QCX
Avro
CF105
R-7-0400-34
Iss-17

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ARROW 2 Report # 7-0400-34

~~Declassified~~ Authority of AVRS Prod. A/C Issue 17

27 Sept 56 ANALYZED

WEIGHT & C.G. SUMMARY

~~Signature~~ SECRET

~~NAE~~

~~UNE~~ / Rank / Appointment Mar. 1/58 AVRS

Templin

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Ref. 6726/11/J
Date March 1st, 1958
To See Distribution
From Mr. E.F. Burnett
Subject ARROW 2 PRODUCTION A/C WEIGHT & C.G. SUMMARY - REPORT # 7-0400-34 Iss. 17.

Attached is a copy of Weight and C.G. Summary Report # 7-0400-34 Iss. 17, dated March 1st, 1958 for your retention.

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

E F Burnett
ppkg

amc.

E. F. Burnett
Weights Supervisor

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12503793

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

Report # 7-0400-34 Iss. 17

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Classification cancelled / Changed to UNCLASS
By authority of AVRS
Date 27 Sept 96
Signature
Unit / Rank / Appointment AVRS 5

Date: March 1st, 1958
Aircraft: Arrow 2

SECRET
Report # 7-0400-34 Iss. 17
Sheet # 1-1

INTRODUCTION & WEIGHT CHANGES

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

All Weight & C.G. Changes are relative to Issue 16 of February 1st, 1958.

The early Arrow 2 Aircraft 25206 onwards 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. Weight Statements for these Aircraft will be issued at a later date.

GENERAL:-

a) Orenda PS 13 Engines comprise the Power Plant (4,500 lb each, brochure weight, excluding Nose Bullet and 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 weight and C.G. breakdown is from the latest information received from R.C.A., dated October 4th, 1957. 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 added for the missile firing system, junction boxes and some AVRO installed antennae.

Initially it was understood that the R.C.A. weight was for the complete system installed, now, however, it appears that only intercompartment cables were allowed for by R.C.A. not junction boxes etc.

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

In addition to the above the 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 and Communication equipment only).

d) A considerable number of Arrow 1 parts, assemblies and equipment have now been weighed. Where these weights apply to the Arrow 2 Aircraft, they have been recorded in the Arrow 2 records.

On the I.B.M. Sheets in this report, immediately preceding the item title, will be found a number varying from 0 to 100. This is the percentage actual weight recorded in that report.

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

INTRODUCTION & WEIGHT CHANGES

1. STRUCTURE	WEIGHT (lb)
a) Wings:	
Structure F/Spar to M/Spar I/W - alterations to pivot door structure	+ 3.15
hardware changes & revised estimates of all skin attachments in area	+ 6.71
Wing Weight Increase	+ 9.86
b) Fin & Rudder	
No Weight Change	
c) Front Fuselage Fwd. Sta. 255"	
Pilot's Canopy - alterations to castings for MK 2 A/C, addition of step on L.H.S.	+ 2.23
Navigator's Canopy - MK 2 production drawings now estimated	+ 5.23
Canopy Arches - miscellaneous production drawing reissues on Rear Arch	+ 0.29
Centre Arch has window added and correction made to hardware estimate	+ 4.81
Lower Shear Panel - Miscellaneous minor drawing revisions	- 0.18
Front Fuselage Increase	+ 12.38
d) Centre Fuselage Sta. 255" - 485"	
Forward Dorsal Fairing - two reinforcing angles now Steel were titanium, production request	+ 0.24
C.F. Radar Access Door - first estimate to MK 2 schemes	+ 5.22
Centre Fuselage Increase	+ 5.46
e) Duct Bay Sta. 485"-591.65"	
Dive Brake Accommodations - drawing reissues, alterations to hardware etc.	- 0.67
Longerons & Joints - since former Sta. 485" is now assembled to the D.B. there has been some considerable change to hardware etc. (see also Fuselage "Marry-up").	+ 4.48
Side Formers D.B. - miscellaneous changes to several formers due to production drawing reissues net change negligible	+ 0.03
Floating Duct - Now fully estimated to production drawings machined rings etc. increased in gauge since scheme estimate was made.	+ 21.55
Duct Bay Increase	+ 25.39

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

INTRODUCTION & WEIGHT CHANGES

		WEIGHT (lb)
1.	STRUCTURE	
	f) Engine Bay Sta. 591.65"-742.5"	
	With the exception of the Shroud this section has now been entirely re-estimated to production drawings. Due to the advantages of conforming to the drawing office 'call up' system, for record purposes the entire weight reporting of this section has also changed (for details regarding I.B.M. listing etc. see Section 2)	
	Resulting weight changes are as follows:	
	Inner Longeron - increases to top cap	+ 5.88
	No. 1 Engine Door structural increases	+ 5.21
	No. 2 Engine Door - structural increase excluding the added section which weighs approx. as before.	+ 7.24
	Addition of various diaphragms and miscellaneous other changes	+ 5.57
	Engine Bay Increase	+ 23.90
	g) Rear Fuselage Sta. 742.5 Aft.	
	No Weight Change.	
	h) Fuselage "Marry-Up"	
	Joint C.F. to D.B. - MK 2 production drawings now estimated changes due to Bulkhead Sta. 485" now being assembled to Duct Bay Joints (see section (e))	- 0.72
	Fuselage "Marry-up" Decrease	- 0.72
	TOTAL STRUCTURAL INCREASE	+ 76.27
2.	LANDING GEAR	
	Nose U/C Door & Fairing - minor changes to door structure for ground connectors etc added to fwd. end of fairing	+ 0.36
	Main U/C Doors & Fairings - redesign of spring housings pivot door stabilizing arm now included here	+ 2.62
	LANDING GEAR INCREASE	+ 1.94
		+ 8.62
3.	POWER PLANT & SERVICES	
	No Weight Change	
4.	FLYING CONTROLS GROUP	
	No Weight Change	

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

INTRODUCTION & WEIGHT CHANGES

4. FLYING CONTROLS GROUP

In Aircraft # 25201 boosters have been added at the elevator and aileron quadrants to overcome excessive friction within the system. These together with associated valves, filters and piping account for a weight increase of approximately 77 lb. Some similar system of boosters will have to be built into the arrow 2 Flying Control Hydraulic System but no information pertaining to details of the installation is yet available. The probable weight increase will be of the same order as that on Aircraft # 25201.

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

INTRODUCTION & WEIGHT CHANGES

5. EQUIPMENT GROUP		WEIGHT (lb)
Cabin Consoles - production drawing issue of L.H. Pilot's Console.	-	0.10
Electric Cables - production drawing estimates of I/W Cables	+	3.27
Electrics D.B. - production drawing estimates of panels E 20 and E 21, 18 fuses added to E 20	+	2.94
Electrics E.B. - addition of wiring on Nose Bullet	+	1.40
Radio & Radar Fixed - addition of mag. amp, dehydrator, sense antenna transformer and flexible waveguide and installation in dorsal	+	17.08
Radio &Radar Removable - addition of J4 compass flux valve	+	1.30
I.R. servo amp. - R.C.A. made error in previous weight estimate	+	14.00
Cockpit Equipment - addition of map case in observer's cockpit, escape ropes and frequency card holders in both cockpits	+	6.00
Missile Pack Structure - previously no account was taken of installation of hydraulic equipment and routing of lines. Now numerous doublers and stiffeners have been added, resulting in: Longitudinal Beams	+	9.30
Transverse Beams	+	2.96
Cable duct - added	+	2.40
Micro Switch Mountings - added	+	2.82
Hydraulic Equipment mounts - added	+	2.51
Misc. other changes	+	1.84
Missile Pack Mechanisms - production drawing estimates of aft launcher	+	0.23
.14 Al. packing rings at drag link bearing housings	+	1.02
Flexible conduits added at drag links and tie rods	+	3.88
Jack attachment bolts at upper end of telescopic links now called up with hydraulics	-	2.93
EQUIPMENT GROUP INCREASE	+	69.92

6. OPERATIONAL LOAD		
Trapped Water - Specification Weight of water trapped in evaporator is increased from 15 lb to 25 lb. Usable water remains unchanged at 260 lb.	+	10.00
OPERATIONAL LOAD INCREASE	+	10.00

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

S E C R E T
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INTRODUCTION & WEIGHT CHANGES

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+	76.27 lb.
Landing Gear	+	8.62 lb.
Equipment	+	69.92 lb.
	+	154.81 lb.

Weight Change - Operational Load

Trapped Water	+	10.00 lb

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

Issue 16	Issue 17	
45,880.00 lb	46,044.81 lb	+ 164.81 lb

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

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Report # 7-0400-34 Iss. 17
Section 2

DETAILED WEIGHT CHANGES WITH REFERENCE TO REPORT SYSTEM AS LISTED ON I.B.M. SHEETS FOR ENGINE BAY STRUCTURE

Due to the Design Office method of 'call-up' in panel sub-assys. the weight recording system has been changed to correspond.

		WEIGHT (lb)
Light Formers E. B.	These items are no longer considered seperately and all these reports have now been DELETED	- 110.41
Inner Longerons E. B.		- 71.84
Miscellaneous Items E.B.		- 9.12
Structure at Engine Doors E.B.		- 65.37
Service Access Doors E.B.		- 59.29
Outer Skins E.B.		- 164.89
Intermediate Formers E.B.		- 46.06
Panels at Engine Doors	New reports introduced in accordance with the drawing system	+ 110.83
Bottom Panel Aft.		+ 46.10
Bottom Panel Centre		+ 41.20
Bottom Panel Fwd.		+ 74.22
Side Panel Fwd.		+ 86.02
Side Panel Centre		+ 74.82
Side Panel Aft		+ 74.54
Engine Access Doors - increased in size		+ 28.69
Top Longerons - minor changes		+ 0.23
Heavy Formers - some items transferred above		- 2.35
Bottom Longerons - Assy. hardware included here		+ 16.58
Engine Bay Increase		+ 23.90

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT lb	H. ARM ins.	V. ARM ins.
STRUCTURE	19,143.15	566.73	137.36
Wings	10,021.89	642.45	142.22
Fin & Rudder	1,034.75	754.31	209.80
Fuselage - fwd. Sta. 255"	2,571.78	184.33	128.80
Sta. 255"-485"	1,700.73	375.08	130.51
Sta. 485"-591.65"	1,151.34	538.57	105.53
Sta. 591.65"-742.5"	1,574.10	659.88	110.35
Sta. 742.5" Aft.	1,036.95	805.24	128.71
Marry-Up	51.61	466.89	105.41
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
Gear Box & Drives on Fuselage	281.84	601.70	102.49
Engine Controls	32.43	375.76	118.61
Gear Box Starter & Drives on Engine	315.45	615.98	105.24
Engine Nose Bullet (Orenda Supplied)	70.00	587.17	116.00
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	1,792.80	683.95	140.43
Mechanical Flying Controls	944.53	684.69	148.25
Hydraulic Flying Controls	848.27	683.13	131.72
EQUIPMENT FIXED AND REMOVABLE	8,925.18	333.27	114.18
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	339.06	204.43	134.10
Air Conditioning System	856.00	333.49	134.98
Hydraulics Main System	640.81	540.22	117.77
Cockpit Insulation	14.31	187.48	132.00
Drag Chute	91.07	786.68	143.19
Electrical System	1,283.87	434.94	112.67
Low Pressure Pneumatics	56.94	421.96	128.47
Surface Finish	100.00	591.52	140.20
Intake De-icing 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	180.15	471.27	135.69
Radio & Radar Removable	2,095.20	209.73	108.59
Radio & Radar Fixed	784.08	238.57	117.84
Sparrow Pack Structure	912.02	384.10	98.16
Sparrow Pack Mechanisms	553.32	372.85	99.13

continued.

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Sheet # 3-2

Date: March 1st, 1958
Aircraft: ARROW 2
Production A/C

WEIGHT & C.G. SUMMARY

		WEIGHT lb	H. ARM ins.	V. ARM ins.	M.A.C. %
Equipment Fixed & Removable (Cont'd.)					
Sparrow Pack Hydraulics		331.94	373.52	99.00	
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	
	U/C Up		544.83	128.55	
AIRCRAFT BASIC WEIGHT		43,246.05			
	U/C Down		547.06	124.85	
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	389.29	88.30	
Oxygen Charge		13.39	259.68	159.91	
Water for Air Conditioning		285.00	267.91	131.56	
	U/C Up		534.65	127.11	27.26
Operational Weight Empty		46,044.81			
	U/C Down		536.76	123.63	27.84
	U/C Up		540.32	128.62	28.82
Operational Weight Empty		44,316.81			
Less Missiles	U/C Down		542.51	125.01	29.42
Normal Combat Mission Fuel*		17,490.00	-	-	-
Normal Combat Weight *		63,534.81	-	-	-
Half Combat Mission Fuel*		8,745.00	-	-	-
Combat Weight (half * Mission Fuel)		54,789.81	-	-	-
Maximum Internal Fuel (2,492 gal. at 7.8 lb/gal.)		19,438.00	541.85	144.16	
	U/C Up		536.79	132.17	27.85
A/U.W. Maximum Internal Fuel		65,482.81			
	U/C Down		538.27	129.73	28.25
Maximum External Fuel (500 gal @ 7.8 lb/gal. + drop tank)		4,248.00	521.84	60.67	
	U/C Up		535.88	127.81	30.35
A.U.W. Maximum Internal and External Fuel		69,730.81			
	U/C Down		537.27	125.52	27.98

N.B. 1) Aircraft Datum = 120" above an arbitrarily chosen ground line.
2) * Fuel weights in accordance with latest data issued by Aerodynamics November 19th, 1957. Centres of Gravity have temporarily been omitted until a fuel sequencing system is finally established.
3) With the increase of 165 lb in Operational Weight Empty the Normal Combat Mission fuel has increased by a further 50 lb.

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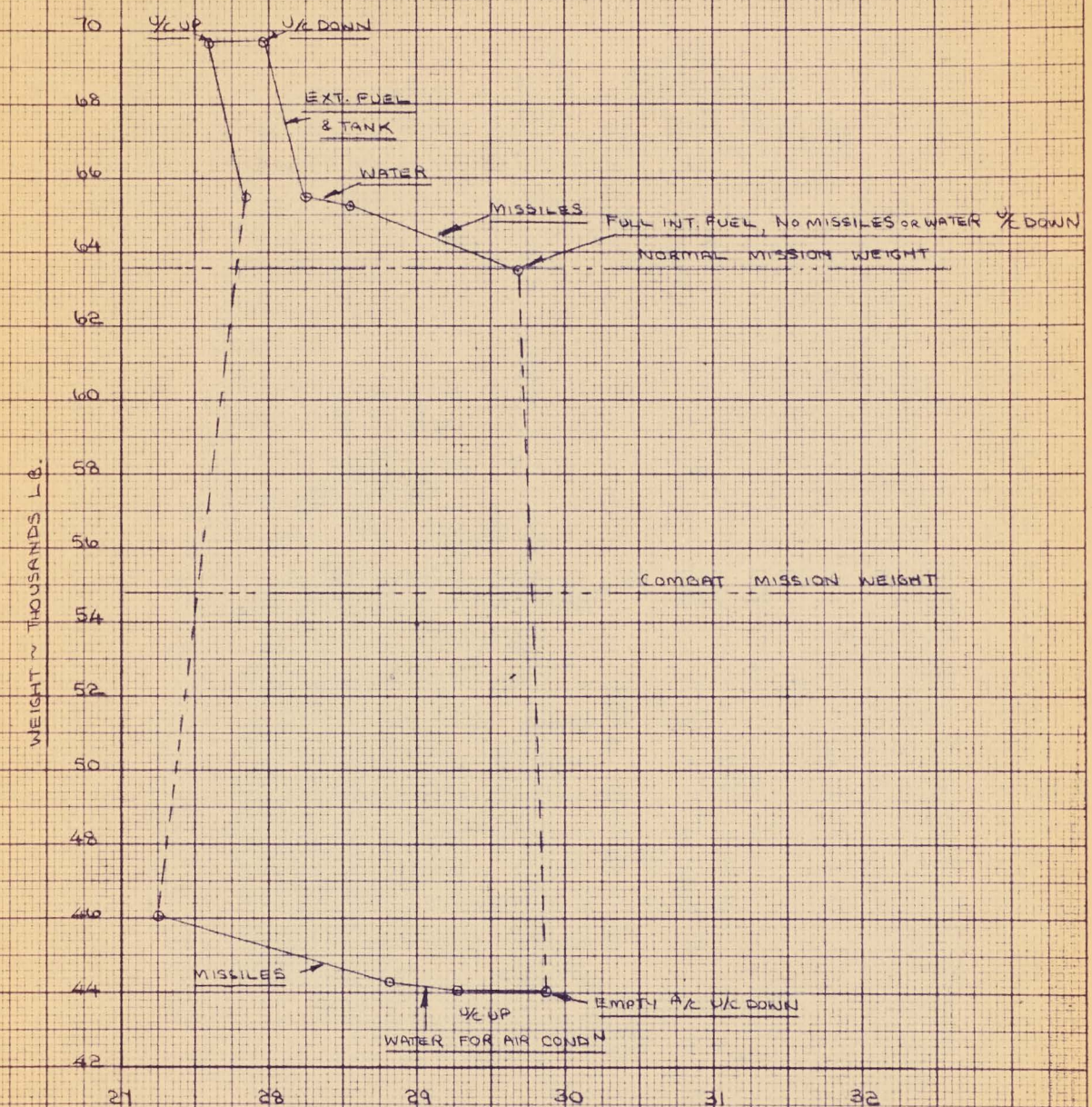
REPORT NO: 7-0400-34-17

BY: Kathleen Griffin

DATE: March 1st 1958

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



G9-12
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MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPON

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
	TOTAL WING GROUP	1000000			
	OUTER WING	1010000			
100	OUTER WING SKINS	1010001	64	92910	7
100	POSTS AND INTERCOSTALS	1010002	64	2436	7
100	OUTER WING SPARS	1010003	64	39258	7
100	OUTER WING RIBS	1010004	64	13456	6
18	AILERON CONTROL BOX	1010006	64	37920	7
100	RIB 12	1010007	64	7626	6
100	O W AILERON JACK FITTING	1010009	64	1046	7
	AILERON JOINTS AND FAIRING	1010010		3293	7
				19794	5
	AILERON	1020000			
100	AILERON STRUCTURE	1020001	74	33600	7
				33600	
97	ELEVATOR MARRY UP	1030000		1597	7
97	ELEVATOR	1030000	82	44900	7
				4649	7
	INNER WING	1040000			
79	MAIN U C STRUCTURE	1040001	62	33071	5
16	INNER WING SPARS	1040002	62	41010	5
5	I W STRUCTURE F S TO M S	1040007	62	108484	4
	I W STRUCTURE M S TO R S	1040008	62	14979	6
	STRUCT AFT OF REAR SPAR	1040009	62	31639	7
40	ELEVATOR CONTROL BOX I W	1040010	62	42838	7
25	TRANSP JOINT MARRY UP	1040011		7065	6
36	CENTRE LINE JOINTS	1040012	62	59069	6
	INNER WING SKINS	1040013	62	224204	6
17	STRUT PICK UP FITTINGS	1040014	62	12740	6
8	RIBS 1 TO 9 INNER WING	1040016	62	48618	6
74	DORSAL FAIRINGS I W	1040017	62	95	4
100	RIB 10	1040018	62	10800	6
	FUSELAGE HINGE JOINT I W	1040019	62	13812	6
25	TRANSP JOINT	1040020	62	12942	6
	FUSELAGE HINGE JOINT	1040021		3740	5
74	DORSAL FAIRINGS C A	1040023		6033	5
				671139	
	LEADING EDGE INNER WING	1050000	62	22138	4
				2213	8

GHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. 7-0400-34 Iss. 17
Mar. 1/58
SHEET 5-1-

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	1000000						
	1010000						
	101000164		92910	70646	13597	65637199	12632973
	101000264		2436	73207	13410	1783323	326668
	101000364		39258	70118	13636	27526924	5353221
	101000464		13456	69506	13650	9352727	1836744
	101000664		37920	77409	13508	29353493	5122234
	101000764		7626	64573	13832	4947215	1054828
NG	101000964		1046	72791	13670	761394	142988
RING	1010010		3293	78726	13224	2592447	435466
			19794 5			141954722	26905122
	1020000						
	102000174		33600	79213	13556	26615568	4554816
			33600			26615568	4554816
	1030000		1597	73810	14260	1178746	227732
	103000082		44900	75523	14260	33909827	6402740
			46497			35088573	6630472
	1040000						
	104000162		33071	57757	13983	19100817	4624315
	104000262		41010	58072	14318	2381532 7	5871812
S	104000762		108484	49971	14405	54210540	15627120
S	104000862		14979	60964	14572	9131798	2182740
R	104000962		31639	72041	14887	22793052	4710098
W	104001062		42838	72470	14328	31044699	6137829
	10400011		7065	63621	13876	4494824	980339
	104001262		59069	66246	15029	39130850	8877480
	104001362		2242046	24401	14472	139992978	32446803
	104001462		12740	61711	14584	7861981	1858002
	104001662		48618	61173	14513	29741089	7055930
	104001762		954	8280	16150	45866	15343
	104001862		10800	63683	13835	6877764	1494180
W	104001962		13812	62104	13790	8577804	1904675
	104002062		12942	63071	13710	8162649	1774348
	10400021		3740	52796	14309	1974570	535157
	10400023		6033	57025	16034	3440318	967331
			671139			410396926	97063505
G	105000062		22138	46841	14423	10369661	3192964
			22138			10369661	3192964

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WEIGHT AND C. OF G BY FUNCTIONAL COMPON

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
LEADING EDGE O W	106000065		308706	
			30870	

AVRO AIRCRAFT LTD.
MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
12 FIN	2010000	83	851707	
12 FIN TO WING MARRY UP	2010002		48306	
FIN POD FOR I R TRACKER	2010003	83	10757	
			91075	
95 RUDDER	2020000	84	12400	
			12400	

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
TUNNEL FIXED R F	30100665	9	13054	7
SKIN AND INTERCOSTAL R F	30100675	9	5579	7
FAIRING UNDER RUDDER R F	30100685	9	2767	7
FORMERS FIXED R F	30100695	9	10509	7
LONGERONS C BEAM FIXED R F	30100705	9	2519	7
REMOVABLE NACELLES R F	30100715	9	49147	8
CNTR STRUC STING REMOV R F	30100725	9	10794	8
MTG BRKTS SIDE PANEL D B	30100755	6	190	5
FORMERS LOWER PANEL D B	30100765	6	7416	5
LOWER PANEL D B	30100775	6	5054	5
JOINT F F TO C F	30100785		855	2
JOINT AIR INTAKES TO F F	30100795		952	2
JOINT D B TO E B	30100815		2508	5
FUS JOINT AT STA 742 50	30100825		418	7
DROP TANK MTG STRUCT D B	30100835	6	1133	5
MISC STRUCTURE F F	30100865	2	552	1
ENG RAILS ATTACHM TO FORM	30100875	8	2854	6
COCKPIT FORMERS	30100925	2	10261	1
JOINT D B TO C F	30100935		428	4
SIDE PANEL F E B	30100955	8	8602	6
SIDE PANEL C E B	30100965	8	7482	6
SIDE PANEL A E B	30100975	8	7454	7
PANELS ENGINE ACCESS DOORS	30100985	8	11083	6
BOTTOM CENTRE PANEL F E B	30100995	8	4610	6
			667423	
BOTTOM CENTRE PANEL C E B	30101005	8	4120	6
BOTTOM PANEL AFT	30101015	8	7422	7
			11542	
DIVE BRAKES	30200007	2	11790	5
DIVE BRAKES C A	3020001		406	4
			12196	
AIR INTAKES	3030000			
AIR INTAKES	30301005	5	75886	2
			75886	
PILOTS AND NAVIG CANOPIES	3040000			
PILOTS CANOPY	30401005	3	24431	1
			24431	

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
NAVIGATORS CANOPY	3040200	53	171732	
			17173	

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PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
UNDERCARRIAGE UP POSITION	4000000			
MAIN UNDERCARRIAGE GROUP	4010000			
MAIN UNDERCARRIAGE	4010100	92	193494	5
			19349	4
80 MAIN U C DOORS FAIRINGS	4010200	62	2879	85
			2879	8
NOSE UNDERCARRIAGE GROUP	4020000			
100 NOSE UNDERCARRIAGE	4020100	91	33381	1
			3338	1
NOSE U C DOOR AND FAIRING	4020200	52	275	21
			275	2

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
ENGINE GROUP	5000000			
PS 13 ENGINES	5010000		917228	6
			917228	
PS 13 ENGINES SERV ACCESS	5010100		1450	6
			1450	
ACC GEAR BOX ON FUS D B	5020001 56		45245	
ACC GEAR BOX ON FUS E B	5020002 58		23660	6
			28184	
ENGINE CONTROLS	5030000			
ENGINE CONTROLS F F	5030001 52		14581	
ENGINE CONTROLS C F	5030002 54		2643	
ENGINE CONTROLS D B	5030003 56		5084	
ENGINE CONTROLS E B	5030004 58		10136	
			3243	
STARTER AND ENG GEAR BOX	5040000		31545	6
			31545	
ENGINE ANTI ICING	5050000		7000	5
			7000	
FIRE EXT SYSTEM	5060000			
55 ENG FIRE EXT SYSTEM ENG	5060001 58		6400	7
55 ENG FIRE EXT SYSTEM D B	5060002 56		1465	
			6546	
ENGINE MTGS AND BRACKETS	5070000			
ENGINE MOUNTS	5070001		8421	6
ENGINE MTG ACCESSORIES	5070002		4817	6
			13238	
FUEL SYSTEM	5080000			

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PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	FLYING CONTROLS GROUP	6000000			
	MECHANICAL CONTROLS	6010000			
68	MECHANICAL CONTROLS F F	6010001	52	952316	
	MECHANICAL CONTROLS C F	6010002	54	95438	
70	MECHANICAL CONTROLS FIN	6010005	83	1242378	
70	MECHANICAL CONTROLS I W	6010006	62	4067071	
46	MECHANICAL CONTROLS O W	6010007	64	3023777	
	MECHANICAL CONTROLS C A	6010008		64670	
				94453	
	FLYING CONTROLS HYDRAULICS	6020000			
	FLYING CONT HYDRAULICS D B	6020001	56	233257	
37	FLYING CONT HYDRAULICS E B	6020002	58	3907664	
	FLYING CONT HYDRAULICS R F	6020003	59	4875	
80	FLYING CONT HYDRAULICS I W	6020004	62	2626470	
74	FLYING CONT HYDRAULICS O W	6020005	64	1170174	
60	FLYING CONT HYDRAULICS FIN	6020006	83	540676	
				84827	

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PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
	BRAKE PARACHUTE I W	7080006	62	1246	
				9107	
	ELECTRICAL SYSTEM	7090000			
	ELECTRICAL WIRING R N	7090001	51	129	
	ELECTRICAL WIRING F F	7090002	52	29661	
	ELECTRICAL WIRING C F	7090003	54	23543	
	ELECTRICAL WIRING A I	7090004	55	12742	
	ELECTRICAL WIRING D B	7090005	56	90155	
	ELECTRICAL WIRING E B	7090006	58	645	
	ELECTRICAL WIRING I W	7090008	62	92365	
	ELECTRICAL WIRING FIN	7090009	83	3527	
	ELECTRICAL WIRING NUC	7090010	91	3301	
	ELECTRICAL WIRING ENG	7090011		20026	
	ELECTRICAL WIRING C A	7090012		137463	
	ELECTRICS F F	7090013	52	152481	
	ELECTRICS C F	7090014	54	87094	
	ELECTRICS E B	7090015	58	6706	
	ELECTRICS ENG	7090016		187725	
	ELECTRICS C A	7090017		7186	
	ELECTRICS FIN	7090018	83	838	
	ELECTRICS I W	7090019	62	23366	
	ELECTRICS CAW	7090020		1126	
	ELECTRICS NUC	7090021	92	745	
20	ELECTRICS A I	7090022	55	49002	
	ELECTRICS D B	7090023	56	312835	
	ELECTRICS R F	7090024	59	1368	
	WINDSCREEN DEMISTING	7090025	52	35641	
	SPARROW ELECTRICS F F	7090026	52	2541	
	SPARROW ELECTRICS C F	7090027	54	602	
				128387	
	L P PNEUMATICS	7100000			
24	L P PNEUMATICS F F	7100001	52	22551	
18	L P PNEUMATICS C F	7100002	54	6713	
	L P PNEUMATICS D B	7100003	56	4185	
	L P PNEUMATICS E B	7100004	58	15266	
	L P PNEUMATICS FIN	7100005	83	6407	
	L P PNEUMATICS R N	7100006	51	124	
	L P PNEUMATICS S P	7100007	94	602	
				5694	
	INTAKE DE ICING	7120000	55	88001	
				8800	
	RADIO AND RADAR FIXED	7140000			

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PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	RADIO AND RADAR FIXED R N	7140001	51	20900	
	RADIO AND RADAR FIXED F F	7140002	52	12700	1
	RADIO AND RADAR FIXED C F	7140003	54	19000	2
	RADIO AND RADAR FIXED D B	7140004	56	18005	1
	RADIO AND RADAR FIXED F I N	7140005	83	4700	7
	RADIO AND RADAR FIXED C A	7140006		17600	2
	RADIO AND RADAR FIXED I W	7140007	62	1708	5
				78408	
29	CANOPY ACTUATION	7160000	52	6492	2
				6492	
	CABIN CONSOLES	7170000	52	1728	1
				1728	
	RADAR DOOR ACTUATION	7180000	54	1000	2
				1000	
	SURFACE FINISH F F	7190001	52	363	1
	SURFACE FINISH CANOPY	7190002	53	64	2
	SURFACE FINISH C F	7190003	54	1400	3
	SURFACE FINISH 2NTAKES	7190004	55	408	2
	SURFACE FINISH D B	7190005	56	377	5
	SURFACE FINISH E B	7190006	58	443	6
	SURFACE FINISH R F	7190007	59	648	8
	SURFACE FINISH I W	7190008	62	3151	6
	SURFACE FINISH O W	7190009	64	1067	7
	SURFACE FINISH O W L EDGE	7190010	65	319	6
	SURFACE FINISH AILERON	7190011	74	353	7
	SURFACE FINISH ELEVATOR	7190012	82	566	7
	SURFACE FINISH FIN	7190013	83	639	7
	SURFACE FINISH RUDDER	7190014	84	202	8
				10000	

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PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
REMOVABLE EQUIPMENT GROUP	8000000			
77 EJECTOR SEATS	801010052		33906	2
			33906	
RADAR REMOVABLE	80201 00			
RADAR REMOVABLE R N	802010151		103930	
RADAR REMOVABLE F F	802010252		20910	1
RADAR REMOVABLE C F	802010354		60770	2
RADAR REMOVABLE D B	802010456		7550	5
RADAR REMOVABLE F I N	802010583		3500	7
RADAR REMOVABLE C A	80201 06		8230	5
RADAR REMOVABLE E B	802010758		4500	7
RADAR REMOVABLE I W	802010862		130	4
			209520	
DAMPING SYSTEM	8030000			
DAMPING SYSTEM F F	803010152		7841	7
DAMPING SYSTEM C F	803010254		23033	2
DAMPING SYSTEM E B	803010358		3696	3
DAMPING SYSTEM I W	803010462		6070	5
DAMPING SYSTEM O W	803010564		957	4
DAMPING SYSTEM R N	803010651		287	7
DAMPING SYSTEM C A	80301 07		8107	4
			18015	
SPARROW PACK	8050000			
MISSILE PACK STRUCTURE	805010094		9120	3
			91202	
SPARROW PACK MECHANISMS	805020094		5533	3
			55332	
SPARROW PACK HYDRAULICS	805030094		3319	4
			33194	
SP PACK ELECTRONICS FIXED	805040094		2171	1
			21711	

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PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
SP PACK ELECTRONICS REMOV	80505 00	94	185 50	3
			185 50	
MISSILE AIRCONDITIONING	807000 00	94	52 1	3
			52 1	
COCKPIT EQUIPMENT	808000 00	52	600	1
			600	

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
OPERATIONAL LOAD	9000000			
CREW MEMBERS	901000052		390001	
			39000	
ENGINE OIL	9020000			
ENGINE OIL DRAINABLE	9020001		9290	6
ENGINE OIL TRAPPED ENG	9020002		1773	6
ENGINE OIL TRAPPED D B	902000356		1925	5
ENGINE OIL TRAPPED E B	902000458		909	5
			13897	
SPARROW MISSILES	903000094		1728003	
			172800	
OXYGEN CHARGE	9040000			
OXYGEN CHARGE F F	904000152		72	2
OXYGEN CHARGE C F	904000254		1267	2
			1339	
ENGINE FIRE EXT FLUID	9060000		2500	7
			2500	
RESIDUAL FUEL	9070000			
RESIDUAL FUEL C F	907000154		4680	3
RESIDUAL FUEL I W	907000262		1716	5
			21840	
WATER FOR AIR CONDITIONING	910000054		2600	2
UNUSABLE WATER FOR AIRCOND	910000154		2500	2
			28500	