CHECK FLIGHT CERTIFICATE

SA 341G and Ex-Military Gazelle **CFS 168 Iss 2**

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:

(Note that climb only applicable to SA341G, Ex-mil Gazelle based on level flight 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
Pilots using this document should be familiar with the tests and techniques needed. If the results are to be submitted to the CAA the pilot must be specifically briefed on techniques and safety considerations by the CAA and must have carried out a Check Flight within the last 4 years.

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 engine start. Also delete Kg or Lbs as appropriate.
Takeoff cg: Actual cg at lift-off
Performance
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

SA 341G and Ex-Military Gazelle

CFS 168 Issue 2

Registration | Test Date(s)

1. INTRODUCTION

This schedule is applicable only to the SA 341G and ex-military Gazelle helicopters fitted with the Astazou III A and III N2 engines. 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.

CAA policy is that pilots who conduct airtests on the behalf of the Authority must be acceptable to the Authority, must have been briefed by the CAA on techniques and safety considerations before carrying out the tests in this schedule. 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. For flights without a Certificate of Airworthiness in force (or for flights carried out with a Permit to Fly restricted to the purpose of flight testing for the issue or renewal of a Permit to Fly), it is illegal to carry a passenger except an occupant performing duties in the aircraft in connection with the flight. For the recording of data on this Schedule, the observer is considered to be necessary for the safe operation of the flight.

   Before accepting any passenger/observer 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 or Aircrew 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 at Airworthiness Division, Flight Department, Aviation House, Gatwick must be consulted.

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	
		Flight Date	
Aerodrome		Pilot	
		Observer	

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

2. LOADING

The aircraft is to be loaded to achieve a take-off weight close to MAUW. The C.G. should be approximately in the neutral position. Note that the performance check of speed attainable at IPS and MPS (Section 9) need to be carried out at within a certain weight range and this may determine take off weight.

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

3. PRE-FLIGHT INFORMATION

Aircraft model		Ex Mil Type:
Constructors No.		
Total airframe hours		

Engine model	
Serial number	
Hours run since new	
Hours run since overhaul	

4. PRE-FLIGHT CHECKS

Carry out the normal external inspection and normal pre-flight inspection.

Doors and transparencies: Conditions and operation	
Seats and harnesses	
Placarding: Legibility and accuracy	
Instruments: Legibility and accuracy of colour bands and markings. General condition.	
Warning captions illuminate correctly	
Fuel flow flow control lever and fuel shut off lever work freely over their full range of control	
Primary flying controls and their frictions work correctly over the full range	
Satisfactory completion of normal pre-start checks	

ENGINE STARTING AND GROUND IDLE

a	(1) Residual T4		°C
	(2) Engine oil temperature (EOT)		°C
	(3) Voltmeter reading		V
b.	Complete ENGINE STARTING checks :		
	Record:		
	(1) Minimum volts during start		V
	(2) Maximum T4 during start		°C
	(3) START light out Nc		RPM
	(4) ENG GI caption clear		RPM
	(5) Time to ground idle (50 sec max for III N2)		sec.

c. At ground Idle - Record :

(1) Nc (25,500 ± 400)		RPM
(2) Stabilised T4		°C
(3) GEN caption clear (Nc 19,000 To 30,000) Note: Caption may not clear until engine above Ground Idle.		
(4) Torque zero (+ 0.5%, - 1.0%)		

ROTOR ENGAGEMENT AND MPOG

a. Complete ROTOR STARTING check and check for no drag on clutch. Record:		
(1) Eng. P Caption clear (should be out by 28,000 Nc. If not out by 35,000 Nc, shut down engine)		RPM
(2) Clutch engagement RPM 27,000 to 34,000 Nc)		RPM
(3) Synchronisation time (30 to 45 sec)		sec.
(4) Clutch engagement torque (15 to 20%)		%
(5) Maximum T4 during engagement		°C
(6) Rotor rpm for MGBP caption clear		Nr rpm

b. Check freewheel and no engine flame-out :

(1) Set 300 Nr - Retard rapidly to Ground Idle; Check freewheel operation (needles split). If engine flames out, shut down and investigate.		
(2) If engine satisfactory, advance throttle fully forward (normal rate); Record - ALTNR caption clear Nc (40,700 - 41,900)		RPM
(3) Select starter switch to OFF then RUN. Check engine continues to run.		
(4) Test warning lights, engine should not stop.		

c. With engine stable, record :

(1) Nc (43,500 - 0 + 400 Astazou III A) Nc (43,700 ± 400 Astazou III N2)		RPM
(2) T4		°C
(3) EOT		°C
(4) Voltmeter reading (28.5 ± 0.5 V)		V
(5) Torque		%

FUNTIONAL CHECKS

a. Complete checks for Flying controls, Stick feel, SAS (if fitted)	
b. Check hydraulics. SAS OFF :	
(1) Set - Hydraulics ON	
(2) Set - Friction off: Make slow and rapid cyclic control movements amplitude ± 1”; Check - control forces symmetrical.	
(3) Set Hydraulics OFF: Check - no control jarring, excessive shake or stir. HYD Caption on ex-military.	
(4) Apply - Left and right yaw pedal only (± 0.5”): Assess - Change in vibration level - Freedom of movement.	
(5) Set - Hydraulics ON: Check - friction dampers.	

5. HOVER, TAKE-OFF CHECKS

a. Complete TAKE-OFF checks

b. Hover into wind - 5 feet AGL

c. Record :

		Take off time
(1) Collective pitch (Should not exceed IPS)		°
(2) Nc		RPM
(3) T4		°C
(4) EOT		°C
(5) Fuel contents		kg
(6) Torque		%
(7) OAT		°C
(8) Wind velocity		kt.

d. Ground resonance check :

(1) Land on level surface - Check no resonance during touchdown.	
(2) Collective pitch - Apply gradually to 30% torque approx. Helicopter should be free from ground resonance. Fully lower collective lever.	

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

6. LOW SPEED MANOEUVRES

a) Axial turns left and right

b) Sideways flight left and right up to an estimated 17 kts

c) Rearwards flight up to an estimated 17 kts

SAS HOVER CHECK (if Fitted)

a. Ensure all channel switches - ON

(1) Establish hover, engage SAS, check any engagement errors are negligible.

b. In trimmed hover - Fly ‘hands off’ but monitoring closely.

(1) Check - SAS operation normal; no consistent drift in any axis (Limits: 2° / minute in pitch and roll, 4° / minute in yaw).
Note: Channel switches may be selected OFF in turn to facilitate assessment.

c. Ensure channel switches - ON, SAS engaged :

CAUTION: If the heading hold fails to disengage correctly during spot turns, the yaw pedals move to oppose the turn and need to be overriden.

(1) With feet off - vary hover power: Check - SAS yaw stabilises heading.

(2) Make spot turns of 90° in each direction; Check - During turn, heading hold is disengaged.

(3) Reduce rate of turn to less than 2°/sec: Check: With ‘feet off’ and at each out of wind heading (90° intervals), full SAS heading stabilisation regained.

7. PERFORMANCE - EN ROUTE CLIMB

[only applicable to SA341G, no climb carried out on Ex-military Gazelle]

With the altimeter set to 1013 mb climb at first collective detent for 3 minutes.

Conditions

Coll Pitch	**IPS (First collective detent)**
Torque	**Limit set by alt/OAT**
T4	**550°C**
IAS	**65 Kts**

Time	Alt	OAT	IAS	Torque	T4	N_C	Coll Pitch	Engine Oil Temp	Engine Oil Press	Fuel
0										
0.30										
1.00										
1.30										
2.00										
2.30										
3.00										

After the climb, obtain an accurate OAT by flying at approximately mid-climb altitude at Vy (65 kts) in level flight for 1 min. to allow OAT to stabilise

Alt	
OAT	

Turbulence level

8. HANDLING CHECKS

a.	At the lesser of IPS or MAX TORQUE, allow speed to stabilise then assess vibration levels in 45° AoB turns. Ensure no tendency to vertical bounce or jack stall:	Kts
	Left	
	Right	
b.	At cruise speed; Heater, check operation- no leaks when OFF	
c.	Ventilator - open/close	
d.	Apply maximum power in level flight and then dive to VL. Assess vibration level.	
e.	Gentle turns at VL (20° AoB).	
f.	At 70 knots approx. enter descent and set about 5% torque to ensure engine is driving rotor. Carry out rapid recovery to approx. 60% torque in not less than 3 seconds. Note satisfactory engine response	

SAS (if Fitted)

a.	Set - IPS	
b.	Trim in steady cruise	
c.	Fly ‘hands off’ for 2 minutes	
d.	Note drift in pitch and roll (max 2°/minute)	
e.	Set - MPS	
f.	Trim in steady cruise	
g.	Fly hands off for 2 minutes	
h.	Note drift in pitch and roll (max 2°/minute)	
i.	Fly at 60 knots in level flight, With ‘feet off’, enter 5° banked turn. Reduce speed slowly; check - Yaw channel engages fully at 50 knots approx.	

9. LEVEL PERFORMANCE CHECKS AT IPS AND MPS

WARNING: When MPS is selected, ensure that maximum permissible torque for engine (from torque bug) and gearbox are not exceeded.

a. *Ex-military Gazelle*: Ensure weight 1600 to 1900 kg.
SA341G: Ensure weight 1600 to 1700 kg.

b. *Ex Military Gazelle*: Set collective quadrant temperature ADJUSTER to 30°C (see Note 1)
SA341G: Set temperature ADJUSTER as appropriate for actual OAT. Note that SA341G data for IPS is only published for 20°C setting.

c. Set 1013.2mb. All air bleeds off

d. Procedure - At 1650 feet (4000 feet or 6000 feet also acceptable for Ex-military Gazelles), fly straight and level, set IPS. After 2 min, or when speed has stabilised, using sideslip string and RCDI reference, record figures in table below. Repeat at MPS.

Altitude (ft)	*Selection*	*C pitch Deg*	*Fuel Kg*	*Nc RPM*	*T4 °C*	*Tq %*	*OAT °C*	*IAS Kts*	*Weight Kg*
1650	IPS								
	MPS (2)								
or 4000	IPS								
	MPS (2)								
or 6000	IPS								
	MPS (2)								

Note :

(1) Reset for local conditions after test.

(2) At MPS ball should be displaced one ball to the right.

T4 correction factor (SA341G only) [ ]

SA341G only: Engine condition check must be determined after flight and recorded in Section 14.

10. AUTOROTATION

a. At safe altitude carry out a gentle entry into autorotation maintaining 65 to 70 kts, maintain fuel flow lever fully forward. Helicopter weight should be such that collective lever can be fully lowered. **Do not exceed power off limits.**

ALT	OAT	IAS	N_R	FUEL STATE

b. Carry out 30° AoB turns left and right.

11. MANUAL REVERSION

a. Attain 70 knots in level flight; 8° collective approx : ☐

(1) SAS - Disengage ☐

(2) Hydraulics - OFF ☐

(3) Ensure - No excessive stick forces, stick stir or shake ☐

b. Increase speed slowly to 95 knots : Check control quality in 30° AoB left and right turns. ☐

c. Set - 10° Collective
Check - Feedback forces and control ☐

d. **Reduce speed to 70 kt.** Reset collective (approx 8°) Set hydraulics ON ☐

e. SAS - Re-engage ☐

f. Ensure - No excessive attitude change ☐

12. LANDING AND SHUT-DOWN

Landing time		
a. After landing :		
(1) Reduce to Ground Idle, record Nc		RPM
(2) At 170 Nr - Apply rotor brake		
(3) Record - Stopping time (25 sec max)		sec
b. At stabilised Ground Idle - Record :		
(1) Nc (25,500 ± 400)		RPM
(2) T4		°C
(3) EOT		°C
(4) OAT		°C
c. Complete STOPPING THE ENGINE Check - Record :		
(1) Engine rundown time (45 sec minimum)		sec
(2) STOP light action		

13. LIGHTING

a. Cockpit lighting	
(1) Panel lights	
(2) Instrument ligths	
(3) Wander light	
b. External lights	
(1) navigation lights	
(2) Anti-collision lights	
(3) Strobe lights	
(4) Landing lamp and extension/retraction	

14. POST FLIGHT

a. Autorotation RPM :

(1) Calculate AUM in autorotation | | Kg.

(2) Check observed Nr against scheduled (Fig. 4 for Ex-mil.)
(Limit ± 5 Nr)

Obs - sched	
-	=

b. Level performance checks at IPS and MPS
(AS341G use Flight Manual Appendix "Test Programme")
Use table below.

(1) Convert recorded IAS to RAS/CAS (See Fig. 1 for Ex-mil), SA341G error is negligible.

(2) Check RAS/CAS at **IPS** within 5% of theoretical airspeed, and torque within 2½% of theoretical torque at IPS **and** MPS. (See Fig. 2, 2A, 3 and 3A for Ex-mil.)

c. SA341G only: Plot the climb on the attached sheet.
Achieved rate of climb - scheduled rate of climb =

d SA341G only:
Engine condition check.

IPS				MPS			
Airspeed			Torque	Airspeed			Torque
Achieved	IAS			Achieved	IAS		
	RAS				RAS		
Scheduled	RAS			Scheduled	RAS		
Δ Achieved -	Scheduled =			Δ Achieved -	Scheduled =		

From –5M (see copy in Appendix 2) determine the decrements for excrescences:

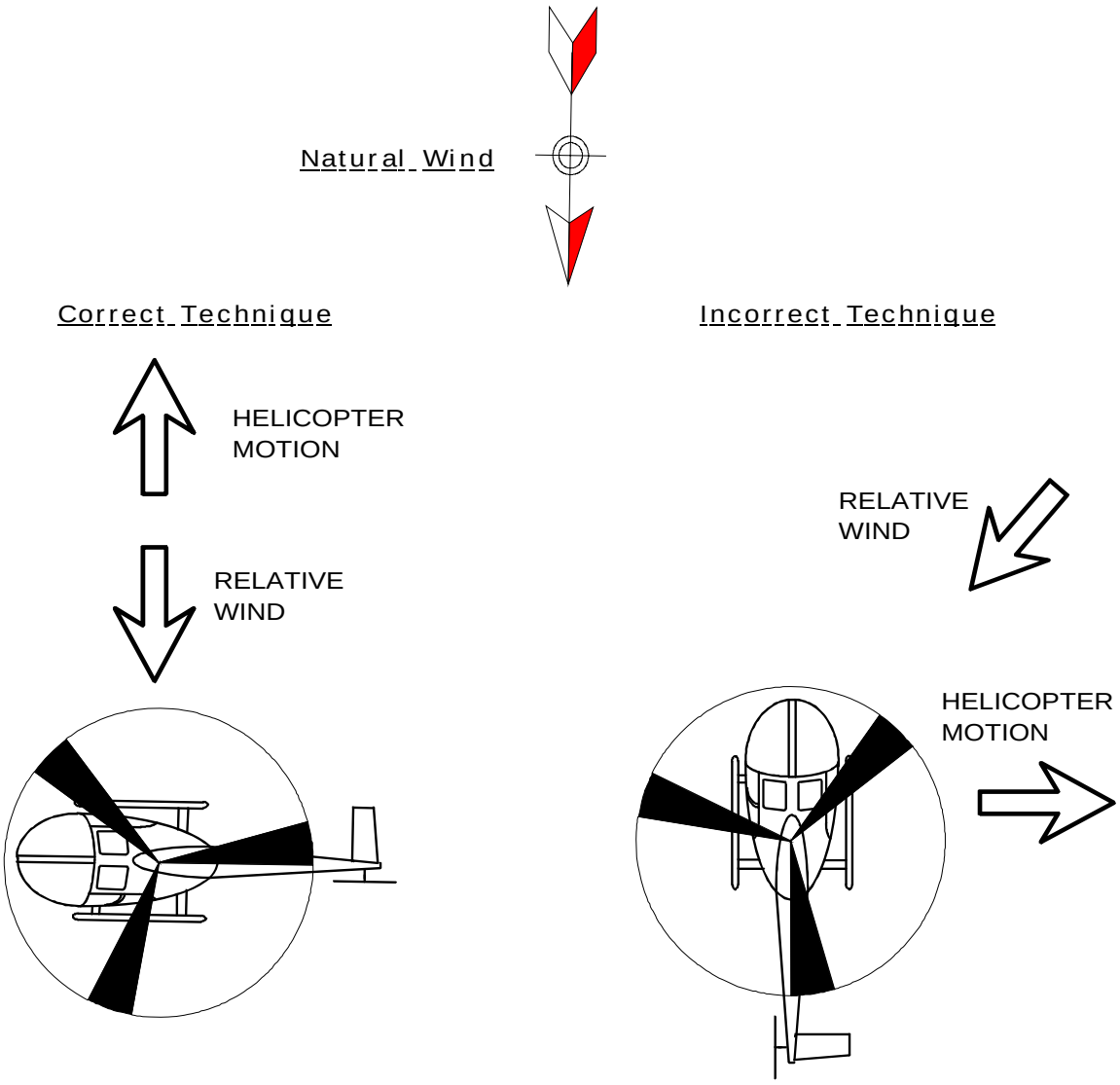
Excrescence	Knots
Total	

Calculation for table above:		Knots
Scheduled IPS is Fig 2 value – Total =	-	=
Scheduled MPS is Fig 3 value – Total =	-	=

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.

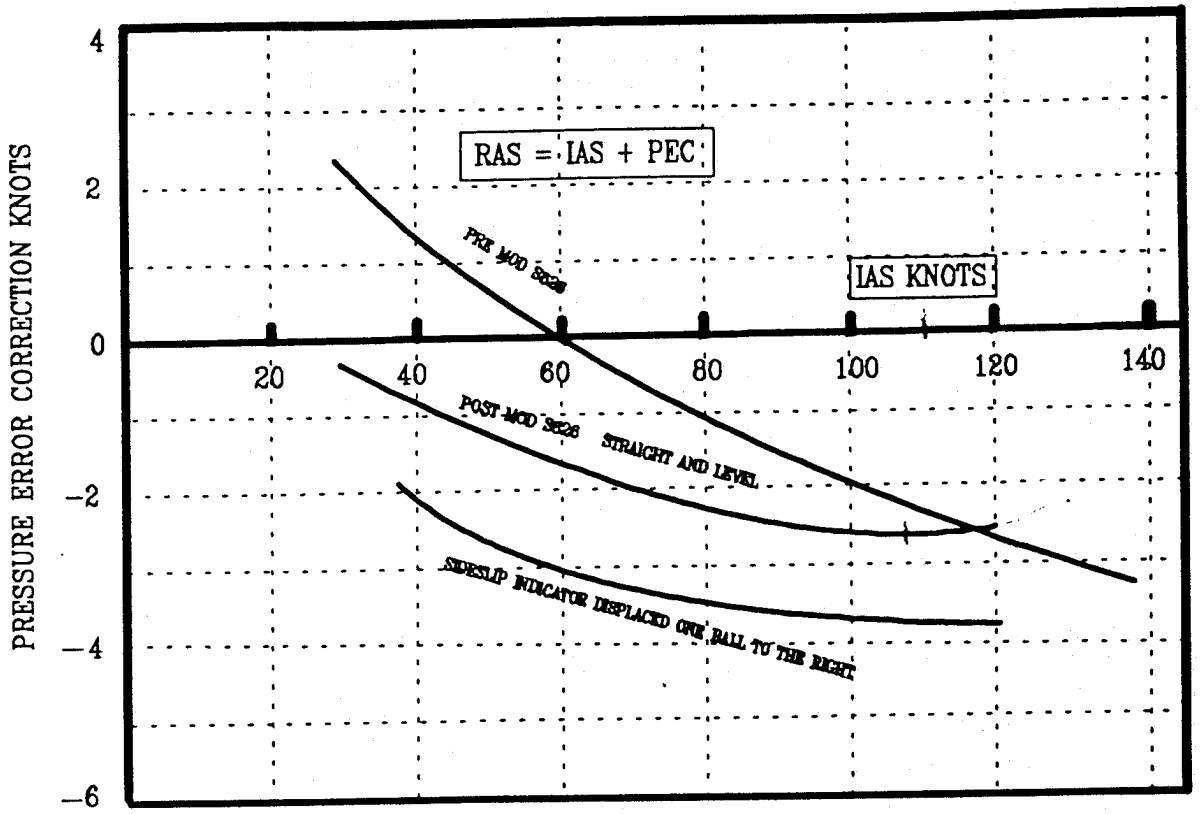
For rearwards flight the helicopter should be lined up tail into wind and gently accelerated rearwards to achieve the required relative air speed.



Depending on mod state, the follwong decrements apply:

Excrescence	*Knots*
S450 ARC 340 / VHF	2.5
S8 PTR 446 IFF/SSR	0.9
Windscreen Wipers	0.6
Yaw Indicators	0.3
S596 GOA - Plinth	2.4
Sight	1.7
Strobe Light and Deflector	0.2
Hook	0.9
Doppler	3.0
HF Aerial	0.6
V / UHF	0.1
Stores Boom	11.0
Nitesun Search Light and Stores Boom	16.6
Nitesun Search Light Bracket and Stores Boom (without Lamp Unit)	12.6
Finch Role Equipment (including Stores Boom)	20.5
Emergency Flotation Gear	5.2

APPLICABLE TO EX-MILITARY GAZELLES ONLY



Note: Within the flight envelope RAS = EAS

Fig.1: Airspeed Pressure Correction (PEC)
Pre and Post Mod S626 (Clean Aircraft)

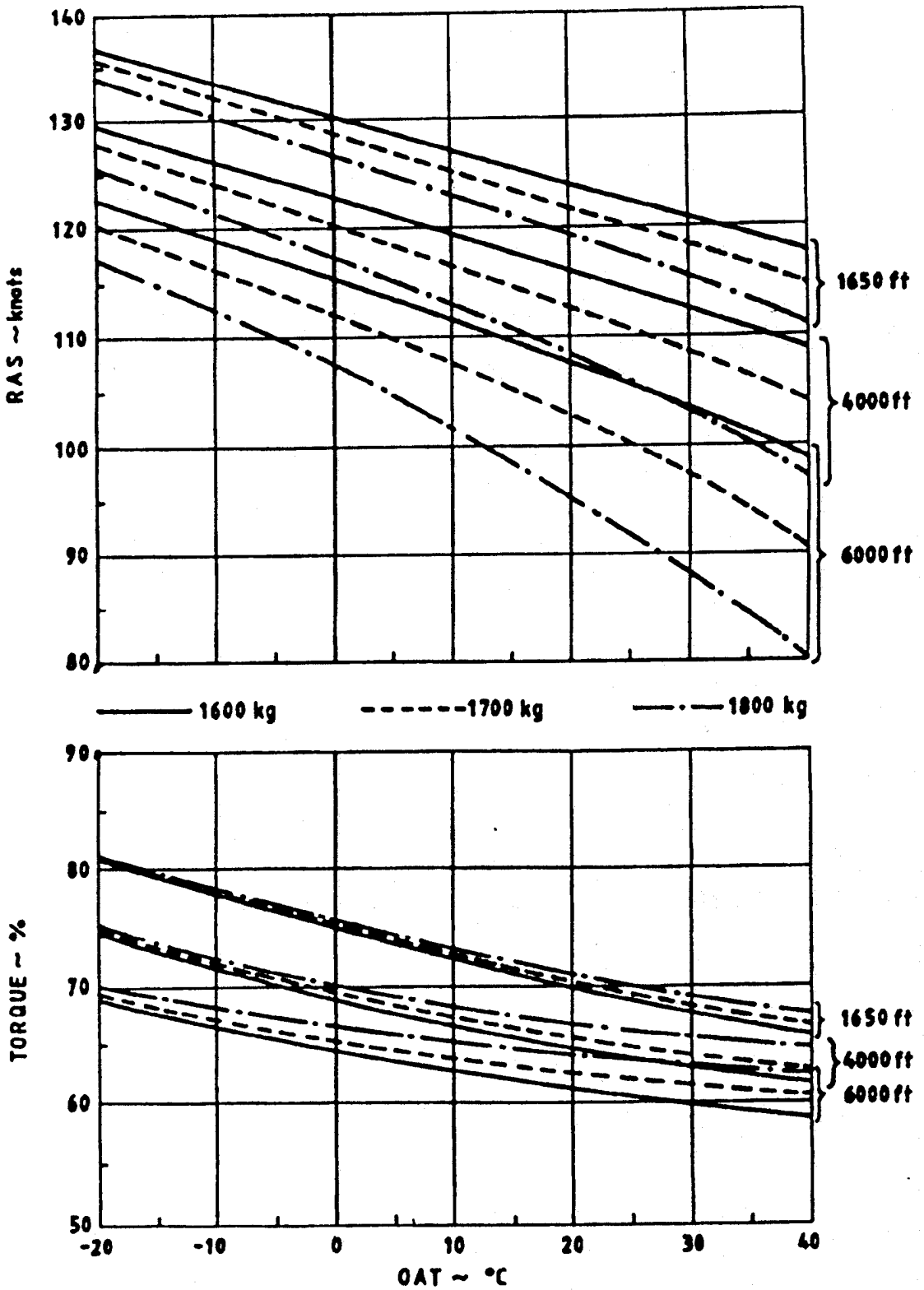
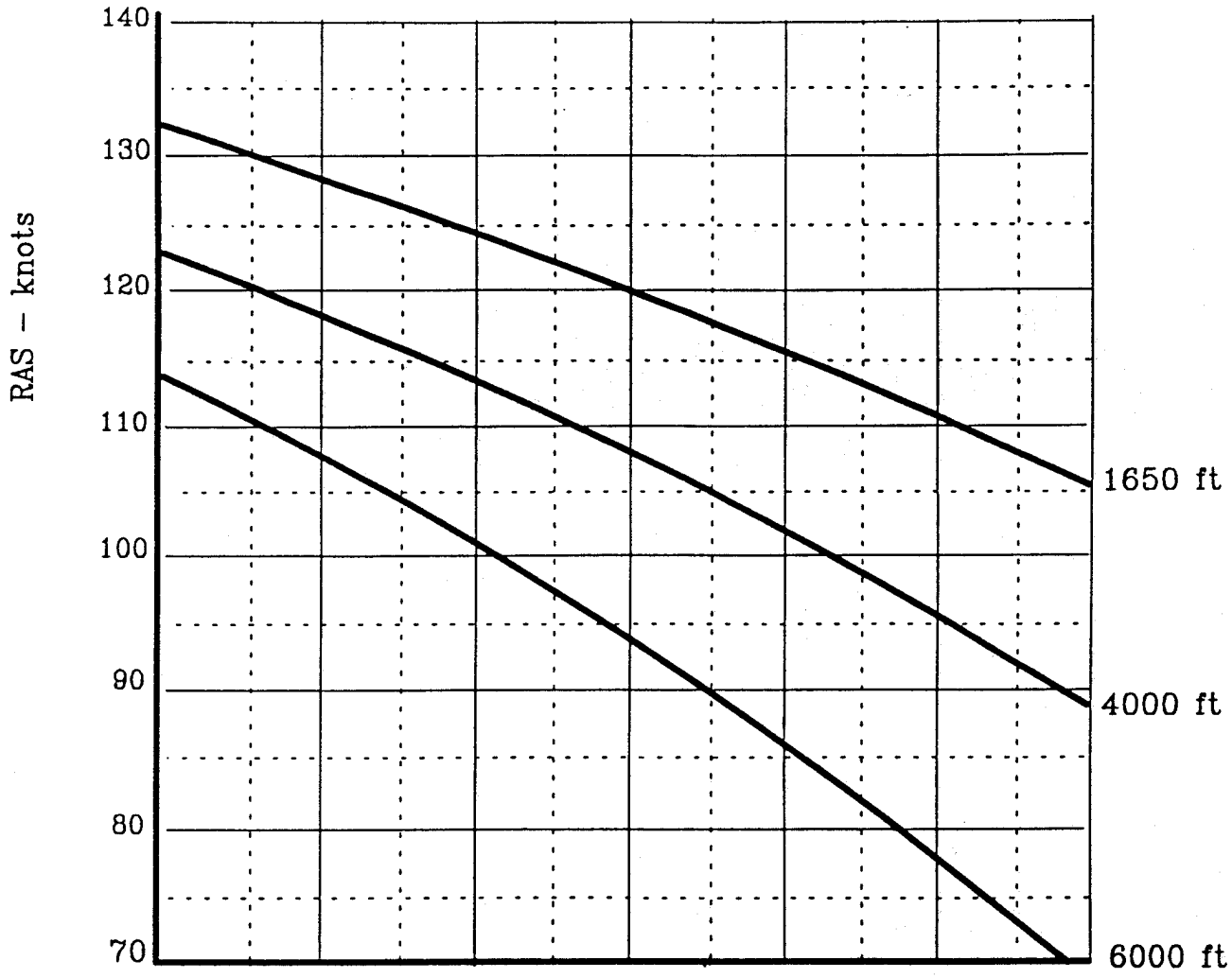
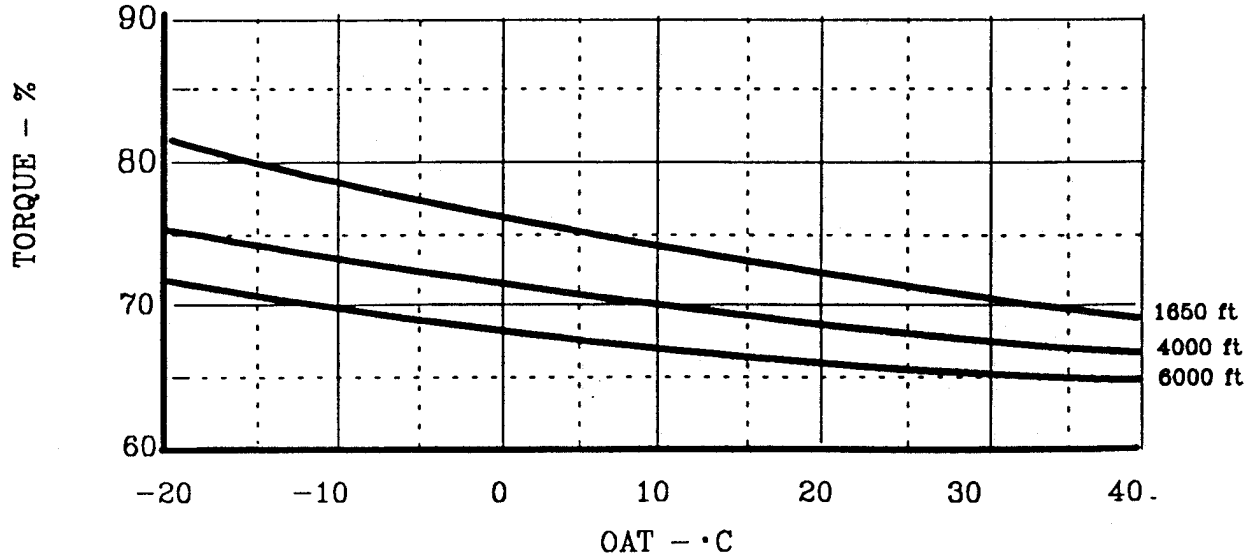


Fig .2 - Level Flight Performance - IPS (Index 30 °)

APPLICABLE TO EX-MILITARY GAZELLES ONLY



1900 kg



◆ **Fig 2A - Level Flight Performance - IPS (Index 30 °)** ◆

SM 91/0161 (5) AL2 Sheet 17A

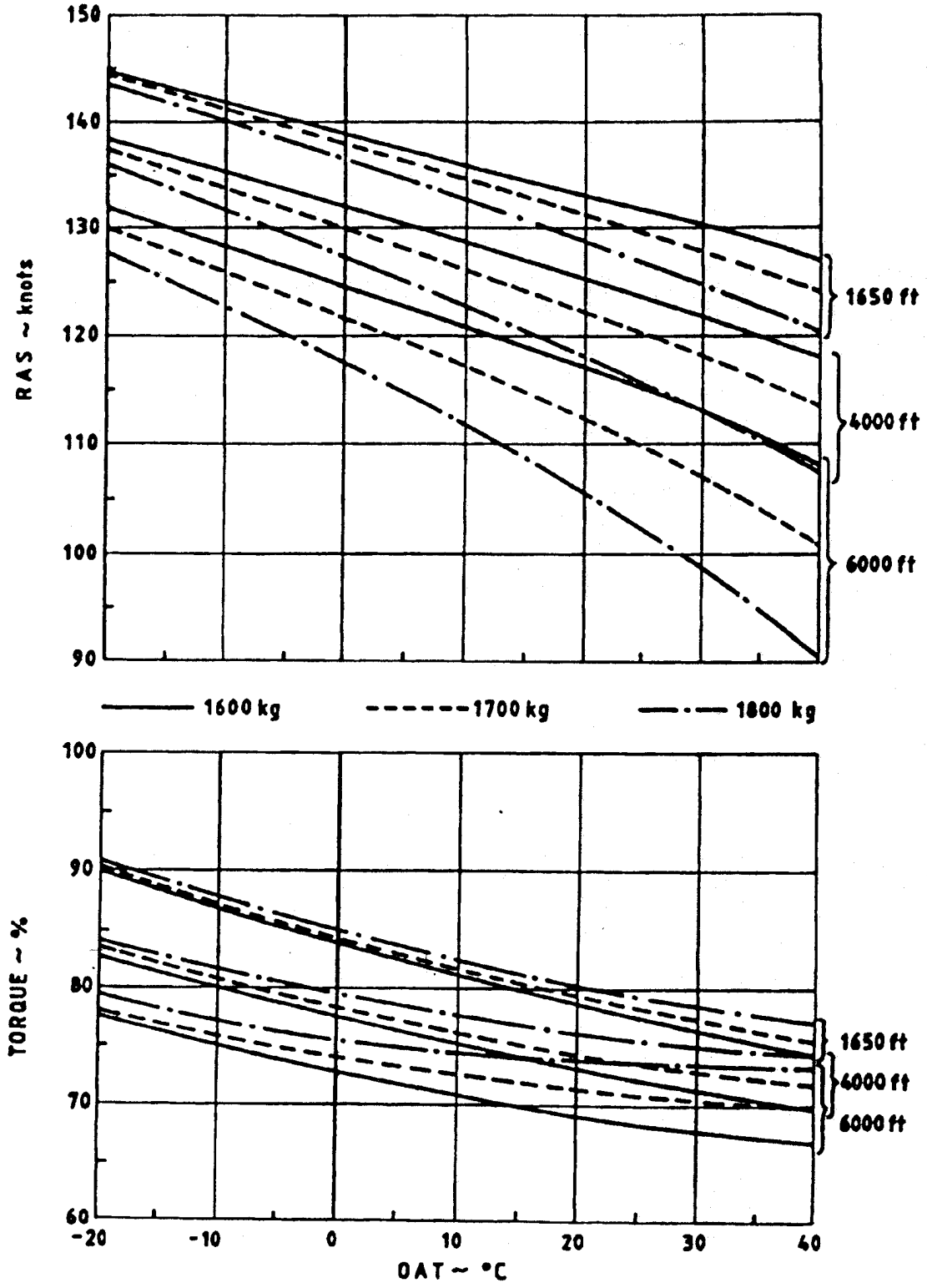
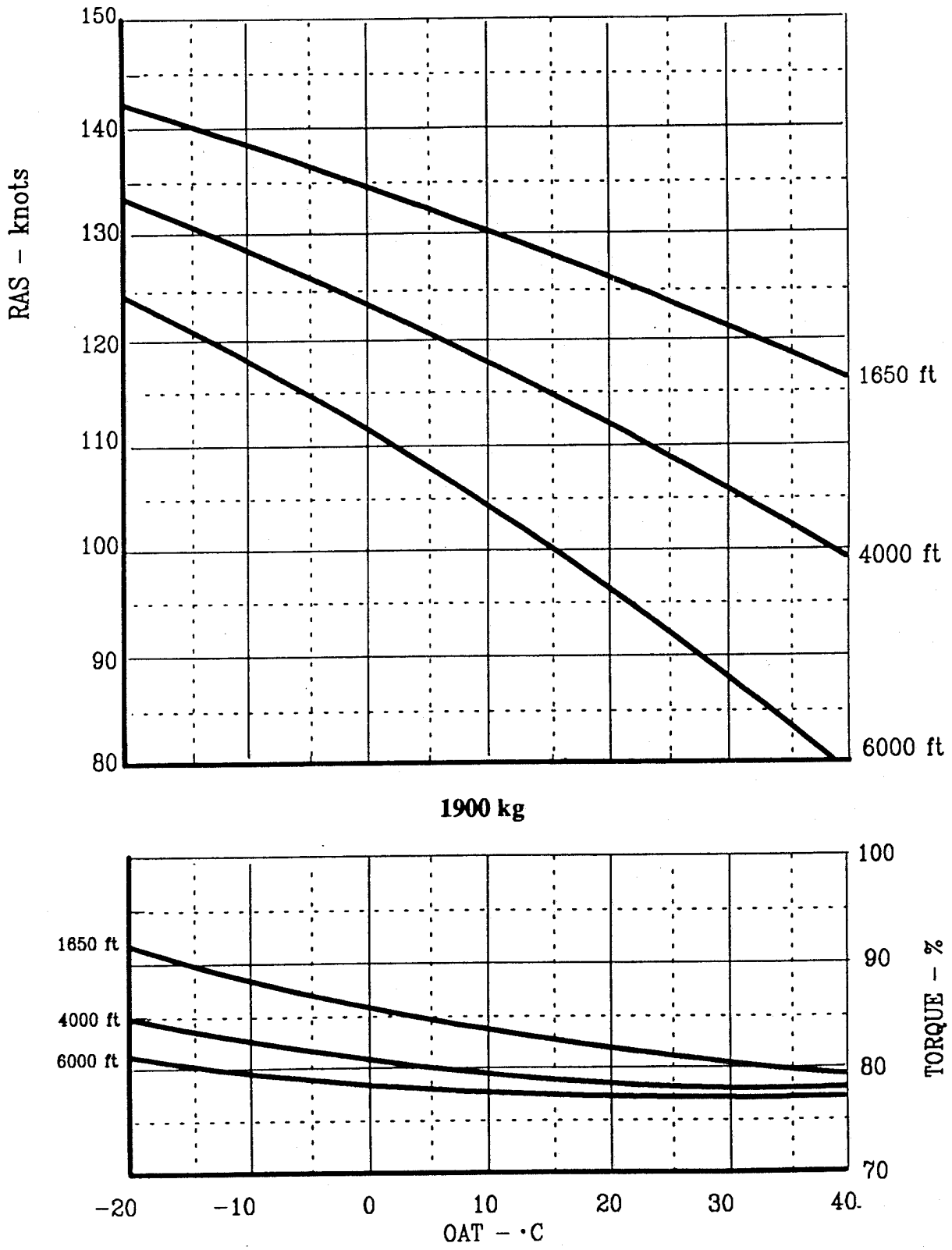


Fig. 3 - Level Flight Performance - MPS (Index 30°)

APPLICABLE TO EX-MILITARY GAZELLES ONLY



◆ Fig 3A - Level Flight Performance - MPS (Index 30 °) ◆

Sheet 18A

SM 91/0161 (6) CSDE AL2

APPLICABLE TO EX-MILITARY GAZELLES ONLY

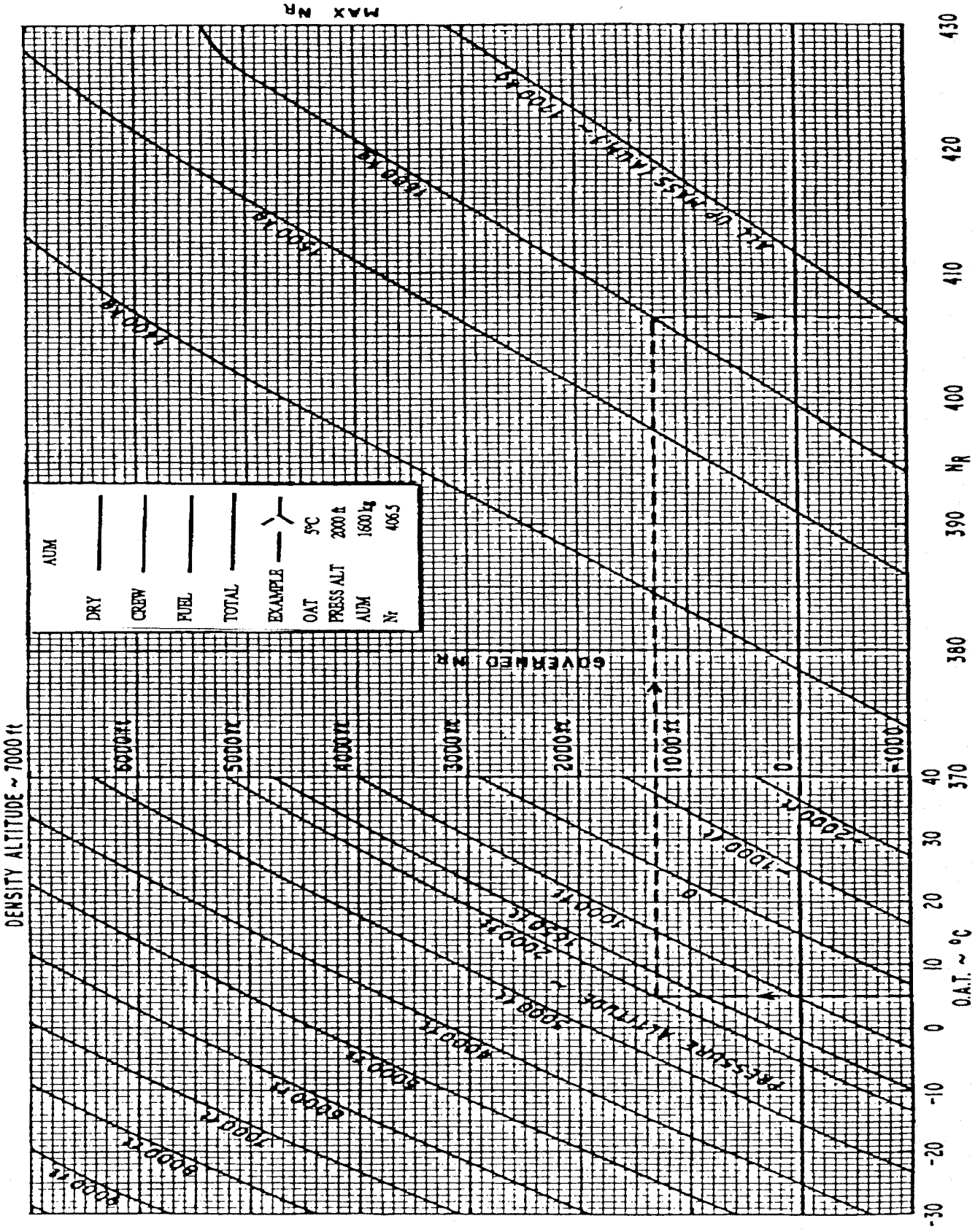
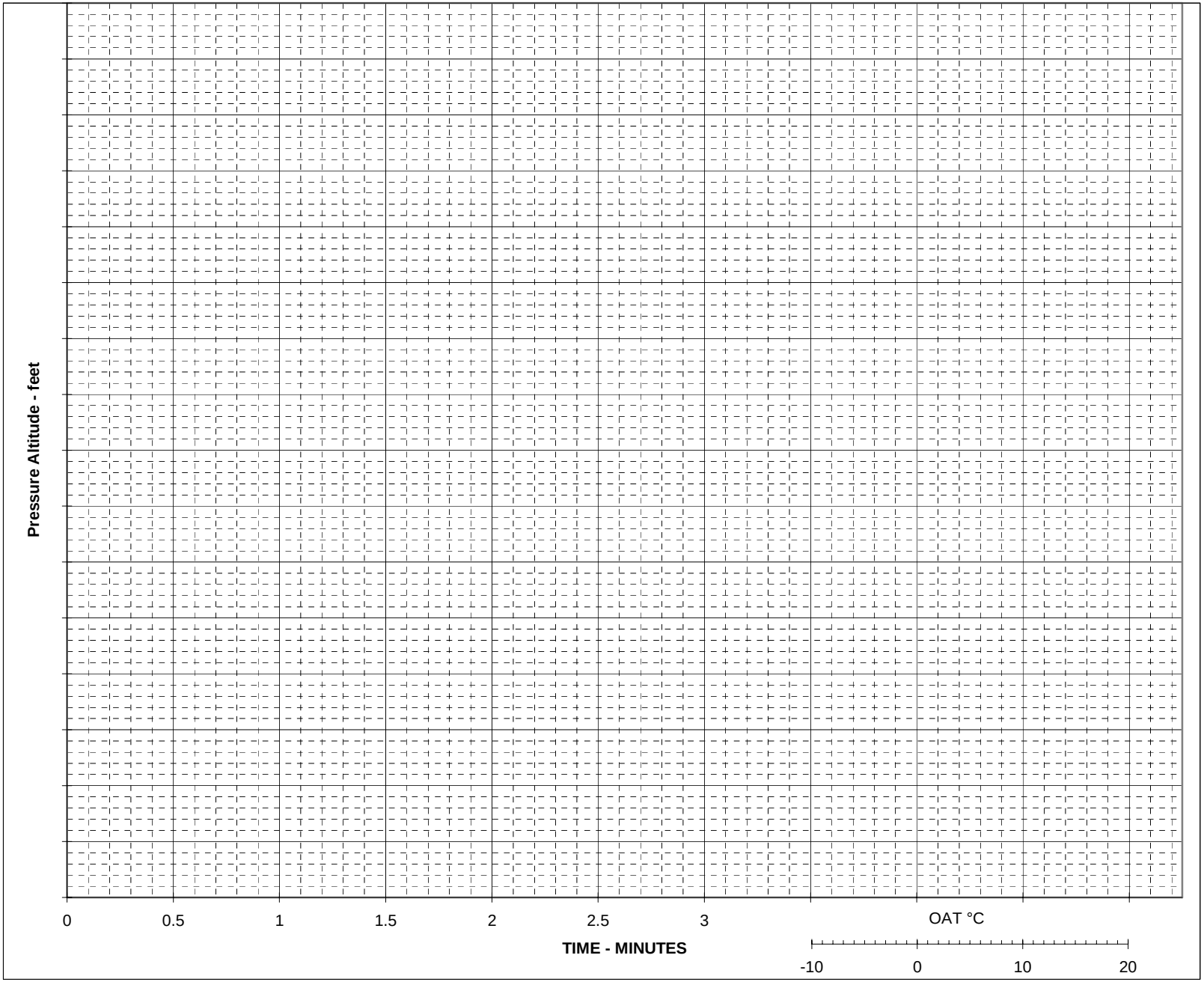


Fig 4. Autorotation RPM



AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	_____ lb
Mean Altitude	_____ feet
Mean OAT	_____ °C
SCHEDULED ROC	
Basic	_____ ft/min
Correction (if applicable)	_____ ft/min
Correction (if applicable)	_____ ft/min
Final SROC	_____ ft/min
Observed ROC	_____ ft/min
Difference from Scheduled (Observed ROC minus Final SROC)	_____ ft/min

Amendment Record

Changes from issue 1 to issue 2

Cover sheet. Add to Performance summary that a climb is only applicable to SA341G.

Para 1. Add Permit to Fly warning similar to C of A wording.

Para 4c(4). Change tolerance for Torque.

Para 4. Functional checks. Add HYD caption.

Para 5. Add Note for ground resonance check.

Para 6. Rationalise test (reduce boxes).

Para 9. Add weight column.

Para 10. Delete c. (auto at 120 KIAS).

Para 11.d. Add “reset collective”.

Para 12. Add landing time. Add “record Nc”.

Para 14. Add box for autorevs observed and scheduled. Change to **BOLD** for **IPS** and **and** to emphasise that only IPS needs to be within 5%. Add table for excrescence decrement calculation. Increase size of table.

End