

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

Classification cancelled / Changed to *Declass*
Arrow 1 Report: 7-~~0100~~-63
By authority of *1/0 25204 & 5* Issue: 5
Date *27 Sept 66*
Signature *WRIGHT & C.G. SUMMARY* *ABCS*
Unit / Raw **CONFIDENTIAL** *1 Oct 58*

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

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

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I N D E X

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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, compare 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.

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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

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2. Landing Gear Weight lb

Main Landing Gear - deletion of cross shaft, spacer (-12.0) + 32.00
replaced with integral jack pick up fitting
(+ 44.0) ref assig. X73-4175 actual weights
obtained.

Total Landing Gear Increase + 32.00

3. Power Plant & Services

No weight change.

4. Flying Controls Group

No weight change.

5. Equipment Group

Flight Test Installations - preliminary estimate of R.C.A. test + 91.10
wiring from Radar Nose to Missile Pack

Total Equipment Group Increase + 91.10

6. Trapped Fuel

No weight change.

7. Operational Load

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

49,299.88 lb

Issue 5

49,426.29 lb

+ 126.41 lb

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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	612.99	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	462.21	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
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	375.77	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	621.73	131.87
Mechanical Flying Controls	935.00	675.98	147.65
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	423.71	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 Dicing Boots	88.00	195.82	118.00
Canopy Actuation	65.36	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 Rack 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
MH 64 Damping System	184.72	464.22	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

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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.

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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 I 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

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7. Operational Load Cont'd

	<u>Weight lb</u>
..... ballast (see Equip. Group)	<u>- 140.00</u>
<u>Operational Load</u>	<u>- 140.00</u>

Summary

Weight Change - Aircraft Basic Weight

Structure	10.67
Equipment	<u>- 2423.94</u>
	<u>- 2143.27</u>
Ballast	+ 1011.00
<u>Op. Load - Water</u>	<u>- 140.00</u>

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

BALLASTED Condition

<u>Complete A/C</u>	<u>Early A/C</u>	
49,299.88	47,757.61	<u>- 1542.27 lb</u>

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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

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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	
Operation Weight Empty	47,827.02			
U/C Up		545.27	127.55	
U/C Down		547.42	123.97	
Max. Internal Fuel (2468 gals @ 7.8 lb/gal)	19,253.00	540.80	144.09	
Gross Weight (Max Internal Fuel)	67,080.02			
U/C Up		543.99	132.31	
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

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BY P. E. French

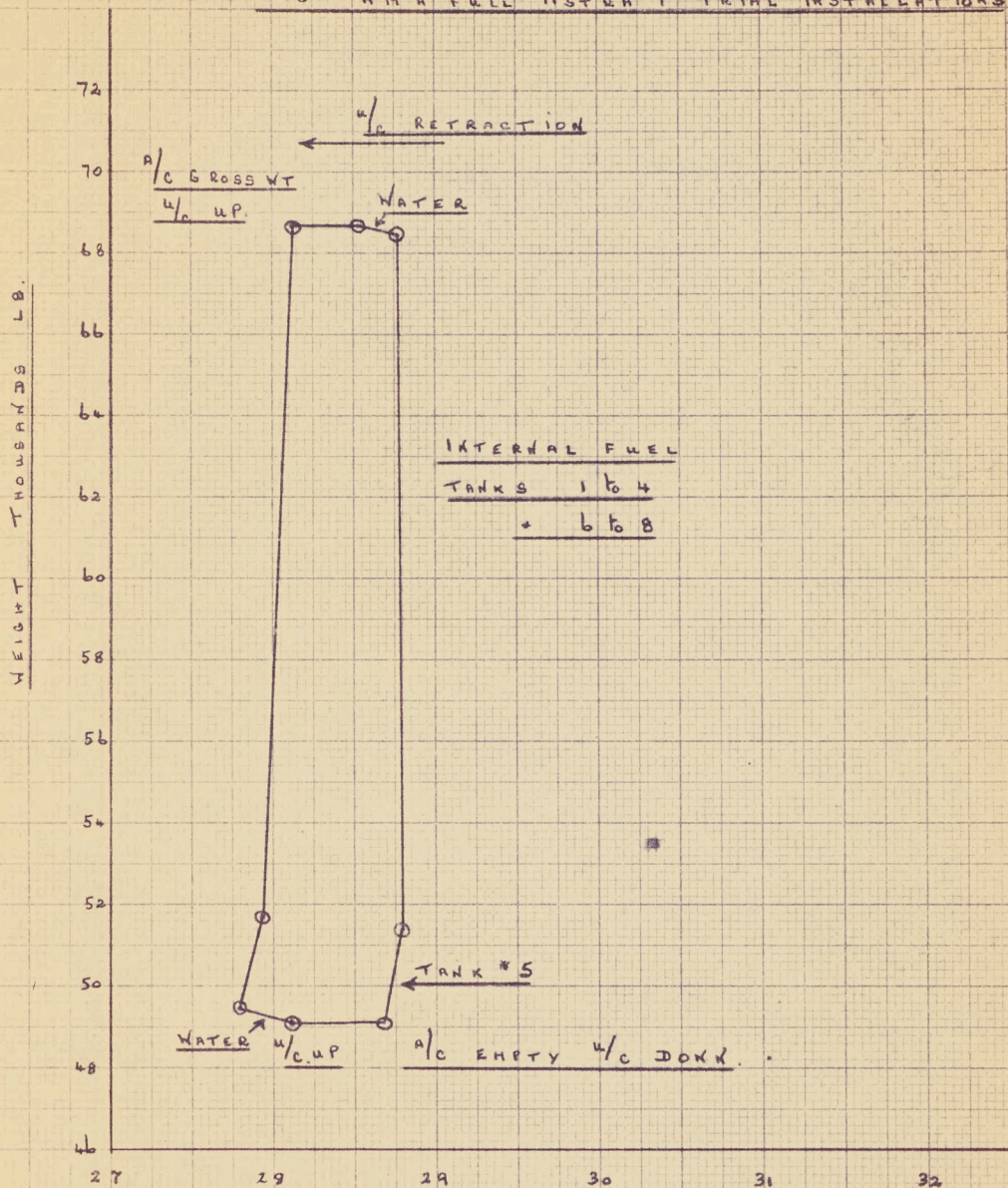
HORIZONTAL C.G. ENVELOPE

ARROW 1 ~ % 25204 + 25205

NORMAL FLIGHT CONDITIONS

FUEL PROPORTIONERS USED

A/C WITH FULL ASTRA I TRIAL INSTALLATIONS



359-12

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



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		1000000			
OUTER WING		1010000			
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	10100005	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	10200007	74	35380	79
				35380	
94	ELEVATOR	1030000		15977	73
94	ELEVATOR MARRY UP	10300001	82	45336	75
				46933	
INNER WING		1040000			
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	5527	4
74	DORSAL FAIRING C A	10400023		6033	57
				667744	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

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	REFERENCE NO.				COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT		V. MOMENT												
	1	0	0	0	0																		
	10	1	0	0	0																		
LB	10	1	0	0	0	1	64	929	107	06	46	135	97	656	37	199	126	329	73				
	10	1	0	0	2	64		243	67	32	07	134	10	178	33	23			32	66	68		
	10	1	0	0	3	64		392	58	70	60	135	79	277	19	289			53	30	84	44	
	10	1	0	0	4	64		134	56	69	50	136	50	935	27	27			18	36	74	44	
	10	1	0	0	6	64		375	30	77	40	135	08	290	51	598			50	69	55	52	
	10	1	0	0	7	64		76	26	64	87	138	32	49	47	21			10	54	82	28	
TING	10	1	0	0	9	64		10	46	72	79	136	70	76	13	94			14	29	88		
AIRING	10	1	0	0	10			32	93	78	72	132	24	25	92	44			4	35	46	66	
O W	10	1	0	0	11	64		80	07	58	28	136	80	60	66	24			10	94	40		
								198	35					142	45	18	16		26	93	95	03	
	10	2	0	0	0	74		35	38	07	91	135	61	280	17	42			47	97	82	82	
								35	38					280	17	42			47	97	82	82	
	10	3	0	0	0			15	97	73	81	142	60	11	78	74			22	77	32		
	10	3	0	0	0	182		45	33	67	55	23	142	34	23	91	107		64	64	91	14	
								46	93					35	41	78	53		66	92	26	46	
	10	4	0	0	0			33	07	15	77	57	139	19	10	08	17		46	24	31	18	
	10	4	0	0	0	2	62	11	11	10	48	42	142	5	38	03	51		15	84	28	86	
	10	4	0	0	0	3	62	15	10	6	56	70	142	8	54	54	64		21	57	13	37	
	10	4	0	0	0	4	62	5	36	4	60	09	144	3	23	36	57		7	73	22	21	
	10	4	0	0	0	5	62	3	66	6	54	92	144	2	40	09	37		5	29	73	37	
	10	4	0	0	0	6	62	7	66	7	03	74	144	5	39	55	75		11	10	55	81	
M S	10	4	0	0	0	7	62	10	85	79	49	95	143	5	42	39	54		15	62	34	32	
	10	4	0	0	0	8	62	14	97	79	60	96	145	9	13	17	98		21	82	74	40	
R SPAR	10	4	0	0	0	9	62	32	21	12	71	82	150	2	31	37	57		48	38	24	42	
	10	4	0	0	0	10	62	42	83	8	72	47	143	3	10	44	69		61	37	82	29	
	10	4	0	0	0	11		70	65	6	36	21	138	4	49	48	24		9	80	33	39	
	10	4	0	0	0	12	62	6	34	71	66	22	150	4	20	31	76		9	54	98	47	
	10	4	0	0	0	13	62	2	19	15	3	62	144	1	36	87	85		3	16	96	98	
	10	4	0	0	0	14	62	5	39	1	56	76	143	3	06	02	55		7	72	53	30	
GS	10	4	0	0	0	16	62	5	12	04	61	28	144	3	13	81	39		7	42	40	68	
NG	10	4	0	0	0	17	62	9	54	82	80	16	150	4	58	66			1	53	43	43	
	10	4	0	0	0	18	62	10	80	00	63	68	138	6	87	77	64		14	94	18	03	
	10	4	0	0	0	19	62	12	62	88	61	68	138	7	78	90	77		17	44	05	53	
O I W	10	4	0	0	0	20	62	12	94	28	63	07	137	8	16	26	49		17	74	34	48	
	10	4	0	0	0	21		38	18	52	98	84	143	20	22	29	29		5	46	01	12	
I W	10	4	0	0	0	22	62	5	52	74	15	0	142	4	09	30	8		7	83	84		
	10	4	0	0	0	23		60	33	57	02	5	160	3	40	31	8		9	67	33	31	
								66	77	44				40	81	95	14		9	65	99	05	66

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

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A.
100 LEADING EDGE I W	1050000	62	22138	468
			22138	
100 LEADING EDGE O W	1060000	65	30870	630
12 FIN TO WING HARRY OP	101000		30870	
12 FIN FOR FIN. INST. STAGES	101000			
225 RUDDER	101000	65		

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						
	201000083		85170	74957	21170	63840877	18030489
FIN	201000183		18580	300	22342	148555	41333
	2010002		4830	68538	15355	3310385	741647
CKER	201000383		107576000	25950		817000	278963
			91260			68116817	19092432
	202000084		1263481316	21374		10273463	2700391
			12634			10273463	2700391

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	95
	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	537
	LIGHT FORMERS E B	3010014	58	13501	668
72	HEAVY FORMERS E B	3010015	58	21890	661
	LONGERONS F F	3010016	52	6969	184
	LONGITUDINAL MEMBERS E B	3010017	58	1106	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	48
43	LONGERONS A D B	3010025	56	8655	529
	ELECTRONICS BAY STRUCTURE	3010026	54	4361	27
	LONGITUDINAL BEAMS D B	3010027	56	7378	520
	RADAR ACCESS DOOR C F	3010028	54	2479	27
72	MAIN FRAME AT STN 538 77	3010029	56	5980	538
	DIVE BRAKE ACCOMMODATIONS	3010030	56	3620	50
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	20
	EQUIPMENT BAY STRUCTURE	3010039	54	6550	28
86	WINDSCREEN	3010041	52	13057	138
33	SERVICE ACCESS DOORS	3010042	58	6704	661
	TORSION BOX E B	3010043	58	6046	613
	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	668
100	INTEGRAL FUS FUEL TANK CF	3010055	54	21168	397

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
	3000000						
ATURE	3010000						
	301000151		15958	3992	11070	637043	1766551
C A	3010002		270	12000	11200	32400	30240
R N	301000351		17032	9583	11325	1632177	1928874
	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		10761	18292	12033	1968402	1294871
	301001254		27824	37482	13306	10428992	3702261
	301001356		7491	53710	11316	4023416	847682
	301001458		13501	66827	11119	9022313	1501176
	301001558		21890	66217	10984	14494901	2404398
E B	301001652		6969	18483	9044	1288080	630276
	301001758		1106	70853	9611	783634	106298
	301001858		6842	65810	9781	4502720	669216
	301001958		638	66605	13911	424940	88752
F B	301002052		2952	23414	8900	691181	262728
	301002156		498	53899	13550	268417	67479
	301002354		14453	41038	12144	5931222	1755172
	301002454		1258	48717	10700	612860	134606
CTURE	301002556		8655	52931	9759	4581178	844641
B	301002654		4361	27376	9300	1193867	405573
	301002756		7378	52041	9113	3839585	672357
	301002854		2479	27382	9020	678800	223606
B 77	301002956		5980	53877	10383	3221845	620903
TIONS	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
UCTURE	301003656		3964	54013	10340	2141075	409878
	301003752		3343	21049	9186	703668	307088
URE	301003852		13327	20641	12274	2750826	1635756
	301003954		6550	28368	13624	1858104	892372
	301004152		13057	13814	15006	1803694	1959333
	301004258		6704	66397	9189	4451255	616031
UTLET	301004358		6046	61926	9058	3744046	547647
	301004454		2143	29245	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		13494	38408	1434	5182776	193504
	301005052		3185	12000	11430	382200	364046
	301005152		10548	25500	12043	2689740	1270296
	301005254		11254	48500	10530	5458190	1185046
K CF	301005458		47926	66524	11574	31882292	5546955
	301005554		21168	39722	14553	8408353	3080579

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A.
COCKPIT FLOOR	3010056	52	6160	176
CENTRE BEAM 697 28 717 36	3010059	58	5577	11
DORSAL OVER FUEL TANK	3010061	54	5007	41
SHIELD EXHAUST DEFLECTOR	3010062	54	1981	33
SHEAR PANEL BELOW NAV ARCH	3010063	52	2115	25
33 PACK MOUNTING STRUCTURE	3010064	54	2119	29
88 ENG ACCESS DOORS R F	3010065	59	8457	77
99 TUNNEL FIXED R F	3010066	59	1040	37
100 SKIN AND STIFFENERS R F	3010067	59	5143	77
100 FAIRING UNDER RUDDER R F	3010068	59	2616	78
100 FORMERS FIXED R F	3010069	59	9001	77
100 LONGERONS C BEAM FIXED R F	3010070	59	2799	77
99 TAILCONES	3010071	59	4496	68
100 CNTR STRUCT STING REM R F	3010072	59	9000	83
MISCELLANEOUS ITEMS E B	3010073	58	919	66
MTG BRKTS SIDE PANEL D B	3010075	56	243	52
FORMERS LOWER PANEL D B	3010076	56	7640	54
LOWER PANEL D B	3010077	56	5348	55
JOINT F F TO C F	3010078		855	25
JOINT AIR INTAKES TO F F	3010079		1092	22
JOINT C F TO D B	3010080		520	48
JOINT D B TO E B	3010081		2521	58
FUS JOINT AT STA 742 50	3010082		443	74
MISCELLANEOUS ITEMS F F	3010086	52	1699	18
			6462	86
DIVE BRAKES	3020000	72	11790	50
DIVE BRAKES C A	3020001		406	48
			12196	
AIR INTAKES	3030000			
7 AIR INTAKES	3030100	55	77248	21
			77248	
PILOTS AND NAVIG CANOPIES	3040000			
76 PILOTS CANOPY	3040100	53	24208	17
			24208	
100 NAVIGATORS CANOPY	3040200	53	15321	23
			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
DRE	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		44966	83168	12877	37397323	5790272
M R F	301007259		9000	83155	13729	7483950	1235610
E B	301007358		919	66400	10284	610216	94510
D B	301007556		243	52514	13145	127609	31942
D B	301007656		7640	54472	9006	4161661	688058
	301007756		5348	55246	8800	2954556	470624
	3010078		855	25500	12000	218025	102600
F F	3010079		1092	22000	12000	240240	131040
	3010080		520	48500	9800	252200	50960
	3010081		2521	58475	9150	1474155	230672
50	3010082		443	74250	11500	328928	50945
F F	301008652		1699	18924	12571	321519	213581
			646286			308647544	76235679
	302000072		11790	50884	9049	5999224	1066877
	3020001		406	48794	9374	198104	38058
			12196			6197328	1104935
	3030000						
	303010055		77248	21079	11868	16283106	9167793
			77248			16283106	9167793
0 PIES	3040000						
	304010053		24208	17686	15915	4281427	3852703
			24208			4281427	3852703
	304020053		15321	23277	16223	3566269	2485526
			15321			3566269	2485526

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A.
UNDERCARRIAGE UP POSITION	4000000			
MAIN UNDERCARRIAGE GROUP	4010000			
MAIN UNDERCARRIAGE	4010100	92	211067540	
			211067	
89 MAIN U C DOORS FAIRINGS	4010200	62	28234531	
			28234	
NOSE UNDERCARRIAGE GROUP	4020000			
100 NOSE UNDERCARRIAGE	4020100	91	33381170	
			33381	
42 NOSE U C DOOR AND FAIRING	4020200	52	2770161	
			2770	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

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

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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		3803	62
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		28680	58
			28680	
91 ENGINE ANTI ICING	5050000		7561	56
			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		14653	62
ENGINE MTGS ACCESSORIES	5070002		520266	
ENGINE MTGS ACCESSORIES CA	5070003		76664	
			20621	

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
	5000000						
	5010000		1187578	66543	11983	790250029	142307472
			1187578			790250029	142307472
ESS	5010100		380362941	110354		2393646	393763
			3803			2393646	393763
S D B	502000156		444557866	9765		2572144	434054
S E B	502000258		2322560850	10431		14132413	2422600
			27670			16704557	2856654
	5030000						
	503000152		155816668	12431		259687	193675
	503000254		11726800	11800		31356	13806
	503000458		94663787	10081		603425	95366
	503000562		68949745	13137		342743	90514
	5030006		2564137	10000		16034	2500
			3335			1253245	395861
ON ENG	5040000		28680	58918	10554	16897682	3026887
			28680			16897682	3026887
	5050000		7561	56269	11511	4254499	870347
			7561			4254499	870347
B	5060000						
B	506000256		14655318	13749		80764	20074
B	506000358		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 GROUP COMPONENT

REPORT NO. _____

SHEET _____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
50800000						
508000154		14973	40619	14161	6081883	2120327
508000256		17382	53418	11311	9285117	1966078
508000358		4025	66918	12500	2693450	503125
508000462		54349	55715	14413	30280545	7833321
5080005		1648	68563	8916	1129918	146936
5080006		754	61525	9658	463899	72821
		93131			49934812	12642608

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WEIGHT AND C. OF G BY FUNCTIONAL
COMPONE

PROJECT _____

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	12134	0
70	MECHANICAL CONTROLS FIN	6010005	83	12443	78
74	MECHANICAL CONTROLS I W	6010006	62	39672	71
85	MECHANICAL CONTROLS O W	6010007	64	30317	77
	MECHANICAL CONTROLS C A	6010008		66370	
				95300	
FLYING CONTROLS HYDRAULICS		6020000			
	FLYING CONT HYDRAULICS D B	6020001	56	3618	56
	FLYING CONT HYDRAULICS E B	6020002	58	45384	65
	FLYING CONT HYDRAULICS R F	6020003	59	4875	
77	FLYING CONT HYDRAULICS I W	6020004	62	27475	70
66	FLYING CONT HYDRAULICS O W	6020005	64	13086	74
63	FLYING CONT HYDRAULICS FIN	6020006	83	5564	76
	FLYING CONT HYDRAULICS R N	6020008	51	3500	11
	FLYING CONT HYDRAULICS F F	6020009	52	18423	20
	FLYING CONT HYDRAULICS C F	6020010	54	2882	35
				119980	
AIR CONDITIONING					
AIR CONDITIONING					
AIR CONDITIONING					
HYDRAULICS					
38	UTILITY HYDRAULICS F F	7000001	32		
39	UTILITY HYDRAULICS C F	7000002	34		
40	UTILITY HYDRAULICS D B	7000003	36		
41	UTILITY HYDRAULICS E B	7000004	38		
42	UTILITY HYDRAULICS I W	7000005	40		
43	UTILITY HYDR MAIN O W	7000006	42		
44	UTILITY HYDR MAIN R F	7000007	44		
EARTH INSULATION		7070001	32		
BRAKE PARACHUTE					
BRAKE PARACHUTE F F		7000001	32		

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
	6000000						
	6010000						
F	6010001	52	10992	16269	11434	1788288	1256825
F	6010002	54	1213	40097	11790	486377	143013
I	6010005	83	12443	78819	22157	9807448	2756996
W	6010006	62	39672	71857	14385	28507109	5706817
W	6010007	64	30317	77057	13563	23361371	4111895
A	6010008		663	70984	14338	470624	95061
			95300			64421217	14070607
ULICS	6020000						
S	6020001	56	3618	56342	10468	2038454	378732
S	6020002	58	45384	65157	11020	29570853	5001317
S	6020003	59	48	75875	10824	36420	5196
S	6020004	62	27475	70357	14721	19330586	4044595
S	6020005	64	13086	74031	13587	9687697	1777995
S	6020006	83	5564	76036	20808	4230643	1157757
S	6020008	51	3500	11309	10513	395815	367955
S	6020009	52	18423	20376	10200	3753870	1879146
S	6020010	54	2882	35670	11132	1028009	320824
			119980			70072347	14933517

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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	200	22
ELECTRICAL WIRING			4909	
ELECTRICAL WIRING				
COCKPIT PRESSURE SEALING	7020000	52	500	18
ELECTRICAL WIRING			500	
OXYGEN SYSTEM	7030000			
58 OXYGEN SYSTEM	7030001	52	2240	25
ELECTRICAL WIRING			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	80	51
			85320	
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	213	18
24 UTILITY HYDR MAIN U C	7050007	92	2980	54
NUC AND MUC DOOR SEC MECH	7050010		6689	34
			72182	
CABIN INSULATION	7070000	52	1431	18
			1431	
BRAKE PARACHUTE	7080000			
BRAKE PARACHUTE F F	7080001	52	462	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						
GE	7010001	52	4709	15651	13637	737006	642166
	7010004	52	200	22000	13000	44000	26000
			4909			781006	668166
ING	7020000	52	500	18600	13000	93000	65000
			500			93000	65000
	7030000						
	7030001	52	2240	25282	15603	566317	349507
			2240			566317	349507
EM	7040000						
	7040001	52	4558	18260	10634	832291	484698
	7040002	54	47599	29442	13499	14014096	6425389
	7040003	56	2159	51690	12474	1115987	269314
	7040005		28069	39471	13687	11079115	3841804
	7040006		2855	64017	13900	1827685	396845
	7040007	62	80	51500	15950	41200	12760
			85320			28910376	11430810
M	7050000						
F	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						
	7070000	52	1431	18748	13200	268284	188892
			1431			268284	188892
	7080000						
	7080001	52	462	16895	12875	78055	59483

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

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
BRAKE PARACHUTE R F	708000559		85138	
BRAKE PARACHUTE I W	708000662		1246	
			9099	
ELECTRICAL SYSTEM	7090000			
33 ELECTRICAL WIRING R N	709000151		129	
33 ELECTRICAL WIRING F F	709000252		2966	
33 ELECTRICAL WIRING C F	709000354		1304	
33 ELECTRICAL WIRING A I	709000455		1274	
33 ELECTRICAL WIRING D B	709000556		6515	
33 ELECTRICAL WIRING E B	709000658		645	
33 ELECTRICAL WIRING I W	709000862		8909	
33 ELECTRICAL WIRING FIN	709000983		3527	
33 ELECTRICAL WIRING NUC	709001091		3301	
33 ELECTRICAL WIRING ENG	7090011		2002	
33 ELECTRICAL WIRING C A	7090012		13746	
65 ELECTRICS F F	709001352		16771	
26 ELECTRICS C F	709001454		7596	
85 ELECTRICS E B	709001558		670	
85 ELECTRICS ENG	7090016		11632	
85 ELECTRICS C A	7090017		718	
ELECTRICS FIN	709001883		638	
ELECTRICS I W	709001962		2336	
ELECTRICS CAW	7090020		1126	
ELECTRICS MUC	709002192		745	
19 ELECTRICS A I	709002255		5303	
93 ELECTRICS D B	709002356		27132	
ELECTRICS R F	709002459		1368	
62 WINDSCREEN DEMISTING	709002552		2964	
			113118	
L P PNEUMATICS	7100000			
L P PNEUMATICS F F	710000152		1836	
L P PNEUMATICS C F	710000254		4212	
L P PNEUMATICS D B	710000356		2575	
L P PNEUMATICS E B	710000458		1526	
L P PNEUMATICS FIN	710000583		6407	
L P PNEUMATICS R N	710000651		200	
L P PNEUMATICS C A	7100007		7513	
			5631	
INTAKE DE ICING	712000055		8800	
			8800	
RADAR FIXED GROUP	7140000			
RADIO AND RADAR FIXED R N	714000151		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
708000559		851382210	14392		6998537	1225191
708000662		12462022	14500		76907	17980
		9099			7153499	1302654
7090000						
709000151		129 9285	12000		11978	15480
709000252		296619977	11200		592518	332192
709000354		130441878	11000		546089	143440
709000455		127421984	12000		280076	152880
709000556		651553375	9200		3477381	599380
709000658		6459500	9200		38080	5888
709000862		890954111	13900		4820749	1238351
709000983		35279754	30000		280734	105600
709001091		33018600	9800		61380	32340
7090011		200258583	10000		1172832	200200
7090012		1374633473	11234		4601199	1544226
709001352		1677115582	11097		2613257	1861078
709001454		759644897	10870		3410376	825685
709001558		67067944	11597		455225	77700
7090016		1163256207	11472		6537998	1334423
7090017		71861350	12000		440493	86160
709001883		6389550	28840		74327	23937
709001962		233662053	14500		1449558	338720
7090020		11262946	13561		70500	15188
709002192		7451600	13700		38184	10138
709002255		530322076	13833		1170690	733564
709002356		2713251861	10254		14070927	2782115
709002459		13680200	11360		109072	15450
709002552		296419896	9981		589717	295837
		113118			46913340	12769972
7100000						
710000152		183619487	12684		357781	232878
710000254		42129264	10316		123201	43430
710000356		25755930	8965		143740	23040
710000458		152665650	9737		1001819	148587
710000583		64075818	25515		485235	163296
710000651		200 7067	9261		14134	18522
7100007		75134320	11797		257743	88595
		5631			2383653	718348
712000055		880019582	11800		1723216	1038400
		8800			1723216	1038400
R N		7140000				
		714000151	24160	904010000	2184064	2416000

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	714000252		22901	18696	11224	4201571	2570408
C F	714000354		15255	27593	9885	4209312	1507957
D B	714000456		1931	53205	14000	1027389	270340
F I N	714000583		3200	76180	24600	2437760	787200
C A	7140006		19540	22161	12000	4330259	2344800
I W	714000762		2228	54570	16000	1215820	356480
			89215			19686175	10253185
	716000052		6586	22201	15436	1462158	1016615
			6586			1462158	1016615
	717000052		2362	18023	12505	425703	295368
			2362			425703	295368
	7190000152		363	18744	12200	68041	44286
	719000253		64	20218	15900	12940	10176
S	719000354		1400	37197	12455	520758	174370
	719000455		408	22798	12020	93016	49042
	719000556		377	53828	11200	202932	42224
	719000658		443	66701	11200	295485	49616
	719000759		648	80362	13175	520746	85374
	719000862		3151	60144	14400	1895137	453744
	719000964		1067	70650	13590	753836	145005
EDGE	719001065		3196	3948	13526	203994	43148
N	719001174		353	79190	13556	279541	47853
OR	719001282		566	75523	14260	427460	80712
	719001383		639	74663	20837	477097	133148
	719001484		202	81279	21431	164184	43291
			10000			5915167	1401989
IONS	7200000		97788	44445	11744	43461877	11484223
			97788			43461877	11484223

AVRO AIRCRAFT LTD.
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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	9
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	3700	74
RADIO AND RADAR REMOV C A	8020106		38335	5
RADIO AND RADAR REMOV E B	8020107	58	6400	73
RADIO AND RADAR REMOV I W	8020108	62	9204	47
			20675	8
DAMPING SYSTEM	8030000			
DAMPING SYSTEM F F	8030101	52	784	17
DAMPING SYSTEM C F	8030102	54	2303	32
DAMPING SYSTEM E B	8030103	58	3696	3
DAMPING SYSTEM I W	8030104	62	6070	53
DAMPING SYSTEM O W	8030105	64	957	4
DAMPING SYSTEM R N	8030106	51	287	7
DAMPING SYSTEM C A	8030107		8564	47
			18472	
98 INSTRUMENT PACK	8050800	94	68680	38
			68680	
INSTRUMENTATION	8050900	94	200000	39
			200000	
MISSILE SEEKER AND INST	8060000		16700	51
			16700	

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

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										
R N	8020101	51			101895	9017	10100	9187872		10291395	
F F	8020102	52			20905	18663	12438	3901500		2600164	
C F	8020103	54			67695	27954	10484	18923460		7097144	
O B	8020104	56			1410	49718	10000	701024		141000	
F I N	8020105	83			3700	74757	25900	2766009		958300	
C A	8020106				3833	55288	16000	2119189		613280	
E B	8020107	58			6400	73050	12500	4675200		800000	
I W	8020108	62			920	47802	15933	439778		146584	
					206758			42714032		22647867	
	8030000										
	8030101	52			784	17201	12047	134856		94448	
	8030102	54			2303	32213	10949	741865		252155	
	8030103	58			369	63242	13432	233363		49564	
	8030104	62			6070	53781	15720	3264507		954204	
	8030105	64			95	74855	14000	71112		13300	
	8030106	51			287	7350	9340	21095		26806	
	8030107				8564	47972	12893	4108322		1104157	
					18472			8575120		2494634	
	8050800	94			68680	38581	9468	26497431		6502622	
					68680			26497431		6502622	
	8050900	94			200000	39400	9500	78800000		19000000	
					200000			78800000		19000000	
I S T	8060000				16700	51989	5064	8672143		845688	
					16700			8672143		845688	

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

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
OPERATIONAL LOAD	9000000			
CREW MEMBERS	9010000	52	39000	19
			39000	
ENGINE OIL	9020000			
ENGINE OIL USABLE	9020001		88166	61
ENGINE OIL TRAPPED ENG	9020002		17736	67
ENGINE OIL TRAPPED D B	9020003	56	19255	58
ENGINE OIL TRAPPED E B	9020004	58	90959	
			13423	
OXYGEN CHARGE	9040000			
OXYGEN CHARGE F F	9040001	52	7220	
OXYGEN CHARGE C F	9040002	54	12672	6
			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	690	49
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	14290	11840607		2958030	
			23820			13188119		3368621	
	9100000								
ONING	9100001	54	12500	26800	13200	3350000		1650000	
F	9100002	94	12500	36200	10100	4525000		1262500	
ND C F	9100003	54	1500	26800	12700	402000		190500	
ND APF	9100004	94	1500	36200	10100	543000		151500	
			28000			8820000		3254500	

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