

QCX
Avro
CF105
R-7-0400-63
Iss-5

Classification cancelled / Changed to <u>SECRET</u>	
Arrow 1	Report: 7-0100-63
By authority of <u>1/0 25204 & 5</u>	Issue: 5
Date	<u>22 Sept 66</u>
Signature	<u>WRIGHT & C.G. SUMMARY</u>
Unit / Raw	<u>AVRO</u>
CONFIDENTIAL	
<u>1 Oct 68</u>	

C O N F I D E N T I A L

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Classification cancelled / Changed to UNCLASS

By authority of AVRS

Date 27.10.58

Signature P.B. Bell

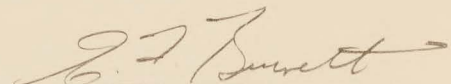
Unit / Rank / Appointment AVRS

Ref: 4400/11/J
Date: 1 October, 1958
To: See Distribution
From: E.F. Burnett - Weight Supervisor
Subject: Arrow 1 - A/Cs 25204 & 25205 Weight and C.G. Summary Report: 7-0400-63
Issue 5

Attached is a copy of Weight and C.G. Summary Report 7-0400-63 Issue 5 dated 1 October, 1958

The report defines the aircraft to the completed configuration assuming the fitment of full Astra. An appendix is attached which indicates the Weight and Balance for Phase I Flight Testing prior to fitment of full Astra.

The report will be issued monthly until the actual weight of the Aircraft has been obtained.


E.F. Burnett

EFB/ag

cc: Messrs. J.C. Floyd	R. Marshall	T. Roberts
R.N. Lindley	F. Brame	J. Zurakowski
C.V. Lindow	W. Czerwinski	A. Crust (6 copies R.C.A.F.)
F.P. Mitchell	J. Lucas	D. Inglis
T. Higgins	S. Kwiatkowski	D. Moore
B.C. Alford	A. Cornish	R. Cairns
D.N. Scard	C. Marshall	R. Brownridge
		D. Wade*



58038

15855193

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue : 5

I N D E X

<u>Sheet</u>	<u>Content</u>
1-1 to 1-2	Introductory notes and explanations of weight changes.
2-1 to 2-2	Weight and C.G. Summary
3-1 to 3-5	Appendix I - 4th and 5th Aircraft prior to installation of Full Astra I trails
4-1	Horizontal C.G. Envelope for A/C with full Astra I.
4-2	Horizontal C.G. Envelope for ballasted Aircraft.
5-1 to 5-15	I.B.M. Detail sheets of Weight and C.G. for an A/C with full Astra I T.I.

Aircraft: Arrow 1
 A/C 25204 & 25205
 Date : 1 October, 1958

Report: 7-0400-63
 Issue : 5
 Sheet : 1-1

Introduction & Weight Changes

The following is a Weight and C.G. Summary for Aircraft Serial Numbers 25204 and 25205 with J 75 P5, based on the latest information available.

All Weight and C.G. changes quoted are relative to issue 4 of September 1, 1958.

Note

This summary is for the Aircraft in the completed stage with full Astra I trial installations and a completed instrument Package. For a preliminary estimate of the condition of the Aircraft at first flights see Appendix I.

General

- a) Pratt and Whitney J75 P5 Engines comprise the Power Plant for A/C 25204 and 25205 (5,850 lb each, Pratt and Whitney's latest brochure weight with their installation kit, excluding P & W actual weight recorded in Engine Inspection records).
- b) A package containing Flight Instrumentation is installed. This pack will be entirely different from those for A/C's 25201 to 25203.

Final proposals are still awaited from R.C.A. as to their entire requirements for instrumentation. The Air Conditioning equipment to be installed has been evaluated at 134 lb (less water). It is felt that the current allowance of 2,000 lb will adequately cover all equipment & cable weights, however, this is subject to future confirmation. Additional water required for Air Conditioning is recorded separately as an item of Operational Load.

For early flights full instrumentation will not be available, however, it is assumed that ballast will be installed to simulate the completed pack.

A reasonably detailed estimate of Avro required Flight Test Installations has been made amounting to 887 lb. In addition an initial estimate of the R.C.A. test wiring from the Radar Nose to the Missile Pack has been evaluated at 91 lb.

- c) In A/C 25201 for early flights additional emergency fire protection and additional emergency provisions for landing gear lowering were installed. These are no longer considered necessary and consequently are not to be installed on A/c's 25204 & 25205
- d) A missile seeker is installed, mounted beneath the Aircraft, between A/C Sta. 485 and 538.7 ins, from the dive brake jack beams. Canadair has supplied information to the effect that missile seeker shall weigh 124.4 lb.
- e) There is to be a trial installation in these A/C of the full R.C.A. Astra I system, weights of which are based on R.C.A.'s statement dated June 5, 1958. but with the following amendments:-
 1. A complete J4 compass system is added.
 2. The missile auxiliaries normally housed within, or in close proximity to, the missile pack, will not be necessary, however, one each of the Range Slaving, Angle Slaving and Optical mode units will be installed in the Instrument Pack.
 3. The miniature stable platform, amplifier assy and platform repeater will not be required.

C O N F I D E N T I A L

Aircraft: Arrow 1
 A/C 25204 & 25205
 Date : 1 October, 1958

Report: 7-0400-63
 Issue : 5
 Sheet : 1-2

General Cont'd

N.B. When Astra I is first installed, the I.R. Tracker system and ARD 501 Homer system may not be available.

- f) The Mk 1A Tailcones and Stringer are fitted.
 - g) Due to material substitutions and concessions introduced by Planning and Production Departments, there is a structural weight penalty of 72 lb approx. This is all recorded in the structural weight breakdown. No account has been taken of variations on machinings nor of minor shop repair schemes, since it is impossible to assess these, except where actual weights have been obtained. Major repair schemes e.g. cracked outer skin on Air Intakes have been assessed and recorded.
 - h) A dry weighing of A/C 25201 has now been obtained. Based on the good agreement shown between estimated and actual weights of the first Arrow I it is felt that this summary is entirely representative of the subject aircraft in the completed state, within $\pm 0.30\%$.
- Preceding 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.
- j) No further work is being proceeded with in the fuel management system for Arrow 1 Aircraft. The fuel proportioners are functioning satisfactorily and it is not considered necessary to fit the fuel sequencing system.
 - k) The aircraft as recorded with full Astra I trial installation (ref note (e)) is not ballasted. However, in Appendix I will be found a estimate of A/C 25204 and 25205 for early Flight Testing, these Aircraft are ballasted such that the C.G. on a flight envelope (using fuel proportioners) does not travel aft. of 31% M.A.C.

1. Structure

Weight lb

- a) Wings No weight change
- b) Fin & Rudder No weight change
- c) Front Fuselage Fwd Sta 255 No weight change
- d) Fuselage Sta 255 - 742.5 No weight change
- e) Fuselage Sta 742.5 - Aft

Centre Struct & Stinger - actual weight of stinger obtained	+	1.65
Tailcones - addition of skin stiffeners	+	1.66

Total Structural Increase	+	3.31
---------------------------	---	------

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue : 5
Sheet : 1-2

- | | <u>Weight lb</u> |
|--|---|
| 2. <u>Landing Gear</u> | |
| Main Landing Gear - deletion of cross shaft, spacer (-12.0)
replaced with integral jack pick up fitting
(+ 44.0) ref assig. X73-4175 actual weights
obtained. | + 32.00 |
| | <u>Total Landing Gear Increase + 32.00</u> |
| 3. <u>Power Plant & Services</u> | |
| No weight change. | |
| 4. <u>Flying Controls Group</u> | |
| No weight change. | |
| 5. <u>Equipment Group</u> | |
| Flight Test Installations - preliminary estimate of R.C.A. test
wiring from Radar Nose to Missile Pack | + 91.10 |
| | <u>Total Equipment Group Increase + 91.10</u> |
| 6. <u>Trapped Fuel</u> | |
| No weight change. | |
| 7. <u>Operational Load</u> | |
| No weight change. | |

Summary

Weight Change - Aircraft Basic Weight

Structure	+ 3.31
Landing Gear	+ 32.00
Equipment	+ 91.10
Total	<u>+126.41 lb</u>

Weight Change Operational Weight Empty (A/C less usable fuel)

Issue 4

Issue 5

49,299.88 lb

49,426.29 lb

+ 126.41 lb

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue: 5
Sheet : 2-1

Wt. & C.G. Summary Full Astra Installed

Description	Weight lb	H. Arm ins	V. Arm ins
Structure	18,805.73	564.33	137.47
Wings	10,011.20	642.99	112.22
Fin and Rudder	1,038.94	754.52	209.77
Fuselage Fwd Sta 255 ins	2,631.72	184.17	128.31
Sta 255 - 485 ins	1,686.53	379.30	130.44
Sta 485 - 591.65 ins	1,018.71	533.73	104.38
Sta 591.65 - 742.5 ins	1,437.47	660.98	107.30
Sta 742.5 ins aft	923.85	807.83	128.97
"Marry-Up"	54.31	462.81	104.25
Landing Gear - Retracted	2,754.52	491.31	135.20
Main Landing Gear	2,110.67	540.12	111.00
Main Gear Doors & Fairings	282.34	537.60	138.37
Nose Landing Gear	333.81	170.81	99.70
Nose Gear Door & Fairing	27.70	162.60	88.70
Power Plant & Services	13,789.32	652.23	120.39
Engine & Accessories J75P5	11,913.81	665.32	119.78
Gear Box & Drives on Fuselage	276.70	603.71	103.24
Gear Box & Starters on Engine	286.80	589.18	105.54
Engine Controls	33.35	375.79	118.49
Engine Nose Bullets	75.61	562.62	115.11
Fire Extinguishing System	65.53	700.45	134.21
Engine Mountings	206.21	635.04	127.71
Fuel System	931.31	536.18	135.75
Flying Controls Group	2,152.80	624.73	134.87
Mechanical Flying Controls	935.00	675.98	117.65
Hydraulic Flying Controls	1,199.80	584.03	124.71
Equipment - Fixed & Removable	10,556.10	347.89	111.20
Instruments	49.09	159.10	136.11
Probe	15.25	-23.71	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	853.20	338.84	130.01
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	56.31	423.31	127.57
Electrical System	1,131.18	414.71	112.90
Intake Deicing Boots	88.00	195.82	118.00
Canopy Actuation	65.86	222.01	154.36
Cabin Consoles	23.62	180.23	125.05
Hydraulics Utilities System	654.93	503.19	117.65
Sequencing of U/C Doors	66.89	345.66	116.36
Instrument Pack Structure	686.80	385.81	94.68
Pack Instrumentation	2,000.00	394.00	95.00
Flight Test Installations	977.88	444.45	117.44
NH 64 Damping System	184.72	404.22	135.05
Radio & Radar Fixed	892.15	220.66	114.93
Radio & Radar Removable	2,067.58	206.59	109.54
Missile Seeker	167.00	519.29	50.64

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue : 5
Sheet : 2-2

Description	Weight lb	H. Arm ins	V. Arm ins	M.A.C. %
Trapped Fuel	238.20	553.66	141.42	
U/C Up		540.60	126.43	
Aircraft Basic Weight	48,296.67			
U/C Down		542.70	122.90	
Useful Load (less fuel)	1,129.62	365.75	128.26	
Crew	390.00	194.00	136.50	
Engine Fire Extinguisher Fluid	25.00	730.00	129.00	
Residual Fuel	287.00	508.14	135.33	
Oxygen Charge	13.39	259.69	159.91	
Water for Air Conditioning	280.00	315.00	114.00	
Oil	134.23	608.92	115.68	
U/C Up		536.60	126.67	27.79
Operational Weight Empty	49,426.29			
U/C Down		538.66	123.22	28.36
Max. Internal Fuel (2468 gals at 7.8 lb/gal)	19,253.00	540.80	144.09	
U/C Up		537.78	131.55	28.12
Gross Weight (Max. Int Fuel)	68,679.29			
U/C Down		539.26	129.07	28.53

N.B. Aircraft Datum = 120" above arbitrarily chosen ground line.

Aircraft: Arrow 1
 A/C 25204 & 25205
 Date : 1 October, 1958

Report: 7-0400-63
 Issue : 5
 Sheet : 3-1

Appendix I

Introduction:-

This appendix is to cover the condition of A/C 25204 & 25205 prior to the installation of full Astra I.

All weight changes will be quoted relative to the completed aircraft as defined in the main text of this report.

Changes Applicable to Early Phases of A/C 25204 & 25205 Weight lb

1. Structure

Fin Structure for I.R. tracker - not installed initially	- 10.75
Radome - longer radome fitted as A/C 25201, full electrical properties unnecessary	+ 21.42

<u>Total Structural Increase</u>	<u>+ 10.67</u>
----------------------------------	----------------

2. Landing Gear No weight change.

3. Power Plant Group No weight change.

4. Flying Controls No weight change.

5. Equipment

Interim Radio & Radar - This will be installed initially until Astra 1 units become available	+ 648.68
Radio & Radar Remov - Full Astra I units will not be installed	-2067.58
Radio & Radar Remov - The wiring & Racks etc for complete Astra I will not be installed	- 892.15
Missile Seeker - This will not be installed	- 167.00
Probe - Mk 2 A/C probe is replaced by Mk1 since Mk1 radome is fitted	0.25
MH64 Damping Sys - delete cable allowance now in Interim Radio and Radar Weight	- 85.64
Instrumentation in Pack - during the initial flights of Phase 1 of A/C 25204 Pack No. 5 weight 3,800 lb complete will be installed. However this summary incorporates a pack with instrumentation and ballasted to give a completed pack weight of 2,826.80 lb which is more representative of the majority of flights to be undertaken during Phase I of both A/C 25204 & 25205 This weight is maintained by	+ 140.00

<u>Total Equipment Decrease</u>	<u>-2423.94</u>
---------------------------------	-----------------

6. Trapped Fuel No weight change

7. Operational Load

Water for Air Cond'n - since an incomplete pack will probably be fitted initially the Air Cond'n equip. may not be installed. Thus the wt. of water in the second boiler will be simulated by

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue : 5
Sheet : 3-3

7. Operational Load Cont'd

Weight lb

..... ballast (see Equip. Group)

- 140.00

Operational Load

- 140.00

Summary

Weight Change - Aircraft Basic Weight

Structure 10.67
Equipment - 2423.94

- 2143.27

Ballast + 1011.00
Op. Load - Water - 140.00

Weight Change - Operational Weight Empty (A/C less usable fuel)

BALLASTED Condition

Complete A/C

Early A/C

49,299.88

47,757.61

- 1542.27 lb

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

CONFIDENTIAL
Report: 7-0400-63
Issue : 5
Sheet : 3-4

Wt. & C.G. Summary A/C Prior to Astra I Installation

Description	Weight lb	H. Arm ins	V. Arm ins
Structure	18,816.40	563.60	137.37
Wings	10,014.20	642.99	142.22
Fin & Rudder	1,028.19	754.46	209.25
Fuselage Fwd Sta 255 ins	2,653.14	182.87	128.15
Sta 255 - 485 ins	1,686.53	379.30	130.44
Sta 485 - 591.65 ins	1,018.71	533.73	104.38
Sta 591.65 - 742.5 ins	1,437.47	660.98	107.30
Sta 742.5 ins	923.85	807.83	128.97
"Marry-Up"	54.31	462.81	104.25
Landing Gear - Retracted	2,754.52	491.31	135.20
Main Landing Gear	2,110.67	540.12	141.00
Main Gear Doors & Fairings	282.34	537.60	138.37
Nose Landing Gear	333.81	170.81	99.70
Nose Gear Door & Fairing	27.70	162.60	88.70
Power Plant & Services	13,789.32	652.23	120.39
Engines & Accessories J75 P5	11,913.81	665.32	119.78
Gear Box & Drives on Fuselage	276.70	603.71	103.24
Gear Box & Starter on Engines	286.80	589.18	105.54
Engine Controls	33.35	375.79	118.49
Engine Nose Bullets	75.61	562.62	115.11
Fire Extinguisher System	65.53	700.45	134.21
Engine Mountings	206.21	635.04	127.71
Fuel System	931.31	536.18	135.75
Flying Controls Group	2,152.80	624.73	134.87
Mechanical Flying Controls	953.00	675.98	147.65
Hydraulic Flying Controls	1,199.80	584.03	124.71
Equipment - Fixed & Removable	8,132.16	392.55	113.01
Instruments	49.09	159.10	136.11
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	853.20	338.84	130.01
Surface Finish	100.00	591.52	140.20
Cockpit Insulation	14.31	187.48	132.00
Drag Chute	99.09	786.18	143.17
Low Pressure Pneumatics	56.31	423.31	127.57
Electrical System	1,313.18	414.71	112.90
Intake De-icing Boots	88.00	195.82	118.00
Canopy Actuation	65.86	222.01	154.36
Cabin Consoles	23.62	180.23	125.05
Hydraulic Utilities System	654.93	503.19	117.65
Landing Gear Door Sequencing	66.89	345.66	116.36
Instrument Pack Structure	686.80	385.81	94.68
Pack Instrumentation	2,140.00	391.50	95.00
Flight Test Installations	977.88	444.45	117.44
MH 64 Damping System	99.08	450.83	140.34
Interim Radio & Radar	648.68	342.30	124.04
Trapped Fuel	238.20	553.66	141.42
Aircraft Basic Weight	45,883.40	558.40	127.72
U/C Up			
U/C Down		560.62	124.00

C O N F I D E N T I A L

Aircraft: Arrow 1
A/C 25204 & 25205
Date : 1 October, 1958

Report: 7-0400-63
Issue : 5
Sheet : 3-5

Description	Weight lb	H. Arm ins	V. Arm ins	M.A.C. %
Useful Load	989.62	366.28	132.83	
Crew	390.00	194.00	136.50	
Engine Fire Extinguisher Fluid	25.00	730.00	129.00	
Residual Fuel	287.00	508.14	135.33	
Oxygen Charge	13.39	259.69	159.91	
Water for Air Conditioning	140.00	268.00	132.00	
Oil	134.23	608.92	115.69	
Ballast	954.00	100.29	113.65	
U/C Up		545.27	127.55	
Operation Weight Empty	47,827.02			
U/C Down		547.42	123.97	
Max. Internal Fuel (2468 gals @ 7.8 lb/gal)	19,253.00	540.80	144.09	
U/C Up		543.99	132.31	
Gross Weight (Max Internal Fuel)	67,080.02			
U/C Down		545.29	129.78	

N.B. 1) Aircraft Datum = 120" above arbitrarily chosen ground line

- 2) The above figures are for a BALLASTED AIRCRAFT so that the aft C.G. on the horizontal C.G. envelope, using fuel proportioners does not exceed 31% using 954 lb ballast between stations 67.5 and 96.25

DATE Oct 1st 1958

SHEET 4-1
BY P. E. F. L.

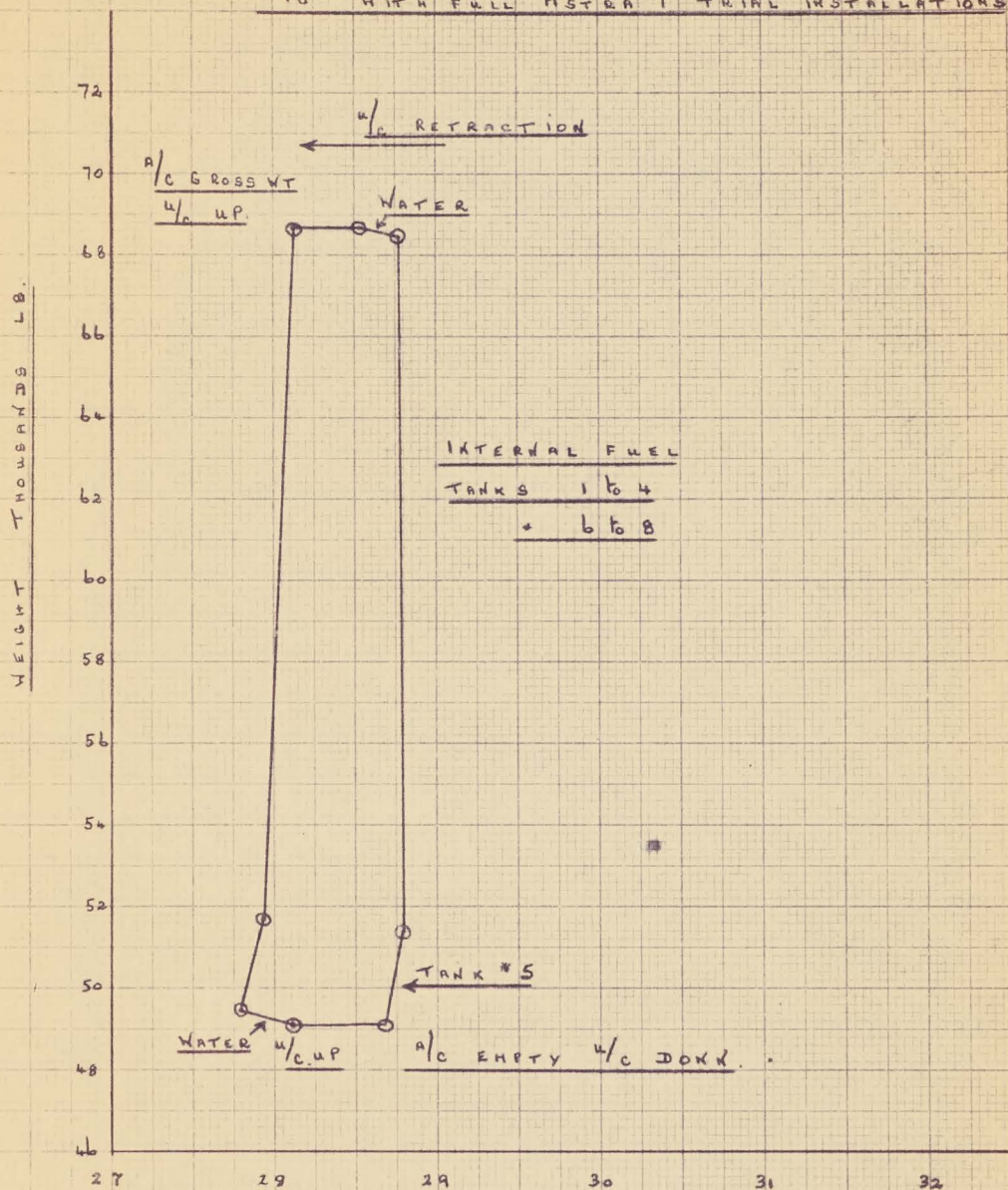
HORIZONTAL C.G. ENVELOPE

ARROW 1 ~ $\frac{1}{2}$ 25204 + 25205

NORMAL FLIGHT CONDITIONS

FUEL PROPORTIONERS USED

A/C WITH FULL ASTRA 1 TRIAL INSTALLATIONS



HORIZONTAL C.G. POSITION ~ % H.A.C.

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT Arrow 1

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
TOTAL WING GROUP		10000000			
OUTER WING		10100000			
100	OUTER WING SKINS	10100001	64	92910	70
100	POSTS AND INTERCOSTALS	10100002	64	2436	73
100	OUTER WING SPARS	10100003	64	39258	70
100	OUTER WING RIBS	10100004	64	13456	69
98	AILERON CONTROL BOX	10100006	64	37530	77
100	RIB 12	10100007	64	7626	64
100	O W AILERON JACK FITTING	10100009	64	1046	72
AILERON JOINTS AND FAIRING		10100010		3293	78
BUZZ DAMP STRUC PROV O W		10100011	64	800	75
				198355	
96 AILERON		10200000	74	35380	79
				35380	
94 ELEVATOR		10300000		15977	73
94 ELEVATOR MARRY UP		10300001	82	45336	75
				46933	
INNER WING		10400000			
96	MAIN U C STRUCTURE	10400001	62	33071	57
100	FRONT SPAR I W	10400002	62	11110	48
100	MAIN SPAR I W	10400003	62	15106	56
100	FWD CENTRE SPAR I W	10400004	62	5364	60
100	AFT CENTRE SPAR I W	10400005	62	3666	65
100	REAR SPAR I W	10400006	62	7667	70
99	I W STRUCTURE F S TO M S	10400007	62	10857	49
100	STRUCTURE MS TO R S	10400008	62	14979	60
100	STRUCTURE AFT OF REAR SPAR	10400009	62	32212	71
40	ELEVATOR CONTROL BOX	10400010	62	42838	72
25	TRANSP JOINT MARRY UP	10400011		7065	63
100	INNER WING JOINTS	10400012	62	63471	66
100	INNER WING SKINS	10400013	62	21915	62
100	STRUT PICK UP FITTINGS	10400014	62	5391	56
100	RIBS 1 TO 9 INNER WING	10400016	62	51204	61
74	DORSAL FAIRING I W	10400017	62	9548	
100	RIB 10	10400018	62	10800	63
77	WING TO FUS JOINT I W	10400019	62	12628	61
65	TRANSPORT JOINT O W TO I W	10400020	62	12942	63
77	WING TO FUS JOINT C A	10400021		3818	52
BUZZ DAMP STRUC PROV I W		10400022	62	552	74
74 DORSAL FAIRING C A		10400023		6033	57
				667744	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. 7-0400-63-5

SHEET 4 to 15

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	1000000						
	1010000						
	1010000164		9291070646	13597		65637199	12632973
L S	1010000264		243673207	13410		1783323	326668
	1010000364		3925870608	13579		27719289	5330844
	1010000464		1345669506	13650		9352727	1836744
	1010000664		3753077409	13508		29051598	5069552
	1010000764		762664873	13832		4947215	1054828
TING	1010000964		104672791	13670		761394	142988
AIRING	10100010		329378726	13224		2592447	435466
O W	1010001164		80075828	13680		606624	109440
			198355			142451816	26939503
	102000074		3538079190	13561		28017422	4797882
			35380			28017422	4797882
	1030000		159773810	14260		1178746	227732
	1030000182		4533675523	14260		34239107	6464914
			46933			35417853	6692646
	1040000						
	1040000162		3307157757	13983		19100817	4624318
	1040000262		1111048428	14260		5380351	1584286
	1040000362		1510656570	14280		8545464	2157137
	1040000462		536460098	14415		3223657	773221
	1040000562		366665492	14450		2400937	529737
	1040000662		766770374	14420		5395575	1105581
M S	1040000762		10857949954	14389		54239554	15623432
	1040000862		1497960964	14572		9131798	2182740
R SPAR	1040000962		3221271829	15020		23137557	4838242
	1040001062		4283872470	14328		31044699	6137829
	10400011		706563621	13876		4494824	980339
	1040001262		6347166222	15046		42031766	9549847
	1040001362		21915362458	14463	1	36878581	31696098
GS	1040001462		539156766	14330		3060255	772530
NG	1040001662		5120461287	14499		31381395	7424068
	1040001762		9548280	16150		45866	15343
	1040001862		1080063683	13835		6877764	1494180
	1040001962		1262861681	13811		7789077	1744053
O I W	1040002062		1294263071	13710		8162649	1774348
	10400021		381852984	14301		2022929	546012
I W	1040002262		55274150	14200		409308	78384
	10400023		603357025	16034		3440318	967331
			667744			408195141	96599056

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT_____

[illegible]

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO.

SHEET

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
105000062		22138	46841	14423	10369661	3192964
		22138			10369661	3192964
106000065		30870	63013	13561	19452113	4186281
		30870			19452113	4186281

WEIGHT AND C. OF G BY FUNCTIONAL G COMPONENT

PROJECT		DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. AREA
		FIN AND RUDDER GROUP	2000000			
100	FIN		2010000	83	85170	749
	BUZZ DAMP STRUC PROV FIN		2010001	83	185	803
12	FIN TO WING HARRY UP		2010002		4830	685
	FIN POD FOR I R TRACKER		2010003	83	1075	760
					91260	
94	RUDDER		2020000	84	12634	813
					12634	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

REFERENCE NO.		COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
2000000							
FIN	201000083		8517074957	21170		63840877	18030489
	201000183		18580300	22342		148555	41333
	2010002		483068538	15355		3310385	741647
KER	201000383		107576000	25950		817000	278963
			91260			68116817	19092432
	202000084		1263481316	21374		10273463	2700391
			12634			10273463	2700391

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H. A
TOTAL FUSELAGE GROUP		3000000			
FUSELAGE BASIC STRUCTURE		3010000			
RADOME		3010001	51	15958	39
RADAR NOSE STRUCTURE C A		3010002		270	120
RADAR NOSE STRUCTURE R N		3010003	51	17032	98
SKIN F F		3010004	52	11054	190
88	SKIN C F	3010005	54	21263	376
	SKIN D B	3010006	56	5937	534
3	SKIN E B	3010007	58	17725	669
4	FORMERS F F	3010011	52	10761	182
100	FORMERS C F	3010012	54	27824	374
	FORMERS D B	3010013	56	7491	153
	LIGHT FORMERS E B	3010014	58	13501	1668
72	HEAVY FORMERS E B	3010015	58	21890	662
	LOWER LONGERONS F F	3010016	52	6969	184
	LONGITUDINAL MEMBERS E B	3010017	58	11067	708
75	LOWER LONGERON E B	3010018	58	6842	658
	TOP LONGERONS E B	3010019	58	638	666
	LOWER SHEAR PANEL F F	3010020	52	2952	234
	TOP WING LONGERONS D B	3010021	56	498	538
66	LONGERONS C F	3010023	54	14453	410
43	LONGERONS F D B	3010024	54	1258	488
43	LONGERONS A D B	3010025	56	8655	529
	ELECTRONICS BAY STRUCTURE	3010026	54	4361	127
	LONGITUDINAL BEAMS D B	3010027	56	7378	520
	RADAR ACCESS DOOR C F	3010028	54	2479	273
72	MAIN FRAME AT STN 538 77	3010029	56	5980	538
	DIVE BRAKE ACCOMMODATIONS	3010030	56	3620	501
48	TOP LONGERONS F F	3010031	52	19253	191
100	DUCT C F	3010032	54	33475	377
97	DUCT D B	3010033	56	31663	544
22	CANOPY ARCH	3010034	52	8659	228
4	ACCESS PANELS D B	3010036	56	3964	540
66	NOSE U C SUPPORT STRUCTURE	3010037	52	3343	210
3	CREWS BULKHEADS	3010038	52	13327	201
	EQUIPMENT BAY STRUCTURE	3010039	54	6550	281
86	WINDSCREEN	3010041	52	13057	138
33	SERVICE ACCESS DOORS	3010042	58	6704	661
	TORSION BOX E B	3010043	58	6046	619
	DORSAL FAIRING AIR OUTLET	3010044	54	2143	297
66	INTERMEDIATE FORMERS	3010045	58	5154	697
3	ENGINE ACCESS DOORS	3010046	58	14739	628
	SEALING MISSILE BAY	3010047	54	743	319
100	MISCELLANEOUS ITEM C F	3010048	54	392	370
97	ARMAMENT BAY ROOF	3010049	54	13494	384
	BULKHEAD STA 120	3010050	52	3185	120
	BULKHEAD STA 255	3010051	52	10548	251
100	BULKHEAD STA 485	3010052	54	11254	485
	ENGINE TUNNEL	3010054	58	47926	665
100	INTEGRAL FUS FUEL TANK CF	3010055	54	21168	391

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

		REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT		V. MOMENT	
		3000000								
TURE		3010000								
		3010000151		15958	3992	11070	637043	1766551		
C A		30100002		270	12000	11200	32400	30240		
R N		3010000351		17032	9583	11325	1632177	1928874		
		3010000452		11054	19058	12024	2106671	1329133		
		3010000554		21263	37670	14300	8009772	3040609		
		3010000656		5937	53413	11157	3171130	662391		
		3010000758		17725	66945	10996	11866001	1949041		
		3010001152		10761	18292	12033	1968402	1294871		
		3010001254		27824	37482	13306	10428992	3702261		
		3010001356		7491	53710	11316	4023416	847682		
		3010001458		13501	66827	11119	9022313	1501176		
		3010001558		21890	66217	10984	14494901	2404398		
		3010001652		6969	18483	9044	1288080	630276		
E B		3010001758		1106	70853	9611	783634	106298		
		3010001858		6842	65810	9781	4502720	669216		
		3010001958		638	66605	13911	424940	88752		
		3010002052		2952	23414	8900	691181	262728		
B		3010002156		498	53899	13550	268417	67479		
		3010002354		14453	41038	12144	5931222	1755172		
		3010002454		1258	48717	10700	612860	134606		
		3010002556		8655	52931	9759	4581178	844641		
CTURE		3010002654		4361	27376	9300	1193867	405573		
B		3010002756		7378	52041	9113	3839585	672357		
		3010002854		2479	27382	9020	678800	223606		
B 77		3010002956		5960	53877	10383	3221845	620903		
TIONS		3010003056		3620	50328	9339	1821874	338072		
		3010003152		19253	19308	14763	3717369	2842320		
		3010003254		33475	37249	12917	12469103	4323966		
		3010003356		31663	54471	11812	17247153	3740034		
		3010003452		8659	22804	16053	1974598	1390029		
		3010003656		3964	54013	10340	2141075	409878		
ICTURE		3010003752		3343	21049	9186	703668	307088		
		3010003852		13327	20641	12274	2750826	1635756		
URE		3010003954		6550	28368	13624	1858104	892373		
		3010004152		13057	13814	15006	1803694	1959333		
		3010004258		6704	66397	9189	4451255	616031		
		3010004358		6046	61926	9058	3744046	547647		
UTLET		3010004454		2143	29245	16400	626720	351452		
		3010004558		5154	69289	10257	3571155	528646		
		3010004658		14739	62867	8874	9265967	1307939		
		3010004754		743	31991	10964	237693	81463		
F		3010004854		392	37000	12500	145040	49000		
		3010004954		13494	38408	1434	5182776	193504		
		3010005052		3185	12000	11430	382200	364046		
		3010005152		10548	25500	12043	2689740	1270296		
		3010005254		11254	48500	10530	5458190	1185046		
		3010005458		47926	66524	11574	31882292	5546955		
K CF		3010005554		21168	39722	14553	8408353	3080579		

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A
COCKPIT FLOOR	301005652		6160	176
CENTRE BEAM 697 28 717 36	301005958		55771	
DORSAL OVER FUEL TANK	301006154		500741	
SHIELD EXHAUST DEFLECTOR	301006254		198133	
SHEAR PANEL BELOW NAV ARCH	301006352		211525	
33 PACK MOUNTING STRUCTURE	301006454		211929	
88 ENG ACCESS DOORS R F	301006559		845777	
99 TUNNEL FIXED R F	301006659		1040377	
100 SKIN AND STIFFENERS R F	301006759		514377	
100 FAIRING UNDER RUDDER R F	301006859		261678	
100 FORMERS FIXED R F	301006959		900177	
100 LONGERONS C BEAM FIXED R F	301007059		279977	
99 TAILCONES	301007159		449668	
100 CNTR STRUCT STING REM R F	301007259		900083	
MISCELLANEOUS ITEMS E B	301007358		919664	
MTG BRKTS SIDE PANEL D B	301007556		243525	
FORMERS LOWER PANEL D B	301007656		764054	
LOWER PANEL D B	301007756		534855	
JOINT F F TO C F	3010078		85525	
JOINT AIR INTAKES TO F F	3010079		109222	
JOINT C F TO D B	3010080		52048	
JOINT D B TO E B	3010081		252158	
FUS JOINT AT STA 742 50	3010082		44374	
MISCELLANEOUS ITEMS F F	301008652		169918	
			646286	
DIVE BRAKES	302000072		1179050	
DIVE BRAKES C A	3020001		406487	
			12196	
AIR INTAKES	3030000			
7 AIR INTAKES	303010055		772482	
			77248	
PILOTS AND NAVIG CANOPIES	3040000			
76 PILOTS CANOPY	304010053		242081	
			24208	
100 NAVIGATORS CANOPY	304020053		153212	
			15321	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	301005652		6160	17636	11561	1086378	712158
717 36	301005958		5577	1367	11524	397514	64189
K	301006154		5007	41403	14202	2073048	711094
CTOR	301006254		1981	33428	16400	662209	324884
V ARCH	301006352		2115	25699	15352	543534	324695
UPE	301006454		2119	29285	10309	620549	218448
	301006559		8457	77280	9910	6535570	838089
	301006659		10403	77168	13059	8027787	1358528
R F	301006759		5143	77149	13796	3967773	709528
R F	301006859		2616	78134	15379	2043985	402315
	301006959		9001	77929	13652	7014389	1228817
ED R F	301007059		2799	77170	12570	2159988	351834
	301007159		4496	683168	12877	37397323	5790272
M R F	301007259		9000	83155	13729	7483950	1235610
E B	301007358		9196	6400	10284	610216	94510
D B	301007556		2435	2514	13145	127609	31942
D B	301007656		7640	54472	9006	4161661	688058
	301007756		5348	55246	8800	2954556	470624
	3010078		8552	5500	12000	218025	102600
F F	3010079		1092	22000	12000	240240	131040
	3010080		5204	8500	9800	252200	50960
	3010081		2521	58475	9150	1474155	230672
50	3010082		4437	4250	11500	328928	50945
F F	301008652		1699	18924	12571	321519	213581
			646286			308647544	76235679
	302000072		11790	50884	9049	5999224	1066877
	3020001		4064	8794	9374	198104	38058
			12196			6197328	1104935
	3030000						
	303010055		77248	21079	11868	16283106	9167793
			77248			16283106	9167793
OPIES	3040000						
	304010053		24208	17686	15915	4281427	3852703
			24208			4281427	3852703
	304020053		15321	23277	16223	3566269	2485526
			15321			3566269	2485526

WEIGHT AND C. OF G BY FUNCTIONAL G
COMPONENT

PROJECT_____

PROJECT	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A.
	UNDERCARRIAGE UP POSITION	4000000			
	MAIN UNDERCARRIAGE GROUP	4010000			
	MAIN UNDERCARRIAGE	401010092		211067540	
				211067	
	89 MAIN U C DOORS FAIRINGS	401020062		2823453	
				28234	
	NOSE UNDERCARRIAGE GROUP	4020000			
	100 NOSE UNDERCARRIAGE	402010091		33381170	
				33381	
	42 NOSE U C DOOR AND FAIRING	402020052		277016	
				2770	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

REFERENCE NO.		COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT			V. MOMENT		
ITION	4000000										
ROUP	4010000										
	401010092		21106754012	14100		114001508			29760447		
			211067			114001508			29760447		
NGS	401020062		2823453760	13837		15178598			3906739		
			28234			15178598			3906739		
ROUP	4020000										
	402010091		3338117080	9970		5701475			3328086		
			33381			5701475			3328086		
IRING	402020052		277016260	8870		450402			245699		
			2770			450402			245699		

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
ENGINE GROUP		5000000			
ENGINE J 75		5010000		1187578	66
J 75 ENGINE SERV ACCESS		5010100		380362	
ACC GEAR BOXES ON FUS D B		5020001	56	444557	
ACC GEAR BOXES ON FUS E B		5020002	58	2322560	
				27670	
ENGINE CONTROLS		5030000			
35 ENGINE CONTROLS F F		5030001	52	155816	
35 ENGINE CONTROLS C F		5030002	54	11726	
35 ENGINE CONTROLS E B		5030004	58	94663	
35 ENGINE CONTROLS I W		5030005	62	68949	
35 ENGINE CONTROLS ENG		5030006		2564	
				3335	
83 GEARBOX AND STARTER ON ENG		5040000		2868058	
				28680	
91 ENGINE ANTI ICING		5050000		756156	
				7561	
FIRE EXT SYSTEM		5060000			
FIRE EXTING SYSTEM D B		5060002	56	14655	
FIRE EXTING SYSTEM E B		5060003	58	640770	
				6553	
ENGINE MTGS AND BRACKETS		5070000			
64 ENG MOUNTING AND BRKTS		5070001		1465362	
ENGINE MTGS ACCESSORIES		5070002		520266	
ENGINE MTGS ACCESSORIES CA		5070003		76664	
				20621	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	5000000						
	5010000		1187578	66543	11983	790250029	142307472
			1187578			790250029	142307472
ESS	5010100		380362941	10354		2393646	393763
			3803			2393646	393763
S D B	5020001	56	444557866	9765		2572144	434054
S E B	5020002	56	2322560850	10431		14132413	2422600
			27670			16704557	2856654
	5030000						
	5030001	52	155816668	12431		259687	193675
	5030002	54	11726800	11800		31356	13806
	5030004	58	94663787	10081		603425	95366
	5030005	62	68949745	13137		342743	90514
	5030006		2564137	10000		16034	2500
			3335			1253245	395861
IN ENG	5040000		28680	58918	10554	16897682	3026887
			28680			16897682	3026887
	5050000		7561	56269	11511	4254499	870347
			7561			4254499	870347
	5060000						
B	5060002	56	14655318	13749		80764	20074
B	5060003	58	640770381	13414		4509311	859435
			6553			4590075	879509
ETS	5070000						
S	5070001		1465362504	12935		9158711	1895366
ES	5070002		520266213	12248		3444400	637141
ES CA	5070003		76664236	13192		492048	101051
			20621			13095159	2633558

WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

[illegible]

WEIGHT AND C. OF G BY FUNCTIONAL
COMPONE

DESCRIPTION					REFERENCE NO.	COMP. NO.	WEIGHT	H.	
FLYING CONTROLS GROUP					6000000				
MECHANICAL CONTROLS					6010000				
59	MECHANICAL	CONTROLS	F	F	6010001	52	10992	16	
	MECHANICAL	CONTROLS	C	F	6010002	54	1213	40	
70	MECHANICAL	CONTROLS	F	N	6010005	83	12443	71	
74	MECHANICAL	CONTROLS	I	W	6010006	82	3967	271	
85	MECHANICAL	CONTROLS	O	W	6010007	64	3031	777	
	MECHANICAL	CONTROLS	C	A	6010008		663	70	
							953	00	
FLYING CONTROLS HYDRAULICS					6020000				
	FLYING	CONT	HYDRAULICS	D	B	6020001	56	3618	56
	FLYING	CONT	HYDRAULICS	E	B	6020002	58	4538	465
	FLYING	CONT	HYDRAULICS	R	F	6020003	59	487	5
77	FLYING	CONT	HYDRAULICS	I	W	6020004	62	2747	570
66	FLYING	CONT	HYDRAULICS	O	W	6020005	64	1308	674
63	FLYING	CONT	HYDRAULICS	F	N	6020006	83	5564	76
	FLYING	CONT	HYDRAULICS	R	N	6020008	51	3500	11
	FLYING	CONT	HYDRAULICS	F	F	6020009	52	1842	320
	FLYING	CONT	HYDRAULICS	C	F	6020010	54	2882	35
							1199	80	
EARTH INSULATION					7070000	50	2471	16	
EARTH INSULATION					7070001	52	2471	16	
EARTH INSULATION					7070002	54	2471	16	
EARTH INSULATION					7070003	56	2471	16	
EARTH INSULATION					7070004	58	2471	16	
EARTH INSULATION					7070005	60	2471	16	
EARTH INSULATION					7070006	62	2471	16	
EARTH INSULATION					7070007	64	2471	16	
EARTH INSULATION					7070008	66	2471	16	
EARTH INSULATION					7070009	68	2471	16	
EARTH INSULATION					7070010	70	2471	16	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	6000000						
F	6010000						
F	6010001	52	10992	16269	11434	1788288	1256825
I N W	6010002	54	12134	40097	11790	486377	143013
A	6010005	83	12443	78819	22157	9807448	2756996
	6010006	62	39672	71857	14385	28507109	5706817
	6010007	64	30317	77057	13563	23361371	4111895
	6010008		663	70984	14338	470624	95061
			95300			64421217	14070607
ULICS	6020000						
S D B	6020001	56	3618	56342	10468	2038454	378732
S E B	6020002	58	45384	65157	11020	29570853	5001317
S R F	6020003	59	487	5875	10824	36420	5196
S I W	6020004	62	27475	70357	14721	19330586	4044595
S O W	6020005	64	13086	74031	13587	9687697	1777995
S FIN	6020006	83	5564	76036	20808	4230643	1157757
S R N	6020008	51	3500	11309	10513	395815	367955
S F F	6020009	52	18423	20376	10200	3753870	1879146
S C F	6020010	54	2882	35670	11132	1028009	320824
			119980			70072347	14933517

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
	FIXED EQUIPMENT GROUP	7000000			
	INSTRUMENTS	7010000			
	INSTRUMENTS F F	7010001	52	4709	15
	NAVIC TABLE AND STOWAGE	7010004	52	2002	22
				4909	
	COCKPIT PRESSURE SEALING	7020000	52	5001	18
				500	
	OXYGEN SYSTEM	7030000			
58	OXYGEN SYSTEM	7030001	52	2240	25
				2240	
	AIR CONDITIONING SYSTEM	7040000			
	AIR CONDITIONING F F	7040001	52	4558	18
	AIR CONDITIONING C F	7040002	54	4759	29
	AIR CONDITIONING D B	7040003	56	2159	51
	AIR CONDITIONING C A	7040005		2806	39
	AIR CONDITIONING ENG	7040006		2855	64
	AIR CONDITIONING I W	7040007	62	8051	
				8532	0
	HYDRAULICS MAIN SYSTEM	7050000			
32	UTILITY HYDRAULICS F F	7050001	52	8981	20
29	UTILITY HYDRAULICS C F	7050002	54	4578	44
20	UTILITY HYDRAULICS D B	7050003	56	2733	55
74	UTILITY HYDRAULICS E B	7050004	58	7892	60
24	UTILITY HYDRAULICS I W	7050005	62	1351	155
32	UTILITY HYDR NOSE U C	7050006	91	2131	18
24	UTILITY HYDR MAIN U C	7050007	92	2980	54
	NUC AND MUC DOOR SEC MECH	7050010		6689	34
				7218	2
	CABIN INSULATION	7070000	52	1431	18
				1431	
	BRAKE PARACHUTE	7080000			
	BRAKE PARACHUTE F F	7080001	52	4621	16

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	7000000						
	7010000						
	7010001	52	4709	15651	13637	737006	642166
GE	7010004	52	200	22000	13000	44000	26000
			4909			781006	668166
	7020000	52	500	18600	13000	93000	65000
ING			500			93000	65000
	7030000						
	7030001	52	2240	25282	15603	566317	349507
			2240			566317	349507
	7040000						
EM	7040001	52	4558	18260	10634	832291	484698
	7040002	54	47599	29442	13499	14014098	6425389
	7040003	56	21595	1690	12474	1115987	269314
	7040005		28069	39471	13687	11079115	3841804
	7040006		28556	4017	13900	1827685	396845
	7040007	62	805	1500	15950	41200	12760
			85320			28910376	11430810
	7050000						
M	7050001	52	8981	20071	10926	1802577	981264
F	7050002	54	4578	44016	10399	2015052	476066
B	7050003	56	27338	55692	11077	15225079	3028230
B	7050004	58	7892	60587	10861	4781526	857150
W	7050005	62	13511	55304	14234	7472123	1923156
	7050006	91	213	18863	9318	40178	19847
	7050007	92	2980	54325	14100	1618885	420180
MECH	7050010		6689	34566	11636	2312120	778332
			72182			35267540	8484225
	7070000	52	1431	18748	13200	268284	188892
			1431			268284	188892
	7080000						
	7080001	52	462	16895	12875	78055	59483

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
BRAKE PARACHUTE R F		7080000559		85138	
BRAKE PARACHUTE I W		7080000662		1246	
				9099	
ELECTRICAL SYSTEM		70900000			
33 ELECTRICAL WIRING R N		7090000151		129	
33 ELECTRICAL WIRING F F		7090000252		2966	
33 ELECTRICAL WIRING C F		7090000354		1304	
33 ELECTRICAL WIRING A I		7090000455		1274	
33 ELECTRICAL WIRING D B		7090000556		6515	
33 ELECTRICAL WIRING E B		7090000658		645	
33 ELECTRICAL WIRING I W		7090000862		8909	
33 ELECTRICAL WIRING FIN		7090000983		3527	
33 ELECTRICAL WIRING NUC		7090001091		3301	
33 ELECTRICAL WIRING ENG		70900011		2002	
33 ELECTRICAL WIRING C A		70900012		1374	
65 ELECTRICS F F		7090001352		1677	
26 ELECTRICS C F		7090001454		7596	
85 ELECTRICS E B		7090001558		670	
85 ELECTRICS ENG		70900016		1163	
85 ELECTRICS C A		70900017		718	
ELECTRICS FIN		7090001883		838	
ELECTRICS I W		7090001962		2336	
ELECTRICS GAW		70900020		1126	
ELECTRICS MUC		7090002192		745	
19 ELECTRICS A I		7090002255		5303	
93 ELECTRICS D B		7090002356		2713	
ELECTRICS R F		7090002459		1368	
62 WINDSCREEN DEMISTING		7090002552		2964	
				1131	
L P PNEUMATICS		71000000			
L P PNEUMATICS F F		7100000152		1836	
L P PNEUMATICS C F		7100000254		4212	
L P PNEUMATICS D B		7100000356		2575	
L P PNEUMATICS E B		7100000458		1526	
L P PNEUMATICS FIN		7100000583		6407	
L P PNEUMATICS R N		7100000651		200	
L P PNEUMATICS C A		71000007		7513	
				5631	
INTAKE DE ICING		7120000055		8800	
				8800	
RADAR FIXED GROUP		71400000			
RADIO AND RADAR FIXED R N		7140000151		24160	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
7080000559		851382210	14392		6998537	1225191
7080000662		12462022	14500		76907	17980
		9099			7153499	1302654
70900000						
7090000151		129 9285	12000		11978	15480
7090000252		296619977	11200		592518	332192
7090000354		130441878	11000		546089	143440
7090000455		127421984	12000		280076	152880
7090000556		651553375	9200		3477381	599380
7090000658		6459500	9200		38080	5888
7090000862		890954111	13900		4820749	1238351
7090000983		35279754	30000		280734	105600
7090001091		33018600	9800		61380	32340
70900011		200258583	10000		1172832	200200
70900012		1374633473	11234		4601199	1544226
7090001352		1677115582	11097		2613257	1861078
7090001454		759644897	10870		3410376	825685
7090001558		67067944	11597		455225	77700
70900016		1163256207	11472		6537998	1334423
70900017		71861350	12000		440493	86160
7090001883		6389550	28840		74327	23937
7090001962		233662053	14500		1449558	338720
70900020		11262946	13561		70500	15188
7090002192		7451600	13700		38184	10138
7090002255		530322076	13833		1170690	733564
7090002356		2713251861	10254		14070927	2782115
7090002459		13680200	11360		109072	15450
7090002552		296419896	9981		589717	295837
		113118			46913340	12769972
71000000						
7100000152		183619487	12684		357781	232878
7100000254		42129264	10316		123201	43430
7100000356		25755930	8965		143740	23040
7100000458		152665650	9737		1001819	148587
7100000583		64075818	25515		485235	163296
7100000651		200 7067	9261		14134	18522
71000007		75134320	11797		257743	88595
		5631			2383653	718348
7120000055		880019582	11800		1723216	1038400
		8800			1723216	1038400
R N 71400000						
7140000151		24160 9040	10000		2184064	2416000

WEIGHT AND C. OF G BY FUNCTIONAL
COMPONE

[illegible]

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
F F	7140000252		22901	18696	11224	4201571	2570408
C F	7140000354		15255	27593	9885	4209312	1507957
D B	7140000456		1931	53205	14000	1027389	270340
F IN	7140000583		3200	76180	24600	2437760	787200
C A	71400006		19540	22161	12000	4330259	2344800
I W	7140000762		2228	54570	16000	1215820	356480
			89215			19686175	10253185
	7160000052		6586	22201	15436	1462158	1016615
			6586			1462158	1016615
	7170000052		2362	18023	12505	425703	295368
			2362			425703	295368
	7190000152		363	18744	12200	68041	44286
	7190000253		64202	1815900		12940	10176
	7190000354		1400	37197	12455	520758	174370
S	7190000455		408	22798	12020	93016	49042
	7190000556		377	53828	11200	202932	42224
	7190000658		443	66701	11200	295485	49616
	7190000759		648	80362	13175	520746	85374
	7190000862		315	160144	14400	1895137	453744
	7190000964		1067	70650	13590	753836	145005
EDGE	7190001065		319	63948	13526	203994	43148
N	7190001174		353	79190	13556	279541	47853
OR	7190001282		566	75523	14260	427460	80712
	7190001383		639	74663	20837	477097	133148
	7190001484		202	81279	21431	164184	43291
			10000			5915167	1401989
IONS	72000000		97788	44445	11744	43461877	11484223
			97788			43461877	11484223

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
REMOVABLE EQUIPMENT GROUP	8000000			
94 EJECTOR SEATS	8010100	52	34294	20
			34294	
RADAR REMOV GROUP	8020000			
RADIO AND RADAR REMOV R N	8020101	51	101895	5
RADIO AND RADAR REMOV F F	8020102	52	20905	18
RADIO AND RADAR REMOV C F	8020103	54	67695	27
RADIO AND RADAR REMOV O B	8020104	56	14104	9
RADIO AND RADAR REMOV F I N	8020105	83	37007	4
RADIO AND RADAR REMOV C A	8020106		38335	5
RADIO AND RADAR REMOV E B	8020107	58	64007	3
RADIO AND RADAR REMOV I W	8020108	62	92047	
			206758	
DAMPING SYSTEM	8030000			
DAMPING SYSTEM F F	8030101	52	78417	
DAMPING SYSTEM C F	8030102	54	23033	2
DAMPING SYSTEM E B	8030103	58	36963	
DAMPING SYSTEM I W	8030104	62	60705	3
DAMPING SYSTEM O W	8030105	64	9574	
DAMPING SYSTEM R N	8030106	51	2877	
DAMPING SYSTEM C A	8030107		85644	7
			18472	
98 INSTRUMENT PACK	8050800	94	68680	38
			68680	
INSTRUMENTATION	8050900	94	200000	39
			200000	
MISSILE SEEKER AND INST	8060000		167005	1
			16700	

EIGHT AND C. OF G BY

FUNCTIONAL GROUP COMPONENT

REPORT NO.

SHEET

		REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
GROUP		8000000						
		801010052		34294	20450	13411	7013123	4599168
				34294			7013123	4599168
		8020000						
R	N	802010151	1	101895	9017	10100	9187872	10291395
F	F	802010252		20905	18663	12438	3901500	2600164
C	F	802010354		67695	27954	10484	18923460	7097144
O	B	802010456		1410	49718	10000	701024	141000
F	I	802010583		3700	74757	25900	2766009	958300
C	A	8020106		3833	55288	16000	2119189	613280
E	B	802010758		6400	73050	12500	4675200	800000
I	W	802010862		920	47802	15933	439778	146584
				206758			42714032	22647867
		8030000						
		803010152		784	17201	12047	134856	94448
		803010254		2303	32213	10949	741865	252155
		803010358		3696	3242	13432	233363	49564
		803010462		6070	53781	15720	3264507	954204
		803010564		95	74855	14000	71112	13300
		803010651		287	7350	9340	21095	26806
		8030107		8564	47972	12893	4108322	1104157
				18472			8575120	2494634
		805080094		68680	38581	9468	26497431	6502622
				68680			26497431	6502622
		805090094		200000	39400	9500	78800000	19000000
				200000			78800000	19000000
IST		8060000		16700	51929	5064	8672143	845688
				16700			8672143	845688

AVRO AIRCRAFT LTD.
MALTON, ONT.

**WEIGHT AND C. OF G BY FUNCTIONAL
COMPONENT**

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
OPERATIONAL LOAD	9000000			
CREW MEMBERS	9010000	52	39000	1
			39000	
ENGINE OIL	9020000			
ENGINE OIL USABLE	9020001		88166	
ENGINE OIL TRAPPED ENG	9020002		17736	
ENGINE OIL TRAPPED D B	9020003	56	19255	
ENGINE OIL TRAPPED E B	9020004	58	9095	
			13423	
OXYGEN CHARGE	9040000			
OXYGEN CHARGE F F	9040001	52	7220	
OXYGEN CHARGE C F	9040002	54	12672	
			1339	
100 ENGINE FIRE EXT FLUID	9060000		2500	73
			2500	
RESIDUAL FUEL	9070000			
RESIDUAL FUEL C F	9070001	54	5700	39
RESIDUAL FUEL D B	9070002	62	23000	53
			28700	
TRAPPED FUEL	9080000			
TRAPPED FUEL C F	9080001	54	2430	41
TRAPPED FUEL D B	9080002	56	6904	9
TRAPPED FUEL I W	9080003	62	20700	57
			23820	
WATER FOR AIRCONDITIONING	9100000			
WATER FOR AIRCOND C F	9100001	54	12500	26
WATER FOR AIRCOND APP	9100002	94	12500	36
UNUSABLE WATER AIRCOND C F	9100003	54	1500	26
UNUSABLE WATER AIRCOND APP	9100004	94	1500	36
			28000	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

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		8816	61246	12186	5399447	1074318
	9020002		1773	62676	11640	1111245	206377
NG	9020003	56	1925	58084	9555	1118117	183934
B	9020004	58	909	59928	9704	544746	88209
			13423			8173555	1552838
	9040000						
	9040001	52	72	20493	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	5700	39263	12360	2237991	704520
	9070002	62	23000	53676	60344	12345480	13879120
			28700			14583471	14583640
	9080000						
	9080001	54	2430	41426	13106	1006652	318476
	9080002	56	690	49400	13350	340860	92115
	9080003	62	20700	57201	114290	11840607	2958030
			23820			13188119	3368621
	9100000						
	9100001	54	12500	26800	13200	3350000	1650000
	9100002	94	12500	36200	10100	4525000	1262500
	9100003	54	1500	26800	12700	402000	190500
	9100004	94	1500	36200	10100	543000	151500
			28000			8820000	3254500
ONING							
F							
F							
ND C F							
ND APF							

ODD-TANG
3553
MADE IN U.S.A.