SMOKE IN BAGGAGE warning on EICAS page.
"SMOKE IN BAGGAGE" audio alert active
Cancel audio alerts with the pilot's cyclic audio alert cancel button.

Rotate the FIRE DET switch to NORM.

4.8 Fire Extinguishing System Test (NOTE this test may be carried out post flight if desired)

With the APU running (not engines) place Fuel Control Switches, in DIR and note "green fuel lines" on EICAS page from left and right tanks to the appropriate engines. Repeat for XFD. Reselect DIR.

Press the FIRE #1 ENG and FIRE #2 ENG guarded buttons on the Fire Control Panel (FCP).

ARM light illuminates on #1 Engine and #2 Engine FCP button.
EICAS fuel line indication disappear to #1 and #2 engines.
Continue the test with ARM illuminated.

Select the FIRE EXTG test switch to OPEN.

Verify the WARN light on the FIRE EXTG TEST panel next to the switch illuminates.

Activate the fire extinguisher select switch to the MAIN position.

TEST light on the FIRE EXTG TEST panel illuminates.
Repeat for RESERVE position.

Place the FIRE EXTG test switch to SHORT.

WARN light and the TEST light on the FIRE EXTG TEST panel illuminates

Activate the fire extinguisher select switch to MAIN position.

The WARN and TEST lights on the FIRE EXTG TEST panel remain illuminated. Repeat for RESERVE position. Confirm in OFF position.

FIRE EXTG switch – NORM. Verify WARN and TEST lights extinguish.

Depress both #1 and #2 Engine guarded buttons to de-arm the extinguishing system. ARM lights extinguish EICAS fuel lines to the #1 and #2 engines appear on the EICAS.

4.9 Lights

Functioning of:
Landing lights.
Controllable Searchlight, extend swivel and retract.

Anti collision lights
Position lights

Cockpit lighting

HEELS lighting (if fitted). Place the HEELS switch to ON, pilot and co-pilot HEELS lights illuminate.

4.10 Instruments:

Barometric altimeters are within 70 ft of field elevation and within 50 ft of one another.

Vertical velocity indicators indicate zero.
OAT display accurate

4.11 Flight Control System Checks

Note 1 Complete RFM Cockpit Equipment Checks to Hydraulic GND PUMP – ON before next check.

Note 2 No stick jump is allowed when selecting either stage of the primary servos.

Select GND PUMP ON. BST – ON
SAS 1, SAS 2 and YAW/CYCLIC/COLL TRIM - OFF.
Cyclic and pedals centred.
Place the servo switch to No 1 position.
MR SVO 2 PRES and TR SVO 2 cautions illuminated.
Flight controls – Slowly move through full range
Check for unusual binding or restrictions.

To access control position data, follow the sequence below:
HLTH=>HUMS=>MAINT=>PARAMS=>ENTR=>ANLG=>ANLG 2
Place the servo switch to No 2 position.
MR SVO 1 PRES and TR SVO 1 cautions illuminated.
Flight controls – Slowly move through full range
Check for unusual binding or restrictions.
SERVO - BOTH. Confirm servo cautions off. Flight controls – Slowly move through full range
Check for unusual binding or restrictions.

NOTE THE BOTTOMED COLLECTIVE NUMBER FOR USE IN AUTOROTATION FLIGHT CHECKS (para 16.1)
Determine collective corresponding to 10%, 15% and 20%
Example: Coll up 55, coll down –60, range 115, 10% (-60 + 11.5) = -48.5
(Typically 15% is used):

Range = 15 % =

Note 3 With boost OFF there is an interaction between the collective and the pedals. Restrain pedals at the neutral position while moving the collective through full range. Restrain the collective at mid-position while moving the pedals through full range.

Repeat checks above with BST – OFF.
BOOST PRES Caution light: ON
Check for no unusual binding, restriction or excessive dead band.
Note increased forces.
BST – ON

4.12 Pitot Heater Check

Select PITOT HT CPLT, PLT and STBY - ON.
(TURN OFF PITOT HT Caution will illuminate if OAT is above 5°C) check pitot tubes for heat (pitot tubes can be very hot) or at end of flight if more convenient.

PITOT HT PWR Circuit Breakers (x 3) – Pull.
Check PITOT 1 HEAT, PITOT 2 HEAT, and PITOT 3 HEAT cautions on.

Circuit breakers – Reset. Cautions disappear (except TURN OFF PITOT HT).
PITOT HT CPLT, PLT and STBY - OFF.

4.13 Rotor Brake

a) Apply the rotor brake. Check rotor brake pressure at least 450 psi and the ROTOR BRAKE caution light on.

Satisfactory completion of pre-start checks.

5. **ENGINE START/ROTOR ENGAGEMENT**

5.1 Throttle Disengagement

Select No 1 FUEL selector OFF, Select ENG 1 IGN OFF,
Place No 1 THROTTLE in IDLE.
Press the No 1 ENG START switch, STARTER 1 ON illuminates, Ng increases. Move No 1 THROTTLE from IDLE to OFF. STARTER No 1 extinguishes, Ng decreases.

Repeat for No 2

5.2 Engine Start

Carry out rotor brake on starts for both engines in automatic.

Satisfactory control of TGT during start

Eng. 1	Eng.2

5.2 Rotor Engagement

(Remain at 50 to 54% Nr for a minimum of 1 minute)

Hydraulic pressure system 1 and 2 in green range by 40% Nr.

No.1	No.2

5.3 MGB Oil Bypass

At Nr between 50% and 55% place the MGB OIL BYP switch in BYP, verify the MGB BYPASS caution light illuminates. Return to NORM, caution extinguishes.

5.4 Engine Accel/Decel Checks

	No.1	No.2
Both Throttles FLY. Verify No 1 and No 2 torque within 5%. 105% Nr		
Throttle 1 retard rapidly to IDLE, no stalls should occur. Allow parameters to stabilise.		
Throttle 1 Advance rapidly to FLY (in one second) and hold until Ng peaks.		
Throttle 2 retard rapidly to IDLE, no stalls should occur. Allow parameters to stabilise.		
Throttle 2 Advance rapidly to FLY (in one second) and hold until Ng peaks.		

5.5 AFCS Ground Run Checks

Note: A jump in the flight controls or tip path plane could indicate an accelerometer or rate gyro bias. If a jump is noted an ACCEL NULL may be performed through the Mode Select Panel and TEST.

105 % Nr, select YAW, CYCLIC and COLL TRIM ON.
Select ATT, AP1, AP2, SAS 2 PRI and SAS 1 PRI ON

Without engaging any trim release select AP 1 OFF, verify that the flight controls do not jump, the tip path plane does not move appreciably and the AFCS stays in ATT mode. Select AP 1 ON.	
Select SAS 1 OFF, verify that the flight controls do not jump, the tip path plane does not move appreciably and the AFCS stays in ATT mode. Select SAS 1 ON	
Repeat for AP2 Repeat for SAS 2	

Satisfactory completion of pre-taxy checks. [ ]

6. **TAXIING CHECKS**

Taxy time

6.1 Satisfactory operation of parking brake.

6.2 During taxi, depress pilot's brakes and insure that the aircraft comes to a smooth controlled stop with no indication of binding or swerving.

Repeat this check using the co-pilots' brakes.

Turns :

Perform a ground taxi turn to the right by depressing the right pedal. Increase to a tight turn.

Repeat the check in a ground taxi turn to the left.

7. **HOVER CHECKS**

7.1 Weight on Wheels Check

Select WX on weather radar and WX overlay on Nav Display (radar in FSTBY)
Select Transponder ON (in standby)

In a suitable area away from people, lift to a hover, verify the WX display changes from FSTBY to WX and Transponder to green (ON)

7.2 Establish a low hover. Record the following:-

Take-off time.

ENG	***Press ALT***	***OAT***	***TORQUE***	***TGT***	***N_R***	***MGB Press***
1						
2						

Verify both PFD ASIs read zero + wind speed.

7.3 While in a stable hover with AFCS fully engaged and feet off pedals, make a torque change of up to 20%, heading should not change by more than 2° during power change.

8. **LOW SPEED ENVELOPE**

8.1 AFCS fully engaged. See Appendix 1 for test method. Assess the vibration level, control response and position (adequate control margin) during the following manoeuvres. The tests should be flown at the Flight Manual sideways/rearwards airspeed limits (35 knots). If this would result in a groundspeed in excess of 20 kts, the speed may be restricted to avoid exceeding this value if desired.

a) Turns on the spot.

b) Sideways flight left and right

c) Rearwards flight

8.2 Select SAS Mode and carry out gentle hover manoeuvres (it is not necessary to fly sideways/rearwards up to the speeds flown in b) and c) above).

Re-engage AFCS, note smooth re-engagement.

8.3 Check correct operation of radar altitude hold. Engage Rad Alt hold, selected altitude maintained ± 4 feet.

Without depressing collective trim, push collective down to descend 5 feet and release the collective. Aircraft returns to the trimmed altitude (±4 ft) with no more than a 4 foot overshoot.

Depress the collective TRIM REL and change hover height by at least 10 feet.
Release the collective TRIM REL and the aircraft should maintain the newly selected altitude (±4 ft).

9. CLIMB PERFORMANCE

Carry out a climb for 4 minutes on a straight course. Climbs should be carried out in stable, non turbulent conditions away from cloud. Do not start to record until established in the climb on condition. If conditions are excellent carry out one climb, if not carry out a second climb. OEI power cannot be used in normal operation, a dual engine climb is carried out on the check flight. The second climb (Section 9.2) is carried out at exactly the same conditions but may not be required if the first climb was carried out in good conditions.

Associated Conditions

Altimeter - set to 1013 hectopascals Landing gear - retracted. Speed - V_{BROC} (80 KIAS - 1 knot per 1000 ft PA)
All air bleeds - as required

Engine power -**Dual engine** max continuous

Torque 100/100%	N_g 99.9%	TGT 935°C	N_R 105%

NOTE 1: Torque/engine parameters not to exceed values shown above during climb.

NOTE 2: The climb performance must be analysed and compared with the scheduled performance, see Section 17.1 of this Schedule.

9.1 DUAL ENGINE CLIMB PERFORMANCE *Climb No 1*

Conditions

Torque	**100%**
N_g	**99.9%**
TGT	**935°C**
N_R	**105%**
V_{BROC}	**80 KIAS – 1/1000 ft**

Time	Alt	OAT	IAS	Torque	N_g	TGT	N_R	MGB Oil Temp	MGB Oil Press	Fuel Flow	Fuel
0											
0.30											
1.00											
1.30											
2.00											
2.30											
3.00											
3.30											
4.00											

After the climb, obtain an accurate OAT by flying at approximately mid-climb altitude at V_{BROC} in level flight for 1 min. to allow OAT to stabilise

Alt	
OAT	

9.2 DUAL ENGINE CLIMB PERFORMANCE *Climb No 2 (If Required)*

Conditions

Torque	**100%**
N_g	**99.9%**
TGT	**935°C**
N_R	**105%**
V_{BROC}	**80 KIAS – 1/1000 ft**

Time	Alt	OAT	IAS	Torque	N_g	TGT	N_R	MGB Oil Temp	MGB Oil Press	Fuel Flow	Fuel
0											
0.30											
1.00											
1.30											
2.00											
2.30											
3.00											
3.30											
4.00											

10. **HANDLING CHECKS**

10.1 Cruise

Ensure Landing Gear Up

10.1.1 At normal cruise power note the following in stabilised conditions:

	PRESS ALT	***IAS***	***OAT***	***ENGINE***	***Ng***	***TGT***	***TORQUE***
PILOT				1			
CO-PILOT				2			
STANDBY							

FUEL [ ] WEIGHT [ ] VIBRATION LEVEL [ ]

If vibration level is high, note frequency and axis. [ ]

Altimeters. Check for proper operation and agreement. e.g. no excessive lag, smooth operation. [ ]

ASI's should agree to within ± 5 knots. [ ]

Check VSI's for correct operation. [ ]

Confirm torques matched within 5% [ ]

10.1.2 At normal cruise power carry out turns left and right (30° AOB). Note control response and vibration level. [ ]

10.2 Maximum Speed ***Ensure Landing Gear Up***

Determine Vne before next test.

Without exceeding placarded VNE apply maximum continuous power and stabilise at maximum obtainable speed in level flight.	KIAS
Continue to Vne, note PFD scale limit correct	
Vibration level.	
If vibration level is high, note frequency and axis.	

At Vne carry out gentle turns (up to 20° AOB) left and right (reduce power slightly).

Note:-

Vibration level.	
Control response.	

10.3 Rapid Engine Acceleration

Note approximate collective position at 70% torque. With engine levers in FLY position in a stabilised descent at approximately 80 KIAS with approximately 5% torque set, increase collective to give about 70% torque in 2 to 3 seconds.
Check there is no tendency for surge and satisfactory engine response.

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 70% matched torques.

Note 2 : Do not reduce N_R below 95%.

Engine response/surge	
Transient NR droop %	

11. **POWER ASSURANCE CHECK**

Carry out auto power assurance checks in flight at 120 KIAS (Flight Manual, Part 1, Section II)

ENG	PRESS ALT	OAT	TORQUE	TGT MARGIN
1				
2				

(Margins also to be recorded in Post Flight. Action, Section 20)

ANTI-ICE	ON	OFF

12 **AFCS CHECKS**

12.1 Trim out at approximately 135 kts. Record any bias in any one trim axis that makes it difficult to fly hands off.

12.2 At approximately 120 KIAS with AFCS fully engaged (PRI SAS 1/2., AP 1/2 ATT mode, cyclic, yaw and coll trim) check the aircraft returns to its original attitude, with a maximum of one slight overshoot, after the following disturbances:-

i) Pitch

a) Without re-trimming alter pitch attitude by 5° nose up in less than 2 seconds then release cyclic. (Note this is a 5° change of attitude not 5° nose up absolute).

b) Repeat nose down.

i) Roll

a) Alter roll attitude by 10° left in less than 2 seconds then release cyclic.

b) Repeat 10° right.

iii) Yaw

Note satisfactory yaw channel functioning during i) and ii).

12.3 Reduce speed to 110 KIAS, repeat 12.2 with AP 2 deselected (NOTE 120 KIAS limit).

i) Pitch

a) 5° nose up.

b) 5° nose down

ii) Roll

a) 10° left

b) 10° right

iii) Yaw

Note satisfactory functioning.
Re-engage AP 2

12.4 Repeat 12.2 with AP 1 deselected.

i) Pitch

a) 5° nose up.

b) 5° nose down

ii) Roll

a) 10° left

b) 10° right

iii) Yaw

Note satisfactory functioning.

Re-engage AP 1.

12.5 During the flight test check that when making 30° bank turns without using the trim release or cyclic trimmer and feet off pedals, the fly through capability is retained not continue to increase during the manoeuvre).
Confirm turn coordinator maintains within ½ ball of centre.
The helicopter should return to wings level with only a slight overshoot and no adverse pitching and ball returns to trim.

12.6 <u>ALTITUDE Mode</u>

AFCS fully engaged (PRI SAS 1/2., AP 1/2 ATT mode, cyclic, yaw and coll trim)

i) At a normal cruise speed engage ALT and HDG, check altitude is held ±50 ft and HDG functions satisfactorily (turns left and right on heading select knob).

ii) a) From level flight at 120 KIAS, rotate the REF SET knob to ALTP and select an altitude 500 ft above current altitude. Selected altitude appears above the BARALT in white.

Engage ALT PRE, Confirm:
ALT light extinguishes
ALTP ARM appears
VS ON displayed
VS displayed in green on PFD's next to the C label
Selected climb rate displayed digitally and on VSI bug

Verify the helicopter immediately starts a 500 fpm climb
Confirm the vertical speed can be adjusted using the cyclic beeper trim.

At 300 feet prior to the preset altitude aural "LEVEL OFF"

Approx 100 ft prior to selected altitude (proportional to rate of climb/descent) confirm:
ALTP ARM changes to ALTP CAP, VS ON light extinguishes, VS on pilot PFD is replaced by ALTP

When altitude captures confirm:
ALTP CAP light extinguishes,
ALT ON light on pilot FD MODE SEL
ALT is displayed on pilot PFD
Verify level off to within 50 ft with no more than one overshoot.

After stabilising at selected altitude move cyclic aft against trim. Alert light (ALT flashing yellow) should illuminate at 200 ft deviation and aural "CHECK ALTITUDE".

b) Repeat with a 500 fpm rate of descent on copilot's FD MODE SEL panel.

12.7 AIRSPEED HOLD (2 CUE)

Disengage ALT and engage IAS.

i) a) From trimmed level flight at 120 KIAS with fixed collective and heading hold, move cyclic aft against trim and establish approximately 100 KIAS. Release cyclic.
and check that the aircraft smoothly returns to the trimmed condition ± 5 kts

b) Repeat with forward cyclic to 140 KIAS (do not exceed V_{NE}).

12.8 VOR Tracking

AFCS fully engaged (PRI SAS 1/2, AP 1/2 ATT mode, cyclic, yaw and coll trim)

i) 120 KIAS, select HDG and ALT. Set COURSE 2 to an appropriate radial. Select NAV on pilots MODE SELECT panel. Verify NAV ARM is displayed on the MSP. Verify the intercept occurs with no more than one overshoot and no more than 20° of bank. NAV CAP displayed and helicopter tracks smoothly.

12.9 3 Cue MODE

i) Select IAS, ALT and HDG at typical cruise speed. Confirm satisfactory operation. Confirm longitudinal cyclic beeper changes commanded airspeed. Confirm collective vertical beeper changes the reference altitude. Confirm pedal beeper has no function.

With landing gear down (to increase drag) use the cyclic beeper to increase desired speed to 155 KIAS, verify the torque is limited to 86% before the selected airspeed is achieved.

ii) IAS, VS, HDG mode, collective beeper changes reference vertical speed.

12.10 Pedal Beeper

i) Reduce speed to just below 50 KIAS, ATT mode. Verify pedal beeper changes the reference heading.

ii) Above 50 KIAS verify the beeper will command a 1°/sec turn.

12.11 SAS MODE

At 110 KIAS check operation in SAS mode during straight flight and turns.

12.12 AFCS OUT

At 100 KIAS disengage the AFCS (AP 1 & 2 out SAS 1 & 2 out). Carry out turns, climbs and descents. Check smooth disengagement/ re-engagement.

12.13 ILS (Optional Test)

Carry out a coupled ILS (3 cue) at 120 KIAS. Check correct operation of auto level and deceleration.

12.14 GO-AROUND MODE

a) Align the heading bug with present heading.

b) Set up 120 KIAS, 700 fpm descent (IAS/VS mode).

c) Engage HDG mode.

d) Rotate heading bug left or right 90° to establish 20° to 25° bank angle.

e) Engage GA mode when bank angle is 20° to 25°.

f) Check GA disengages HDG, commands wings level (and then constant heading) at 80 KIAS at 750 fpm climb.

g) Re-engage HDG, rotate heading bug left or right 30° and check new heading is acquired.

13. **FUNCTIONING**

13.1 Heating and Ventilation

Check that the heating/demisting can be satisfactorily controlled and that the ventilation is adequate.	

13.2 Landing Gear

With the gear up and at an altitude above 150 ft AGL, slow below 60 KIAS.	
No gear warning is heard.	
Accelerate to 80 KIAS and descend below 150 ft AGL.	
No gear warning is heard.	
Staying below 150 ft, slow below 60 KIAS.	
The red LNDG GEAR light on both warning panels illuminates and the aural “TOO LOW GEAR” alert is heard.	
Push the audio cancel button on either cyclic.	
The audio is cancelled but the red light remains on.	

14. **AUTOROTATION**

14.1 Carry out a gentle entry to autorotation at 80 KIAS (collective as required).

Check handling/vibration levels in turns left and right to 30° AOB in autorotation.	

14.2

To access control position data, follow the sequence below:
HLTH=>HUMS=>MAINT=>PARAMS=>ENTR=>ANLG=>ANLG 2

Note collective values determined in test 4.11

10%	15%	20%

Carry out a steady autorotative descent at 80 kts with the collective lever at 10%, 15% or 20% as required to be within limits (90% to 110% Nr). Retard throttles to obtain Np/Nr split if required. . Record the following when stabilised.

NOTE : Do not exceed power off rpm limits (95 to 110%).

PRESS ALT	***OAT***	***Coll %***	***N_R***	***FUEL***		***WEIGHT***

Return throttles to FLY.

Satisfactory needle split.	

15. **LANDING**

Time	

15.1	Confirm no tendency to resonance during a smooth landing with a gentle collective lowering..	

NOTE Should any divergent oscillations be noted, lift off immediately and carry out a normal landing, consider repositioning the helicopter.

Fuel quantity	

15.2 Cabin Address System (If fitted)

Operate cabin address system and ensure it functions adequately for use in directing an emergency evacuation.	

18.3 *Flotation System Test*

If not tested on a regular basis carry out the checks in the RFM	

15.3 Electrical System

Switch off both AC generators and check that both AC GEN 1/2 FAIL cautions illuminate. Check essential services maintained by battery (or APU). AC GEN FAIL and DC CONV FAIL illuminate Switch both AC generators back on.	
Select DC converter 1 and 2 off. DC CONV FAIL illuminate (3 screens lost).	

		ENG.1	**ENG.2**
15.4	Retard each engine in turn to idle stop.		
	Ng at ground idle		
	TGT at ground idle		

15.5 Internal and External Lighting

Note that these tests can also be carried out before start with suitable external power supplies.

Internal

Flight Instrument Lights	
Instrument panel and console lights	
Standby compass	
Cockpit floodlight	
Wander light	

16. **SHUTDOWN**

16.1 Engine Fuel Valve Shutdown

Complete Pre Shutdown Checks

a) Retard No 1 engine lever to IDLE. Retard slightly to activate engine out warning. Note Ng for Engine Out Light. (55%). Note that response is very quick and only an approximate figure is required.	
Repeat for No 2 engine	
Switch on Pitot Heat, Check pitot tubes are hot (if not checked in 4.12)	

17. POST FLIGHT ACTION

17.1 Performance Climb

Plot out the data on the analysis sheet (Appendix 2) and determine the achieved rate of climb. The scheduled performance must be obtained from the RFM and compared with the achieved performance.

No.1 climb. Achieved - Scheduled rate of climb =	
No.2 climb (if carried out). Achieved - Scheduled rate of climb =	

Tolerance = – 20 fpm.

17.2 Autorotation RPM

Determine the scheduled rotor speed in autorotation (see appendix 3, [from FCPM]) and compare with the achieved value.

Actual NR - Scheduled NR =	

17.3 Engine Power Assurance

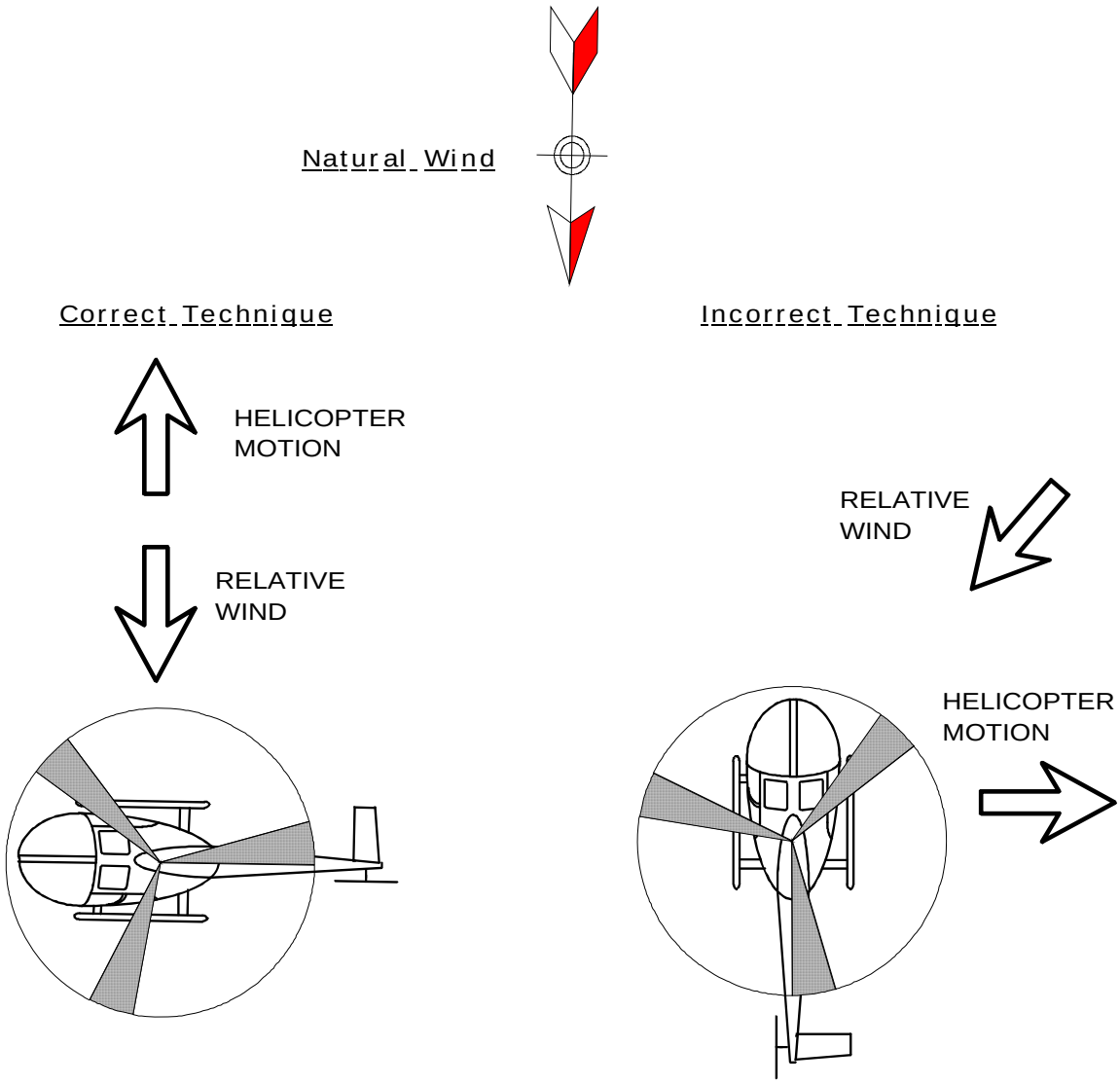
ENGINE	***TGT Margin Flight***
1	
2	

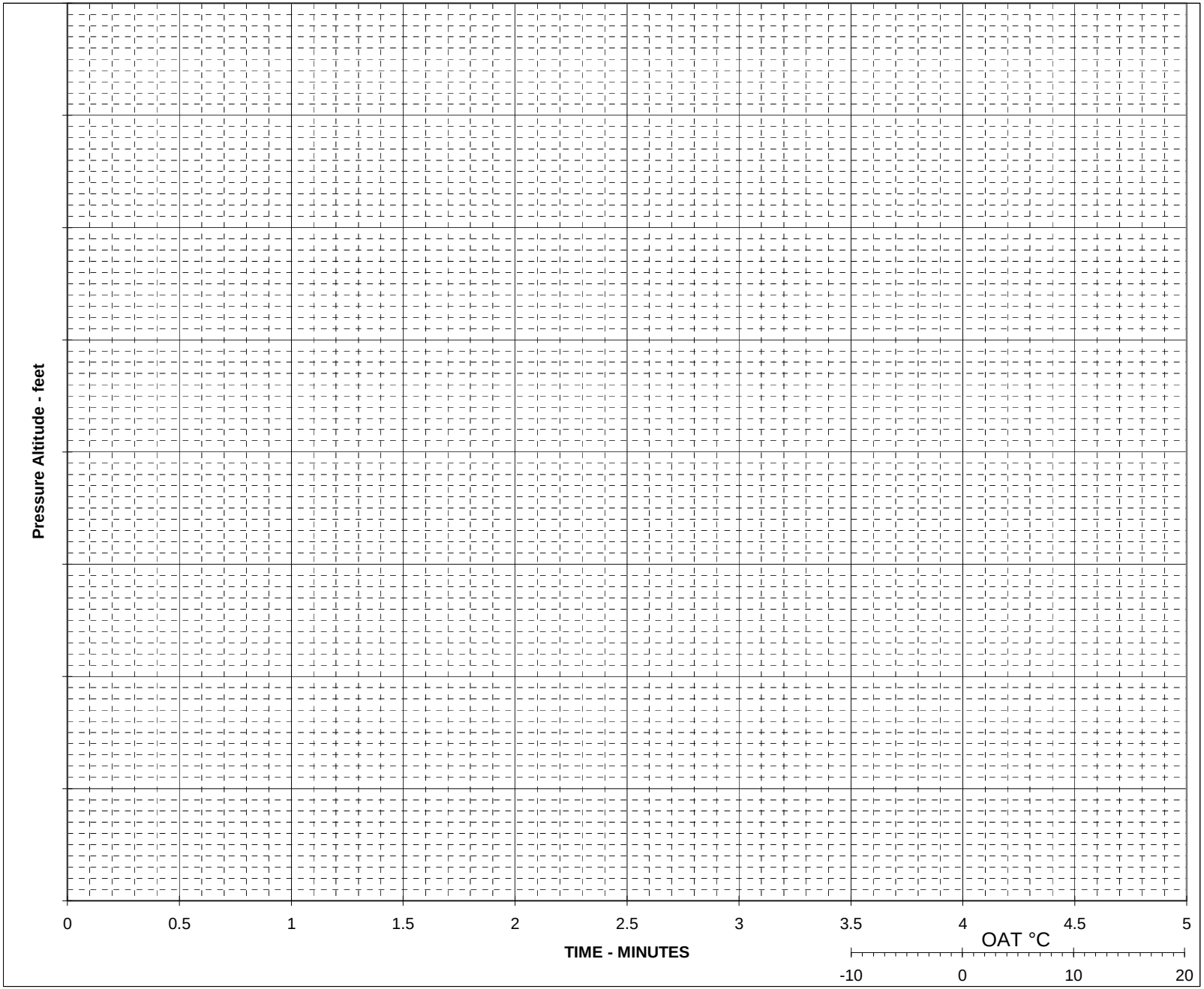
APPENDIX 1

SIDEWAYS AND REARWARDS FLIGHT

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

For rearwards flight the helicopter should be lined up tail into wind and gently accelerated rearwards to achieve the required relative air speed.





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