Arrow 2
Prod. A/C

Report: 7-0400-34
Issue : 27

UNCLASSIFIED / NON CLASSIFIÉ

C.G. Summers

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1 Aug/58

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Report no.: QCX - AVRO - CF105 - R-7-0400-34 - Iss.22

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by (Name): Michel W. Drapeau

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

Date: Dec. 7, 1992

R. Drapeau
Signature

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

AVRO AIRCRAFT LIMITED
INTER-DEPARTMENTAL MEMORANDUM

Ref: 2713/11/J
Date: 1 August, 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 22

Attached is a copy of Weight and C.G. Summary Report 7-0400-34 Issue 22 dated August 1st, 1958, for your retention

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

E.F. Burnett

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

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

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I N E D X

Aircraft: Arrow 2
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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 22 of July 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 (4,800 lb each, revised weight, excluding Nose Bullet, Input Frame and AVRO installed accessories).

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 unit weights quoted herein are as received from R.C.A. in their weight statement dated June 5th, 1958. This includes the Infra Red Tracker system seeker head installed in its Fin pod location.

(Total weight of the installed system is 3336 lb, including Missile actuation and firing systems).

In addition to the above, Minneapolis-Honeywell MH64 Damping system is installed.

Arrow 2 Aircraft 25206 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 tailcone plugs have been introduced to restrict the exhaust area. Provision for carrying these plugs, which are jettisonable, will be made on all Mk 2A/C. The plug may be installed for any mission, but would probably be jettisoned prior to combat. It is only recorded in this report for a ferrying mission.

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1. Structure	Weight lb
a) Wings	
Elevators - allowance for slotting of surface, false rib, steel seal strip, T/Edge shear link etc. added	+ 4.36
Wing Weight Increase	+ 4.36
b) Fin & Rudder	
Rudder - surface slotted, false rib, steel seal strip T/Edge link etc added	+ 2.34
Fin & Rudder Increase	+ 2.34
c) Fuselage Fwd Sta 255 ins	
Canopy Arches - act wts. of seal fillet & jack support fittings	- 1.10
Lower Longeron - brackets added, hinges for circuit breaker panel on R.H. side etc.	+ 0.65
Upper Shear Panel - addn. of equip. Mtg. panel	+ 0.25
Air Intakes - minor prodn. drg. changes - repair scheme was already allowed for, now est. to drgs.	+ 0.13
Front Fuselage Decrease	- 0.07
d) Centre Fuselage Sta 255 - 485 ins	
No weight change	
e) Duct Bay Sta 485 - 591.65 ins	
No weight change	
f) Engine Bay Sta 591.65 - 742.5 ins	
Lower Longerons - Act. wt. of O/B long. & doublers, some hardware changes	- 1.45
Panels at Engine Access Doors - production drawing reissues	+ 0.34
Engine Rails & Attachments - actual wt of rails obtained	+ 0.61
Side Panel Fwd - production drawing reissues	+ 0.03
Top Longerons - actual weight of longerons	+ 0.13
Side Panel aft - actual wt. of 32% of structure obtained	- 0.01
Side Panel Centre - Prodn. drg. reissues and some actual wts	- 0.08
Engine Bay Decrease	- 0.43

		Weight lb
1.	Structure (Cont'd)	
	g) Rear Fuselage Sta 742.5 aft	
	Tailcones - addn. of two splice straps to former Sta 814	+ 0.90
	addn. of seal retainers etc.	+ 2.66
	Alterations to O/Skin capping to accomodate tailcone plug provisions	+ 0.44
	Addition of plug attachment fittings etc	+ 4.32
	Rear Fuselage Increase	+ 8.32
	h) Fuselage Joints	
	No weight change	
	Total Structural Increase	+ 14.52
2.	Landing Gear	
	Main Landing Gear - Leg assy. as supplied by Dowty for Mk 2 A/C was lighter than the original Mk 1 leg due to the proposed redesigned shortening mechanism. In view of recent developments Dowty inform us that the Mk 2 leg will be No lighter than the Mk 1. Hence the Mk 1 A/C Dowty leg assy. weight will be reverted to (Goodrich 170 lb / assy	+ 23.57
	Wheel tyre & brake assys have now been accepted, the weight was recorded in July 1st, 1958, issued of Wt Statement)	
	Total Landing Gear Increase	+ 23.57
3.	Power Plant & Services	
	Engines - Orenda have now quoted a weight of 4,800 lb for the PS13 Engine; 4,500 lb was the original brochure weight recorded in all weight statements to date. This wt of 4,800 lb is exclusive of input frame, nose bullet etc	+ 600.00
	Engine Accessory Equipment - allowances were made for misc. piping, adaptors, breather lines etc similar to those on J75 P5 Engines - some of these items are no longer necessary on PS13 engines	- 20.98
	Accessories Gear Boxes on Fuselage - Air-oil heat exchanges added (see also utility hydraulics D.B.)	+ 7.09
	Fire Extinguishing System - D.O. error in piping call-up	+ 0.71
	Fuel System - general reissues of Mk 2 prodn. drgs	+ 3.08
	Actual wt of air pressure reg. valve 5.13 lb each, Spec. wt was 3.25 lb hence (2 off)	+ 3.76
	Modifications to fuel no-air valves, to facilitate recovery of residual fuel*	+ 1.30

3. Power Plant & Services (Cont'd)		Weight lb
Fuel System - Cont'd		
Modification to tank #5, by addition of a sump etc to regain presently unusable fuel	+	24.80
N.B. * reference note for Residual Fuel in the Operational Load Group		
	Φ	
Total Power Plant Group Increase	+	619.76

N.B. Φ Weight recording of reports in this Group has been changed to agree with D.O. drawing "call-Up".

4. Flying Controls Group

No weight change.

5. Equipment Group

Utility Hydraulics D.B. - 2 x 110 cu in. accumulators deleted, replaced by one 200 cu. in. accum. in E.B. (see below)	-	30.00
Filter inst. & pressure control valve redesigned	-	6.05
2 Air-Oil heat exchangers deleted - similar exchangers now part of gear box system (see Engine Group)	-	5.63
General changes to the system	-	13.75
Utility Hydraulics E.B. - addition of 200 cu in accumulator (see above) piping rerouted etc	+	29.47
U/C Door Sequencing - the main U/C door sequencing system has been deleted, partially due to excessive weight	-	24.10
Main U/C Door Stops - these are small spring loaded stops, 2 per door located in the duct bay side skins, currently as a T.I.	+	3.02
Low Pressure Pneumatics - initial estimate to Mk 2 drawings deletion of differential pressure switch in E.B.	-	2.56
One probe on Fin, not 2 as in Mk 1 A/C	-	2.26
Misc. other changes to weight allowances	-	2.04

5. Equipment Group (Cont'd)

		Weight lb
Radio & Radar Remov. -	Weights quoted herein are to R.C.A.'s latest available wt breakdown of June 5th, 1958.	
	1950 I.R. Tracking Unit - deleted	-15.00
	1940 I.R. Servo Amp - Increased	+ 3.00
	1920 I.R. Control Assy - decreased	- 5.00
	1960 Demodulator - increased	+ 5.00
	6130 Target Data Display - increased	+11.00
	6120 Wind Data Display - increased	+ 2.00
	6100 Dead Reckoner - increased	+10.50
	5420 Remote Channel unit-added	+ 8.00
	5451 Rotary switch panel-added	+ 1.50
	Misc. other changes	- 5.52
	Total Change	+15.48 + 15.48
Radio & Radar Fixed -	latest R.C.A. list of Rack weights, previously rack for minature stable platform was omitted etc. etc.	+ 16.50
	Junction Box R2 - estimate based on that for Partial Astra on A/C 25206, but with all necessary ammendments made	+ 22.01
M.H. 64 Damping System -	larger rack for G limiter and mach & attitude amps	+ 1.70
Missile Pack Structure -	correction in D.O. error in Call-Up of track back-up structure	+ 1.59
	D.O. error in omitting shims from G.A.	+ 2.30
	Deletion of plug panel	- 0.24
	Misc. minor changes	+ 0.73
	Addition of fittings & stiffeners where necessary for mounting missile cocoons (see also Op. load)	+ 4.57
Missile Pack Hydraulics -	addition of 25 cu in accumulator and CSV103 check valve assy	+ 4.19
Missile Pack Mechanisms -	addition of cocoon release mechanism, operated off wing door mech	+ 4.00
Missile Pack Electronics Remov -	R.C.A. included a range slaving unit rack in error, now deleted in their latest statement	- 3.00
	Total Equipment Increase	+ 15.93

6. Trapped Fuel — Weight lb

Trapped Fuel - the figures established last month were considered unacceptable due to possible inaccuracies in the method of obtaining them. Now detailed estimates, partially supported by test rig results, reveal that the trapped fuel in the system is probably 213.8 lb. Hence a decrease in weight is shown here (372 lb July 1st, 1958). * - 158.20

Total Trapped Fuel Decrease - 158.20

7. Operational Load

Missile Cocoons - it is a requirement on a production pack that a protective covering shall enclose the missile, this is automatically jettisoned on lowering the missile. Two schemes are being considered a metal honeycomb and a moulded plastic structure (probably the heavier). The weight recorded here is preliminary estimate for the metal cocoons + 84.00

Residual Fuel - that fuel which is drainable but not usable. On July 1st the weight of this item was quoted from an experimental determination, however, due to possible inaccuracies in the method these figures have not been accepted. A figure of 304 lb has been established by calculation for the present fuel system configuration. However, it is proposed to modify the fuel system (ref Power Plant Group) to recover this fuel, thus at this date no residual fuel will be recorded. Hence the allowance from July 1st will be deleted. * - 285.00

Total Operational Load Decrease - 201.00

* See also note following the summary on Sheet 2-2.

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Summary

Wt. Change - Aircraft Basic Weight

Structure	+ 14.52
Landing Gear	+ 23.57
Power Plant	+ 619.76
Equipment	+ 15.93
Trapped Fuel	- 158.20
	+ 515.58

Wt. Change - Operational Load

Cocoons	+ 84.00
Residual Fuel	-285.00

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

Issue 21	Issue 22	
46,912.87	47,227.45	+314.58 lb

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Description	Weight lb	H. Arm ins	V. Arm ins
Structure	19,177.24	566.68	137.23
Wings	10,029.11	642.94	142.20
Fin & Rudder	1,041.35	753.96	208.83
Fuselage Fwd Sta 255 ins	2,589.47	184.57	128.60
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	1,573.64	659.68	110.73
Sta 742.5 ins aft	1,027.80	806.84	127.47
"Marry-Up"	42.64	466.91	109.85
Landing Gear - Retracted	2,681.98	489.14	135.04
Main Landing Gear	2,032.67	538.85	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	11,433.54	672.15	121.38
Engines Bare PS13	9,600.00	689.94	121.25
Engine Accessories (inlet frame etc)	303.04	607.92	119.29
Engine Controls	32.32	379.90	117.49
Gear Box & Drives on Fuselage	293.93	602.67	102.24
Gear Box Starter & Drives on Engine	305.20	614.82	105.66
Fire Extinguisher System	73.58	686.35	131.21
Engine Mountings	75.39	671.91	141.52
Fuel System	750.08	532.21	134.96
Flying Controls Group	1,932.21	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	9,124.22	331.09	114.20
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
Hydraulics Utilities System	631.57	503.07	118.31
Sequencing of Nose U/C Door	27.00	200.00	115.00
Mechanical Door Stops Main U/C Doors	3.02	516.00	120.00
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	50.08	394.63	126.02
Surface Finish	100.00	591.52	140.20
Intake De-icing Boots	88.00	195.82	118.00
Canopy Actuation	64.92	221.99	154.32
Cabin Consoles	17.28	174.66	124.33
Radar Door Actuation	10.00	268.00	95.00
MH64 Damping System	186.42	462.33	134.70
Radio & Radar Removable	2,110.48	212.15	108.86

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Description	Weight lb	H. Arm ins	V. Arm ins	M.A.C. %
Radio & Radar Fixed	880.04	216.54	114.59	
Sparrow Pack Structure	906.31	383.90	98.72	
Sparrow Pack Mechanisms	557.32	372.64	99.11	
Sparrow Pack Hydraulics	369.70	378.00	104.00	
Sparrow Pack Electronics Remov.	186.80	326.19	100.00	
Sparrow Pack Electric & Electronic 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	213.80	548.26	141.79	
U/C Up		544.43	128.38	
Aircraft Basic Weight	44,563.09			
U/C Down		546.71	124.59	
Useful Load (Less usable fuel)	2,664.36	363.22	101.81	
Crew	390.00	194.00	136.50	
Engine Fire Ext. Fluid	25.00	730.00	129.00	
Oil	138.97	636.92	110.57	
Oxygen Charge	13.39	259.68	159.91	
Water for Air Conditioning	285.00	267.91	131.56	
Missiles	1,728.00	389.29	88.30	
Missile Cocoons	84.00	390.40	85.80	
U/C Up		534.21	126.88	27.13
Operational Weight Empty	47,227.45			
U/C Down		536.38	123.30	27.73
Normal Combat Mission Fuel Φ (200 Nav. miles - 2290 gals at 7.8 lb/gal)	17,860.00	-	-	
Normal Gross Weight	65,087.45			
Half Combat Mission Fuel (1145 gals at 7.8 lb/gal)	8,930.00			
Combat Weight ($\frac{1}{2}$ mission fuel)	56,157.45	-	-	
Max. Internal Fuel * (2491 gals at 7.8 lb/gal)	19,433.00	541.85	144.16	
U/C Up		536.44	131.92	27.75
Gross Weight (Max. Int. fuel)	66,660.45			
U/C Down		537.97	129.38	28.17
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		536.61	127.67	27.80
Max.Gross Weight (Int + Ext Fuel)	71,154.81			
U/C Down		538.05	125.29	28.19

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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 November 19th, 1957. Centres of gravity have temporarily been omitted until a fuel sequencing system is finally established.

3) * The trapped and residual fuel figures have now been calculated in detail (see notes section 6 & 7 of Wt. change summary).

Previous figure trapped + residual	= 657 lb
Current est. for trapped fuel *	= 214 lb
Decrease in unusable fuel	= 433 lb

(* Residual fuel is now considered recoverable)

Hence since the trapped + residual fuel have decreased by approx. 433 lb, the usable fuel has increased by a similar smount, it being assumed that the total volume within the aircraft remains constant.

It is hoped, in the near future, to make an accurate check on the total volumes contained in each tank, currently only calculations are available.

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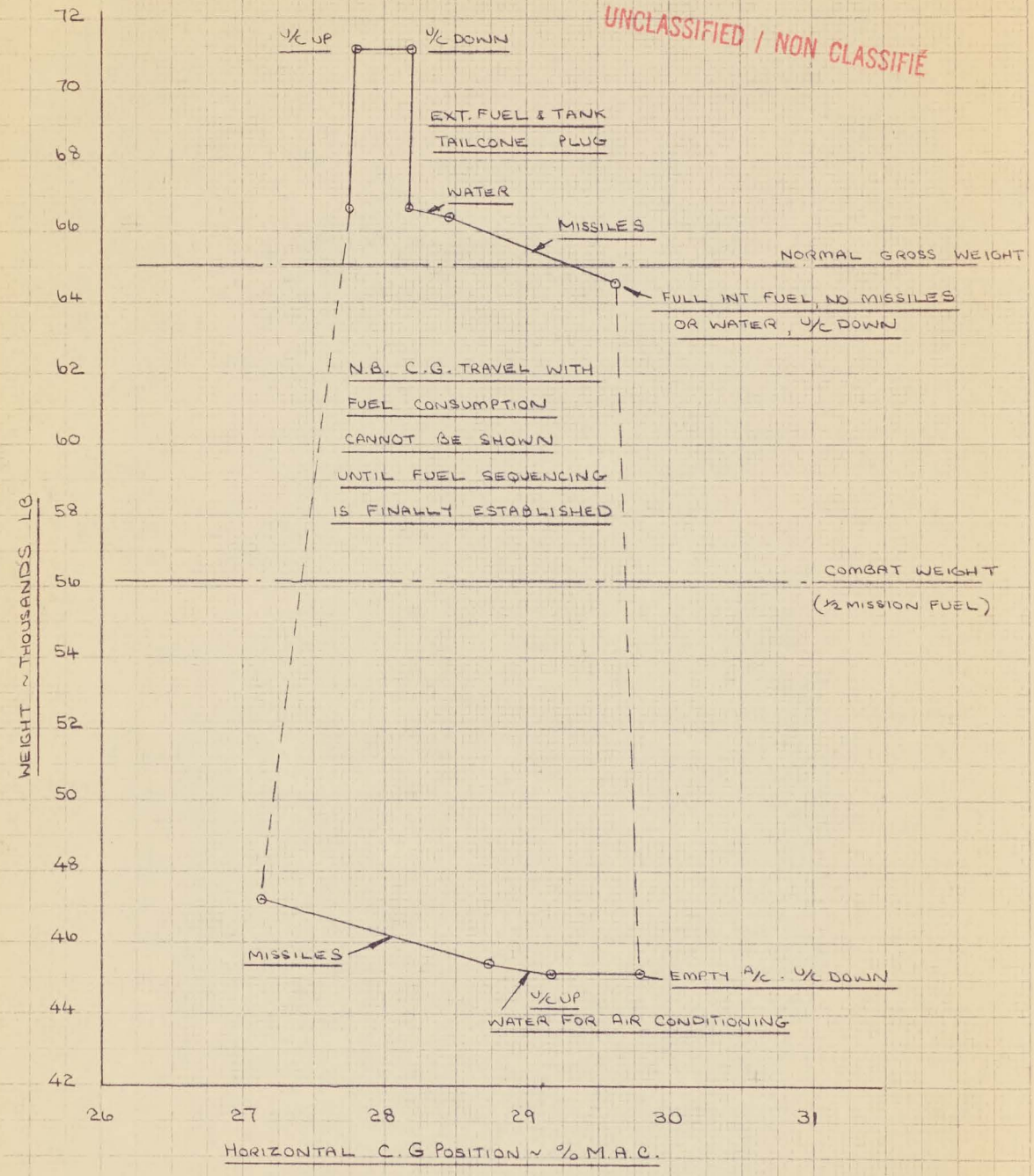
BY: Kathleen Griffin

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



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WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
FIN AND RUDDER GROUP	2000000			
13 FIN	2010000	83	85596	74
FIN TO WING MARRY UP	2010001		4830	68
FIN POD FOR IR TRACKER	2010002	83	1075	76
			91501	
94 RUDDER	2020000	84	12634	81
			12634	

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
	TOTAL FUSELAGE GROUP	3000000			
	RADAR NOSE STRUCTURE	3010000			
	RADOME	3010001	51	15958	
	RADAR NOSE STRUCTURE C A	3010002		2701	
	RADAR NOSE STRUCTURE R N	3010003	51	17032	
				33260	
	FRONT FUSELAGE STRUCTURE	3020000			
	SKIN F F	3020001	52	82641	
	COCKPIT FORMERS	3020002	52	104261	
	LOWER LONGERONS F F	3020003	52	68371	
38	TOP LONGERONS F F	3020004	52	187461	
66	NOSE U C SUPPORT STRUCT	3020005	52	33432	
	CREW BULKHEADS	3020006	52	126092	
	BULKHEAD STA 120	3020007	52	31101	
	BULKHEAD STA 255	3020008	52	109212	
	COCKPIT FLOOR	3020009	52	58811	
	SHEAR PANEL BELOW NAV ARCH	3020010	52	20262	
	MISC STRUCTURE F F	3020011	52	5521	
	LOWER SHEAR PANEL	3020012	52	31412	
22	CANOPY ARCHES	3020013	52	85532	
58	WINDSCREEN	3020014	52	131391	
				107548	
	CENTRE FUSELAGE STRUCTURE	3030000			
	SKIN C F	3030001	54	221123	
	FORMERS C F	3030002	54	287493	
5	BULKHEAD STA 485	3030003	54	127404	
66	LONGERONS C F	3030004	54	144534	
	STR BELOW LOWER LONGERONS	3030005	54	46502	
	RADAR ACCESS DOOR	3030006	54	24182	
	FWD DORSAL FAIRING	3030008	54	29692	
	DEFLECTOR SHIELD	3030009	54	20453	
	DORSAL OVER FUEL TANK	3030010	54	41384	
	PACK MTG. STRUCTURE	3030011	54	22802	
	SEALING MISSILE BAY	3030012	54	55929	
	MISC ITEMS C F	3030013	54	12163	
	ARAMENT BAY ROOF	3030014	54	124323	
	FUSELAGE FUEL TANK	3030015	54	226653	
	DUCT C F	3030016	54	318673	
	EQUIPMENT BAY STRUCTURE	3030017	54	59592	
				171252	
	DUCT BAY STRUCTURE	3040000			

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PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
	SKIN D B	30400015	56	62275	
5	FORMERS D B	30400025	56	73355	
	TOP LONGERONS	30400035	56	4985	
	MTG BRKTS SIDE PANEL	30400045	56	1905	
	LOWER LONGERONS	30400055	56	103015	
72	MAIN FRAME STA 538 77	30400065	56	59805	
	ACCESS PANELS	30400075	56	39595	
	LOWER PANEL ASSY	30400085	56	2175	
	DROP TANK MTG STRUCTURE	30400095	56	11335	
20	LOWER SIDE PANELS FWD	30400105	56	107125	
	LOWER CENTRE PANEL FWD	30400115	56	25615	
	LOWER SIDE PANELS AFT	30400125	56	66985	
	LOWER CENTRE PANEL AFT	30400135	56	25635	
	FLOATING DUCT D B	30400145	56	455555	
				103929	
	ENGINE BAY	30500000			
100	TOP LONGERONS	30500015	58	6746	
84	BOTTOM LONGERONS	30500025	58	84326	
	ENGINE ACCESS DOORS	30500035	58	136046	
	ENGINE TUNNEL	30500045	58	613246	
71	ENG RAILS ATTACH TO FORM	30500055	58	29066	
	PANELS AT ENG ACCESS DOORS	30500065	58	111176	
	BOTTOM CTR PANEL FWD	30500075	58	46106	
	BOTTOM CTR PANEL CENTRE	30500085	58	41206	
	BOTTOM CTR PANEL AFT	30500095	58	74227	
5	SIDE PANEL FRONT	30500105	58	86056	
5	SIDE PANEL CENTRE	30500115	58	74746	
32	SIDE PANEL AFT	30500125	58	74537	
4	HEAVY FORMERS	30500135	58	196236	
				157364	
	REAR FUSELAGE	30600000			
	SKIN OUTER FIXED R F	30600015	59	55797	
	FORMERS FIXED R F	30600025	59	105097	
	LONGERONS FIXED R F	30600035	59	25197	
	TUNNEL FIXED R F	30600045	59	106707	
	ENGINE ACCESS DOORS R F	30600055	59	88617	
	FAIRING UNDER RUDDER FIXED	30600065	59	28397	
	REMOV TAILCONES	30600075	59	513098	
	CENTRE STRUC STING REM R F	30600085	59	104948	
				102780	
	DIVE BRAKES	30700015	72	117905	
	D B JOINT TO FUSELAGE	30700025		4064	
				12196	

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WEIGHT AND C. OF G BY FUNCTIONAL C COMPONEN

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. A
UNDERCARRIAGE UP POSITION	4000000			
MAIN UNDERCARRIAGE GROUP	4010000			
MAIN UNDERCARRIAGE	4010100	92	203267	53
			203267	
80 MAIN U C DOORS FAIRINGS	4010200	62	28798	53
			28798	
NOSE UNDERCARRIAGE GROUP	4020000			
100 NOSE UNDERCARRIAGE	4020100	91	33381	17
			33381	
NOSE U C DOOR AND FAIRING	4020200	52	2752	16
			2752	

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WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	ENGINE GROUP	5000000			
	PS 13 ENGINES	5010000		9903046	8
				990304	
	ACC GEAR BOX ON FUS D B	5020001	56	52335	7
	ACC GEAR BOX ON FUS E B	5020002	58	23360	60
	ACC GEAR BOX ON FUS C A	5020003		8006	1
				29393	
	ENGINE CONTROLS	5030000			
	ENGINE CONTROLS F F	5030001	52	15761	6
	ENGINE CONTROLS C F	5030002	54	1092	6
	ENGINE CONTROLS E B	5030004	58	8896	6
	ENGINE CONTROLS I W	5030005	62	6585	2
				3232	
	STARTER AND GEARBOX	5040000			
	STARTER AND GEARBOX ENG	5040001		302156	1
	STARTER AND GEARBOX C A	5040002		3056	5
				30520	
	FIRE EXT SYSTEM	5060000			
	ENG FIRE EXT SYSTEM E B	5060001	58	59857	1
	ENG FIRE EXT SYSTEM D B	5060002	56	12315	6
	ENG FIRE EXT SYSTEM ENG	5060003		1426	7
				7358	
	ENGINE MTGS AND BRACKETS	5070000			
	ENGINE MOUNTS	5070001		75396	7
				7539	
	FUEL SYSTEM	5080000			
19	FUEL SYSTEM C F	5080001	54	99624	0
18	FUEL SYSTEM D B	5080002	56	157355	3
4	FUEL SYSTEM E B	5080003	58	18366	1
39	FUEL SYSTEM I W	5080004	62	472805	5
	FUEL SYSTEM ENG	5080005		1956	8
				75008	

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	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	FLYING CONTROLS GROUP	6000000			
	MECHANICAL CONTROLS	6010000			
60	MECHANICAL CONTROLS F F	6010001	52	107131	6
	MECHANICAL CONTROLS C F	6010002	54	12903	9
70	MECHANICAL CONTROLS FIN	6010005	83	125287	8
71	MECHANICAL CONTROLS I W	6010006	62	401357	1
80	MECHANICAL CONTROLS O W	6010007	64	305207	7
	MECHANICAL CONTROLS C A	6010008		6637	0
				95849	
	FLYING CONTROLS HYDRAULICS	6020000			
	FLYING CONT HYDRAULICS D B	6020001	56	31845	6
	FLYING CONT HYDRAULICS E B	6020002	58	398536	4
	FLYING CONT HYDRAULICS R F	6020003	59	487	5
80	FLYING CONT HYDRAULICS I W	6020004	62	26264	0
74	FLYING CONT HYDRAULICS O W	6020005	64	11701	4
60	FLYING CONT HYDRAULICS FIN	6020006	83	5406	6
	FLYING CONT HYDRAULICS R N	6020007	51	3500	1
	FLYING CONT HYDRAULICS F F	6020008	52	5506	6
	FLYING CONT HYDRAULICS C F	6020009	54	1920	7
				97382	

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PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	FIXED EQUIPMENT GROUP	7000000			
	INSTRUMENTS	7010000			
	INSTRUMENTS	701000152		440716	
	NAVIG TABLE AND STOWAGE	701000452		20022	
				4607	
	COCKPIT SEALING	7020000052		50018	
				500	
	OXYGEN SYSTEM	7030000			
	OXYGEN SYSTEM	703000152		260724	
				2607	
	AIR CONDITIONING SYSTEM	7040000			
	AIRCONDITIONING SYSTEM F F	704000152		311517	
	AIRCONDITIONING SYSTEM C F	704000254		5241028	
	AIRCONDITIONING SYSTEM D B	704000356		103451	
	AIRCONDITIONING SYSTEM C A	70400005		2832643	
	AIRCONDITIONING SYSTEM ENG	70400006		145367	
	AIRCONDITIONING SYSTEM I W	704000762		7152	
				86409	
	HYDRAULICS MAIN SYSTEM	7050000			
14	UTILITY HYDRAULICS F F	705000152		841520	
6	UTILITY HYDRAULICS C F	705000254		436243	
15	UTIL&TY HYDRAULICS D B	705000356		2179554	
68	UTILITY HYDRAULICS E B	705000458		1083960	
30	UTILITY HYDRAULICS I W	705000562		1444155	
14	UTILITY HYDR. NOSE U C	705000691		32519	
30	UTILITY HYDR MAIN U C	705000792		298054	
	ANTI SKID SYSTEM C F	705000854		313447	
	ANTI SKID SYSTEM MUC	705000992		63451	
	NUC AND MUC DOOR SEQ MECH	705001 0		27002 0	
				69625	
	MUC DOOR STOPS	706000056		30251	
				302	
	CABIN INSULATION	7070000052		143118	
				1431	

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	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	BRAKE PARACHUTE	7080000			
	BRAKE PARACHUTE F F	708000152		455	16
	BRAKE PARACHUTE R F	708000559		8528	82
	BRAKE PARACHUTE I W	708000662		1246	62
				9107	
	ELECTRICAL SYSTEM	7090000			
	ELECTRICAL WIRING R N	709000151		129	9
	ELECTRICAL WIRING F F	709000252		2966	19
	ELECTRICAL WIRING C F	709000354		2354	39
	ELECTRICAL WIRING A I	709000455		1274	21
	ELECTRICAL WIRING D B	709000556		9015	52
	ELECTRICAL WIRING E B	709000658		64	59
	ELECTRICAL WIRING I W	709000862		9236	53
	ELECTRICAL WIRING FIN	709000983		352	79
	ELECTRICAL WIRING NUC	709001091		330	18
	ELECTRICAL WIRING ENG	70900011		2002	60
	ELECTRICAL WIRING C A	70900012		13746	33
	ELECTRICS F F	709001352		1524	81
	ELECTRICS C F	709001454		870	94
	ELECTRICS E B	709001558		67	06
	ELECTRICS ENG	70900016		1877	25
	ELECTRICS C A	70900017		71	86
	ELECTRICS FIN	709001883		83	89
	ELECTRICS I W	709001962		2336	62
	ELECTRICS CAW	70900020		112	62
	ELECTRICS MUC	709002192		74	51
20	ELECTRICS A I	709002255		4900	22
	ELECTRICS D B	709002356		3005	15
	ELECTRICS R F	709002459		136	80
	WINDSCREEN DEMISTING	709002552		3564	19
				12684	1
	L P PNEUMATICS	7100000			
	L P PNEUMATICS F F	710000152		1993	19
	L P PNEUMATICS C F	710000254		796	32
	L P PNEUMATICS FIN	710000583		414	74
	L P PNEUMATICS R N	710000651		199	7
	L P PNEUMATICS ENG	71000008		1403	63
	L P PNEUMATICS I W	710000962		203	52
				5008	
	INTAKE DE ICING	712000055		8800	19
				8800	
	RADIO AND RADAR FIXED	7140000			

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
REMOVABLE EQUIPMENT GROUP	8000000			
94 EJECTOR SEATS	80101005 2		34294	20
			34294	
RADAR REMOVABLE	8020100			
RADAR REMOVABLE R N	80201015 1		101895	9
RADAR REMOVABLE F F	80201025 2		20755	18
RADAR REMOVABLE C F	80201035 4		68745	27
RADAR REMOVABLE D B	80201045 6		55505	5
RADAR REMOVABLE F I N	80201058 3		37007	4
RADAR REMOVABLE C A	8020106		38335	5
RADAR REMOVABLE E B	80201075 8		64007	3
RADAR REMOVABLE I W	80201086 2		17041	
			211048	
DAMPING SYSTEM	8030000			
DAMPING SYSTEM F F	80301015 2		78417	
DAMPING SYSTEM C F	80301025 4		24733	1
DAMPING SYSTEM E B	80301035 8		3696	3
DAMPING SYSTEM F I N	80301046 2		60705	3
DAMPING SYSTEM O W	80301056 4		9574	
DAMPING SYSTEM R N	80301065 1		287	7
DAMPING SYSTEM C A	8030107		85644	7
			18642	
SPARROW PACK	8050000			
SPARROW PACK STRUCTURE	80501009 4		90631	38
			90631	
SPARROW PACK MECHANISMS	80502009 4		55732	37
			55732	
21 SPARROW PACK HYDRAULICS	80503009 4		36970	37
			36970	
SP PACK ELECTRONICS FIXED	80504009 4		18873	33
			18873	

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PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
SP PACK ELECTRONICS REMOV	8050500	94	18680	32
			18680	
SPARROW PACK PNEUMATICS	8050600	94	2445	38
			2445	
MISSILE AIRCONDITIONING	8070000	94	521	30
			521	
COCKPIT EQUIPMENT	8080000	52	600	18
			600	

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
OPERATIONAL LOAD	9000000			
CREW MEMBERS	901000052		39000	19
			39000	
ENGINE OIL	9020000			
ENGINE OIL DRAINABLE	9020001		92906	5
ENGINE OIL TRAPPED ENG	9020002		17736	3
ENGINE OIL TRAPPED D B	902000356		19255	8
ENGINE OIL TRAPPED E B	902000458		9095	9
			13897	
SPARROW MISSILES	903000094		172800	38
			172800	
DISPOSABLE COCOONS	904000094		8400	39
			8400	
OXYGEN CHARGE	9050000			
OXYGEN CHARGE F F	905000152		72	20
OXYGEN CHARGE C F	905000254		1267	26
			1339	
ENGINE FIRE EXT FLUID	9060000		2500	73
			2500	
TRAPPED FUEL	9080000			
TRAPPED FUEL C F	908000154		2430	41
TRAPPED FUEL D B	908000256		690	49
TRAPPED FUEL I W	908000362		18260	56
			21380	
WATER FOR AIR CONDITIONING	910000054		26000	26
UNUSABLE WATER FOR AIRCOND	910000154		2500	26
			28500	