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QCX
AVRO
CF105
R-7-0400-44
Iss-16

FILE IN VAULT

MRCW 1 Report 7-0400-44
 A/C 24201 Issue 16
 WEIGHT / NON-G. SUMMARY a6
 A.J. Crust ~~SECRET~~ April 1/58
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JAN, 09 1993

Report no.: QCX - AVRO - CF105 - R-7-0400-44-I35-16

has been downgraded to : _____

de-classified

by (Name): Michel W. Drapeau

(Dept.): A/DND Coordinator, Access to Information

Date: Dec. 7, 1992

B. Auger
Signature

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AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Ref: 7717/11/J
Date: 1 April, 1958
To: See Distribution
From: E.F. Burnett
Subject: ARROW 1 A/C 25201 WEIGHT & C.G. SUMMARY - Report #7-0400-44 Issue 16

Attached is a copy of Weight and C.G. Summary, Report #7-0400-44 Issue 16, dated April 1, 1958, for your retention.

This report, based on A/C 25201, will be superseded on May 1, 1958 by Report #7-0400-64 Issue 1, which is based on A/C 25202 and 25203.

All future Weight & Balance reporting on A/C 25201 will be done on "Weight Statement for Flight Test", forms and will be issued to those concerned.

Classification cancelled / changed to: UNCLASSIFIED
By authority of: DRDA 7/DARFT 5-8/DAS Eng 6-4-5
Date: 5 Nov 1992
Signature: Baubrey
Unit / Rank / Appointment: DSIS 3, Secretary CRAD HQ DRP

E.F. Burnett
E.F. Burnett

EFB/ag

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Aircraft: ARROW 1
Date: 1 April, 1958

Report #7-0400-44
Issue 16

I N D E X

<u>Sheet</u>	<u>Content</u>
1-1 to 1-7	Introductory notes and explanations of Weight Changes.
2-1 to 2-3	Weight & C.G. Summaries
3	Horizontal C.G. Envelopes for Flight conditions with fuel proportioners used.
4-1 to 4-15	I.B.M. Detail Sheets of Weight & C.G.'s.

N.B. The C.G. Envelope for A/C 25201 with fuel sequencing has been omitted until a fully approved sequencing is established.

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Aircraft: ARROW 1
Date: 1 April, 1958

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Report # 7-0400-11
Issue 16
Sheet 1-1

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INTRODUCTION & WEIGHT CHANGES

The following is a Weight & C.G. Summary for the first Arrow I Aircraft #25201, with J75 P3 Engines based on the latest information available. All Weight & C.G. changes are relative to issue 15 of March 1st, 1958.

NOTE:

- 1) This summary does not apply for A/C 25202 and 25203 which will have J75 P5 Engines, nor for Aircraft 25204 and 25205 which are for full Astra I trial installations etc.
- 2) The summary herein is for the aircraft complete to drawings, not in the condition encountered for first flight.
For first flight there was full Radar Nose ballast as originally designed (1397 lb), 507 lb additional nose ballast, 160 lb ballast & Dummy in Navigators seat, and some shortages in the Pack Instrumentation.
The required c.g. for this flight was 28% M.A.C.

In this summary the aircraft is ballasted such that the aft C.G. shall not exceed 31% M.A.C. which is the theoretical aft limit.

- 3) This is the final summary to be issued on A/C 25201. (see also notes H and K).

GENERAL

- a) Pratt & Whitney J75 P3 Engines comprise the Power Plant for Aircraft #25201. J75 P5 Engines, which are partially redesigned versions of the J75 P3 Engines, are to be installed on A/C 25202 and subsequent Arrow I Aircraft. (J75 P3 Engines = 6,175 lb each, J75 P5 Engines = 5,950 lb each)
- b) The Instrument Package containing Flight Instrumentation is installed, the packages for A/C 25201 to 25203 differing from those for A/C 25204 and 25205. A/C 25203 is also to have a weapon pack trial installation eventually.

The weight recorded here is Flight Test Department's estimate of cable & instruments - for first flight there were shortages to this weight and an actual weight of the pack to be installed was obtained.

A relatively detailed estimate of other proposed Flight Test Installations throughout the Aircraft has been made. These installations amount to 1,457 lb (figure partially confirmed by Actual Weights of some cable assys.).

- c) Emergency lowering for the landing gear and hydraulic actuation to close nose wheel door with landing gear extended also additional Fire Protection, all installed on the first aircraft are allowed for in this summary.
- d) An Interim Radio & Radar System with Minneapolis-Honeywell MH64 Damping System is installed. Currently there is no Doppler or Tacan installation, though provision for future installation of Doppler, which is not yet available, is made.

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Aircraft: ARROW 1
Date: April 1st, 1958

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Sheet #1-2

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INTRODUCTION & WEIGHT CHANGES (Cont'd)

GENERAL (Cont'd)

- e) The original design of tailcones & stinger are recorded (manufactured, however, in St. Steel not titanium as shown on drawings); the redesigned versions will be fitted to the Aircraft at a later date.

When Mk. 1A Tailcones are fitting the ensuing weight changes will be:

Tailcones	+ 139.84 lb/A/C
Stonger	= 29.72
Net change	+ 110.12 lb/A/C

- f) Pending further flight testing it may be necessary to install a "Buzz Damping" system on the first aircraft. Provisions for this installation are already included in the Structural weight as modifications to the Control boxes. For the first flight the control surfaces were unmodified, if the need for Dampers is proven, a modified set of control surfaces will be made available.

The following weight penalties ensue:

Ailerons	+ 11.68 lb/a/c
Elevators	+ 11.07 lb/a/c
Rudder	+ 8.78 lb
Equipment	+ 123.97 lb
	<u>+ 155.50 lb</u>

- g) Note exactly as March 1st
- h) Several weighings of A/C 25201 have been made and the results obtained show good agreement with the estimated weights as recorded in this report. However, at no time has it yet been possible to obtained a dry weight of the complete aircraft.

A considerable number of actual weights of parts have, however, been obtained. Structural weights have checked within 0.5% of estimates of subassemblies etc. Equipment (most of which is now actual weight) has shown a consistant increase averaging about 11% over manufacturer's quotations or initial specification weights (excluding Engines & Gear Boxes). Preceeding the report titles on the I.B.M. Tabulation sheets, will be found a number varying from 0 to 100, this is the percentage of actual weight recorded within the report.

A summary of actual weights obtained so far is as follows:-

Structure	75.12 %
Landing Gear	48.75 %
Power Plant	42.97 %
Flying Controls	53.85 %
Equipment	24.83 %

⁷⁰⁻⁶⁶
i.e. % of the Basic Weight of A/C 25201.

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Aircraft: ARROW 1
Date: 1 April, 1958

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INTRODUCTION & WEIGHT CHANGES

GENERAL (Cont'd)

j) The aircraft is ballasted such that the c.g. on a flight envelope (using fuel proportions) does not travel aft of 31% M.A.C.

For first flight a c.g., with landing gear retracted, of 28.15% M.A.C. was obtained as required (see also introductory note #2).

k) All outstanding drawings, reissues, trial installations etc pertaining to A/C 25201 have now been estimated. Some of the weight changes appear trivial, but all recorded here.

This issue of report 7-0400-44 now closes the monthly weight reports on A/C 25201. In future this aircraft will be covered by Weight Statements for Flight Testing.

On May 1, 1958, a statement will be issued for A/C 25202 & 25203. This will be report No. 7-0400-64 Issue 1.

1. STRUCTURE

WEIGHT lb

a) Wing

Aileron - due to failure of trailing edge on test, the aileron has been split at rib #4A, an additional rib introduced and the space between packed with sponge rubber strips.	+ 6.12
Wing to Fus. Joint - Addition of small flexible hoses and some hardware changes	+ 0.78
<u>Wing Weight Increase</u>	<u>+ 6.90</u>

b) Fin & Rudder

No weight change

c) Fuselage Fwd Sta. 255"

Structure fwd Sta 120 ins - addition of coupling to joint at Sta 120 ins	+ 0.19
Winscreen - addition of shims for installation	+ 0.54
Lower Longeron - addition of .072" Al channels to shear web from Sta 214 - 255, etc.	+ 1.23
Bulkhead Sta. 255 - addition of packing, rubbing strip etc.	+ 0.44
Cockpit Floor - Prod. drg. reissues, bracketry added to accomodate F/cont. hydraulic changes	+ 1.77

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Aircraft: ARROW 1
Date: April 1, 1958

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Issue 16
Sheet #1-4

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INTRODUCTION & WEIGHT CHANGES

1. <u>STRUCTURE</u> (Cont'd)	<u>WEIGHT</u> (lb)
c) <u>Fuselage Fwd Sta. 255" (Cont'd)</u>	
Canopy Arches - Misc. changes on ECNs etc	+ 1.98
Air Intakes - Misc. E.C.N.s incorporated	+ 0.21
Crew's Bulkheads - Stiffener 7/16" Al added on Pilot's bulkh'd, equipment bracketry added etc.	+ 0.57 + 1.28
Formers FF. - addition of attachment for elevator feel and trim unit	+ 0.53
Misc. Items - alterations & additions to systems bracketry	+ 1.39
Lower Shear Panel - addition of small electrical brackets	+ 0.12
<u>Front Fuselage Increase</u>	<u>+ 10.25</u>
d) <u>Centre Fuselage Sta 255 - 485"</u>	
Skin CF - addition of brackets fittings	+ 0.81
Bulkhead Sta 485 - addition of brackets	+ 0.09
Sealing Missile Bay - addition of brackets & doublers to fwd seal	+ 0.46
Armament Bay Roof - addition of systems bracketry	+ 1.10
Equipment Bay Structure - equip. mtg bracketry changes	+ 0.61
Radar Access Door - brackets for micro-switch mountings added etc	+ 0.22
Longerons - actual weight obtained - some redesign since last estimate was made	+ 5.87
Integral Fuel Tanks - addition of union & cap on doors insulation "Bestobel" added on bulkhead 317 etc	+ 0.37 + 1.73
all other estimates revised, E.C.N.'s incorporated etc, many minor changes	+ 5.99
Duct CF - Outer plates fwd .04 were .032 Al rolled section & one .02 top hat superceded by a .032 channel	+ 1.07
<u>Centre Fuselage Increase</u>	<u>+ 18.32</u>
e) <u>Duct Bay Sta 485 -591.105 ins</u>	
Lower Panel - addition of .07 steal strap from Sta 486 to Sta 538	+ 1.86
misc. other hardware changes etc	+ 0.25
Access Doors - minor prod. drg. changes	+ 0.10
Duct - misc. E.C.N.s incorporated since time of actual weighing of this component	+ 0.30
<u>Duct Bay Increase</u>	<u>+ 2.51</u>

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Aircraft: ARROW 1
Date: April 1, 1958

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Sheet #1-5

INTRODUCTION & WEIGHT CHANGES

1. STRUCTURE (Cont'd) WEIGHT (lb)

f) Engine Bay Sta 591.65 - 742.5 ins

Engine Access Doors - addition of seal around No. 2 door	+	0.80
Torsion Box - minor changes to brackets etc	+	0.04
Misc Items - mtg. bracket air duct changed	-	0.04
Engine Tunnel - addition of Al bar stiffeners & associated changes, tube elbow added to air duct, assy	+	<u>3.13</u>
<u>Engine Bay Increase</u>	+	<u>3.93</u>

g) Rear Fuselage Sta. 742.5 ins. Aft

Now weight change

h) Fuselage Joints

Joint Air Intakes to F.F. - shims added	+	1.40
Joint C.F. to D.B. - hardware changes	+	0.20
<u>Fuselage Joints Increase</u>	+	<u>1.60</u>

TOTAL STRUCTURAL INCREASE + 43.51

2. LANDING GEAR

Main Landing Gear - Most items for joints are Dowty supplied, however, some bolts etc for joints to Wing are AVRO supplied & these have been previously omitted in error

	+	<u>2.67</u>
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TOTAL LANDING GEAR INCREASE + 2.67

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Aircraft: ARROW 1
Date: 1 April, 1958

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INTRODUCTION & WEIGHT CHANGES

<u>3. POWER PLANT & SERVICES</u>	<u>WEIGHT (lb)</u>
Accessories Gear Boxes on Fws. - act. Wt. of oil tank de-aerater (2 off)	- 1.50
additional gauges	+ 1.00
Misc. hardware alterations etc.	+ 1.66
Accessories Gear Boxes on Eng - Oil waste drain altered & other minor piping changes	+ 0.82
Fire Extinguishing System - minor changes to clamps & hardware	+ 0.07
Fuel System - actual weight of differential pressure valves gate valve mechanism - manual operation	+ 2.50
Steel pipes for power plant waste fuel drain added etc.	+ 10.22
Misc. other changes & act. wts. of equip	+ 3.41
<u>TOTAL POWER PLANT GROUP INCREASE</u>	<u>+ 21.70</u>

4. FLYING CONTROLS GROUP

Mechanical Flying Controls - rudder cable tension regulator added, elevator feel & trim unit redesigned and moved to fwd quadrant from aft quadrant. Alterations also made to nose wheel steering cables & brackets. There is an appreciable C.G. shift fwd of approx. 8" for the whole system	+ 8.50
F/Cont. Hydraulics Fus - full production drawing ests. made of booster installation in fwd fuselage (Initial allowance of 77 lb was too light). Production drawings also estimated for installation of surge damping accumulators. Elevator servos moved fwd etc.	+ 59.17
<u>FLYING CONTROLS INCREASE</u>	<u>+ 67.67</u>

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Aircraft: ARROW 1
 Date: April 1, 1958

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INTRODUCTION & WEIGHT CHANGES

<u>5. EQUIPMENT GROUP</u>	<u>WEIGHT (lb)</u>
Oxygen System - actual wt. of O ₂ converter obtained	- 3.67
Utility Hydraulics FF - addition of shock mount at air charging valve	+ 0.76
Flow control valve added	+ 0.54
check valve added	+ 0.53
Piping changes etc associated with flow regulator in nose gear circuit	+ 2.65
Utility Hydraulics CF - misc. changes to 1st A/C only. No account is taken of the Ram Air Turbine piping	+ 3.06
Utility Hydraulics EB - Actual wt. of pressure regulator valve 10.22 lb target wt. was 55lb.	+ 4.72
redesign of p.r. valve mtg.	+ 0.41
misc. other changes	+ 0.26
Canopy Actuation - actual wt. obtained of Idler lever	+ 0.94
Ejector Seats - gas generator on seat was previously omitted - this was not installed on seat at time of weighing of seat	+ 3.88
Emergency Fire Protection - no allowance was previously made for associated electrics hoses replace rigid tubing, some rerouting etc.	+ 11.12
<u>TOTAL EQUIPMENT INCREASE</u>	<u>+ 28.01</u>

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+ 43.51
Landing Gear	+ 2.67
Power Plant	+ 21.70
Flying Controls	+ 67.67
Equipment	+ 28.01
	<u>+ 163.56</u>

Weight Change - Operational Weight Empty (A/C Less Fuel)

UNBALLASTED CONDITION

<u>Issue 15</u>	<u>Issue 16</u>	
48,061.59	48,225.15	<u>+ 163.56 lb</u>

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Aircraft: ARROW 1
 Date: April 1, 1958

Report 7-0400-14
 Issue 16
 Sheet #2-1

UNCLASSIFIED / NON CLASSIFIÉ
 S E C R E T

WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT LB	H. ARM ins.	V. ARM ins
STRUCTURE	18,642.16	561.38	137.48
Wings	9,980.26	642.83	142.26
Fin & Rudder	1,025.85	754.34	209.31
Fuselage Fwd Sta 255"	2,661.52	181.74	128.18
Sta 255 - 485"	1,670.36	380.23	130.70
Sta 485 - 591.65"	1,010.63	533.81	104.49
Sta 591.56 - 742.5"	1,437.06	660.97	107.30
Sta 742.5" aft	802.17	802.05	129.06
"Marry-Up"	54.31	462.81	104.25
LANDING GEAR - RETRACTED	2,609.23	488.30	134.90
Main Landing Gear	1,966.41	539.55	141.01
Main Gear Doors & Fairings	282.34	537.60	138.37
Nose Landing Gear	333.81	170.81	99.70
Nose Gear Door & Fairing	26.67	161.77	88.25
POWER PLANT & SERVICES	14,413.51	652.74	120.33
Engine Accessories J75 P3	12,562.29	664.92	119.78
Gear Box & Drives on Fuselage	276.70	603.71	103.24
Gear Box & Starter on Engine	287.12	589.12	105.57
Engine Controls	32.43	375.76	118.62
Engine Nose Bullets	70.58	562.75	115.07
Fire Extinguishing System	65.53	700.45	134.21
Engine Mountings	206.21	635.04	127.71
Fuel System	912.65	537.27	135.48
FLYING CONTROLS GROUP	2,014.15	653.56	137.19
Mechanical Flying Controls	952.63	679.03	147.59
Hydraulic Flying Controls	1,061.52	630.70	127.85
EQUIPMENT FIXED & REMOVABLE	9,625.08	403.28	113.47
Instruments	46.07	163.68	138.70
Probe	15.00	-38.14	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Ejector Seats	342.94	204.50	134.11
Oxygen System	22.40	252.82	156.03
Air Conditioning System	822.07	339.45	134.46

Cont'd

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Aircraft: ARROW 1
Date: April 1, 1958

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WEIGHT & C.G. SUMMARY

DESCRIPTION (Cont'd)	WEIGHT lb	H. ARM ins	V. ARM ins	
Surface Finish	100.00	591.52	140.20	
Cockpit Insulation	14.31	187.48	132.00	
Drag Chute	90.99	786.18	143.17	
Low Pressure Pneumatics	54.65	433.30	129.37	
Electrical System	1,126.18	415.86	112.91	
Intake Deicing boots	88.00	195.82	118.00	
Canopy Actuation	65.86	222.01	154.36	
Console Panels	17.45	174.76	124.34	
MH64 Damping	99.08	450.83	140.34	
Interim Radio & Radar	647.34	341.86	124.39	
Hydraulics Utility System	654.93	503.19	117.65	
Emergency Landing Gear Lowering	12.91	458.83	128.60	
Nose U/C Door Actuation	33.59	202.56	97.89	
Instrument Pack Structure	686.80	385.81	94.68	
Pack Instrumentation (A/C 25201)	3,048.00	394.00	95.00	
Flight Test Installation	1,456.73	488.48	128.90	
Additional Fire Protection	174.78	417.06	107.61	
U/C Up				
AIRCRAFT BASIC WEIGHT	47,304.13	556.94	127.21	
U/C Down				
		559.01	123.79	
USEFUL LOAD (less fuel)	921.02	366.58	132.34	
Crew	390.00	194.00	136.50	
Engine Fire Extinguisher Fluid	25.00	730.00	129.00	
Residual Fuel	218.40	553.98	134.04	
Oxygen Charge	13.39	259.69	159.91	
Water for Air Conditioning	140.00	268.00	132.00	
Oil	134.23	608.92	115.68	
DESCRIPTION	WEIGHT LB	H. ARM	V. ARM	% M.A.C.
BALLAST	815.00	85.12	116.50	
U/C Up				
Operational Wt. Empty	49,040.15	545.52	127.13	30.25
U/C Down				
		547.52	123.83	30.81
Max. Int. Fuel (2,508 gals at 7.81lb/gal)	19,562.00	540.99	144.09	
U/C Up				
A.U.W. Max. Int. Fuel	68,602.15	544.23	131.97	29.90
U/C Down				
		545.66	129.61	30.29

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Aircraft: ARROW 1
Date: April 1, 1958

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Sheet #2-3

N.B.

- 1) Aircraft Datum is considered to be 120" above an arbitrarily chosen ground line.
- 2) The above figures are for the Aircraft in the BALLASTED condition such that the aft c.g. on the horizontal c.g. envelope, using fuel proportioners, does not exceed 31% M.A.C. i.e. 303 lb on Former Sta. 68.5 and 512 lb on the Shear Panel.

These figures are theoretical only and are not to be confused with that ballast which is actually installed on A/C 25201 (reference Introductory note 2).

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DATE: April 1st 1958

BY: Kathleen Lyffur

SHEET: 3

HORIZONTAL C.G. ENVELOPE

ARROW I - A/C 25201

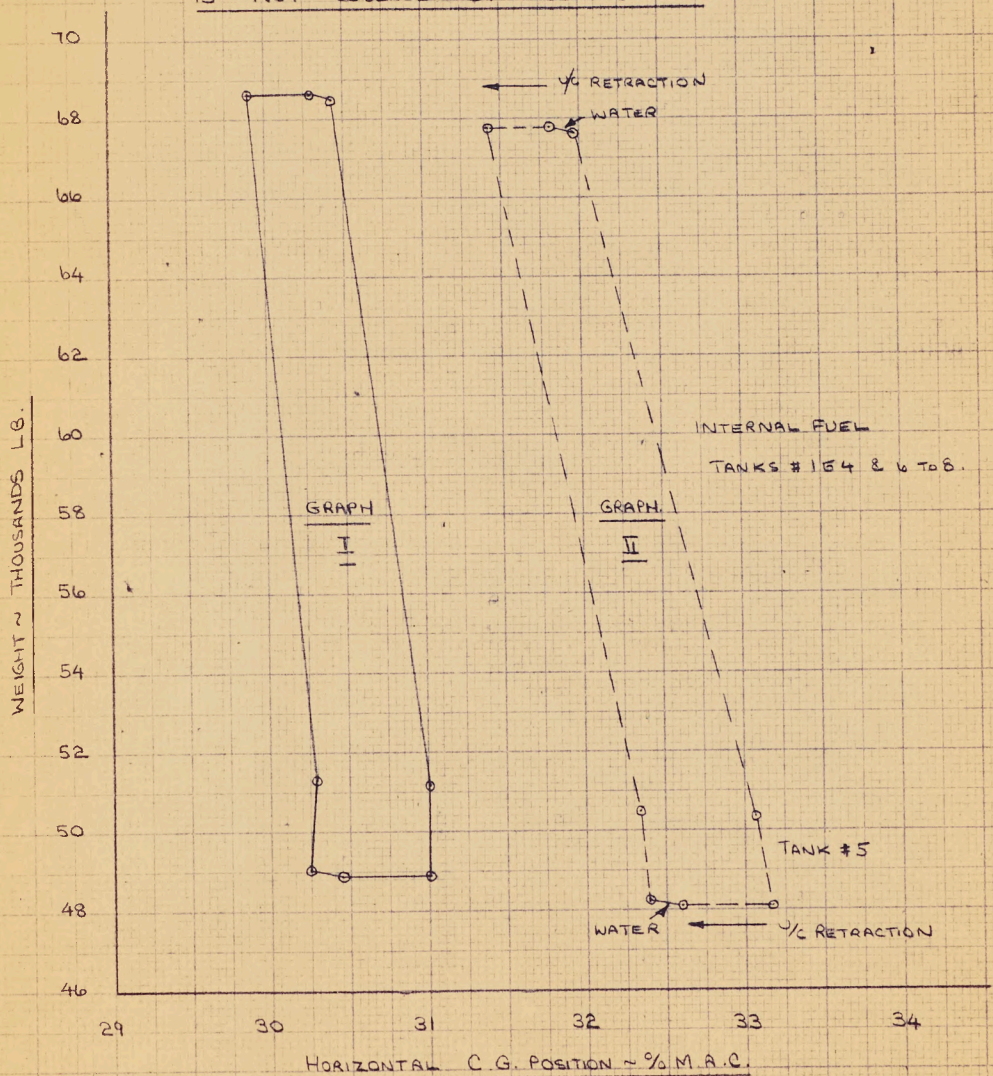
NORMAL FLIGHT CONDITIONS

FUEL SYSTEM PROPORTIONERS USED UNCLASSIFIED / NON CLASSIFIED

GRAPH I ~ A/C BALLASTED SUCH THAT AFT CG DOES NOT EXCEED 3% M.A.C.

GRAPH II ~ NO BALLAST

N.B. THE CONDITION REQUESTED & FULFILLED FOR FIRST FLIGHT IS NOT COVERED BY THESE GRAPHS.



10 X 10 TO THE 1/2 INCH 359-12 KEUFFEL & ESSER CO. MADE IN U.S.A.

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL GROUP
COMPONENT

PROJECT Arrow 1 A/C 25201

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A
TOTAL WING GROUP	1000000			
OUTER WING	1010000			
100 OUTER WING SKINS	1010001	64	92910	706
100 POSTS AND INTERCOSTALS	1010002	64	2436	732
100 OUTER WING SPARS	1010003	64	39258	701
100 OUTER WING RIBS	1010004	64	13456	695
98 AILERON CONTROL BOX	1010006	64	37530	774
100 RIB 12	1010007	64	7626	648
100 O W AILERON JACK FITTING	1010009	64	1046	727
AILERON JOINTS AND FAIRING	1010010		3293	787
BUZZ DAMP STRUC PROV O W	1010011	64	800	758
			198355	
AILERON	1020000			
98 AILERON STRUCTURE	1020001	74	34212	792
			34212	
97 ELEVATOR	1030000	82	44900	755
97 ELEVATOR MARRY UP	1030000		1597	738
			46497	
INNER WING	1040000			
96 MAIN U C STRUCTURE	1040001	62	33071	577
100 FRONT SPAR I W	1040002	62	11110	484
100 MAIN SPAR I W	1040003	62	15106	565
100 FWD CENTRE SPAR I W	1040004	62	5364	600
100 AFT CENTRE SPAR I W	1040005	62	3666	654
100 REAR SPAR I W	1040006	62	7667	703
100 I W STRUCTURE F S TO M S	1040007	62	10690	499
100 STRUCTURE MS TO R S	1040008	62	14979	609
100 STRUCTURE AFT OF REAR SPAR	1040009	62	32212	718
40 ELEVATOR CONTROL BOX	1040010	62	42838	724
25 TRANSP JOINT MARRY UP	1040011		7065	636
100 INNER WING JOINTS	1040012	62	6347	1662
100 SKINS M S TO R S	1040013	62	219038	684
100 STRUT PICK UP FITTINGS	1040014	62	5391	567
100 RIBS 1 TO 9 INNER WING	1040016	62	51204	612
74 DORSAL FAIRING I W	1040017	62	95482	
100 RIB 10	1040018	62	10800	636
77 WING TO FUS JOINT I W	1040019	62	12628	616
65 TRANSPORT JOINT O W TO I W	1040020	62	12942	630
77 WING TO FUS JOINT C A	1040021		3818	529
BUZZ DAMP STRUC PROV I W	1040022	62	552	741
74 DORSAL FAIRING C A	1040023		6033	570
			665954	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT.

REPORT NO 7-0400-44 Iss 16
April 1, 1958

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SHEET 4-1 to 4-15

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	1000000						
	1010000						
	1010001	64	92910	70646	13597	65837199	12632973
LS	1010002	64	24367	3207	13410	1783323	3266668
	1010003	64	39258	70118	13636	27526924	5353221
	1010004	64	13456	69506	13650	9352727	1836744
	1010006	64	37530	77409	13508	29051598	5069552
	1010007	64	7626	64873	13832	4947215	1054828
TING	1010009	64	1046	72791	13670	761394	142988
AIRING	1010010		3293	78726	13224	2592447	435466
O W	1010011	64	800	75828	13680	606624	109440
			198355			142259451	26961880
	1020000						
	1020001	74	34212	79234	13556	27107536	4637779
			34212			27107536	4637779
	1030000	82	44900	75523	14260	33909827	6402740
	1030000		1597	73810	14260	1178746	227732
			46497			35088573	6630472
	1040000						
	1040001	62	33071	57757	13983	19100817	4624318
	1040002	62	11110	48428	14260	5380381	1584286
	1040003	62	15106	56570	14280	8545464	2157137
	1040004	62	5364	60098	14415	3223657	773221
	1040005	62	3666	65492	14450	2400937	529737
	1040006	62	7667	70374	14420	5395575	1105581
M S	1040007	62	10690	44997	14403	53423136	15397383
	1040008	62	14979	60964	14572	9131798	2182740
R SPAR	1040009	62	32212	71829	15020	23137557	4838242
	1040010	62	42838	72470	14328	31044699	6137829
P	1040011		7065	63621	13876	4494824	980339
	1040012	62	63471	66222	15046	42031766	9549847
	1040013	62	21903	62446	14464	136780469	31681656
GS	1040014	62	5391	56766	14330	3060255	772530
NG	1040016	62	5120	46128	14499	31381395	7424068
	1040017	62	95	48280	16150	45866	15343
	1040018	62	10800	63683	13835	6877764	1494180
	1040019	62	12628	61681	13811	7789077	1744053
W	1040020	62	12942	63071	13710	8162649	1774348
TO I W	1040021		3818	52984	14301	2022929	546012
A	1040022	62	552	74150	14200	409308	78384
I W	1040023		6033	57025	16034	3440318	967331
			665954			407280611	96358565

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL
COMPONENT

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
TOTAL FUSELAGE GROUP		3000000			
FUSELAGE BASIC STRUCTURE		3010000			
100	RADOME	301000151		18100	3
100	RADAR NOSE ACCESS DOORS	301000251		8008	9
	NOSE STRUCTURE FWD STA 120	301000351		12207	9
	SKIN F F	301000452		11054	19
88	SKIN C F	301000554		21263	37
	SKIN D B	301000656		5937	53
3	SKIN E B	301000758		17725	66
	FORMERS F F	301001152		10717	18
100	FORMERS C F	301001254		27824	37
	FORMERS D B	301001356		7491	53
	LIGHT FORMERS E B	301001458		13501	66
72	HEAVY FORMERS E B	301001558		21890	66
	LOWER LONGERONS F F	301001652		6969	18
	LONGITUDINAL MEMBERS E B	301001758		11067	0
75	LOWER LONGERON E B	301001858		6842	65
	TOP LONGERONS E B	301001958		638	66
	LOWER SHEAR PANEL F F	301002052		2952	23
	TOP WING LONGERONS D B	301002156		498	53
66	LONGERONS C F	301002354		1445	341
43	LONGERONS F D B	301002454		1258	48
43	LONGERONS A D B	301002556		8655	52
	ELECTRONICS BAY STRUCTURE	301002654		3570	27
59	LONGITUDINAL BEAMS D B	301002756		6570	52
	RADAR ACCESS DOOR C F	301002854		2160	27
72	MAIN FRAME AT STN 538 77	301002956		5980	53
	DIVE BRAKE ACCOMMODATIONS	301003056		3620	50
48	TOP LONGERONS F F	301003152		1925	19
100	DUCT C F	301003254		3347	537
97	DUCT D B	301003356		3166	354
22	CANOPY ARCH	301003452		865	922
4	ACCESS PANELS D B	301003656		3964	54
66	NOSE U C SUPPORT STRUCTURE	301003752		3343	21
3	CREW BULKHEADS	301003852		1290	320
51	EQUIPMENT BAY STRUCTURE	301003954		6211	28
86	WINDSCREEN	301004152		1305	713
33	SERVICE ACCESS DOORS	301004258		6704	66
	TORSION BOX E B	301004358		6046	61
	DORSAL FAIRING AIR OUTLET	301004454		2143	29
66	INTERMEDIATE FORMERS	301004558		5154	69
3	ENGINE ACCESS DOORS	301004658		1473	962
	SEALING MISSILE BAY	301004754		743	31
100	MISCELLANEOUS ITEM C F	301004854		392	37
98	ARMAMENT BAY ROOF	301004954		1332	38
	BULKHEAD AT STA 120	301005052		3144	12
	BULKHEAD STA 255	301005152		1047	325
100	BULKHEAD STA 485	301005254		1125	48
	ENGINE TUNNEL	301005458		4788	566
100	INTEGRAL FUS FUEL TANK CF	301005554		2116	839

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

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SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	3000000						
URE	3010000						
	301000151		18100	3796	11037	687076	1997697
RS	301000251		8008	9509	11450	761481	916916
A 120	301000351		12207	9477	11401	1156857	1391720
	301000452		11054	19058	12024	2106671	1329133
	301000554		21263	37670	14300	8009772	3040609
	301000656		5937	53413	11157	3171130	662391
	301000758		17725	66945	10996	11866001	1949041
	301001152		10717	18294	12036	1960568	1289898
	301001254		27824	37482	13306	10428992	3702261
	301001356		7491	53710	11316	4023416	847682
	301001458		13501	66827	11119	9022313	1501176
	301001558		21890	66217	10984	14494901	2404398
	301001652		6969	18483	9044	1288080	630276
E B	301001758		1106	70853	9611	783634	106298
	301001858		6842	65810	9781	4502720	669216
	301001958		638	66605	13911	424940	88752
	301002052		2952	23414	8900	691181	262728
B	301002156		498	53899	13550	268417	67479
	301002354		14453	41038	12144	5931222	1755172
	301002454		1258	48717	10700	612860	134606
	301002556		8655	52931	9759	4581178	844641
TURE	301002654		3570	27359	9197	976716	328333
B	301002756		6570	52007	9125	3416860	599513
	301002854		2160	27400	8976	591840	193882
77	301002956		5980	53877	10383	3221845	620903
IONS	301003056		3620	50328	9339	1821874	338072
	301003152		19253	19308	14763	3717369	2842320
	301003254		33475	37249	12917	12469103	4323966
	301003356		31663	54471	11812	17247153	3740034
	301003452		8659	22804	16053	1974598	1390029
	301003656		3964	54013	10340	2141075	409878
CTURE	301003752		3343	21049	9186	703668	307088
	301003852		12903	20798	12294	2683566	1586295
RE	301003954		6211	28362	13736	1761564	853143
	301004152		13057	13814	15006	1803694	1959333
	301004258		6704	66397	9189	4451255	616031
	301004358		6046	61928	9058	3744046	547647
TLET	301004454		2143	29243	16400	626720	351452
	301004558		5154	69289	10257	3571155	528646
	301004658		14739	62867	8874	9265967	1307939
	301004754		743	31991	10964	237693	81463
F	301004854		392	37000	12500	145040	49000
	301004954		13326	38460	11427	5125180	1522762
	301005052		3144	12000	12280	377280	386083
	301005152		10473	25500	12033	2670615	1260216
	301005254		11254	48500	10530	5458190	1185046
	301005458		47885	66520	11574	31853102	5542210
K CF	301005554		21168	39722	14553	8408353	3080579

AVRO AIRCRAFT LTD.
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WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
COCKPIT FLOOR	3010056	52	61.001	
CENTRE BEAM 697 28 717 36	3010059	58	557	
DORSAL OVER FUEL TANK	3010061	54	5007	
SHIELD EXHAUST DEFLECTOR	3010062	54	19813	
SHEAR PANEL BELOW NAV ARCH	3010063	52	21152	
33 PACK MOUNTING STRUCTURE	3010064	54	21192	
88 ENG ACCESS DOORS R F	3010065	59	84577	
99 TUNNEL FIXED R F	3010066	59	104037	
100 SKIN AND STIFFENERS R F	3010067	59	51437	
100 FAIRING UNDER RUDDER R F	3010068	59	26167	
100 FORMERS FIXED R F	3010069	59	90017	
100 LONGERONS C BEAM FIXED R F	3010070	59	27997	
100 TAILCONES	3010071	59	300008	
100 CNTR STRUCT STING REM R F	3010072	59	117988	
MISCELLANEOUS ITEMS E B	3010073	58	9196	
MTG BRKTS SIDE PANEL D B	3010075	56	2435	
FORMERS LOWER PANEL D B	3010076	56	76405	
LOWER PANEL D B	3010077	56	53485	
JOINT F F TO C F	3010078		8552	
JOINT AIR INTAKES TO F F	3010079		10922	
JOINT C F TO D B	3010080		5204	
JOINT D B TO E B	3010081		25215	
FUS JOINT AT STA 742 50	3010082		4437	
6 MISCELLANEOUS ITEMS F F	3010086	52	8501	
			635274	
DIVE BRAKES	3020000	72	117905	
DIVE BRAKES C A	3020001		4064	
			12196	
AIR INTAKES	3030000			
7 AIR INTAKES	3030100	55	766062	
			76606	
PILOTS AND NAVIG CANOPIES	3040000			
76 PILOTS CANOPY	3040100	53	2420817	
			24208	
100 NAVIGATORS CANOPY	3040200	53	1532123	
			15321	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

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SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	301005652		6160	17636	11561	1086378	712158
17 36	301005958		557	71367	11524	397514	64189
	301006154		5007	41403	14202	2073048	711094
TOR	301006254		1981	33428	16400	662209	324884
ARCH	301006352		2115	25699	15352	543534	324695
RE	301006454		2119	29285	10309	620549	218448
	301006559		8457	77280	9910	6535570	838089
	301006659		10403	77168	13059	8027787	1358528
F	301006759		5143	77149	13796	3967773	709528
R F	301006859		2616	78134	15379	2043985	402315
	301006959		9001	77929	13652	7014389	1228817
D R F	301007059		2799	77170	12570	2159988	351834
	301007159		30000	82154	12868	24646200	3860400
M R F	301007259		11798	83585	13586	9861358	1602876
B	301007358		919	66400	10284	610216	94510
D B	301007556		243	52514	13145	127609	31942
B	301007656		7640	54472	9006	4161661	688058
	301007756		5348	55246	8800	2954556	470624
	3010078		855	25500	12800	218025	102500
F F	3010079		1092	22000	12000	240240	131040
	3010080		520	48500	9800	252200	59960
	3010081		2521	58475	9150	1474155	230672
50	3010082		443	74250	11500	328928	50945
F	301008652		850	19050	12150	161925	103275
			635274			297408728	76206434
	302000072		11790	50884	9049	5999224	1066877
	3020001		406	48794	9374	198104	38058
			12196			6197328	1104935
	3030000						
	303010055		76606	21065	11860	16137054	9085472
			76606			16137054	9085472
PIES	3040000						
	304010053		24208	17686	15915	4281427	3852793
			24208			4281427	3852703
	304020053		15321	23277	16223	3566269	2485526
			15321			3566269	2485526

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REPORT NO. _____

SHEET _____

UNCLASSIFIED / NON CLASSIFIED

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
TION	4000000						
GROUP	4010000						
	401010092		1966.41	539.55	141.01	106097652	27728347
			1966.41			106097652	27728347
GS	401020062		282.34	537.60	138.37	15178598	3906739
			282.34			15178598	3906739
GROUP	4020000						
	402010091		333.81	170.80	99.70	5701475	3328086
			333.81			5701475	3328086
RING	402020052		26.67	161.77	88.25	431441	235363
			26.67			431441	235363

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL
COMPON

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT
ENGINE GROUP	5000000		
99 ENGINE J 75	5010000		12527076
J 75 ENGINE SERV ACCESS	5010100		1252707
			35226
			3522
ACC GEAR BOXES ON FUS D B	502000156		44455
ACC GEAR BOXES ON FUS E B	502000258		232256
			27670
ENGINE CONTROLS	5030000		
36 ENGINE CONTROLS F F	503000152		14581
36 ENGINE CONTROLS C F	503000254		2643
36 ENGINE CONTROLS D B	503000356		5084
36 ENGINE CONTROLS E B	503000458		10136
			3243
83 GEARBOX AND STARTER ON ENG	5040000		287125
			28712
91 ENGINE ANTI ICING	5050000		70585
			7058
FIRE EXT SYSTEM	5060000		
FIRE EXTING SYSTEM D B	506000256		1465
FIRE EXTING SYSTEM E B	506000358		64077
			6553
ENGINE MTGS AND BRACKETS	5070000		
64 ENG MOUNTING AND BRKTS	5070001		146536
ENGINE MTGS ACCESSORIES	5070002		52026
ENGINE MTGS ACCESSORIES CA	5070003		7666
			20621
FUEL SYSTEM	5080000		

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SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	5000000						
	5010000		1252707	66502	11983	833075209	150111880
			1252707			833075209	150111880
SS	5010100		352263097	10341		2222276	364210
			3522			2222276	364210
D B	5020001	56	4445	57866	9765	2572144	434054
E B	5020002	58	2322560850	10431		14132413	2422600
			27670			16704557	2856654
	5030000						
	5030001	52	1458	16129	12476	235161	181900
	5030002	54	264	30813	11798	81346	31147
	5030003	56	508	49991	13459	253954	68372
	5030004	58	1013	63982	10194	648138	103265
			3243			1218599	384684
ON ENG	5040000		28712	58912	10557	16914813	3031126
			28712			16914813	3031126
	5050000		7058	56275	11507	3971890	812164
			7058			3971890	812164
B	5060000						
B	5060002	56	146	55318	13749	80764	20074
	5060003	58	6407	70381	13414	4509311	859435
			6553			4590075	879509
KETS	5070000						
TS	5070001		14653	62504	12935	9158711	1895366
ES	5070002		5202	66213	12248	3444400	637141
ES CA	5070003		766	64236	13192	492048	101051
			20621			13095159	2633558
	5080000						

AVRO AIRCRAFT LTD.
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**WEIGHT AND C. OF G BY FUNCTIONAL
COMPON**

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	
FLYING CONTROLS GROUP		6000000			
MECHANICAL CONTROLS		6010000			
50	MECHANICAL CONTROLS F F	6010001	52	10996	1
	MECHANICAL CONTROLS C F	6010002	54	12134	
70	MECHANICAL CONTROLS FIN	6010005	83	12423	7
72	MECHANICAL CONTROLS I W	6010006	62	39748	7
45	MECHANICAL CONTROLS O W	6010007	64	30237	7
	MECHANICAL CONTROLS C A	6010008		6467	
				95263	
FLYING CONTROLS HYDRAULICS		6020000			
31	FLYING CONT HYDRAULICS D B	6020001	56	3243	5
31	FLYING CONT HYDRAULICS E B	6020002	58	46814	6
31	FLYING CONT HYDRAULICS R F	6020003	59	487	
77	FLYING CONT HYDRAULICS I W	6020004	62	27444	7
72	FLYING CONT HYDRAULICS O W	6020005	64	12060	7
59	FLYING CONT HYDRAULICS FIN	6020006	83	55977	
31	FLYING CONT HYDRAULICS R N	6020008	51	35001	
31	FLYING CONT HYDRAULICS F F	6020009	52	55061	
31	FLYING CONT HYDRAULICS C F	6020010	54	19203	
				106152	
HYDRAULICS MAIN SYSTEM					
30	UTILITY HYDRAULICS F F				
30	UTILITY HYDRAULICS C F				
30	UTILITY HYDRAULICS R F				
30	UTILITY HYDRAULICS I W				
30	UTILITY HYDRAULICS O W				
30	UTILITY HYDRAULICS FIN				
30	UTILITY HYDRAULICS R N				
30	UTILITY HYDRAULICS F F				
30	UTILITY HYDRAULICS C F				
EMERGENCY LOW PRESSURE					
30	UTILITY HYDRAULICS F F				
CABIN INSULATION					
AVAIL PERCENTAGE					

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	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	6000000						
	6010000						
F	6010001	52	10996	16316	11391	1794107	1252554
F	6010002	54	12134	40097	11790	486377	143013
I	6010005	83	12423	78817	22159	9791436	2752813
W	6010006	62	39748	71845	14386	28556951	5718147
W	6010007	64	30237	77068	13562	23303051	4100742
A	6010008		6467	0982	14338	458544	92623
			95263			64390466	14059892
ULICS	6020000						
S	6020001	56	3243	56610	10123	1835862	328289
S	6020002	58	46814	65199	11129	30522260	5209930
S	6020003	59	4875	8751	10824	36420	5196
S	6020004	62	27444	70359	14721	19309324	4040031
S	6020005	64	12080	74061	13580	8946569	1640464
S	6020006	83	5597	76013	20796	4254448	1163952
S	6020008	51	3500	11309	10513	395815	367955
S	6020009	52	5506	16928	11600	932056	605660
S	6020010	54	1920	37329	11000	716717	211200
			106152			66949471	13572677

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PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
FIXED EQUIPMENT GROUP	7000000			
INSTRUMENTS	7010000			
INSTRUMENTS F F	7010001	52	4407	1
NAVIG TABLE AND STOWAGE	7010004	52	2002	
ELECTRICAL WIRING C F			4607	
ELECTRICAL WIRING A I				
COCKPIT PRESSURE SEALING	7020000	52	5001	
ELECTRICAL WIRING F I B			500	
OXYGEN SYSTEM	7030000			
58 OXYGEN SYSTEM	7030001	52	2240	2
ELECTRICALS E H			2240	
AIR CONDITIONING SYSTEM	7040000			
54 AIRCONDITIONING F F	7040001	52	3549	1
54 AIRCONDITIONING C F	7040002	54	4721	2
54 AIRCONDITIONING D B	7040003	56	1148	5
54 AIRCONDITIONING C A	7040005		2736	3
54 AIRCONDITIONING ENG	7040006		2855	6
54 AIRCONDITIONING I W	7040007	62	805	
VIBROSCREEN DEWIRING			8220	7
HYDRAULICS MAIN SYSTEM	7050000			
32 UTILITY HYDRAULICS F F	7050001	52	8981	2
29 UTILITY HYDRAULICS C F	7050002	54	4578	4
20 UTILITY HYDRAULICS D B	7050003	56	2733	8
74 UTILITY HYDRAULICS E B	7050004	58	7892	6
24 UTILITY HYDRAULICS I W	7050005	62	1351	1
32 UTILITY HYDR NOSE U C	7050006	91	2131	
24 UTILITY HYDR MAIN U C	7050007	92	2980	5
28 EMERGENCY LOWERING M U C	7050008	62	853	5
35 EMERGENCY LOWERING N U C	7050009	52	438	2
15 N W DOOR ACTUATING MECH	7050010		3359	2
INTAKE DE ICING			7014	3
CABIN INSULATION	7070000	52	1431	1
RADIO RADAR INT SYST			1431	
RADIO RADAR INT SYST				
BRAKE PARACHUTE	7080000			

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COMPONENT

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SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	7000000						
	7010000						
GE	701000152		4407	16112	13909	710056	612970
	701000452		200	22000	13000	44000	26000
			4607			754056	638970
ING	702000052		500	18600	13000	93000	65000
			500			93000	65000
	7030000						
	703000152		2240	25282	15603	566317	349507
			2240			566317	349507
EM	7040000						
	704000152		3549	17813	11118	632183	394578
	704000254		47212	29489	13515	13922347	6380702
	704000356		1148	51640	12503	592827	143534
	7040005		27363	39792	13613	10888285	3724925
	7040006		2855	64017	13900	1827665	396845
	704000762		80	51500	15950	41200	12760
			82207			27904527	11053344
FF	7050000						
	705000152		8981	20071	110926	1802577	981264
	705000254		4578	44016	10399	2015052	476066
	705000356		27338	55692	11077	15225079	3028230
	705000458		7892	60587	10861	4781526	857150
	705000562		13511	55304	14234	7472123	1923156
	705000691		213	18863	9316	40178	19847
	705000792		2980	54325	14100	1618885	420180
U C	705000862		853	58436	14188	498459	121024
U C	705000952		438	21435	10275	93885	45005
CH	7050010		3359	20256	9789	680399	328813
			70143			34228163	8200735
	707000052		1431	18748	13200	268284	188892
			1431			268284	188892
	7080000						

AVRO AIRCRAFT LTD.
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WEIGHT AND C. OF G BY FUNCTIONAL
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PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
	5 BRAKE PARACHUTE F F	708000152		46216	
	5 BRAKE PARACHUTE R F	708000559		851382	
	5 BRAKE PARACHUTE I W	708000662		12462	
	5 RADIO RADAR INT SYST R N			9099	
	5 RADIO RADAR INT SYST F F				
	ELECTRICAL SYSTEM	7090000			
33	ELECTRICAL WIRING R N	709000151		129	9
33	ELECTRICAL WIRING F F	709000252		2966	19
33	ELECTRICAL WIRING C F	709000354		1304	41
33	ELECTRICAL WIRING A I	709000455		1274	21
33	ELECTRICAL WIRING D B	709000556		6515	53
33	ELECTRICAL WIRING E B	709000658			6459
33	ELECTRICAL WIRING I W	709000862		8909	54
33	ELECTRICAL WIRING FIN	709000983		352	79
33	ELECTRICAL WIRING NUC	709001091		330	18
33	ELECTRICAL WIRING ENG	7090011		2002	58
33	ELECTRICAL WIRING C A	7090012		13746	33
65	ELECTRICS F F	709001352		16271	15
26	ELECTRICS C F	709001454		7596	44
85	ELECTRICS E B	709001558		670	67
85	ELECTRICS ENG	7090016		11632	56
85	ELECTRICS C A	7090017		718	61
	ELECTRICS FIN	709001883			8389
	ELECTRICS I W	709001962		2336	62
	ELECTRICS CAW	7090020		112	62
	ELECTRICS MUC	709002192		745	1
19	ELECTRICS A I	709002255		5303	22
93	ELECTRICS D B	709002356		27132	51
	ELECTRICS R F	709002459		1368	0
62	WINDSCREEN DEMISTING	709002552		2964	19
	SURFACE FLUSH RUDER			1126	18
	L P PNEUMATICS	7100000			
26	L P PNEUMATICS F F	710000152		2060	19
18	L P PNEUMATICS C F	710000254		671	33
	L P PNEUMATICS D B	710000356		444	55
	L P PNEUMATICS E B	710000458		1526	65
	L P PNEUMATICS FIN	710000583		640	75
	L P PNEUMATICS R N	710000651		124	7
				546	5
	INTAKE DE ICING	712000055		8800	19
				8800	
5	RADIO RADAR INT SYST R N	715000151		1872	99
5	RADIO RADAR INT SYST F F	715000252		9699	19

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

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SHEET _____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
708000152	52	462	16895	12875	78055	59483
708000559	59	8513	82210	14392	6998537	1225191
708000662	62	124	62022	14500	76907	17980
		9099			7153499	1302654
7090000						
709000151	51	129	9285	12000	11978	15480
709000252	52	2966	19977	11200	592518	332192
709000354	54	1304	41878	11000	546089	143440
709000455	55	1274	21984	12000	280076	152880
709000556	56	6515	53375	9200	3477381	599380
709000658	58	64	59500	9200	38080	5888
709000862	62	8909	54111	13900	4820749	1238351
709000983	83	352	79754	30000	280734	105600
709001091	91	330	18600	9800	61380	32340
7090011		2002	58583	10000	1172832	200200
7090012		13746	33473	11234	4601199	1544226
709001352	52	16271	15582	11097	2535347	1805593
709001454	54	7596	44897	10870	3410376	825685
709001558	58	670	67944	11597	455225	77700
7090016		11632	56207	11472	6537998	1334423
7090017		718	61350	12000	440493	86160
709001883	83	83	89550	28840	74327	23937
709001962	62	2336	62053	14500	1449558	338720
7090020		112	62946	13561	70500	15188
709002192	92	745	1600	13700	38184	10138
709002255	55	5303	22076	13833	1170690	733564
709002356	56	27132	51861	10254	14070927	2782115
709002459	59	136	80200	11360	109072	15450
709002552	52	2964	19896	9981	589717	295837
		112618			46835430	12714487
7100000						
710000152	52	2060	19474	12434	401164	256140
710000254	54	671	33431	11033	224322	74031
710000356	56	444	55296	11859	245514	52654
710000458	58	1526	65650	9737	1001819	148587
710000583	83	640	75818	25515	485235	163296
710000651	51	124	7431	9955	9214	12344
		5465			2367268	707052
712000055	55	8800	19582	11800	1723216	1038400
		8800			1723216	1038400
R N	715000151	1872	9909	9034	185496	169116
F F	715000252	9699	19242	12007	1866282	1164559

AVRO AIRCRAFT LTD.
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WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
5 RADIO RADAR INT SYST C F	7150003	54	225012	
5 RADIO RADAR INT SYST I W	7150005	62	49275	
5 RADIO RADAR INT SYST O W	7150006	64	10497	
5 RADIO RADAR INT SYST FIN	7150007	83	33807	
5 RADIO RADAR INT SYST C A	7150008		212933	
5 RADIO RADAR INT SYST D B	7150009	59	1374	
			64734	
37 CANOPY ACTUATION	7160000	52	658622	
			6586	
CABIN CONSOLES	7170000	52	174517	
			1745	
SURFACE FINISH F F	7190000	152	36318	
SURFACE FINISH CANOPY	7190000	253	6420	
SURFACE FINISH C F	7190000	354	140037	
SURFACE FINISH INTAKES	7190000	455	40822	
SURFACE FINISH D B	7190000	556	37753	
SURFACE FINISH E B	7190000	658	44366	
SURFACE FINISH R F	7190000	759	64880	
SURFACE FINISH I W	7190000	862	315160	
SURFACE FINISH O W	7190000	964	106770	
SURFACE FINISH O W L EDGE	7190000	1065	31963	
SURFACE FINISH AILERON	7190000	1174	35379	
SURFACE FINISH ELEVATOR	7190000	1282	56675	
SURFACE FINISH FIN	7190000	1383	63974	
SURFACE FINISH RUDDER	7190000	1484	20281	
			10000	
FLIGHT TEST INSTALLATION	7200000		14567348	
			145673	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

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	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
C F	715000354	54	225.01	27490	10294	6185525	2316253
I W	715000562	62	4927	57215	15695	2818983	773293
O W	715000664	64	1049	74642	13720	782995	143923
FIN	715000783	83	3380	76179	25195	2574850	851591
C A	7150008		21293	36192	15230	7706363	3242924
D B	715000959	59	13745	550	15800	9692	2054
			64734			22130186	8663713
	716000052	52	6586	22201	15436	1462158	1016615
			6586			1462158	1016615
	717000052	52	1745	17476	12434	304956	216973
			1745			304956	216973
	7190000152	52	363	18744	12200	68041	44286
	7190000253	53	64	20218	15900	12940	10176
S	7190000354	54	1400	37197	12455	520758	174370
	7190000455	55	408	22798	12820	93016	49042
	7190000556	56	377	53828	11200	202932	42224
	7190000658	58	443	66701	11200	295485	49616
	7190000759	59	648	80362	13175	520746	85374
	7190000862	62	3151	60144	14400	1895137	453744
	7190000964	64	1067	70650	13590	753836	145005
EDGE	7190001065	65	319	63948	13526	203994	43148
N	7190001174	74	353	79190	13556	279541	47853
OR	7190001282	82	566	75523	14260	427460	80712
	7190001383	83	639	74663	20837	477097	133148
	7190001484	84	202	81279	21431	164184	43291
			10000			5915167	1401989
ION	7200000		145673	48848	12890	71158347	18777250
			145673			71158347	18777250

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GROUP	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	8000000						
	8010100	52	34294	20450	13411	7013123	4599168
			34294			7013123	4599168
	8020000						
	8030000						
	8030101	52	784	17201	12047	134856	94448
	8030102	54	2303	32213	10949	741865	252155
	8030103	58	3696	3242	13432	233363	49564
	8030104	62	6070	52781	15720	3203807	954204
	8030105	64	95	74855	14000	71112	13300
	8030106	51	287	7350	9340	21095	26806
			9908			4406098	1398477
	8050800	54	68680	38581	9468	26497431	6502622
			68680			26497431	6502622
	8050900	54	304800	39400	9500	120091200	28956000
			304800			120091200	28956000
C CF	8051000	54	13844	38650	10710	5350706	1482692
C CA	8051003		3634	53345	10954	1938557	398068
			17478			7289263	1880760

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SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	9000000						
	9010000	52	39000	19400	13650	7566000	5323500
			39000			7566000	5323500
	9020000						
	9020001		88166	1246	12186	5399447	1074318
	9020002		17736	2676	11640	1111245	206377
NG	9020003	56	19255	8084	9555	1118117	183934
B	9020004	58	9095	9928	9704	544746	88209
			13423			8173555	1552838
	9040000						
	9040001	52	7220	493	13200	14755	9504
	9040002	54	1267	26280	16150	332968	204621
			1339			347723	214125
	9060000						
			2500	73000	12900	1825000	322500
			2500			1825000	322500
	9070000						
	9070001	54	4680	39424	12300	1845043	575640
	9070002	62	17160	59755	13705	10253958	2351778
			21840			12099001	2927418
IONING	9100000	54	12500	26800	13200	3350000	1650000
IRCOND	9100001	54	1500	26700	12700	400500	190500
			14000			3750500	1840500

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