

QCX
AVRO
CF105
R-7-0400-44
Iss-15

ARROW 1
A/C 25201

Report # 7-0400-44
Issue 15

WEIGHT & C.G. SUMMARY

C.E.P.E.

Mar. 1/58

UNCLASSIFIED
SECRET

209
MKI-15

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Ref. 6725/11/J
Date March 1st, 1958
To See Distribution
From Mr. E.F. Burnett
Subject ARROW 1 A/C 25201 WEIGHT & C.G. SUMMARY - Report # 7-0400-44 Iss. 15

Attached is a copy of Weight and C.G. Summary Report # 7-0400-44 Iss. 15, date March 1st, 1958 for your retention.

This report is revised monthly and is issued complete on the 1st of each month.

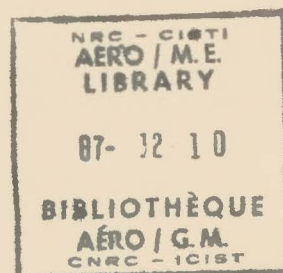
Classification cancelled/changed to **UNCLASSIFIED**
By authority of _____ (date) _____
Signature _____ Rank _____

E. F. Burnett
pky

amc.

E. F. Burnett
Weights Supervisor

Messrs.	J.C. Floyd	F. Brame
	R.N. Lindley	W. Czerwinski
	J.A. Chamberlin	J. Lucas
	R. Marshall	S. Kwiatkowski
	C.V. Lindow	A. Cornish
	F.P. Mitchell	J. Hodge
	A. Buley	C. Marshall
	J. Ames	J. Zurakowski
	B.C. Alford	A.D. Crust (6) for RCAF
	D. Wade	N. Ring
	L. St. Leger	D. Inglis
	E. Kosko	D. Moore
	H. Shoji	K. Wreghitt
	D. Hayward	R. Cairns
	D. Scard	G. Eves
	J. Booth	



Date: March 1st, 1958
Aircraft: ARROW 1, A/C 25201
with J75 P3 Engines

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I N D E X

<u>Sheet #</u>	<u>Content</u>
1-1 to 1-5	Introductory notes and explanations of Weight Changes.
2-1 to 2-2	Weight & C.G. Summaries.
3	Horizontal C.G. Envelopes for Flight conditions with fuel proportioners used.
4-1 to 4-15	I.B.M. Detail Sheets of Weights & C.G.'s.

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

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Date: March 1st, 1958
ARROW 1, A/C 25201 With
J 75 P3 Engines

Report # 7-0400-44 Iss. 15
Sheet # 1-1

INTRODUCTION & WEIGHT CHANGES

The following is a Weight & C.G. Summary for the first Arrow 1 Aircraft # 25201, with J75 P3 Engines, based on the latest information available. All weight and C.G. changes are relative to issue 14 of February 1st, 1958.

- Note: 1) This summary does not apply for A/C 25202 and 25203 which will have J75 P5 Engines, nor for Aircraft 25204 and 25205 which are for full Astra I Trial Installations etc.
- 2) The statement herein is for the Aircraft complete to drawings and not necessarily in the condition to be encountered for first flight.

For early flights there may be some shortages in non-essential equipment, some flight test installations will probably be incomplete etc. (see also general note (j)). A statement for first flight will be issued later.

GENERAL:

- a) Pratt & Whitney J75 P3 Engines comprise the Power Plant for Aircraft # 25201. J75 P5 Engines, which are partially redesigned versions of the P3 Engines, are to be installed on Aircraft # 25202 and subsequent Arrow 1 Aircraft. (J75 P3 Engines = 6,175 lb each; J75 P5 Engines = 5,950 lb each).
- b) The Instrument Package containing Flight Instrumentation is installed, the packages for A/C 25201 to 25203 differing from those for A/C 25204 and 25205 (Astra I Trial Installations.)

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

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

- c) Emergency Lowering for the Landing Gear and hydraulic actuation to close Nose Wheel Door with Landing Gear extended also additional Fire Protection, all to be installed on the first aircraft, are allowed for in the summary.
- d) An Interim Radio and Radar System with Minneapolis-Honeywell M.H. 64 Damping System is installed. Currently there is no Doppler or Tacan installation, although provisions for future installation of Doppler, which is not yet available, will be made.
- e) The original design of tailcones and stinger are recorded, the redesigned versions will be recorded at a later date, when they are available for retrofit. The ensuing weight changes will be:

Tailcones	+ 139.84 lb/A/C
Stinger	- 29.72
Net Change	+ 110.12 lb/A/C

Date: March 1st, 1958
ARROW 1, A/C 25201 With
J75 P3 Engines

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INTRODUCTION & WEIGHT CHANGES

GENERAL:

- f) Pending Flight Test requirements a "Buzz Damping" System may be installed on the first Aircraft. Provisions for this installation are already included in the structural group as modifications to the Control Boxes. For the first flight the control surfaces will be unmodified, however, if the need for Dampers is proven, a modified set of control Surfaces will be made available.

The following weight penalties ensue:

Ailerons	+	11.68 lb/A/C
Elevators	+	11.07 lb/A/C
Rudder	+	8.78 lb
Equipment	+	123.97 lb
	+	<u>155.50 lb.</u>

- g) It should be noted that due to material substitutions and concessions introduced by Planning & Production Departments there is a structural weight penalty of 203 lb to-date. This is all recorded in the structural weight breakdown. No account has been taken of variations on machinings etc. nor of shop repair schemes, since it is impossible to assess these, except where actual weights have been obtained.
- h) A considerable number of Actual Weights have now been obtained. Structural weights are checking within 0.5% of estimates of sub-assemblies etc. However, equipment (excluding Engines and Gear Boxes) shows a consistent increase averaging about 11% over manufacturer's quotations or initial specification weights. 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.

A Summary of Actual Weights obtained so far is as follows:

Structure	74.78%
Landing Gear	98.75%
Power Plant	92.97%
Flying Controls	56.18%
Equipment	23.61%

i.e. 70.56% of the Basic Weight of A/C 25201

- j) The Aircraft is ballasted such that the C.G. on a flight envelope (using fuel proportioners) does not travel aft of 31% M.A.C.

For first flight the Aft restriction is 30% M.A.C., this may be achieved by installing maximum ballast in the Radar Nose and any further ballast in accordance with existing schemes.

Date: March 1st, 1958
ARROW 1 A/C 25201 with
J75 P3 Engines

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INTRODUCTION & WEIGHT CHANGES

<u>1. STRUCTURE</u>	<u>WEIGHT (lb)</u>
a) <u>Wings:</u>	
Structure F/Spar to M/Spar - fixed struct. pivot door	+ 3.15
general revision of all hard- ware in area	+ 6.71
<u>Wings Weight Increase</u>	<u>+ 9.86</u>
b) <u>Fin & Rudder</u>	
No Weight Change	
c) <u>Front Fuselage Fwd. Sta. 255"</u>	
Top Longerons - Addition of steps to facilitate entry	+ 1.61
CKL Blind Rivets replaced by Jobolts	+ 1.04
ALSF Huckbolts replaced by NAS 221 bolts and hex. nut	+ 1.22
Bulkhead Sta. 120" - addition of equipment mounting brackets	+ 0.84
<u>Front Fuselage Increase</u>	<u>+ 4.71</u>
d) <u>Centre Fuselage Sta. 255-485"</u>	
No Weight Change	
e) <u>Duct Bay Sta. 485" to 591.65"</u>	
Dive Brake Accommodations - MK 2 limiter & refuel door added and miscellaneous changes to sealing and decking	+ 0.14
Dive Brakes - MK 2 D/Brakes to be installed on MK 1 A/C	+ 6.40
<u>Duct Bay Increase</u>	<u>+ 6.26</u>
f) <u>Engine Bay Sta. 591.65" to 742.5"</u>	
No Weight Change	
g) <u>Rear Fuselage Sta. 742.5" Aft.</u>	
Stinger & Removable Centre Structure - Modification to parabrake doors	+ 0.38
<u>Rear Fuselage Increases</u>	<u>+ 0.38</u>
h) <u>Fuselage "Marry-Up"</u>	
No Weight Change	
<u>TOTAL STRUCTURAL INCREASE</u>	<u>+ 21.21</u>

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ARROW 1, A/C 25201 with
J75 P3 Engines

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INTRODUCTION & WEIGHT CHANGES

2. LANDING GEAR

WEIGHT (lb)

No Weight Change

3. POWER PLANT & SERVICES

No Weight Change

4. FLYING CONTROLS GROUP

No Weight Change

5. EQUIPMENT GROUP

Windscreen De-misting - Actual Weight of Transformer	+	0.35
Electrics F.F. - addition of wiring to close Nose		
Wheel Doors with Landing Gear extended	+	3.80
Nose U/C Door Actuation Mech. - added to close door		
with Landing Gear extended	+	33.59
Interim Radio & Radar - installation of phasing unit		
and amp. in lieu of Qc amp.	+	10.88
Wiring changes due to reposition of feel		
and trim unit and parallel servos.	+	4.57
Emergency Fire Protection - Kidde's quoted weights of		
bottles	-	17.94
Miscellaneous structural changes	+	1.15
<u>TOTAL EQUIPMENT INCREASE</u>	+	<u>36.40</u>

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+	21.21 lb
Equipment	+	36.40 lb
	+	<u>57.61 lb</u>

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

UNBALLASTED CONDITION

Issue 14

Issue 15

48,003.98 lb

48,061.59

+ 57.61 lb

Date: March 1st, 1958
Aircraft: ARROW 1, with
J75 P3 Engines

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Report # 710400-1 Iss. 15
Sheet # 2-1

WEIGHT & CG. SUMMARY

<u>DESCRIPTION</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>V. ARM</u> <u>ins.</u>
STRUCTURE	18,598.65	561.63	137.52
Wings	9,973.36	642.73	142.26
Fin & Rudder	1,025.85	754.34	209.31
Fuselage fwd. Sta. 255"	2,651.27	181.61	128.19
Sta. 255"-485"	1,652.04	379.71	130.79
Sta. 485"-591.65	1,008.12	533.85	104.52
Sta. 591.65-742.5"	1,433.13	661.00	107.31
Sta. 742.5 Aft.	802.17	801.05	129.06
"Marry-Up"	52.71	469.18	103.86
LANDING GEAR - RETRACTED	2,606.56	488.21	134.89
Main Landing Gear	1,963.74	539.50	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	26.67	161.77	88.25
POWER PLANT & SERVICES	14,391.81	652.82	120.34
Engines & Accessories J75 P3	12,562.29	664.92	119.78
Gear Box & Drives on Fuselage	275.54	601.39	102.98
Gear Box & Starter on Engines	286.30	589.08	105.59
Engine Controls	32.43	375.76	118.62
Engine Nose Bullets	70.58	562.75	115.07
Fire Extinguishing System	65.46	700.45	134.21
Engine Mountings	206.21	635.04	127.71
Fuel System	893.00	536.67	136.12
FLYING CONTROLS GROUP	1,946.48	665.69	138.27
Mechanical Flying Controls	944.13	684.34	148.22
Hydraulic Flying Controls	1,002.35	648.12	128.90
EQUIPMENT FIXED & REMOVABLE	9,597.07	402.99	113.52
Instruments	46.07	163.68	138.70
Probe	15.00	-38.14	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Ejector Seats	339.06	204.43	134.10
Oxygen System	26.07	240.54	156.70
Air Conditioning System	822.07	339.45	134.46
Surface Finish	100.00	591.52	140.20
Cockpit Insulation	14.31	187.48	132.00
Drag Chute	90.99	786.18	143.17
Low Pressure Pneumatics	54.65	433.30	129.37
Electrical System	1,126.18	415.86	112.91
Intake De-icing Boots	88.00	195.82	118.00
Canopy Actuation	64.92	221.99	154.35
Console Panels	17.45	174.76	124.34
MH 64 Damping System	99.08	450.83	140.34
Interim Radio & Radar	647.34	341.86	124.39
Hydraulic Main System	641.97	504.41	117.78
Emergency Landing Gear Lowering	12.91	458.83	128.60
Nose U/C Door Actuation	33.59	202.56	97.89
Instrument Pack Structure	686.80	385.81	94.68
Pack Instrumentation (A/C 25201)	3,048.00	394.00	95.00
Flight Test Installations	1,456.73	488.48	128.90
Additional Fire Protection	160.88	403.63	109.84

Date: March 1st, 1958
 Aircraft: ARROW 1 with
 J75 P3 Engines

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WEIGHT & C.G. SUMMARY

<u>DESCRIPTION</u>		<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>V. ARM</u> <u>ins.</u>	<u>M.A.C.</u> <u>%</u>
Aircraft Basic Weight	U/C Up	47,140.57	557.41	127.27	
	U/C Down		559.49	123.84	
USEFUL LOAD (less fuel)		921.02	366.58	132.34	
Crew		390.00	194.00	136.50	
Engine Fire Extinguisher Fluid		25.00	730.00	129.00	
Residual Fuel		218.40	553.98	134.04	
Oxygen Charge		13.39	259.69	159.91	
Water for Air Conditioning		140.00	268.00	132.00	
Oil		134.23	608.92	115.68	
BALLAST		861.00	85.65	116.50	
Operational Weight Empty	U/C Up	48,922.59	545.51	127.18	30.25
	U/C Down		547.52	123.87	30.80
Maximum Internal Fuel (2,508 gals. * @ 7.8 lb/gal		19,562.00	540.99	144.09	
A.U.W. Maximum Internal Fuel	U/C Up	68,484.59	544.22	132.01	29.89
	U/C Down		545.65	129.65	30.29

N.B. 1) Aircraft Datum is considered to be 120" above an arbitrarily chosen ground line

2) The above figures are for the Aircraft in the BALLASTED condition such that the aft C.G. on the horizontal C.G. Envelope, using fuel proportioners, does not exceed 31% M.A.C. i.e. 303 lb on Former Sta. 68.5 and 558 lb on the Shear Panel.

3)* Capacities of tanks #1 & 2 reduced by 36 gals. total, due to necessity for increased air space, through malfunctioning of vent valves.

REPORT NO: 7-0400-44-15

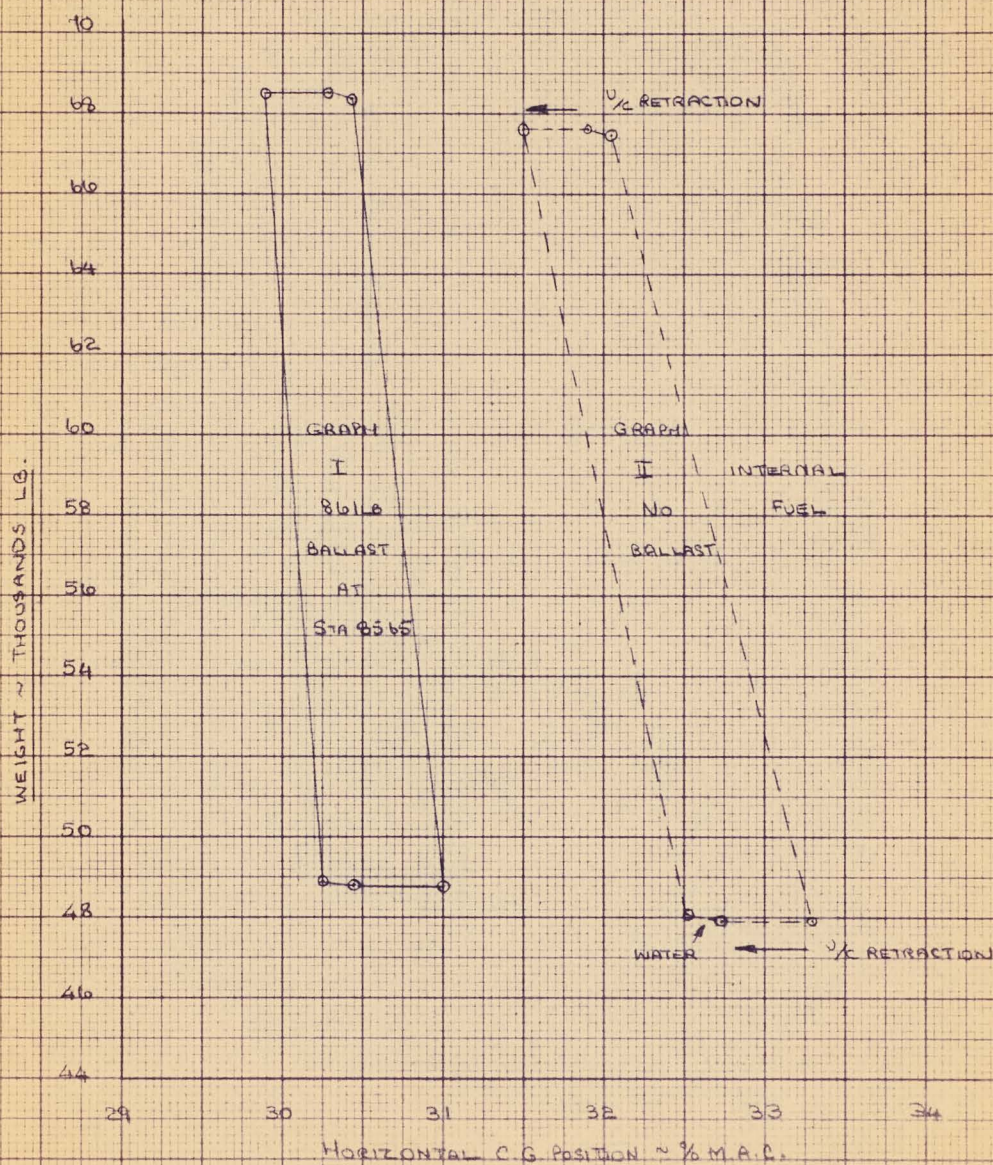
DATE: March 1st 1958

BY: Kathleen Giffen

SHEET: 3

HORIZONTAL C.G. ENVELOPE

ARROW 1 - A/C 25201

NORMAL FLIGHT CONDITIONSFUEL SYSTEM PROPORTIONERS USED

MALTON, ONT.

FUNCTIONAL

Arrow 1

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
TOTAL WING GROUP		1000000			
OUTER WING		1010000			
100	OUTER WING SKINS	10100001	64	92910	7
100	POSTS AND INTERCOSTALS	10100002	64	24367	
100	OUTER WING SPARS	10100003	64	39258	7
100	OUTER WING RIBS	10100004	64	134566	
98	AILERON CONTROL BOX	10100006	64	375307	
100	RIB 12	10100007	64	76266	
100	O W AILERON JACK FITTING	10100009	64	10467	
AILERON JOINTS AND FAIRING		10100010		32937	
BUZZ DAMP STRUC PROV O W		10100011	64	8007	
				198355	
AILERON		1020000			
100	AILERON STRUCTURE	10200001	74	33600	7
				33600	
ELEVATOR		1030000	82	44900	7
97	ELEVATOR MARRY UP	10300000		15977	
				46497	
INNER WING		1040000			
96	MAIN U C STRUCTURE	10400001	62	33071	5
100	FRONT SPAR I W	10400002	62	111104	
100	MAIN SPAR I W	10400003	62	151065	
100	FWD CENTRE SPAR I W	10400004	62	53640	
100	AFT CENTRE SPAR I W	10400005	62	36666	
100	REAR SPAR I W	10400006	62	76677	
100	I W STRUCTURE F S TO M S	10400007	62	1069044	
100	STRUCTURE M S TO R S	10400008	62	149796	
100	STRUCTURE AFT OF REAR SPAR	10400009	62	322127	
40	ELEVATOR CONTROL BOX	10400010	62	428387	
25	TRANSP JOINT MARRY UP	10400011		70656	
100	INNER WING JOINTS	10400012	62	634716	
100	SKINS M S TO R S	10400013	62	2190386	
100	STRUT PICK UP FITTINGS	10400014	62	53915	
100	RIBS 1 TO 9 INNER WING	10400016	62	512046	
74	DORSAL FAIRING I W	10400017	62	954	
100	RIB 10	10400018	62	108006	
77	FUSELAGE HINGE JOINT	10400019	62	126286	
65	TRANSPORT JOINT O W TO I W	10400020	62	129426	
49	FUSELAGE HINGE JOINT	10400021		37405	
BUZZ DAMP STRUC PROV I W		10400022	62	5527	
74	DORSAL FAIRING C A	10400023		60335	
				665876	

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

[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		
FIN	2010000	083				85170	74957	21170	63840	877		18030	489	
	2010001	183				14580	300	22342	148555			41333		
	2010002					4830	68538	15355	33103	85		74164	7	
						90185			67299	817		18813	469	
	2020000	084				12400	81325	21438	10084	300		26583	312	
						12400			10084	300		26583	312	

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
	30000000						
ATURE	30100000						
	3010000151		18100	3796	11037	687076	1997697
DOORS	3010000251		8008	9509	11450	761481	916916
STA 120	3010000351		12188	9473	11401	1154569	1389554
	3010000452		11054	19058	12024	2106671	1329133
	3010000554		21182	37673	14300	7979895	3029026
	3010000656		5937	53413	11157	3171130	662391
	3010000758		17725	66945	10996	11866001	1949041
	3010001152		10664	18304	12026	1951939	1282453
	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		6846	18430	9044	1261718	619152
E B	3010001758		1106	70853	9611	783634	106298
	3010001858		6842	65810	9781	4502720	669216
	3010001958		638	66605	13911	424940	88752
F	3010002052		2940	23414	8900	688372	261660
H	3010002156		498	53899	13550	268417	67479
	3010002252		532	5295	15250	13406	8083
	3010002354		1361	7411	12289	5678801	1697480
	3010002454		1258	48717	10700	612860	134606
	3010002556		8655	52931	9759	4581178	844641
ICTURE	3010002654		3570	27359	9197	976716	320333
B	3010002756		6570	52007	9125	3416860	599513
C F	3010002854		2138	27410	8974	586026	191864
8 77	3010002956		5980	53877	10383	3221845	620903
ATIONS	3010003056		3620	50328	9339	1821874	338072
	3010003152		19253	19308	14763	3717369	2842320
	3010003254		33368	37286	12917	12441592	4310145
	3010003356		31633	54471	11811	17230811	3736174
	3010003452		8461	22844	16055	1932831	1358414
ERS	3010003556		3954	54018	10350	2135872	409239
UCTURE	3010003752		33432	1049	9186	703668	307088
	3010003852		12718	20619	12289	2422324	1562915
URE	3010003954		6150	28360	13752	1744140	845746
	3010004152		13003	13814	15008	1796234	1951490
	3010004258		6704	66397	9189	4451255	616031
	3010004358		6042	61926	9058	3741569	547284
UTLET	3010004454		2143	29245	16400	626720	351452
	3010004556		5154	69289	10257	3571155	528646
	3010004658		1465	96285	18873	9213328	1300693
	3010004754		6973	2148	10900	224072	75973
F	3010004854		3923	7000	12500	145040	49000
	3010004954		1321	6384	3811427	5079966	1510192
	3010005052		3144	12000	12280	377280	386083
	3010005152		1042	2925	50012027	2659395	1254296
	3010005254		1124	5485	0010530	5453825	1184099
	3010005458		4757	2665	2911581	31649176	5509313

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
WK	3010055	54				20359	39339	14536	8009027	2959384
	3010056	52				5983	17684	11569	1058034	692173
717 36	3010059	58				557	71367	11524	397514	64189
	3010061	54				5007	41403	14202	2073048	711094
CTOR	3010062	54				1981	33428	16400	662209	324884
ARCH	3010063	52				2115	25699	15352	543534	324695
URE	3010064	54				2119	29285	10309	620549	218448
	3010065	59				8457	77280	9910	6535570	838089
	3010066	59				10403	77168	13059	8027787	1358528
R F	3010067	59				5143	77149	13796	3967773	709528
R F	3010068	59				2616	78134	15379	2043985	402315
	3010069	59				9001	77929	13652	7014389	1228817
ED R F	3010070	59				2799	77170	12570	2159988	351834
	3010071	59				30000	82154	12868	24646200	3860400
EM R F	3010072	59				11798	83585	13586	9861358	1602876
B	3010073	58				923	66394	10285	612817	94931
D B	3010075	56				243	52514	13145	127609	31942
B	3010076	56				7640	54472	9006	4161661	688058
	3010077	56				5137	55412	8790	2846514	451542
	3010078					855	35500	12000	218025	102600
F F	3010079					952	22000	12000	209440	114240
	3010080					500	48500	9800	242500	49000
	3010081					2521	58475	9150	1474155	230672
50	3010082					443	74250	11500	328928	50945
F	3010086	52				711	19067	12154	135566	86415
						631634			295983553	75771974
	3020000	72				11790	50884	9049	5999224	1066877
	3020001					406	48794	9374	198104	38058
						12196			6197328	1104935
	3030000									
	3030100	55				76585	21065	11860	16132630	9082981
						76585			16132630	9082981
PIES	3040000									
	3040100	53				24208	17686	15915	4281427	3852703
						24208			4281427	3852703
	3040200	53				15321	23277	16223	3566269	2485526
						15321			3566269	2485526

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

[illegible]

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
ENGINE GROUP	5000000			
FUEL SYSTEM				
FUEL SYSTEM ENG				
99 ENGINE J 75	5010000		1252707	66
			1252707	
J 75 ENGINE SERV ACCESS	5010100		352263	
			3522	
68 ACC GEAR BOXES ON FUS D B	5020001	56	452457	
68 ACC GEAR BOXES ON FUS E B	5020002	58	2303060	
			27554	
ENGINE CONTROLS	5030000			
36 ENGINE CONTROLS F F	5030001	52	145816	
36 ENGINE CONTROLS C F	5030002	54	26430	
36 ENGINE CONTROLS D B	5030003	56	50849	
36 ENGINE CONTROLS E B	5030004	58	101363	
			3243	
83 GEARBOX AND STARTER ON ENG	5040000		2863058	
			28630	
91 ENGINE ANTI ICING	5050000		705856	
			7058	
FIRE EXT SYSTEM	5060000			
55 FIRE EXT SYSTEM D B	5060001	56	14655	
55 FIRE EXT SYSTEM E B	5060003	58	640070	
			6546	
ENGINE MTGS AND BRACKETS	5070000			
64 ENG MOUNTING AND BRKTS	5070001		1465362	
ENGINE MTGS ACCESSORIES	5070002		520266	
ENGINE MTGS ACCESSORIES CA	5070003		76664	
			20621	
FUEL SYSTEM	5080000			

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		1252707	66502	11983	833075209	150111880
			1252707			833075209	150111880
SS	5010100		352263097	10341		2222276	364210
			3522			2222276	364210
D B	5020001	56	452457875	9607		2618265	434621
E B	5020002	58	2303060584	10434		13952495	2402950
			27554			16570760	2837571
	5030000						
	5030001	52	145816129	12476		235161	181900
	5030002	54	26430813	11798		81346	31147
	5030003	56	50849991	13459		253954	68372
	5030004	58	101363982	10194		648138	103265
			3243			1218599	384684
N ENG	5040000		2863058908	10559		16865360	3023042
			28630			16865360	3023042
	5050000		705856275	11507		3971890	812164
			7058			3971890	812164
	5060000						
	5060002	56	14655318	13749		80764	20074
	5060003	58	640070381	13414		4504384	858496
			6546			4585148	878570
ETS	5070000						
S	5070001		1465362504	12935		9158711	1895366
ES	5070002		520266213	12248		3444400	637141
ES CA	5070003		76664236	13192		492048	101051
			20621			13095159	2633558
	5080000						

WEIGHT AND C. OF G BY FUNCTIONAL
COMPONE

PROJECT _____

[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
508000	01	54			13474	40781	14045	5494832	1892423
508000	02	56			16857	53575	11233	9031138	1893547
508000	03	58			3592	66531	12549	2389794	450760
508000	04	62			53997	55804	14420	30132486	7786367
508000	05				626	65901	9594	412540	60058
508000	06				754	61525	9658	463899	72821
					89300			47924689	12155976

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

[illegible]

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	4407	16
NAVIG TABLE AND STOWAGE		7010004	52	200	22
				4607	
COCKPIT PRESSURE SEALING		7020000	52	500	18
				500	
OXYGEN SYSTEM		7030000			
OXYGEN SYSTEM		7030001	52	2607	24
				2607	
AIR CONDITIONING SYSTEM		7040000			
54	AIRCONDITIONING F F	7040001	52	3549	17
54	AIRCONDITIONING C F	7040002	54	4721	29
54	AIRCONDITIONING D B	7040003	56	1148	51
54	AIRCONDITIONING C A	7040005		2736	39
54	AIRCONDITIONING ENG	7040006		2855	64
54	AIRCONDITIONING I W	7040007	62	805	51
				82207	
HYDRAULICS MAIN SYSTEM		7050000			
32	UTILITY HYDRAULICS F F	7050001	52	8418	20
31	UTILITY HYDRAULICS C F	7050002	54	4272	43
20	UTILITY HYDRAULICS D B	7050003	56	2733	55
66	UTILUTY HYDRAULICS E B	7050004	58	7353	60
24	UTILITY HYDRAULICS I W	7050005	62	1351	55
32	UTILITY HYDR NOSE U C	7050006	91	325	19
24	UTILITY HYDR MAIN U C	7050007	92	2980	54
28	EMERGENCY LOWERING M U C	7050008	62	853	58
35	EMERGENCY LOWERING N U C	7050009	52	438	21
15	N W DOOR ACTUATING MECH	7050010		3359	20
				68847	
CABIN INSULATION		7070000	52	1431	18
				1431	
BRAKE PARACHUTE		7080000			

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

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