

CHECK FLIGHT CERTIFICATE



BN2A MK3 Trislander

CFS 159 issue 1

Date:	Crew:	Observer:	Registration:
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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	-50	-50	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 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



BN-2A Mark III TRISLANDER LYCOMING O-540-E4C5 ENGINES

CFS 159, Issue 1

Registration	
Date	

INTRODUCTION

This schedule is applicable only to BN-2A Mark III Trislander with Lycoming O-540-E4C5 engines aircraft. It is based on the assumption that the aircraft under test fully incorporates all the Modifications which may be required for UK type certification and it is essential in the interests of flight safety that no attempt be made to test an aircraft to this schedule if it is not so compliant. The tests are intended to cover items, including emergency systems, which are not routinely checked; however, the crew are expected generally to monitor the behaviour of all equipment and report any unserviceable items. In addition to noting items arising directly from tests in the schedule, any other characteristics which are considered unsafe or undesirable must be recorded.

The aircraft and its engines must be operated at all times within its Flight Manual limitations. Unless specified in this Schedule, normal operating procedures and checks should be used.

The minimum flight crew for this test should, whenever possible, be increased by one observer to record the results of the tests. When tests are scheduled above FL100, oxygen shall be available for all persons on board. The tests should be carried out in the sequence as written; altitude conditions must be observed.

Aircraft commanders are reminded that it is illegal to carry passengers on a flight made under 'A' Conditions and that while it is legal to carry passengers on a test flight made with a valid Certificate of Airworthiness, the practice is not recommended. If passengers are carried, they must be informed that the risk is greater than that on a normal scheduled flight.

The data contained in this schedule is correct at the time of writing, but might not be in agreement with subsequent Flight Manual amendments. In cases of conflict, the current Flight Manual is over-riding and CAA (Flight Department) should be informed.

The crew of the aircraft must be familiar with the contents of this schedule before flight and the pilot conducting the tests must be specifically approved by the CAA for airworthiness test flights on BN-2A Mark III Trislander with Lycoming O-540-E4C5 Engines.

LOADING

The aircraft is to be loaded with full fuel and sufficient ballast to ensure a centre of gravity position between 20 and 22 in AOD.

PRE FLIGHT ACTION

If passenger oxygen masks are fitted and are to be deployed, it is acceptable to prevent their complete deployment by the use of appropriate clips or tape; any such mechanism must, however, allow sufficient movement to verify correct functioning of the system.

POST FLIGHT ACTION

The Check Flight Schedule and Check Flight Certificate must be completed and signed by the pilot carrying out the test.

Weather significant to tests (eg. Cloud base and tops, any turbulence).

Where the aircraft weight is required to be recorded for particular tests it should be calculated from the fuel gauges, and the aircraft must be in steady level flight when they are read.

Take-off Weight (actual) (lb)

C.G. Position (actual)

3. PRE-FLIGHT

Flight Clearance authority issued and signed

Check that the following items are on board:-

(1) Aeroplane Flight Manual or other designated manual (eg. Owner's Manual, Pilot's Operating Handbook, Pilot's Notes).

(2) Cabin fire extinguisher

4. GROUND TESTS

4.1 Equipment

Check the following items for security and correct functioning:-

Fuselage compartment doors	
Safety harness/lap straps	
Door fastening	
Adjustment of pilots' seats and locking	

4.2 Flying Controls

Check for full travel, friction, backlash and correct functioning:-

Elevator	
Ailerons	
Rudder	

Elevator Trim	
Rudder Trim	
Wing flaps	

4.3 Centre engine failure warning

Check that the warning operates between 2420 and 2580 RPM		RPM
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4.4 Engine Controls

	Left	Centre	Right
Throttle			
Propeller pitch			
Friction/locking mechanism			
Mixture Carburettor heat			
Alternate air intakes			
Cooling flaps			

4.5 Engine run

	Left	Centre	Right
Ignition test RPM			
No.1 magneto off RPM drop			
No.2 magneto off RPM drop			
Carburettor hot air test RPM			
Hot air RPM drop			
Check propellers for governing, feathering and unfeathering			

4.6 Maximum Power Check

	Left	Centre	Right
Manifold pressure			
RPM			
Fuel pressure/flow (booster pump off)			
Fuel pressure/flow (booster pump on)			

5. **TAXYING**

Parking brake (including Lock and Release)

Brakes (including freedom from binding and normal ability to hold aircraft at high engine power)

Taxying (including nose-wheel steering and differential braking)

6. **TAKE-OFF**

Trimmer settings:
Elevator

Rudder / Aileron

Behaviour during take-off. Record any abnormal features, eg. unusual tendency to swing, ease or difficulty of raising nose wheel/tail wheel, control forces (including any unusual control forces) or wing heaviness.

Was artificial stall warning triggered?

7. Functioning - Part One

At any convenient altitude, within 2000 ft. of the altitude selected for starting the climbs specified in paragraph 5, carry out a short climb at 80 KIAS with all three engines at maximum continuous power.

Altitude	OAT	RPM	Manifold pressure

8. Performance - En-route Climbs

8.1 Test procedure

During the single engine climbs specified in paragraph 5.2, the recording of instrument readings should not be started until the aircraft is in a steady climb in the required configuration. Airspeed should then be kept within 3 kt. of the required speed while maintaining a constant heading, with not more than 5° of bank towards the operating engine. The climb should not be carried out in or near cloud or turbulent air. If no outside air temperature thermometer is fitted, air temperatures should be obtained from a meteorological office. When comparing the measured rate of climb with the gross rate of climb scheduled in the Flight Manual, the average of the rates of climb measured in the two climbs on reciprocal headings should be used, to allow for wind gradient effects.

At any convenient altitude, at least 4,000 ft. above terrain, record the time to feather the port propeller at 90 KIAS (11 sec. Max.)	Secs.
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Carry out an en-route climb for five minutes, using the procedure described above with:

- flaps up
- No.1 engine inoperative with the propeller feathered
- No.2 and 3 engines at maximum continuous power
- airspeed 80 KIAS
- altimeter set to 1013 mbs.

Record:

- altitude every half minute
- airspeed, outside air temperature and manifold pressure every minute
- all other engine instrument reading early in the climb, and note any variation

with time

- aircraft weight
- trimmer settings

Fuel Contents

Weight (lb) at start of climb

Time Minutes	Altitude Feet (1013mb)	IAS Knots	OAT °C
0			
½			
1			
1½			
2			
2½			
3			
3½			
4			
4½			
5			

Towards the end of the climb record:-

	Left	Right
Engine		
Manifold pressure*		
RPM		
Oil pressure		
Oil temperature		

Fuel pressure/flow
Cylinder head temperature

Trimmer positions:-

Elevator

Rudder

If there is any difficulty in recording these figures during the timed climb, maintain the climb speed and power, and record them at the end of the climb.

Fuel Contents

Weight (lb) at end of climb

Carry out a second en-route climb, in the same configuration as above, on a reciprocal heading and starting at approximately the same altitude.

Fuel Contents Weight (lb) at start of climb

Time Minutes	Altitude Feet (1013mb)	IAS Knots	OAT °C
0			
½			
1			
1½			
2			
2½			
3			
3½			
4			
4½			
5			

Towards the end of the climb record:-

	Left	Right	
Engine			
Manifold pressure*			
RPM			Fuel pressure/flow
Oil pressure			Cylinder head temperature
Oil temperature			

Trimmer positions:-

Elevator Rudder

If there is any difficulty in recording these figures during the timed climb, maintain the climb speed and power, and record them at the end of the climb.

Fuel Contents Weight (lb) at end of climb

Check ability to unfeather the port propeller satisfactorily at 90 KIAS including noting any excessive vibration or roughness

9. STALLS

At any convenient altitude, at least 4,000 ft. above terrain, carry out the following stall and functioning tests in this order:

9.1 With flaps up, propellers full fine and the throttles closed, trim the aircraft at 1.5 times the stall speed for the weight, scheduled in the Flight Manual, then reduce speed at approximately 1 kt. per second until the aircraft stalls, or full back stick is reached (whichever occurs first)

Record:

- aircraft weight
- stall warning airspeed
- stall airspeed or minimum speed with full back stick
- behaviour at the stall, including magnitude of nose and/or wing drop, and any abnormal characteristics during the stall or recovery.

NOTE: observed stall speed must be within +/-3 kts. of the scheduled speed, the minimum margin between stall warning and stall is 5 kt., and the maximum margin is 11 kt.

Fuel contents	lbs,
Aircraft weight	lbs.
Trim, power off, at 1.5 x scheduled stall speed	knots
Scheduled stall warning	knots
Achieved stall warning	knots
Scheduled stall speed	knots
Achieved stall speed	knots
Did control column reach back stop?	
Sequence of nose and wing drop (if any)	

9.2 Record the time to lower the flaps at 80 KIAS

Up to T.O. (7 seconds maximum)	seconds
T.O. to land (10 seconds maximum)	seconds

With flaps land and throttles closed, stall the aircraft following the procedure described in 9.1 above.

Fuel contents	lbs.
Aircraft weight	lbs.
Trim, power off, at 1.5 x scheduled stall speed	knots
Scheduled stall warning	knots
Achieved stall warning	knots
Scheduled stall speed	knots
Achieved stall speed	knots
Did control column reach back stop?	
Sequence of nose and wing drop (if any)	

9.3 Record the time to raise the flaps at 80 KIAS

Land to T.O. (8 seconds maximum)	seconds
T.O. to up (8 seconds maximum)	seconds

10. **DIVE TO V_{NE} (THIS TEST MUST ONLY BE DONE IN SMOOTH AIR CONDITIONS)**

With the landing gear and wing-flaps retracted accelerate the aeroplane in level flight using maximum continuous power but with propeller controls set to give approximately 200 RPM below maximum permissible. In level flight, record:-

IAS (knots/mpg)

Elevator trimmer setting

Altitude/IOAT

Rudder trimmer setting

Increase speed in a shallow dive up to V_{NE} . Keep RPM within maximum permissible. If any unusual airframe or control vibration is felt, immediately reduce speed by gradually pulling the control column back and by closing the throttles. Record:-

Any unusual behaviour or buffet	<input type="text"/>		
Weight and response of each main flying control over small angles	<input type="text"/>		
Steadiness of propeller governing	<input type="text"/>		
Maximum RPM	Left	Centre	Right
Maximum IAS	<input type="text"/> knots		
Regain cruising flight by closing throttles and gradually pulling the control column back. Engine and propeller behaviour on closing throttles	<input type="text"/>		

11. FUNCTIONING TESTS - PART 2

Check the following:-

11.1 Flying Controls

During normal cruise, check that the aeroplane:-

- (a) can be trimmed in pitch to fly level
- (b) has no tendency to fly one wing low
- (c) flies straight with slip indicator central

11.2 Engines

Check for excessive mal-alignment of throttles, pitch and mixture controls, when set to same power on each engine and response to rapid smooth throttle movement from the fully closed to the fully open position at the scheduled landing approach speed.

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At any convenient altitude, at least 4000 ft. above terrain, record the time to feather the centre propeller at 90 KIAS (11 sec. max.), and check the ability to unfeather the propeller satisfactorily at 90 KIAS. When the centre engine is running normally again, carry out these feathering and unfeathering tests on the right propeller.

Engine

Time to feather (11 sec maximum)

Propeller unfeathering behaviour, including excessive vibration or roughness

Centre	Right
secs	secs

12.6 Auto-Pilot (if fitted)

Check for smooth engagement and disengagement, and general functioning during level flight, turn, climb and dive. With the auto-pilot engaged, apply a load to each main flying control and check satisfactory ability to overpower auto-pilot.

12.10 De-icing Equipment (if fitted)

Check functioning of de-icing system:

Airframe de-icing sequence time (3 minutes)

minutes

Increase in propeller load with propeller de-icing on

13. **LANDING**

With landing gear extended and wing-flaps in the landing position, carry out a normal landing following an approach at the speed specified in the Manual.

Behaviour during landing, record any abnormal features, eg. unusual inability to trim, unusual control forces, difficulty in flaring, "wheelbarrowing" or porpoising after touch-down.
Was artificial stall warning triggered?

14. **POST-FLIGHT**

14.1 Placards

Check all airframe and engine placard and colour coding for presence, accuracy and legibility.

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14.2 Lighting

Check that all external and internal lighting is serviceable.

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14.3 Climb Performance

The observed figures for the climb are to be plotted on the attached graph and compared with the scheduled performance (see Appendix). It is important that the results are presented as observed, and that any significant meteorological conditions are noted.

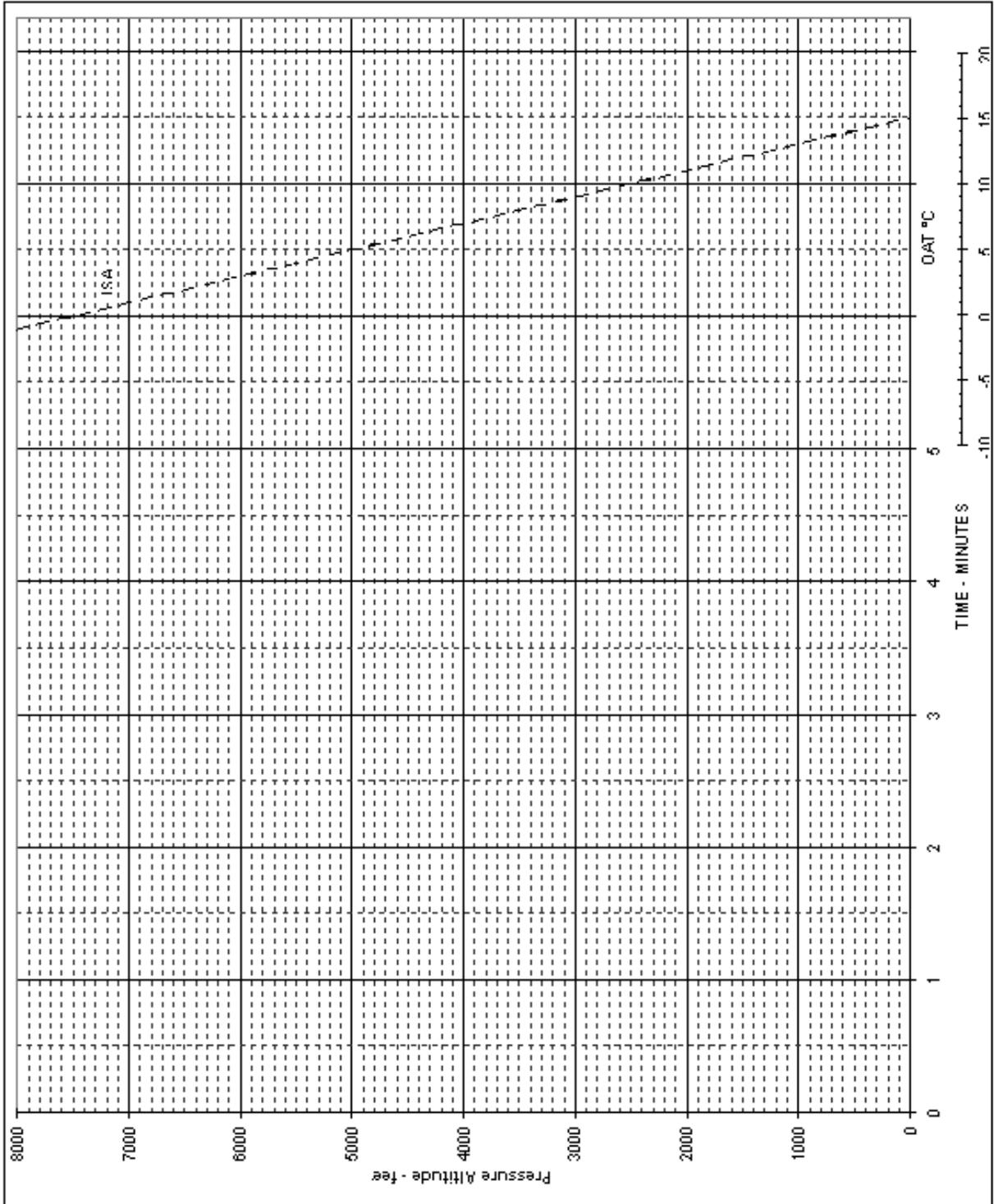
AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	Kg/lb
Mean Altitude	feet
Mean OAT	°C

SCHEDULED ROC	
Basic	ft/min
Correction	ft/min
Correction	ft/min
Final S ROC	ft/min

Observed ROC	ft/min
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Difference from Scheduled	ft/min
<small>100% of S ROC = Basic Final SROC</small>	



AIRCRAFT TYPE
REGISTRATION
DATE OF TEST

Mean Weight	Kg/lb
Mean Altitude	feet
Mean OAT	°C

SCHEDULED ROC	
Basic	ft/min
Correction	ft/min
Correction	ft/min
Final S ROC	ft/min

Observed ROC	ft/min
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Difference from Scheduled	ft/min
<small>100% of S ROC = Basic Final S ROC</small>	

