

QCX
Avro
CF105
R-7-0400-34
Iss-19

FILE IN VAULT

ARROW 2
Prod. A

Report 7-0400-34
Issue 19

WEIGHT & C.G. SUMMARY

~~UNSECRETED~~

May 1/58



National Research Council
Canada
C.I.S.T.I.
Aeronautical and
Mechanical
Engineering Library

Conseil national de recherches
Canada
I.C.I.S.T.
Bibliothèque
d'aéronautique
et de génie mécanique

DATE

JAN 07 1993

Report no.: QCX-AVRO-CF105-R-7-0400-34 - Ess. 19

has been ☐ downgraded to: _____

☒ de-classified

by (Name): Michel W. Drapeau

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

Date: Dec. 7, 1992

R. Druge
Signature

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

UNCLASSIFIED
SECRET
UNCLASSIFIED / NON CLASSIFIED

Ref: 8542/11/J
Date: 1 May, 1958
To: See Distribution
From: E.F. Burnett - Weight Supervisor
Subject: ARROW 2 PRODUCTION A/C WEIGHT & C.G. SUMMARY - Report 7-0400-34 Issue 19

Attached is copy of Weight and C.G. Summary Report 7-0400-34 Issue 19 dated May 1st, 1958, for your retention.

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

confirmed as
Classification ~~canceled~~ / changed to: UNCLASSIFIED
By authority of: DRDA 7/DARET 5-8/DAS Eng 6-4-5
Date: 5 Nov 1992
Signature: *B Aubrey*
Unit / Rank / Appointment: DSIS 3, Secretary CRAD HQ DRP

E.F. Burnett
E.F. Burnett

EFB/ag

Copies to:	J.C. Floyd	J.P. Booth	A.J. Crust (6 copies for
	R.N. Lindley	F. Brame	R.C.A.F.)
	R. Marshall	W. Czerwinski	D. Inglis
	C.V. Lindow	J. Lucas	D. Moore
	J.W. Ames	S. Kwiatkowski	R. Cairns
	B.C. Alford	A. Cornish	G. Eves
	D. Wade	J. Hodge	
	D.N. Scard	C. Marshall	
	A.R. Buley	J. Zurakowski	



54012

Aircraft: ARROW 2
Prod. A/C
Date: 1 May, 1958

Report: 7-0400-34
Issue : 19

UNCLASSIFIED
SECRET
UNCLASSIFIED / NON CLASSIFIÉ

I N D E X

<u>Sheet</u>	<u>Content</u>
1-1 to 1-4	Introductory notes and explanation of weight changes
2-1 to 2-3	Weight and C.G. Summary
3	Horizontal C.G. plot showing basic fixed points on flight envelope. The possible variations of C.G. with fuel used has been omitted until such time as fully approved fuel sequencing is established.
4-1 to 4-15	I.B.M. Detail sheet of Weight and C.Gs.

UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: ARROW 2
Prod. A/C
Date: 1 May, 1958

Report: 7-0400-34
Issue : 19
Sheet : 1-1

INTRODUCTION & WEIGHT CHANGES

The following is a Weight and C.G. Summary of the Arrow 2 production Aircraft based on the latest weight estimates available.

All weight and C.G. changes are relative to Issue 18 of April 1st, 1957.

Some early Arrow 2 Aircraft, serial nos. in the Group 25206 to 25236, will not be as this summary designates, but will be Flight Test Aircraft with Instrumentation, "Astra Minus" or preproduction Astra I Radar, Missile pack trials and various equipment trial installations. Appropriate weight statements will be issued at a later date.

GENERAL:-

- a) Orenda PSL3 Engines comprise the Power Plant (4,500 lb each, excluding Nose Bullet & Input Frame).
- b) A package containing 4 "semi-submerged" Sparrow II missiles (432 lb each) forms the current Armament.
- c) The R.C.A. Astra I Radar System is installed. The basis for the Radar Weight & C.G. breakdown is the latest information received from R.C.A. dated Oct 4th, 1957 (A revised weight statement is expected shortly). No Sparrow III Auxiliaries are carried in the production aircraft.

Where later weights have been received from Minneapolis-Honeywell, these have been incorporated. Allowances have also been made for the missile firing system, junction boxes and some Avro installed antennae.

The Infra red Tracker System seeker head is allowed for in its Fin Pod location (Total weight of the installed system 3,281.9lb, including missile actuation & firing systems).

In addition to the above Minneapolis-Honeywell M.H. 64 Damping System is installed.

Arrow 2 Aircraft 25206 to 25208, and some later Aircraft will have the "Astra Minus" system (Navigational & Communication equipment only).

- d) Where actual weights of Arrow I parts that apply to Arrow 2 Aircraft have been obtained, these weights have been recorded in the Arrow 2 records. Some weights of Arrow 2 parts have also been obtained.

On I.B.M. sheets in this report, immediately preceeding the item title will be found a number varying from 0 to 100. This is precentage actual Weight recorded in the relevant item.

UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: ARROW 2
Prod. A/C
Date: 1 May, 1958

Report: 7-000-34
Issue: 19
Sheet: 1-2

SECRET

UNCLASSIFIED / NON CLASSIFIÉ

1. STRUCTURE

WEIGHT (lb)

a) Wings

I/W Struct M/S to R/S - addition of mounting brackets for
stable platform

+ 1.64

Wing Weight Increase

+ 1.64

b) Fin & Rudder

Fin & Joints to Wing - production drawings for Arrow 2 est.
Mk.1 actual weights used where
applicable

+ 4.26

Fin Weight Increase

+ 4.26

c) Front Fuselage Fwd Sta 255 ins

Formers FF - prod. drg. reissues, misc. bracketry added

+ 1.65

Bulkhead Sta. 255 ins. - prod. drg reissues, hardware
changes etc.

- 0.33

Navigator's Canopy - addition of step to L.H. Canopy

+ 0.69

Radome - addition of brackets to radome ring

+ 0.14

Radar Nose Structure - Prod. drg reissues, misc bracketry
added

+ 0.40

Front Fuselage Increase

+ 2.55

d) Centre Fuselage Sta 255-485 ins

Skins CF - Top inner longeron split & splice fitting added
at Sta. 393 ins

+ 0.62

Duct CF - Access panel added at rear of duct,
seal plates added on duct ring

+ 1.26

+ 1.36

Pack Mtg. Struct - redesign of beam Sta 292 ins for Arrow 2

+ 3.51

Inflatable seal was allowed for here,
but is already included in L.P.

Pneumatics

- 5.41

Integral Fuel Tank - fitting added at aft end of longeron
addition of insulator connectors etc

+ 0.58

+ 0.83

Electronic Bay Struct - side doors fasten with camlocs not
latches as was previously assumed
- prod. drg est.

- 2.26

prod. drg. ests of structural panels,
R.C.A. supply some mtgs previously
allowed for

- 2.54

Doppler mtg - allowance deleted

- 1.56

Mtg. tray - prod. drg ests

+ 0.09

UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: ARROW 2
Prod. A/C
Date: 1 May, 1958

SECRET
Report: 10400-34
Issue: 19
Sheet: 1-3
UNCLASSIFIED / NON CLASSIFIED

d) Centre Fuselage Sta 255-485 ins Cont'd WEIGHT (lb)
Access Door Sta 255" - 292" - side seals added around doors
.06 rubber strips & .01 steel angles + 0.93
Inner skin .04 mg was .032 Al - 0.41
Latches - Hartwell - initial allowance too high - 0.55
allowance for Radar cover panel not required - 2.06
misc. changes & earlier error in hinge wts - 0.63
Centre Fuselage Decrease - 6.44
e) Duct Bay Sta 485"-591.65"
Centre Panel Fwd - T.R. Unit mtg added + 2.15
Misc. prod. drg changes - 0.26
Floating Duct - addition of plate seals at Sta 558" + 1.86
Duct Bay Increase + 3.75
f) Engine Bay Sta 591.65" - 742.5"
No weight change.
g) Rear Fuselage Sta 742.5 aft
Rudder Fairing fixed R.F. - electrics service panel added + 0.39
slit line fairing added between para brake doors & dorsal fairing + 0.33
Rear Fuselage Increase + 0.72
h) Fuselage Joints
Joint F.F. to C.F. - Mk. 2 prod drgs now estimated aft skin Sta 246-268", stringer #15 to longerons no longer called-up here - 1.69
addition of air condit. transition duct joint + 3.46
Misc. other changes - 0.04
Fuselage Joints Increase + 1.73
2. LANDING GEAR TOTAL STRUCTURAL INCREASE + 8.21
No weight change
3. POWER PLANT & SERVICES
No weight change

UNCLASSIFIED / NON CLASSIFIED

Aircraft: ARROW 2
Prod. A/C
Date: 1 May, 1958

Report: 7-0400-34
Issue: 19
Sheet: 1-4

UNCLASSIFIED / NON CLASSIFIÉ
SECRET

4. FLYING CONTROLS GROUP

WEIGHT (lb)

No weight change.

5. EQUIPMENT GROUP

Damping System - alteration to wiring associated with shift fwd
of elevator feel and trim units and servos + 4.57

Missile Pack Hydraulics - first estimate made to drawings -
previously only allowances were
carried for piping etc.
Actual wt obtained of fwd jack
fwd missile + 1.80
Six valve manifold assy. quoted at
21 lb, actual wt obtained of 34 lb +13.00
Filter - allowance initially too
high (actual wt.) - 3.33
Compensating valves - 4 off -
initially quoted at 4.75 lb each -
test specimens act wt. 12 lb,
production valve with wt saving
incorporated allowance increased to
6.5 lb each + 7.00
Piping, fairleads etc. - now est.
in detail + 9.64

Missile Pack Structure - Pack sealing now detailed on prod drgs
Fwd and aft missile fairings - no
longer required - 6.93
Door & missile seals - est in detail + 2.35
Side seal - called up with
Pneumatics (see below) -14.48
Fwd inflatable seal, not located on
pack - 4.69
Misc. drg reissues & ECNs incorporated + 1.08
Missile Pack Pneumatics - new wt report to cover all pneumatic
items in pack ie inflatable side seals
& associated piping etc (see also
above) +24.45

Equipment Group Increase +34.46

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+ 8.21
Equipment	+34.46
	+42.67

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

<u>Issue 18</u>	<u>Issue 19</u>	
46,186.87	46,229.54	+ 42.67 lb

UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: ARROW 2
 Prod. A/C
 Date: 1 May, 1958

Report: 7-0400-34
 Issue: 19
 Sheet: 2-1

UNCLASSIFIED / NON CLASSIFIED
 SECRET

DESCRIPTION	WEIGHT lb.	H. ARM ins	V. ARM ins
STRUCTURE	19,169.11	566.80	137.29
Wings	10,036.73	643.02	142.21
Fin & Rudder	1,039.01	753.84	208.90
Fuselage - Fwd Sta 255 ins	2,585.80	184.45	128.74
Sta 255 - 485 ins	1,700.20	376.06	130.59
Sta 485 - 591.65 ins	1,161.25	538.59	105.63
Sta 591.65 - 742.5 ins	1,574.07	659.68	110.72
Sta 742.5 ins aft	1,019.48	806.57	127.46
"Marry - Up"	52.57	485.08	106.65
LANDING GEAR - RETRACTED	2,584.25	487.74	134.82
Main Landing Gear	1,934.94	539.49	141.00
Main Gear Doors & Fairings	287.98	538.52	138.40
Nose Landing Gear	333.81	170.81	99.70
Nose Gear Door & Fairing	27.52	162.22	88.66
POWER PLANT & SERVICES	10,800.67	671.41	121.32
Engines & Accessories PS 13	9,186.78	687.95	121.16
Engine Nose Bullet (Orenda supplied)	70.00	587.17	116.00
Engine Controls	32.43	375.76	118.61
Gear Box & Drives on Fuselage	281.84	601.70	102.49
Gear Box, Starter & Drivers on Engines	315.45	615.98	105.24
Fire Extinguishing System	65.46	700.45	134.21
Engine Mountings	132.38	666.82	136.52
Fuel System	716.33	530.91	134.48
FLYING CONTROLS GROUP	1,926.56	650.93	138.14
Mechanical Flying Controls	952.74	676.42	147.63
Hydraulic Flying Controls	973.82	626.00	128.86
EQUIPMENT FIXED & REMOVABLE	8,950.19	333.38	114.45
Instruments	46.07	163.68	138.70
Probe	15.25	-23.71	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Oxygen System	26.07	240.54	156.70
Cockpit Equipment	6.00	187.50	145.00
Ejector Seats	342.94	204.50	134.11
Air Conditioning System	856.00	333.49	134.98
Cockpit Insulation	14.31	187.48	132.00
Hydraulics Utility System	647.33	505.17	117.69
Drag Chute	91.07	786.68	143.19

UNCLASSIFIED / NON CLASSIFIED

Aircraft: ARROW 2
 Prod. A/C
 Date: 1 May, 1958

SECRET
 Report: 7-0400-34
 Issue : 19
 Sheet : 2-2

DESCRIPTION	WEIGHT lb	H. ARM ins	V. ARM ins.
EQUIPMENT FIXED & REMOVABLE (Cont'd)			
Electrical System	1,264.02	434.54	112.85
Low Pressure Pneumatics	56.94	421.96	128.47
Surface Finish	100.00	591.52	140.20
Intake Deicing Boots	88.00	195.82	118.00
Canopy Actuation	64.92	221.99	154.35
Cabin Consoles	17.28	174.66	124.33
Radar Door Actuation	10.00	268.00	95.00
MH 64 Damping System	184.72	464.22	135.05
Radio and Radar Removable	2,095.20	209.73	108.59
Radio and Radar Fixed	784.08	238.57	117.84
Sparrow Pack Structure	889.35	384.10	98.80
Sparrow Pack Mechanisms	553.32	372.85	99.13
Sparrow Pack Hydraulics	360.05	377.89	104.06
Sparrow Pack Electronics Removable	185.50	331.91	100.00
Sparrow Pack Electrics & Electronics Fixed	217.11	335.24	110.00
Sparrow Pack Air Conditioning	5.21	305.50	102.50
Sparrow Pack L.P. Pneumatics	24.45	386.92	103.50
Aircraft Basic Weight	43,430.78	U/C Up	543.74
		U/C Down	545.97
USEFUL LOAD (less fuel)	2,798.76	377.29	104.80
Crew	390.00	194.00	136.50
Oil	138.97	636.92	110.57
Engine Fire Extinguishing Fluid	25.00	730.00	129.00
Residual Fuel	218.40	553.98	134.04
Missiles	1,728.00	398.29	88.30
Oxygen Charge	13.39	259.68	159.91
Water for Air Conditioning	285.00	267.91	131.56

UNCLASSIFIED / NON CLASSIFIÉ

~~SECRET~~

Aircraft: ARROW 2
 Prod. A/C
 Date: 1 May, 1958

Report: 7-0400-34
 Issue : 19
 Sheet : 2-3

DESCRIPTION	WEIGHT lb	H. ARM ins	V. ARM ins	% M.A.C.
Operational Weight Empty U/C Up	46,229.54	533.67	127.07	26.98
U/C Down		535.77	123.61	27.56
Op. Wt. Empty Less Missiles U/C Up	44,501.54	539.28	128.58	28.53
U/C Down		541.46	124.98	29.13
* Normal Combat Mission Fuel (2,249 gals. at 7.8 lb/gal)	17,540.00	-	-	
Normal Gross Weight *	63,769.54	-	-	
Half Combat Mission Fuel * (1,124 gals at 7.8 lb/gal)	8,770.00			
Combat Weight (half mission fuel) *	54,999.54			
Max Internal Fuel (2,492 gals at 7.8 lb/gal)	19,438.00	541.85	144.16	
Gross Weight (Max. internal fuel) U/C Up	65,667.54	536.09	132.13	27.65
U/C Down		537.57	129.69	28.06
Max. External Fuel (500 gal at 7.8 lb/gal + drop tank)	4,238.00	520.29	60.75	
Max. Gross Weight (Int.+Ext. Fuel) U/C Up	69,905.54	535.13	127.80	27.39
U/C Down		536.52	125.51	27.77

N.B.

- 1) Aircraft Datum = 120 ins above an arbitrarily chosen ground line
- 2) * Fuel weights in accordance with latest data issued by Performance Group dated November 19, 1957. Centres of Gravity have temporarily been omitted until a fuel sequencing system is finally established.

UNCLASSIFIED / NON CLASSIFIE

REPORT NO: T-0400-34 ISSUE 19

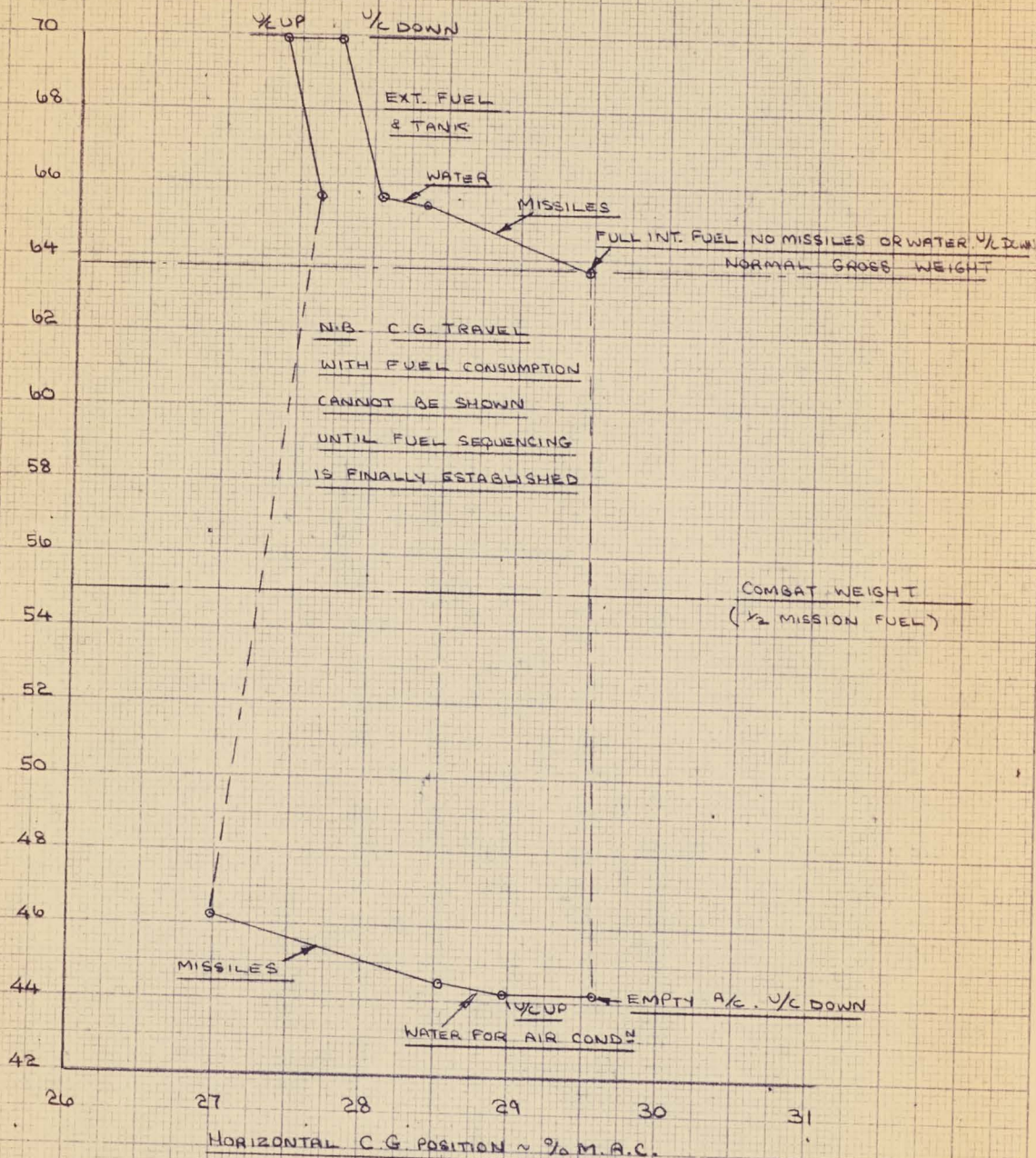
DATE: MAY 1ST 1958

SHEET: 3

BY: Kathleen Griffin

HORIZONTAL C.G. PLOT OF
FIXED POINTS ON ARROW 2
FLIGHT ENVELOPE

UNCLASSIFIED / NON CLASSIFIED



359-12
MADE IN U.S.A.

10 X 10 TO THE 1/2 INCH
KEUFFEL & ESSER CO.

WEIGHT AND C. OF G BY FUNCTIONAL
COMPO

PROJECT_____

[illegible]

WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

[illegible]

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT
UNDERCARRIAGE UP POSITION	4000000		
MAIN UNDERCARRIAGE GROUP	4010000		
MAIN UNDERCARRIAGE	401010092		1934945
80 MAIN U C DOORS FAIRINGS	401020062		287985
NOSE UNDERCARRIAGE GROUP	4020000		
100 NOSE UNDERCARRIAGE	402010091		333811
NOSE U C DOOR AND FAIRING	402020052		27521

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
ENGINE GROUP	5000000			
PS 13 ENGINES	5010000		91722868	
			917228	
PS 13 ENGINES SERV ACCESS	5010100		145063	
			1450	
ACC GEAR BOX ON FUS D B	5020001	56	452457	
ACC GEAR BOX ON FUS E B	5020002	58	2366060	
			28184	
ENGINE CONTROLS	5030000			
ENGINE CONTROLS F F	5030001	52	145816	
ENGINE CONTROLS C F	5030002	54	26430	
ENGINE CONTROLS D B	5030003	56	50849	
ENGINE CONTROLS E B	5030004	58	101363	
			3243	
STARTER AND ENG GEAR BOX	5040000		3154561	
			31545	
ENGINE ANTI ICING	5050000		700058	
			7000	
FIRE EXT SYSTEM	5060000			
55 ENG FIRE EXT SYSTEM ENG	5060001	58	640070	
55 ENG FIRE EXT SYSTEM D B	5060002	56	14655	
			6546	
ENGINE MTGS AND BRACKETS	5070000			
ENGINE MOUNTS	5070001		842167	
ENGINE MTG ACCESSORIES	5070002		481764	
			13238	
FUEL SYSTEM	5080000			

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		7010001	52	440710	
NAVIC TABLE AND STOWAGE		7010004	52	20022	
				4607	
COCKPIT SEALING		7020000	52	50018	
				500	
OXYGEN SYSTEM		7030000			
OXYGEN SYSTEM		7030001	52	260724	
				2607	
AIR CONDITIONING SYSTEM		7040000			
AIRCONDITIONING SYST F F		7040001	52	1232123	
AIRCONDITIONING SYST C F		7040002	54	5752329	
AIRCONDITIONING SYST D B		7040003	56	207451	
AIRCONDITIONING SYST C A		7040005		1236658	
AIRCONDITIONING SYST ENG		7040006		125567	
AIRCONDITIONING SYST I W		7040007	62	6151	
				85600	
HYDRAULICS MAIN SYSTEM		7050000			
14	UTILITY HYDRAULICS F F	7050001	52	841520	
31	UTILITY HYDRAULICS C F	7050002	54	427241	
20	UTILITY HYDRAULICS D B	7050003	56	2733855	
74	UTILITY HYDRAULICS E B	7050004	58	78926	
24	UTILITY HYDRAULICS I W	7050005	62	1351155	
14	UTILITY HYDR NOSE U C	7050006	91	32519	
24	UTILITY HYDR MAIN U C	7050007	92	298054	
				64733	
CABIN INSULATION		7070000	52	143118	
				1431	
BRAKE PARACHUTE		7080000			
BRAKE PARACHUTE F F		7080001	52	45516	
BRAKE PARACHUTE R F		7080005	59	852882	

AVRO AIRCRAFT LTD.
MALTON, ONT.

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

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
BRAKE PARACHUTE I W		7080000662		12462	
				9107	
ELECTRICAL SYSTEM		70900000			
ELECTRICAL WIRING R N		7090000151		129	9
ELECTRICAL WIRING F F		7090000252		2966	19
ELECTRICAL WIRING C F		7090000354		2354	39
ELECTRICAL WIRING A I		7090000455		1274	21
ELECTRICAL WIRING D B		7090000556		9015	52
ELECTRICAL WIRING E B		7090000658		645	9
ELECTRICAL WIRING I W		7090000862		9236	53
ELECTRICAL WIRING FIN		7090000983		3527	9
ELECTRICAL WIRING NUC		7090001091		3301	8
ELECTRICAL WIRING ENG		70900011		2002	60
ELECTRICAL WIRING C A		70900012		1374	63
ELECTRICS F F		7090001352		1524	815
ELECTRICS C F		7090001454		870	945
ELECTRICS E B		7090001558		670	67
ELECTRICS ENG		70900016		1877	258
ELECTRICS C A		70900017		718	61
ELECTRICS FIN		7090001883		838	9
ELECTRICS I W		7090001962		2336	62
ELECTRICS CAW		70900020		112	62
ELECTRICS MUC		7090002192		745	1
20	ELECTRICS A I	7090002255		4900	22
	ELECTRICS D B	7090002356		2961	251
	ELECTRICS R F	7090002459		1368	0
WINDSCIEEN DEMISTING		7090002552		3564	19
				1264	02
L P PNEUMATICS		71000000			
24	L P PNEUMATICS F F	7100000152		2255	19
18	L P PNEUMATICS C F	7100000254		671	33
	L P PNEUMATICS D B	7100000356		418	55
	L P PNEUMATICS E B	7100000458		1526	65
	L P PNEUMATICS FIN	7100000583		640	75
	L P PNEUMATICS R N	7100000651		124	7
	L P PNEUMATICS S P	7100000794		602	9
				5694	
INTAKE DE ICING		7120000055		8800	19
				8800	
RADIO AND RADAR FIXED		71400000			
RADIO AND RADAR FIXED R N		7140000151		20900	8
RADIO AND RADAR FIXED F F		7140000252		12700	18

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

[illegible]

WGT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

UNCLASSIFIED / NON CLASSIFIED

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
	8020100						
	8020101	51	103930	8855	10100	9203002	10496930
	9020102	52	20910	18488	12000	3865841	2509200
	8020103	54	60770	27203	10023	16531263	6090977
	8020104	56	7550	51447	10000	3884249	755000
	8020105	53	3500	73000	25930	2355000	907550
	8020106		8230	55138	16008	4537857	1317458
	8020107	58	4500	73500	14500	3307500	652500
	8020108	62	130	44541	14700	57903	19110
			209520			43942615	22748725
	9030000						
	8030101	52	7841	17201	12047	134856	94448
	8030102	54	2303	32213	10949	741865	252155
	8030103	58	3696	3242	13432	233363	49564
	8030104	62	6070	53781	15720	3264507	954204
	8030105	64	9574	855	14000	71112	13300
	8030106	51	287	7350	9340	21095	26806
	8030107		8564	47972	12893	4108322	1104157
			18472			8575120	2494634
	8050000						
	8050100	94	88935	38410	9880	34159934	8786778
			88935			34159934	8786778
S	8050200	94	55332	37285	9913	20630536	5485061
			55332			20630536	5485061
S	8050300	94	36005	37789	10406	13605929	3746680
			36005			13605929	3746680
XED	8050400	94	21711	33524	11000	7278396	2388210
			21711			7278396	2388210

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT_____

[illegible]

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT_____

[illegible]

