AVRO AIRCRAFT LIMITED

Inter-Departmental Memorandum

Ref 7591/02B/J
Date March 26, 1958
To S. E. Harper
From J. D. Hodge
SUBJECT ARROW 1 ELECTRICAL SYSTEM FLIGHT TESTS

R.F.T. 5041, is attached, covering flight tests to be carried out during the Phase 1 engineering test program of aircraft 25201, 25202 and/or 25203. These tests require that dummy loads be provided to simulate the 8.3 KVA de-icing system load. The initial tests will be carried out with the instrumentation pack power supplied from the shedding bus, as it is at present on aircraft 25201. For later flights, it will be necessary to rearrange the power supply system so that the instrumentation can be supplied from the essential bus.

'Item 15, D.C. Voltage of trans, rect. unit' may be deleted from the Electrics instrumentation as only one TRU voltage measurement is required. This change will be included in the next issue of Report FAR/C105/1.

WE*bb

J. D. Hodge
Technical Flight
Test Co-ordinator

c.c.

Messrs	C. Lindow	W/C G. Waterman	
	F. Mitchell		
	P. Martin	W/C G. Waterman	(2) AVRO T.S.D.
	J. Chamberlin		RCAF for transmittal
	F. Brame		to S/L K. Owen C.E.P.E.
	C. Marshall		Detachment.
	S. Brown		
	D. Scard (6)		
	J. Lynch	Central Files	
	J. Gale		
	J. Booth		
	J. Ames		
	J. Scott		
	D. Rogers		
	D. Ridler		
	S. Whiteley		

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 5041

SHEET NO. 1 OF 3

DATE: March 26, 1958

AIRCRAFT 25201 25202 and/or 25203	ASSIGNMENT NO. X73-384	WORK ORDER NO.

ARROW 1 ELECTRICAL POWER SYSTEM FLIGHT TESTS

1. INTRODUCTION

It is necessary that the electrical A.C. and D.C. power generating systems installed in the Arrow 1 A/C be proven capable of handling all electrical load conditions which are likely to be connected through appropriate switch gear, relays, control equipment, lighting, radio etc. to the main and auxiliary busses which receive power from two 30 KVA A.C. generators for A.C. requirements and two parallelled transformer rectifier units for D.C. requirements.

2. OBJECT

2.1 To check that the combined operation of the A.C. generators, transformer rectifier units and constant speed drives is adequate for the electrical loads supplied on the Arrow 1 A/C.

2.2 To check that the cooling air flow through the A.C. generator is adequate for all conditions of electrical loading and that the maximum operating temperature of the A.C. generator rear bearing is within safe operating limits.

2.3 To check temperatures in different zones where electrical equipment is mounted to ensure operating ambients are satisfactory.

3. FLIGHT CONDITIONS

Instrumentation measurements are to be taken during the following conditions:-

(a) Taxi
(b) Take off & Climb.
(c) Minimum speed at S.L.
(d) Intermediate speeds at S.L.
(e) Max. speed at S.L.
(f) Typical speeds at each 10,000 ft. of altitude
(g) Max. speed at max. altitude
(h) Landing

R.F.T. PREPARED BY: Wm C. Etherington	APPROVED BY: S.A. Brown	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

R.F.T. NO. 5041

SHEET NO. 2 OF 3

DATE: March 26, 1958

REQUISITION FOR FLIGHT TEST

AIRCRAFT	ASSIGNMENT NO.	WORK ORDER NO.
25201 25202 25203	X73-384	

4. EQUIPMENT & INSTRUMENTATION

Instrumentation for the electrical system measurements is to be installed in the A/C in accordance with Report FAR/C105/1, Instrumentation A/C 1, 2 & 3.

1. Temp of aft bearing - port alternator.
2. Voltage A Ø port alternator.
3. Voltage B Ø port alternator.
4. Voltage C Ø port alternator.
5. Voltage A Ø stbd alternator
6. Voltage B Ø stbd alternator
7. Voltage C Ø stbd alternator.
8. Current A Ø port alternator.
9. Current B Ø port alternator.
10. Current C Ø port alternator.
11. Current A Ø stbd alternator.
12. Current B Ø stbd alternator.
13. Current C Ø stbd alternator.
14. D.C. voltage of trans rect unit
15. Frequency (A phase on the essential bus)
16. D.C. current of trans rect unit port.
17. D.C. current of trans rect unit stbd.
18. Exhaust temp of T.R.U.S. (one unit only.)
19. Temp of N.W. well, above circuit breaker
20. Temp of N.W. well, above master warning box
21. Temp of electrical bay.
22. Temp of main wheel well (one side only) above brakes.

During initial instrumentation flights the power supply for the instrumentation pack is to remain as it is at present, i.e. - Telemetry on the essential bus with the remainder supplied from the shedding bus.

R.F.T. PREPARED BY:	APPROVED BY:	AUTHORIZED BY:
W. C. Etherington	L. A. Brown	
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE:

AVRO AIRCRAFT LIMITED

MALTON, ONTARIO

REQUISITION FOR FLIGHT TEST

R.F.T. NO. 5041

SHEET NO. 3 OF 3

DATE: March 26, 1958

AIRCRAFT 25201 25202 and/or 25203	ASSIGNMENT NO. X73-384	WORK ORDER NO.

This means that only Telemetry will be retained in the event of an A.C. generator failure or an engine flame out.

For later flights relays should be installed to cut out R.H. intake de-icing supply allowing all instrumentation to be supplied from the essential bus so that generator shut-off and transfer can be accomplished while instrumentation monitors these features.

The relays mentioned above are to be controlled by a switch in the C/P to allow pick up of de-icing power with drop out of instrumentation for the start, taxi and land configuration during icing conditions. For the later flights, loads should be added to one generator (R.H.) to simulate icing conditions. A 3 Ø load of 3.4 KVA (balanced unity P.F.) is to be continuous during icing simulation with a 3 Ø load of 4.9 KVA (balanced, unity P.F.) to be cycled 4 secs on and ½ sec off during icing simulation. This test is to be conducted during the cruise case only.

5. PROCEDURE

On initial flights (with instrumentation power pick off as is) records are to be taken during condition quoted in para. 3 with no manual load switching. Some flights should be conducted during icing conditions if possible. On later flights (with instrumentation power pick off as per para. 4) records are to be taken during conditions quoted in para. 3 with generator switching to cause transfer and simulated icing load switch. Switching to be conducted during the cruise condition only.

6. DATA REQUIRED

6.1 A.C. phase to neutral voltages.
6.2 A.C. line currents
6.3 Frequency (one phase essential bus)
6.4 D.C. voltage
6.5 D.C. currents
6.6 Generator rear bearing temperature
6.7 Compartment temperatures.

Accumulated data to be presented in table and, where possible graphical form.

R.F.T. PREPARED BY: W. C. Etherington	APPROVED BY: L. L. Brown	AUTHORIZED BY:
DATE FOR COMPLETION	PRIORITY	ESTIMATED COMPLETION DATE: