

QC
Arrow
C-105
7-0400-34
Iss. 21

QCX
Arrow
CF105
R-7-0400-34
Iss-21

FILE IN VAULT

Arrow 2 Report: 7-0400-34
Prod. A/C Issue : 21
UNCLASSIFIED
UNCLASSIFIED SUMMARY
1 July/58

UNCLASSIFIED
SECRET
Our file # S36-38-105-6 (APO-1)
NON CLASSIFIÉ



DEPARTMENT OF NATIONAL DEFENCE

ROYAL CANADIAN AIR FORCE

Malton Ont
31 Jul 58

The Director
National Aeronautical Establishment
Montreal Rd
Ottawa Ont

Arrow Weight and CG Data

1 Please find enclosed one copy each of the Weight and CG Summary reports dated 1 Jul 58 as follows:

- 7-0400-34 Issue 21 - Arrow 2 Production Aircraft Weight and CG Summary
- 7-0400-63 Issue 2 - Arrow 1, Aircraft 25204 and 25205
- 7-0400-64 Issue 3 - Arrow 1, Aircraft 25202 and 25203

2 The Arrow 2 report is submitted with some reservations, since it is incorrect in respect of trapped fuel weight and "Equipment" weight. An explanation of the unusable fuel question was given in Mr. JC Floyd's letter of 16 Jul 58 to G/C HR Footitt. The undercarriage door sequencing described in the "Equipment Group" will not be embodied owing to the weight penalty involved. These items will be corrected in the next issue of the report.

JD Young (me)
(JD Young) F/L
for Det Cmdr 1202 TSD
Avro Aircraft Ltd

No.	File	
To: 1	<i>[Signature]</i>	
2	<i>[Signature]</i>	
3	<i>[Signature]</i>	
Action	Initials	Date
Direct reply		
Draft reply		
Note	<i>[Signature]</i>	11.8.58
Comment		
Record		
Action taken		

RCAF G32 (REV. 8-57)

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

Date: Dec. 7, 1992

R. Auger
Signature

SECRET
CONFIDENTIAL
UNCLASSIFIED

SECRET



National Research Council Canada	Conseil national de recherches Canada
C.I.S.T.I.	I.C.I.S.T.I.
Aeronautical and Mechanical	Bibliothèque d'aéronautique
Engineering Library	et de génie mécanique

TO
A

DATE

JAN 07 1993

Report no.: QCX-AVRO-CF105-R-7-0400-34-155-21

has been downgraded to: _____

de-classified

by (Name): Michel W. Drapeau

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

Date: Dec. 7, 1992

R. Drapeau
Signature

~~UNCLASSIFIED~~
~~SECRET~~
~~UNCLASSIFIED / NON-CLASSIFIED~~

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Ref: 1644/11/J
Date: 1 July, 1958
To: See Distribution
From: E.F. Burnett - Weight Supervisor
Subject: Arrow 2 Production A/C Weight and C.G. Summary - Report 7-0400-34
Issue 21

Attached is a copy of Weight and C.G. Summary Report 7-0400-34
Issue 21 dated June 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: DRDA 7/DARFT 5-8/DAS Eng 6-4-5
Date: 5 Nov 1992
Signature: *S. Aubrey*
Unit / Rank / Appointment: DSIS 3, Secretary CRAD HQ DRP

E.F. Burnett
E.F. Burnett

EFB/ag

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



55864

UNCLASSIFIED
SECRET
UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Report: 7-0100-34
Issue: 21

I N D E X

<u>Sheet</u>	<u>Content</u>
1-1 to 1-5	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.G.s.

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Report: 7-0400-34
Issue : 21
Sheet : 1-1

UNCLASSIFIED / NON CLASSIFIÉ
SECRET

Introduction & Weight Changes

The following is a Weight & C.G. of the Arrow 2 Production Aircraft based on the latest weight estimates available.

All weight & C.G. changes are relative to Issue 20 of June 1st, 1958.

Some early Arrow 2 Aircraft, serial numbers 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 test installations etc. Appropriate weight statements will be issued at a later date.

General:

- a) Orenda PS13 Engines comprise the Power Plant (4,500 lb each, brochure weight, excluding Nose bullet and Input frame. An actual weight of an appropriate PS13 engine should soon be available).
- b) A package containing 4 "semi-submerged" Sparrow II missiles (432 lb each) froms the current Armament.
- c) The R.C.A. Astra I Radar system is installed. The basis of the unit weight and C.G. breakdown is a weight statement received from R.C.A. April 21st, 1958. Some relevant ammendments have been made to this list.

The Infra Red Tracker system seeker head is installed in its fin pod location.

(Total weight of the installed system is 3,325 lb.including missile actuation and firing systems).

In addition to the above, Minneapolis-Honeywell MH 64 Damping System is installed.

Arrow 2 Aircraft 25205 to 25208, and some later serial numbers will have the "Astra Minus" system (Navigational and 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 the report, immediately preceeding the item title will be found a number varying from 0 to 100. This is the percentage actual weight recorded in the relevant item.

- e) To increase the long range capabilities of the Aircraft a tailcone plug has been introduced to restrict the exhaust area. This plug will be used for ferrying missions only and its weight is recorded with the Max. Gross Weight see Sheet 2-2.

UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

SECRET
Report No. 0400-34
Issue : 21
Sheet : 1-2
UNCLASSIFIED / NON CLASSIFIED

<u>1. Structure</u>	<u>Weight lb</u>
a) <u>Wings</u>	
I/W Struct F/S to M/Spar - Additional stiffening elements in U/C Bay	+ 4.75
Fuselage H ₁ nge Joints - Mk 2 prod. drgs estimated. Actual weights obtained of all available applicable parts	- 9.89
<u>Wing Weight Decrease</u>	- 5.14
b) <u>Fin & Rudder</u>	
No weight change	
c) <u>Fuselage Fwd Sta 255 ins</u>	
Bulkhead Sta. 120 ins - doublers added for additional Air-Conditioning holes	+ 0.85
Misc. other equip. bracketry changes etc.	+ 0.45
Cockpit Floor - bracketry changes for equip. etc.	+ 0.17
Lower Shear Panel - misc. minor prod. drg. changes	+ 0.05
<u>Front Fuselage Increase</u>	+ 1.52
d) <u>Centre Fuselage Sta. 255 - 485 ins</u>	
Skin - minor changes to all wing seal clips	+ 0.07
Armament Bay Roof - Additional Services requirements	+ 0.14
Electronics Bay - latches replace Camlocs on side access doors	+ 2.29
Radar Access Door - misc. bracketry changes	+ 0.20
addition of struts to hold door open	+ 0.40
Equip. Bay Structure - Max. venting requirements Air Conditioning bay to electronics bay, tray modified	- 0.47
Misc. Items C.F. - addition of nylon guide strips and seal retainers along lower longeron	+ 8.42
<u>Centre Fuselage Increase</u>	+ 11.05
e) <u>Duct Bay Sta. 485 - 591.65 ins</u>	
No weight change.	
f) <u>Engine Bay Sta 591.65 - 742.5 ins</u>	
No weight change.	
g) <u>Rear Fuselage Sta 742.5 ins aft</u>	
No weight change.	

UNCLASSIFIED / NON CLASSIFIED

UNCLASSIFIED / NON CLASSIFIÉ
 SECRET
 Report: 7-0109-34
 Issue : 21
 Sheet : 1-3

Aircraft: Arrow 2
 Prod. A/C
 Date: 1 July, 1958

<u>h) Fuselage Joints</u>	<u>Weight lb</u>
Joint at Sta 742.5 ins - first estimate to MK 2 Prod. drgs.	+ <u>0.94</u>
<u>Fuselage Joints Increase</u>	+ <u>0.94</u>
<u>Total Structural Increase</u>	+ <u>8.37</u>

2. Landing Gear

Main Landing Gear - proposals for the wheel, tyre, and brake assys are being considered from both Goodrich and Goodyear. Indications are that an assembly will NOT weigh LESS than 170 lb. Previously 165 lb each assy was allowed based on MK 1 A/C. It should be noted that the U/C leg is not stressed for this additional weight and possible changes could occur here also.

	+ <u>20.0</u>
N.B. For Bendix anti-skid control system - see equip group.	
<u>Total Landing Gear Increase</u>	+ <u>20.0</u>

3. Power Plant & Services

Accessories Gear Boxes on Fus. - expected increase for separate oil system for Constant Speed Drive units

	+ 5.00
Fire Extinguishing System - redesigned for MK 2 A/C - Mk 1 A/C weight estimates were previously recorded - considerable additional piping in the Duct Bay around Air-Oil heat exchangers. Supply unit is similar to that in MK 1 A/C	+ <u>7.41</u>
<u>Total Power Plant Increase</u>	+ <u>12.41</u>

4. Flying Controls Group

Mechanical Flying Controls - Prod. drg reissues, including redesign of rear aileron quadrant, installation of rotary actuator for aileron pitch-trim etc.

	+ <u>5.75</u>
<u>Total Flying Controls Increase</u>	+ <u>5.75</u>

UNCLASSIFIED / NON CLASSIFIÉ

UNCLASSIFIED / NON CLASSIFIÉ
SECRET

Aircraft: Arrow 2
 Prod. A/C
 Date: 1 July, 1958

Report: 7-0400-34
 Issue : 21
 Sheet : 1-4

<u>5. Equipment Group</u>	<u>Weight lb</u>
Utility Hydraulics C.F. - first est. to Mk 2 prod. drgs	+ 0.90
Utility Hydraulics I/W - Some piping changes etc - first est to Mk 2 prod. drgs	+ 9.30
Sequencing U/C Doors - a mechanically operated system is being introduced on Mk 2 A/C for both the Nose and the Main U/C Doors. N.B. The Nose Door on Mk 1 A/C was electrically operated. It will now be possible to close doors with U/C extended.	+ 51.10
Anti-Skid System - A.T.I. of a Bendix system is to be made on Mk 1 A/C. An anti-skid system is a basic requirement for a Mk 2 A/C and Wt estimates here have been based on the Mk 1 A/C T.I.	+ 37.68
Radio & Radar Remov - estimates quoted to latest R.C.A. Wt Statement (see General Note d)	- 0.20
Sparrow Pack Electronics Remov - Latest R.C.A. weights of missile auxiliaries	+ 4.30
Sparrow Pack Electronics Fixed - Firing box MPR3 deleted for a prod. aircraft and box MPR2 is increased by approx 20%	- 28.38
<u>Equipment Group Increase</u>	<u>+ 74.70</u>

N.B. Items 6 & 7 Below

Since the tank configuration for Mk 1 and Mk 2 are similar Mk 1 A/C figures quoted below will be considered applicable to MK 2 A/C.

6. Trapped Fuel

Trapped Fuel - Aircraft 25201 was weighed dry and then drained thus establishing a weight of fuel trapped within the system * + 372.00

Total Trapped Fuel + 372.00

7. Operational Load

Residual Fuel - this is the fuel that is drainable, but unusable, the figure has also been established experimentally. Previously this report contained both trapped and residual fuel, which were theoretically underestimated + 66.60

Total Operational Load Increase * + 66.60

UNCLASSIFIED / NON CLASSIFIÉ

UNCLASSIFIED / NON CLASSIFIÉ
SECRET

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Report: 700-34
Issue : 21
Sheet : 1-5

N.B. * This has not influenced the Gross Weight of the Aircraft,
though it has increased the effective Combat Weight;
see also note following Wt. and C.G. summaries Shts 2-2, & 2-3.

Summary

Weight Change - Aircraft Basic Weight

Structure	8.37
Landing Gear	20.00
Power Plant	12.41
Flying Controls	5.75
Equipment	74.70
Trapped fuel	+ 372.00
	<u>+ 493.23</u>

Weight Change - Operational Load

Residual Fuel . + 66.60

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

<u>Issue 20</u>	<u>Issue 21</u>	
46,353.04	46,912.87	<u>+ 559.83</u>

UNCLASSIFIED / NON CLASSIFIÉ

UNCLASSIFIED / NON CLASSIFIED
SECRET
Report: 0100-34
Issue : 21
Sheet : 2-1

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Description	Weight lb	H. Arm ins	V. Arm ins
Structure	19,162.72	566.47	137.23
Wings	10,024.75	642.89	142.20
Fin & Rudder	1,039.01	753.84	208.90
Fuselage Fwd Sta 255 ins	2,589.54	184.40	128.66
Sta 255 - 485 ins	1,711.98	375.85	129.94
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"	42.64	466.91	109.85
Landing Gear - Retracted	2,658.41	488.57	134.99
Main Landing Gear	2,009.10	538.68	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	10,813.78	671.38	121.33
Engines & Accessories PS13	9,186.78	687.95	121.16
Engine Nose Bullets (Orenda Supplied)	70.00	587.17	116.00
Engine Controls	32.32	379.90	117.49
Gear Box & Drives on Fuselage	286.84	603.28	102.50
Gear Box, Starter & Drives on Engines	315.45	615.98	105.24
Fire Extinguisher System	72.87	686.42	131.67
Engine Mountings	132.38	666.82	136.52
Fuel System	717.14	531.46	134.96
Flying Controls Group	1,932.31	651.62	138.20
Mechanical Flying Controls	958.49	677.65	147.69
Hydraulic Flying Controls	973.82	626.00	128.86
Equipment Fixed & Removable	9,108.29	332.60	113.91
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	864.09	341.68	135.33
Cockpit Insulation	14.31	187.48	132.00
Hydraulic Utilities System	657.53	505.29	118.04
Sequencing of U/C Doors	51.10	346.00	116.00
Anti-skid Control System	37.68	480.00	113.97
Drag Chute	91.07	786.68	143.19
Electrical System	1,268.41	434.75	112.77
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
MH64 Damping System	184.72	464.22	135.05
Radio & Radar Removable	2,095.00	212.03	107.09
Radio & Radar Fixed	841.53	212.03	107.09

UNCLASSIFIED / NON CLASSIFIED

UNCLASSIFIED / NON CLASSIFIED
SECRET

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Report: 7-0100-34
Issue: 21
Sheet: 2-2

Description	Weight lb	H. Arm ins	V. Arm ins	% M.A.C.
Sparrow Pack Structure	897.36	383.98	98.77	
Sparrow Pack Mechanisms	553.32	372.85	99.13	
Sparrow Pack Hydraulics	365.51	378.03	103.89	
Sparrow Pack Electronics Remov.	189.80	326.10	100.00	
Sparrow Pack Electronics & Electric Fixed	188.73	336.09	110.00	
Sparrow Pack Air Conditioning	5.21	305.50	102.50	
Sparrow Pack L.P. Pneumatics	24.45	386.92	103.50	
Trapped Fuel	372.00	560.00	136.00	
Aircraft Basic Weight	44,047.51	542.84	128.40	
U/C Up				
U/C Down		545.15	124.58	
Useful Load (Less usable Fuel)	2,865.36	381.78	105.68	
Crew	390.00	194.00	136.50	
Engine Fire Ext. Fluid	25.00	730.00	129.00	
Missiles	1,728.00	389.29	88.30	
Oxygen Charge	13.39	259.68	159.91	
Water for Air Conditioning	285.00	267.91	131.56	
Oil	138.97	636.92	110.57	
Residual Fuel	285.00	557.84	136.07	
U/C Up		533.00	127.01	26.80
Operational Weight Empty	46,912.87			
U/C Down		535.17	123.43	27.40
U/C Up		538.50	128.49	28.31
Op Wt. Empty Less Missiles	45,184.87			
U/C Down		540.75	124.77	27.94
Normal Combat Mission Fuel Φ (200 Naut Miles - 2276 gal at 7.8 lb/gal)	17,750.00	-	-	
Normal Gross Weight	64,662.87	-	-	
Half Combat Mission Fuel (1138 gals at 7.8 lb/gal)	8,875.00	-	-	
Combat Weight (Half mission fuel)	55,787.87	-	-	
Max Internal Fuel *	19,000.00	541.85	144.16	
U/C Up		535.55	131.95	27.50
Gross Weight (Max Int. Fuel)	65,912.87			
U/C Down		537.09	129.40	27.93
Max. External Fuel (500 gal @ 7.8 lb/gal + drop tank)	4,242.36	520.32	60.79	
Tailcone Plugs	252.00	857.07	128.60	
U/C Up		535.78	127.65	27.57
Max Gross Weight (Int + Ext Fuel)	70,407.23			
U/C Down		537.22	125.26	27.96

UNCLASSIFIED / NON CLASSIFIED

SECRET
UNCLASSIFIED / NON CLASSIFIÉ

Aircraft: Arrow 2
Prod. A/C
Date: 1 July, 1958

Report: 7-0400-34
Issue: 21
Sheet: 2-3

N.B.

- 1) Aircraft Datum = 120 ins above an arbitrarily chosen ground line
- 2) Φ Fuel weights in accordance with latest data issued by Performance group dated Nov. 19th, 1957. Centres of gravity have temporarily been omitted until a fuel sequencing system is finally established.
- 3) * The trapped and residual fuel within the Aircraft was determined experimentally by actual weighings in the dry and drained conditions etc for A/C 25201.

Since MK 1 and MK 2 A/C tank configurations are similar Mk 1 figures are considered applicable to Mk 2 A/C until such time as an experimental check can be made on a MK 2 A/C.

The figures obtained on A/C 25201 were considerably in excess of those originally calculated.

Experimentally determined figure = 657 lb
Calculated figure = 218 lb

Increase in trapped + residual fuel = +439 lb

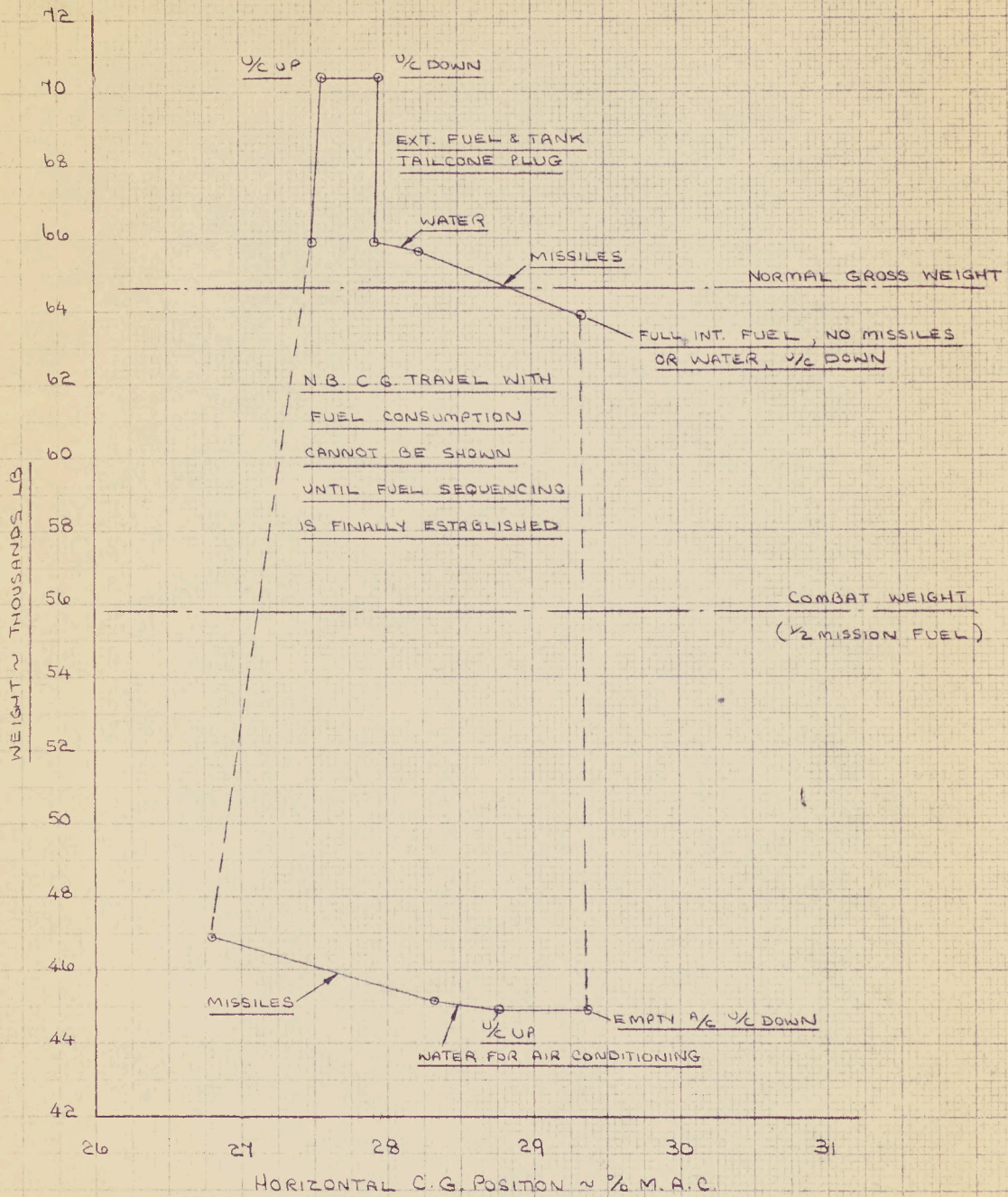
Now actual weighings of MK 1 A/C in a fully fuelled condition have indicated that it would not be desirable to alter the total estimated fuel within the Aircraft. Hence since the unusable fuel has been increased by 439 lb, the usable fuel has been decreased by a similar amount.

An experimental determination of the tank volumes is expected in the near future.

UNCLASSIFIED / NON CLASSIFIÉ

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

UNCLASSIFIED / NON CLASSIFIED



AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT Arrow 2

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
TOTAL WING GROUP	1000000			
OUTER WING	1010000			
100 OUTER WING SKINS	1010001	64	9291070	
100 POSTS AND INTERCOSTALS	1010002	64	243673	
100 OUTER WING SPARS	1010003	64	3925870	
100 OUTER WING RIBS	1010004	64	1345669	
18 AILERON CONTROL BOX	1010006	64	3792077	
100 RIB 12	1010007	64	762664	
100 O W AILERON JACK FITTING	1010009	64	104672	
AILERON JOINTS AND FAIRIN	1010010		329378	
			197945	
100 AILERON	1020000	74	3360079	
			33600	
20 ELEVATOR	1030000	82	4420275	
20 ELEVATOR MARRY UP	1030001		159773	
			45799	
INNER WING	1040000			
70 MAIN UC STRUCTURE	1040001	62	3331557	
16 INNER WING SPARS	1040002	62	4111258	
5 I W STRUCTURE F S TO M S	1040007	62	10853049	
I W STRUCTURE M S TO R S	1040008	62	1513060	
STRUCT AFT OF REAR SPAR	1040009	62	3163972	
40 ELEVATOR CONTROL BOX I W	1040010	62	4283872	
25 TRANSP JOINT MARRY UP	1040011		706563	
38 CENTRE LINE JOINTS	1040012	62	5908366	
INNER WING SKINS	1040013	62	2510762	
17 STRUT PICK UP FITTINGS	1040014	62	1274061	
8 RIBS 1 TO 9 INNER WING	1040016	62	4861861	
74 DORSAL FAIRINGS I W	1040017	62	9548	
RIB 10	1040018	62	1080063	
49 FUSELAGE HINGE JOINT I W	1040019	62	1262861	
25 TRANSP JOINT	1040020	62	1294263	
49 FUSELAGE HINGE JOINT	1040021		393553	
74 DORSAL FAIRINGS C A	1040023		603357	
SHUT OFF VALVE OPERAT MEC	1040024	62	51354	
LEADING EDGE I W	1040025	62	2213846	
			694261	
LEADING EDGE O W	1050000	65	3087063	
			30870	

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
1000000						
1010000						
1010001	64	92910	70646	13597	65637199	12632973
1010002	64	2436	73207	13410	1783323	326668
1010003	64	39258	70118	13636	27526924	5353221
1010004	64	13456	69506	13650	9352727	1836744
1010006	64	37920	77409	13508	29353493	5122234
1010007	64	7626	64873	13832	4947215	1054828
1010009	64	1046	72791	13670	761394	142988
1010010		3293	78726	13224	2592447	435466
		197945			141954722	26905122
1020000	74	33600	79213	13556	26615568	4554816
		33600			26615568	4554816
1030000	82	44202	75619	14260	33425110	6303205
1030001		1597	73810	14260	1178746	227732
		45799			34603856	6530937
1040000						
1040001	62	33315	57743	13983	19237080	4658436
1040002	62	41112	58060	14318	23869627	5886416
1040007	62	108530	49957	14391	54218332	15618552
1040008	62	15130	60868	14563	9209328	2203382
1040009	62	31639	72041	14887	22793052	4710098
1040010	62	42838	72470	14328	31044699	6137829
1040011		7065	63621	13876	4494824	980339
1040012	62	59083	66241	15030	39137170	8880175
1040013	62	225107	62727	14469	141202868	32570732
1040014	62	12740	61711	14584	7861981	1858002
1040016	62	48618	61173	14513	29741089	7055930
1040017	62	9548280	16150		45866	15343
1040018	62	10800	63683	13835	6877764	1494180
1040019	62	12628	61688	13790	7789961	1741401
1040020	62	12942	63071	13710	8162649	1774348
1040021		3935	53234	14364	2094758	565223
1040023		6033	57025	16034	3440318	967331
1040024	62	513549	6514180		281970	72743
1040025	62	22138	46841	14423	10369661	3192964
		694261			421872997	100383424
1050000	65	30870	63013	13561	19452113	4186281
		30870			19452113	4186281

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
2000000						
201000083		85596	74902	21060	64113116	18026518
2010001		4830	68538	15355	3310385	741647
201000283		1075	76000	25950	817000	278963
		91501			68240501	19047128
202000084		12400	81325	21438	10084300	2658312
		12400			10084300	2658312

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
TOTAL FUSELAGE GROUP	3000000			
RADAR NOSE STRUCTURE	3010000			
RADOME	3010001	51	159.58	3
RADAR NOSE STRUCTURE C A	3010002		270	12
RADAR NOSE STRUCTURE R N	3010003	51	170.32	9
			332.60	
FRONT FUSELAGE STRUCTURE	3020000			
SKIN F F	3020001	52	82.64	19
COCKPIT FORMERS	3020002	52	104.26	18
LOWER LONGERONS F F	3020003	52	67.72	18
38 TOP LONGERONS F F	3020004	52	187.46	19
66 NOSE U C SUPPORT STRUCT	3020005	52	33.43	21
CREW BULKHEADS	3020006	52	126.09	20
BULKHEAD STA 120	3020007	52	31.10	12
BULKHEAD STA 255	3020008	52	109.21	25
COCKPIT FLOOR	3020009	52	58.81	17
SHEAT PANEL BELOW NAV ARC	3020010	52	20.01	25
MISC STRUCTURE F F	3020011	52	5.52	18
LOWER SHEAR PANEL	3020012	52	31.41	23
CANOPY ARCHES	3020013	52	86.63	22
58 WINDSCREEN	3020014	52	131.39	13
			1075.68	
CENTRE FUSELAGE STRUCTURE	3030000			
SKIN C F	3030001	54	221.12	36
FORMERS C F	3030002	54	287.49	37
5 BULKHEAD STA 485	3030003	54	127.40	48
66 LONGERONS C F	3030004	54	144.53	41
STR BELOW LOWER LONGERONS	3030005	54	46.50	27
RADAR ACCESS DOOR	3030006	54	24.18	27
FWD DORSAL FAIRING	3030008	54	29.69	28
DEFLECTOR SHIELD	3030009	54	20.45	33
DORSAL OVER FUEL TANK	3030010	54	41.38	41
PACK MTG STRUCTURE	3030011	54	22.80	29
SEALING MISSILE BAY	3030012	54	5.59	29
MISC ITEMS C F	3030013	54	12.16	37
ARAMENT BAY ROOF	3030014	54	124.32	38
FUSELAGE FUEL TANK	3030015	54	226.65	39
DUCT C F	3030016	54	318.67	35
EQUIPMENT BAY STRUCTURE	3030017	54	59.59	28
			1712.52	
DUCT BAY STRUCTURE	3040000			

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIÉ

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	3000000						
	3010000						
A	3010001	51	15958	3992	11070	637043	1766551
N	3010002		270	12000	11200	32400	30240
	3010003	51	17032	9583	11325	1632177	1928874
			33260			2301620	3725665
RE	3020000						
	3020001	52	8264	19296	12301	1594621	1016555
	3020002	52	10426	18298	12064	1907749	1257793
	3020003	52	6772	18493	9045	1252346	612527
T	3020004	52	18746	19435	14763	3643285	2767472
	3020005	52	3343	21049	9186	703668	307088
	3020006	52	12609	20581	12375	2595058	1560364
	3020007	52	3110	12000	11477	373200	356935
	3020008	52	10921	25500	11927	2784855	1302548
ARC	3020009	52	5881	17695	11569	1040643	680373
	3020010	52	2001	25689	15352	514037	307194
	3020011	52	552	18750	11500	103500	63480
	3020012	52	3141	23423	8900	735716	279549
	3020013	52	8663	22590	16025	1956972	1388246
	3020014	52	13139	13817	14999	1815416	1970719
			107568			21021066	13870843
URE	3030000						
	3030001	54	22112	36736	14420	8123064	3188550
	3030002	54	28749	37520	13317	10786625	3828504
	3030003	54	12740	48500	10336	6178900	1316806
ONS	3030004	54	14453	41038	12144	5931222	1755172
	3030005	54	4650	27481	9246	1277867	429939
	3030006	54	2418	27908	9016	674815	218007
	3030008	54	2969	28927	16400	858843	486916
	3030009	54	2045	33739	16400	689963	335380
	3030010	54	4138	41310	14206	1709408	587844
	3030011	54	2280	29289	10280	667789	234384
	3030012	54	559	29616	11074	165553	61904
	3030013	54	1216	37000	12500	449920	152000
	3030014	54	12432	38370	11428	4770158	1420729
	3030015	54	22665	39429	14539	8936583	3295264
E	3030016	54	31867	35898	12969	11439616	4132831
	3030017	54	5959	28506	13549	1698673	807385
			171252			64358999	22251615
	3040000						

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT _____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	SKIN D B	3040001	56	62275	51
5	FORMERS D B	3040002	56	73355	51
	TOP LONGERONS	3040003	56	4985	51
	MTG BRKTS SIDE PANEL	3040004	56	1905	51
	LOWER LONGERONS	3040005	56	10301	52
72	MAIN FRAME STA 538 77	3040006	56	59805	51
	ACCESS PANELS	3040007	56	39595	52
	LOWER PANEL ASSY	3040008	56	21754	52
	DROP TANK MTG STRUCTURE	3040009	56	11335	58
20	LOWER SIDE PANELS FWD	3040010	56	10712	50
	LOWER CENTRE PANEL FWD	3040011	56	25615	51
	LOWER SIDE PANELS AFT	3040012	56	66985	56
	LOWER CENTRE PANEL AFT	3040013	56	25635	56
	FLOATING DUCT D B	3040014	56	45555	55
				103929	
	ENGINE BAY	3050000			
	TOP LONGERONS	3050001	58	66166	66
	BOTTOM LONGERONS	3050002	58	85776	65
	ENGINE ACCESS DOORS	3050003	58	13604	64
	ENGINE TUNNEL	3050004	58	61324	65
	ENG RAILS ATTACH TO FORM	3050005	58	28456	68
	PANELS AT ENG ACCESS DOOR	3050006	58	11083	65
	BOTTOM CTR PANEL FWD	3050007	58	46106	61
	BOTTOM CTR PANEL CENTRE	3050008	58	41206	67
	BOTTOM CTR PANEL AFT	3050009	58	74227	72
	SIDE PANEL FRONT	3050010	58	86026	61
	SIDE PANEL CENTRE	3050011	58	74826	67
	SIDE PANEL AFT	3050012	58	74547	72
4	HEAVY FORMERS	3050013	58	19623	66
				157407	
	REAR FUSELAGE	3060000			
	SKIN OUTER FIXED R F	3060001	59	55797	77
	FORMERS FIXED R F	3060002	59	10509	77
	LONGERONS FIXED R F	3060003	59	25197	77
	TUNNEL FIXED R F	3060004	59	10670	77
	ENGINE ACCESS DOORS R F	3060005	59	88617	77
	FAIRING UNDER RUDDER FIXE	3060006	59	28397	82
	REMOV TAILCONES	3060007	59	50477	82
	CENTRE STRUC STING REM R	3060008	59	10494	83
				101948	
	DIVE BRAKES	3070001	72	11790	50
	D B JOINT TO FUSELAGE	3070002		40648	
				12196	

HEIGHT AND C. OF G BY

FUNCTIONAL GROUP
COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIÉ

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	3040001	56	6227	53483	11227	3330386	699105
	3040002	56	7335	53530	11438	3926426	838977
	3040003	56	498	53899	13550	268417	67479
	3040004	56	190	51866	13066	98545	24825
	3040005	56	10301	52236	9914	5380830	1021241
	3040006	56	5980	53877	10383	3221845	620903
	3040007	56	3959	52776	9951	2089402	393960
	3040008	56	217	54557	8901	118389	19315
RE	3040009	56	1133	58576	8848	663666	100248
	3040010	56	10712	50859	9269	5448016	992895
D	3040011	56	2561	51352	8918	1315125	228390
	3040012	56	6698	56934	8863	3813439	593644
T	3040013	56	2563	56633	8821	1451504	226082
	3040014	56	45555	55363	11713	25220615	5335857
			103929			56346605	11162921
	3050000						
	3050001	58	661	66629	13915	440418	91978
	3050002	58	8577	65912	9961	5653272	854355
	3050003	58	13604	64040	9057	8712002	1232114
FORM	3050004	58	61324	65622	12110	40242035	7426336
DOOR	3050005	58	2845	68763	11364	1956307	323306
	3050006	58	11083	65039	9259	7208272	1026175
	3050007	58	4610	61780	8915	2848058	410982
RE	3050008	58	4120	67078	9239	2763614	380647
	3050009	58	7422	72072	9544	5349184	708356
	3050010	58	8602	61601	11692	5298918	1005746
	3050011	58	7482	67063	11922	5017654	892004
	3050012	58	7454	72153	12188	5378285	908494
	3050013	58	19623	66100	10965	12970803	2151662
			157407			103838822	17412155
	3060000						
	3060001	59	5579	77281	13693	4311507	763932
	3060002	59	10509	77990	13734	8195969	1443306
	3060003	59	2519	77159	12810	1943635	322684
	3060004	59	10670	77520	13201	8271384	1408547
FIXE	3060005	59	8861	77485	7859	6865946	696386
	3060006	59	2839	78214	15590	2220495	442600
	3060007	59	5047	82572	12784	41679868	6452980
M R	3060008	59	10494	83283	13940	8739718	1462864
			101948			82228522	12993299
	3070001	72	11790	50884	9049	5999224	1066877
	3070002		406	48794	9374	198104	38058
			12196			6197328	1104935

WGT AND C. OF G BY

FUNCTIONAL GROUP
COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
3080001	55	77026	21071	11839	16230148	9119108
		77026			16230148	9119108
F 3090000						
3090001		663	22000	12000	145860	79560
3090002		1028	25711	12250	264309	125930
3090003		428	47940	11590	205183	49605
3090004		1421	58950	9150	837680	130022
3090005		724	74250	11500	537570	83260
		4264			1990602	468377
3100000						
3100001	53	244	31176	89159	1600432	3888438
3100002	53	166	16232	49162	54386	3054270
		410	47		8184654	6589701

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
SECTION	4000000						
DUP	4010000						
	4010100	92	200910	53868	14100	108226199	28328310
			200910			108226199	28328310
GS	4010200	62	28798	53852	13840	15508299	3985643
			28798			15508299	3985643
DUP	4020000						
	4020100	91	33381	17080	9970	5701475	3328086
			33381			5701475	3328086
ING	4020200	52	2752	16222	8866	446429	243992
			2752			446429	243992

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
ENGINE GROUP	5000000			
PS 13 ENGINES	5010000		917228	68
			917228	
PS 13 ENGINES SERV ACCESS	5010100		1450	63
			1450	
ACC GEAR BOX ON FUS D B	5020001	56	4524	57
ACC GEAR BOX ON FUS E B	5020002	58	2336	60
ACC GEAR BOX ON FUS C A	5020003		8006	61
			2868	4
ENGINE CONTROLS	5030000			
ENGINE CONTROLS F F	5030001	52	1576	16
ENGINE CONTROLS C F	5030002	54	1092	26
ENGINE CONTROLS E B	5030004	58	889	66
ENGINE CONTROLS I W	5030005	62	658	52
			3232	
STARTER AND ENG GEAR BOX	5040000		3154	56
			3154	5
ENGINE ANTI ICING	5050000		7000	58
			7000	
FIRE EXT SYSTEM	5060000			
ENG FIRE EXT SYSTEM E B	5060001	58	5985	71
ENG FIRE EXT SYSTEM D B	5060002	56	1231	56
ENG FIRE EXT SYSTEM ENG	5060003		7167	
			7287	
ENGINE MTGS AND BRACKETS	5070000			
ENGINE MOUNTS	5070001		8421	67
ENGINE MTG ACCESSORIES	5070002		4817	64
			1323	38

WIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

	REFERENCE NO.	COMP. No.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	5000000						
	5010000		917228	68803	12119	631080381	111158861
			917228			631080381	111158861
CESS	5010100		1450	63819	10390	925376	150655
			1450			925376	150655
B	5020001	56	4524	57875	9607	2618265	434621
B	5020002	58	23360	60764	10399	14194470	2429206
A	5020003		800	61480	9530	491840	76240
			28684			17304575	2940067
	5030000						
	5030001	52	1576	16723	12368	263554	194920
	5030002	54	109	26444	11800	28824	12862
	5030004	58	889	66633	9904	592367	88047
	5030005	62	658	52142	12751	343094	83902
			3232			1227839	379731
BOX	5040000		31545	61598	10524	19431089	3319796
			31545			19431089	3319796
	5050000		7000	58717	11600	4110190	812000
			7000			4110190	812000
	5060000						
B	5060001	58	5985	71074	13583	4253779	812943
B	5060002	56	1231	56856	11237	699897	138327
NG	5060003		71	67960	11560	48252	8208
			7287			5001928	959478
ETS	5070000						
	5070001		8421	67834	14106	5712301	1187866
	5070002		4817	64669	12857	3115106	619322
			13238			8827407	1807188

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
FLYING CONTROLS GROUP		6000000			
MECHANICAL CONTROLS		6010000			
60	MECHANICAL CONTROLS F F	6010001	52	10713	1
	MECHANICAL CONTROLS C F	6010002	54	12903	
70	MECHANICAL CONTROLS FIN	6010005	83	12528	7
71	MECHANICAL CONTROLS I W	6010006	62	40135	7
80	MECHANICAL CONTROLS O W	6010007	64	30520	7
	MECHANICAL CONTROLS C A	6010008		6637	
				95849	
FLYING CONTROLS HYDRAULIC		6020000			
	FLYING CONT HYDRAULICS D	6020001	56	31845	
	FLYING CONT HYDRAULICS E	6020002	58	39853	6
	FLYING CONT HYDRAULICS R	6020003	59	487	
80	FLYING CONT HYDRAULICS I	6020004	62	26264	7
74	FLYING CONT HYDRAULICS O	6020005	64	11701	7
60	FLYING CONT HYDRAULICS FI	6020006	83	54067	
	FLYING CONT HYDRAULICS R	6020007	51	35001	
	FLYING CONT HYDRAULICS F	6020008	52	55061	
	FLYING CONT HYDRAULICS C	6020009	54	19203	
				97382	

HEIGHT AND C. OF G BY

FUNCTIONAL GROUP

COMPONENT UNCLASSIFIED / NON CLASSIFIED

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	6000000						
	6010000						
F	60100001	52	10713	16453	11410	1762610	1222353
F	60100002	54	1290	39654	11727	511537	151278
N	60100005	83	12528	78782	22159	9869809	2776080
W	60100006	62	40135	71809	14383	28820542	5772617
W	60100007	64	30520	77053	13561	23516576	4138817
A	60100008		663	70984	14338	470624	95061
			95849			64951698	14156206
JLIC	6020000						
D	60200001	56	3184	56630	10114	1803099	322030
E	60200002	58	39853	64788	11161	25819962	4447993
R	60200003	59	48	75875	10824	36420	5196
I	60200004	62	26264	70328	14737	18470946	3870526
O	60200005	64	11701	74076	13577	8667633	1588645
FI	60200006	83	5406	76183	20881	4118453	1128827
R	60200007	51	3500	11309	10513	395815	367955
F	60200008	52	5506	16928	11000	932056	605660
C	60200009	54	1920	37329	11000	716717	211200
			97382			60961101	12548032

AVRO AIRCRAFT LTD.
MALTON, ONT.

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

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. No.	WEIGHT	H
FIXED EQUIPMENT GROUP	7000000			
INSTRUMENTS	7010000			
INSTRUMENTS	7010001	52	4407	1
NAVIG TABLE AND STOWAGE	7010004	52	2002	
			4607	
COCKPIT SEALING	7020000	52	5001	
			500	
OXYGEN SYSTEM	7030000			
OXYGEN SYSTEM	7030001	52	2607	2
			2607	
AIR CONDITIONING SYSTEM	7040000			
AIRCONDITIONING SYSTEM F	7040001	52	3115	1
AIRCONDITIONING SYSTEM C	7040002	54	5241	2
AIRCONDITIONING SYSTEM D	7040003	56	1034	5
AIRCONDITIONING SYSTEM C	7040005		2832	6
AIRCONDITIONING SYSTEM EN	7040006		1453	6
AIRCONDITIONING SYSTEM I	7040007	62	715	
			8640	9
14 HYDRAULICS MAIN SYSTEM	7050000			
4 UTILITY HYDRAULICS F F	7050001	52	8415	2
20 UTILITY HYDRAULICS C F	7050002	54	4362	4
74 UTILITY HYDRAULICS D B	7050003	56	2733	5
30 UTILITY HYDRAULICS E B	7050004	58	7892	6
14 UTILITY HYDRAULICS I W	7050005	62	1444	1
30 UTILITY HYDR NOSE U C	7050006	91	3251	
ANTI SKID SYSTEM C F	7050007	92	2980	5
ANTI SKID SYSTEM MUC	7050008	54	3134	4
NUC AND MUC DOOR SEQ MECH	7050009	92	634	5
	7050010		5110	3
			7463	1
CABIN INSULATION	7070000	52	1431	1
			1431	
BRAKE PARACHUTE	7080000			

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	7000000						
	7010000						
	7010001	52	4407	16112	13909	710056	612970
GE	7010004	52	2002	2000	13000	44000	26000
			4607			754056	638970
	7020000	52	500	18600	13000	93000	65000
			500			93000	65000
	7030000						
	7030001	52	2607	24054	15670	627088	408517
			2607			627088	408517
EM	7040000						
M F	7040001	52	3115	17867	10626	556557	331000
M C	7040002	54	52410	28838	13567	15113996	7110465
M D	7040003	56	1034	51762	12492	535219	129167
M C	7040005		28326	43447	13798	12306797	3908421
M EN	7040006		1453	67100	14000	974963	203420
M I	7040007	62	7152	247	15728	37095	11167
			86409			29524627	11693640
M	7050000						
F	7050001	52	8415	20016	10853	1684346	913280
F	7050002	54	4362	43003	10395	1875791	453430
B	7050003	56	27338	55692	11077	15225079	3028230
B	7050004	58	7892	60587	10861	4781526	857150
W	7050005	62	14441	55240	14254	7977208	2058420
	7050006	91	325	19033	9521	61857	30943
	7050007	92	2980	54325	14100	1618885	420180
	7050008	54	3134	47200	10800	1479248	338472
	7050009	92	634	51500	14000	326510	88760
MECH	7050010		5110	34600	11600	1768060	592760
			74631			36798510	8781625
	7070000	52	1431	18748	13200	268284	188892
			1431			268284	188892
	7080000						

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
	BRAKE PARACHUTE F F	70800001	52	455	1
	BRAKE PARACHUTE R F	70800005	59	852	88
	BRAKE PARACHUTE I W	70800006	62	124	6
				9107	
	ELECTRICAL SYSTEM	70900000			
	ELECTRICAL WIRING R N	70900001	51	129	
	ELECTRICAL WIRING F F	70900002	52	296	1
	ELECTRICAL WIRING C F	70900003	54	235	3
	ELECTRICAL WIRING A I	70900004	55	127	2
	ELECTRICAL WIRING D B	70900005	56	901	55
	ELECTRICAL WIRING E B	70900006	58	64	5
	ELECTRICAL WIRING I W	70900008	62	923	65
	ELECTRICAL WIRING FIN	70900009	83	35	27
	ELECTRICAL WIRING NUC	70900010	91	330	1
	ELECTRICAL WIRING ENG	70900011		200	26
	ELECTRICAL WIRING C A	70900012		137	463
	ELECTRICS F F	70900013	52	152	481
	ELECTRICS C F	70900014	54	870	94
	ELECTRICS E B	70900015	58	670	6
	ELECTRICS ENG	70900016		187	725
	ELECTRICS C A	70900017		71	86
	ELECTRICS FIN	70900018	83	83	8
	ELECTRICS I W	70900019	62	233	66
	ELECTRICS CAW	70900020		11	26
	ELECTRICS MUC	70900021	92	74	5
20	ELECTRICS A I	70900022	55	490	02
	ELECTRICS D B	70900023	56	300	515
	ELECTRICS R F	70900024	59	136	8
	WINDSCREEN DEMISTING	70900025	52	356	41
				1268	41
	L P PNEUMATICS	71000000			
24	L P PNEUMATICS F F	71000001	52	225	51
18	L P PNEUMATICS C F	71000002	54	671	3
	L P PNEUMATICS D B	71000003	56	418	5
	L P PNEUMATICS E B	71000004	58	152	66
	L P PNEUMATICS FIN	71000005	83	640	7
	L P PNEUMATICS R N	71000006	51	124	
	L P PNEUMATICS S P	71000007	94	60	2
				569	4
	INTAKE DE ICING	71200000	55	8800	1
				8800	
	RADIO AND RADAR FIXED	71400000			

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
708000152		455	16913	12869	76954	58554
708000559		8528	82205	14394	7010442	1227520
708000662		1246	2022	14500	76907	17980
		9107			7164303	1304054
7090000						
709000151		129	9285	12000	11978	15480
709000252		2966	19977	11200	592518	332192
709000354		2354	39703	11000	934609	258940
709000455		1274	21984	12000	280076	152880
709000556		9015	52769	9921	4757125	894378
709000658		6459	500	9200	38080	5888
709000862		9236	53995	13900	4986978	1283804
709000983		3527	9754	30000	280734	105600
709001091		330	18600	9800	61380	32340
7090011		2002	60683	10000	1214874	200200
7090012		13746	33473	11234	4601199	1544226
709001352		15248	15464	11095	2357951	1691766
709001454		8709	45415	10760	3955192	937088
709001558		670	67944	11597	455225	77700
7090016		18772	58913	11521	11059148	2162722
7090017		7186	1350	12000	440493	86160
709001883		8389	550	28840	74327	23937
709001962		2336	62053	14500	1449558	338720
7090020		1126	2946	13561	70500	15188
709002192		745	1600	13700	38184	10138
709002255		4900	22079	13954	1081871	683746
709002356		3005	151859	10252	15584148	3080829
709002459		1368	0200	11360	109072	15450
709002552		3564	19898	9980	709165	355687
		126841			55144385	14305059
7100000						
710000152		2255	19158	12353	432013	278560
710000254		671	33431	11033	224322	74031
710000356		4185	5545	11592	232178	48455
710000458		1526	65650	9737	1001819	148587
710000583		6407	5818	25515	485235	163296
710000651		124	7431	9955	9214	12344
710000794		6029	800	10400	17880	6240
		5694			2402661	731513
712000055		8800	19582	11800	1723216	1038400
		8800			1723216	1038400
7140000						

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY

**FUNCTIONAL
COMPONE**

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
RADIO AND RADAR FIXED R N	7140001	51	241.60	9
RADIO AND RADAR FIXED F F	7140002	52	207.00	18
RADIO AND RADAR FIXED C F	7140003	54	141.55	27
RADIO AND RADAR FIXED D B	7140004	56	170.51	
RADIO AND RADAR FIXED FIN	7140005	83	320.07	6
RADIO AND RADAR FIXED C A	7140006		195.40	22
RADIO AND RADAR FIXED I W	7140007	62	222.85	4
			841.53	
29 CANOPY ACTUATION	7160000	52	649.22	22
			649.2	
CABIN CONSOLES	7170000	52	172.81	17
			172.8	
RADAR DOOR ACTUATION	7180000	54	1000.26	
			1000	
SURFACE FINISH F F	7190001	52	363.18	18
SURFACE FINISH CANOPY	7190002	53	64.20	
SURFACE FINISH C F	7190003	54	1400.37	
SURFACE FINISH INTAKES	7190004	55	408.22	
SURFACE FINISH D B	7190005	56	377.53	
SURFACE FINISH E B	7190006	58	443.66	
SURFACE FINISH R F	7190007	59	648.80	
SURFACE FINISH I W	7190008	62	3151.60	
SURFACE FINISH O W	7190009	64	1067.70	
SURFACE FINISH O W L EDGE	7190010	65	319.63	
SURFACE FINISH AILERON	7190011	74	353.79	
SURFACE FINISH ELEVATOR	7190012	82	566.75	
SURFACE FINISH FIN	7190013	83	639.74	
SURFACE FINISH RUDDER	7190014	84	202.81	
			10000	

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
R N	7140001	51	241.60	90.40	100.00	21840.64	24160.00
F F	7140002	52	207.00	180.13	113.48	37286.91	23490.36
C F	7140003	54	141.55	276.02	99.00	39070.63	14013.45
D B	7140004	56	170.51	110.00	100.00	8687.00	170.00
FIN	7140005	83	320.00	761.80	246.00	24377.60	7872.00
C A	7140006	6	195.40	221.61	120.00	43302.59	23448.00
I W	7140007	62	22.28	545.70	160.00	12158.20	3564.80
			841.53			178905.27	96718.61
	7160000	52	64.92	221.99	154.35	14411.59	10020.40
			64.92			14411.59	10020.40
	7170000	52	172.8	174.66	124.33	30181.2	21484.2
			172.8			30181.2	21484.2
	7180000	54	10.00	268.00	95.00	2680.00	9500.00
			10.00			2680.00	9500.00
	7190001	52	3.63	187.44	122.00	680.41	442.86
	7190002	53	6.42	202.18	159.00	1294.00	1017.60
	7190003	54	14.00	371.97	124.55	5207.58	1743.70
	7190004	55	4.08	227.98	120.20	930.16	490.42
	7190005	56	3.77	538.28	112.00	2029.32	422.24
	7190006	58	4.43	667.01	112.00	2954.85	496.16
	7190007	59	6.48	803.62	131.75	5207.46	853.74
	7190008	62	31.51	601.44	144.00	18951.37	4537.44
	7190009	64	10.67	706.50	135.90	7538.36	1450.05
DGE	7190010	65	31.96	394.8	135.26	2039.94	431.48
	7190011	74	3.53	791.90	135.56	2795.41	478.53
R	7190012	82	5.66	755.23	142.60	4274.60	807.12
	7190013	83	6.39	746.63	208.37	4770.97	1331.48
	7190014	84	2.02	812.79	214.31	1641.84	432.91
			100.00			59151.67	14019.89

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
REMOVABLE EQUIPMENT GROUP	8000000			
94 EJECTOR SEATS	8010100	52	34294	20
			34294	
RADAR REMOVABLE	8020100			
RADAR REMOVABLE R N	8020101	51	101900	9
RADAR REMOVABLE F F	8020102	52	23985	19
RADAR REMOVABLE C F	8020103	54	63885	28
RADAR REMOVABLE D B	8020104	56	5550	51
RADAR REMOVABLE F I N	8020105	83	3700	74
RADAR REMOVABLE C A	8020106		3810	55
RADAR REMOVABLE E B	8020107	58	6500	71
RADAR REMOVABLE I W	8020108	62	170	41
			209500	
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	369	63
DAMPING SYSTEM I W	8030104	62	6070	51
DAMPING SYSTEM O W	8030105	64	95	74
DAMPING SYSTEM R N	8030106	51	287	7
DAMPING SYSTEM C A	8030107		8564	47
			18472	
SPARROW PACK	8050000			
SPARROW PACK STRUCTURE	8050100	94	89736	38
			89736	
SPARROW PACK MECHANISMS	8050200	94	55332	37
			55332	
21 SPARROW PACK HYDRAULICS	8050300	94	36551	37
			36551	
SP PACK ELECTRONICS FIXED	8050400	94	18873	33
			18873	

WIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

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
	8020100						
	8020101	51	101900	9017	10100	9188323	10291900
	8020102	52	23985	19530	12381	4684271	2969583
	8020103	54	63885	28119	9723	17963823	6211539
	8020104	56	5550	51740	10000	2871570	555000
	8020105	83	3700	74713	25948	2764381	960076
	8020106		3810	55200	16000	2103120	609600
	8020107	58	6500	73450	12500	4774250	812500
	8020108	62	170	41500	14800	70550	25160
			209500			44420288	22435358
	8030000						
	8030101	52	784	17201	12047	134856	94448
	8030102	54	2303	32213	10949	741865	252155
	8030103	58	3696	3242	13432	233363	49564
	8030104	62	6070	53781	15720	3264507	954204
	8030105	64	957	4855	14000	71112	13300
	8030106	51	287	7350	9340	21095	26806
	8030107		8564	47972	12893	4108322	1104157
			18472			8575120	2494634
	8050000						
	8050100	94	89736	38398	9877	34456829	8863225
			89736			34456829	8863225
	8050200	94	55332	37285	9913	20630536	5485061
			55332			20630536	5485061
	8050300	94	36551	37803	10389	13817375	3797283
			36551			13817375	3797283
	8050400	94	18873	33609	11000	6343027	2076030
			18873			6343027	2076030

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIED

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
EMOV	8050500	94	18980	32610	10000	6189378	1898000
			18980			6189378	1898000
CS	8050600	94	2445	38692	10350	946019	253058
			2445			946019	253058
NG	8070000	94	521	30550	10250	159166	53403
			521			159166	53403
	8080000	52	600	18750	14500	112500	87000
			600			112500	87000

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONENTS

PROJECT _____

MK 2

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
OPERATIONAL LOAD	9000000			
CREW MEMBERS	9010000	52	39000	19
			39000	
ENGINE OIL	9020000			
ENGINE OIL DRAINABLE	9020001		9290	65
ENGINE OIL TRAPPED ENG	9020002		1773	63
ENGINE OIL TRAPPED D B	9020003	56	1925	58
ENGINE OIL TRAPPED E B	9020004	58	9095	59
			13897	
SPARROW MISSILES	9030000	94	172800	38
			172800	
OXYGEN CHARGE	9040000			
OXYGEN CHARGE F F	9040001	52		7220
OXYGEN CHARGE C F	9040002	54		126726
			1339	
ENGINE FIRE EXT FLUID	9060000		2500	73
			2500	
100 RESIDUAL FUEL	9070000		28500	55
			28500	
100 TRAPPED FUEL	9080000		37200	56
			37200	
WATER FOR AIR CONDITIONIN	9100000	54	26000	26
UNUSABLE WATER FOR AIRCON	9100001	54	2500	26
			28500	

WEIGHT AND C. OF G BY

FUNCTIONAL GROUP
COMPONENT

REPORT NO. _____

UNCLASSIFIED / NON CLASSIFIÉ

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		9290	65225	11390	6059403	1058131
9020002		1773	63676	11640	1128975	206377
9020003	56	1925	58084	9555	1118117	183934
9020004	58	909	59928	9704	544746	88209
		13897			8851241	1536651
9030000	94	172800	38929	8830	67269312	15258240
		172800			67269312	15258240
9040000						
9040001	52	7220	493	13200	14755	9504
9040002	54	1267	26280	16150	332968	204621
		1339			347723	214125
9060000		2500	73000	12900	1825000	322500
		2500			1825000	322500
9070000		28500	55784	13607	15898440	3877995
		28500			15898440	3877995
9080000		37200	56000	13600	20832000	5059200
		37200			20832000	5059200
9100000	54	26000	26800	13200	6968000	3432000
9100001	54	2500	26700	12700	667500	317500
		28500			7635500	3749500

ON IN
R CON

JUN TANG
3558
MADE IN U.S.A.