

QC
Avro
CF105
R-7-0400-44
Iss-10

QCX
Avro
CF105
R-7-0400-44
Iss-10

FILE IN VAULT

C-105 MK 1 With Report # 7-0400-44
J75 P3 Engines Iss. 10
WEIGHT & C.G. SUMMARY
R.C.A.F. **SECRET** Oct. 1/57



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DATE
JAN 07 1993

Report no.: QCX - AVRO - CF105 - R-7-0400-44-155-10

has been ☐ downgraded to: _____

☒ de-classified

by (Name): Michel W. Drapeau

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

Date: Dec. 7, 1992

R. Auger
Signature

Date: September 1st, 1957
Aircraft: C-105 MK 1 with
J75 P3 Engines

~~SECRET~~
UNCLASSIFIED
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NON CLASSIFIED

I N D E X

<u>Sheet # 1</u>	<u>Content</u>
1-1 to 1-4	Introductory notes and explanations of Weight Changes.
2-1 to 2-2	Weight & C.G. Summaries.
3-1	Horizontal C.G. Envelopes for Flight conditions with fuel proportioners used.
4-1 to 4-15	I.B.M. Detail Sheets of Weights & C.G.'s.
<u>N. B.</u>	The C.G. Envelope for the 1st Aircraft with fuel sequencing has been omitted until a fully approved sequencing is established.

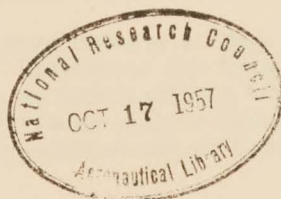
Classification cancelled / changed to: UNCLASSIFIED

By authority of: DRDA 7/DARFT 5-8/DAS Eng 6-4-5

Date: 5 Nov 1992

Signature: *D. Aubrey*

Unit / Rank / Appointment: DSIS 3, Secretary CRAD HQ DRP



49777

Date: October 1st, 1957
Aircraft: C-105 MK 1 with
J75 P3 Engines
1st Aircraft.

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INTRODUCTION & WEIGHT CHANGES

The following is a Weight & C. G. Summary for the 1st C-105 Aircraft, with J75 P3 Engines, based on the latest information currently available. All weight and C.G. changes are relative to Issue 9 of September 1st, 1957.

- Note: 1) This Summary does not apply for the 2nd and subsequent MK 1 Aircraft see context below.
- 2) This Summary is for the 1st Aircraft complete to drawings and not necessarily in the condition for first flight, since there may be some shortages in non-essential equipment, some flight test installations will probably be incomplete etc. A statement for 1st Flight will be issued later.

GENERAL

- a) Pratt & Whitney J75 P3 Engines comprise the Power Plant for the 1st Aircraft. J75 P5 Engines, which are partially redesigned versions of the P3 Engines are to be installed on the 2nd and subsequent MK 1 Aircraft.
(J75 P3 Engines = 6,175 lb each; J75 P5 Engines = 5,950 lb each).

- b) An Instrument Package carrying Flight Instrumentation is installed, this also varies, the package for A/C's No. 1 to 3 differing from those for A/C's No. 4 and 5 (which are to be used for Astra 1 Trial Installations.)

A relatively detailed estimate of other Flight Test Installations throughout the Aircraft has been made. Twin shielded wire at 27 lb/1000 ft is used, there being approximately 250 monitored points. These installations amount to 1,323 lb (figure partially confirmed by actual weights of cable assys.).

- c) Emergency lowering for the Undercarriages and additional fire protection, to be installed in the 1st Aircraft, are allowed for in the summary. There is no provision to jettison any or all of the Instrument Package in an emergency.
- d) An Interim Radio & Radar System, with Minneapolis-Honeywell MH 64 Damping System is installed.
- e) It should be noted that due to material substitutions and concessions introduced by Planning & Production Departments there is a structural weight penalty of 203 lb to-date. This is all recorded in the structural weight breakdown. No account has been taken of variations on machinings etc. nor of shop repair schemes, since it is impossible to assess these, except where actual weights have been obtained.
- f) Pending Flight Test requirements a "Buzz Damping" System may be installed, on the first Aircraft. Provisions for this installation are already included in the structural group as modifications to the Control Boxes. For the first flight the control surfaces will be unmodified, however, if the need for Dampers is proven, a modified set of Control Surfaces will be made available.

Date: October 1st, 1957
Aircraft: C-105 MK 1 With
J75 P3 Engines
1st Aircraft.

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INTRODUCTION & WEIGHT CHANGES

GENERAL

f) (Cont'd.)

The following weight penalties ensue:

Ailerons	+ 11.68 lb/A/C
Elevators	+ 11.07 lb/A/C
Rudder	+ 8.78 lb
Equipment & Installation	+ 123.97 lb
	+ 155.50 lb

- g) A considerable number of Actual Weights have now been obtained. Structural weights are checking within 0.5% of estimates on sub-assemblies etc. However, equipment (excluding Engines and Gear Boxes) shows a consistent increase averaging about 11% over manufacturer's quotations or initial specification weights. Preceding the report titles on the I.B.M Tabulation Sheets, will be found a number varying from 0 to 100, this is the percentage of actual weight recorded within the report.

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

Structure	71.32%
Undercarriage	67.21%
Power Plant	92.71%
Flying Controls	47.59%
Equipment	34.59%

i.e. 69.33% of the Basic Weight of the 1st Aircraft.

- h) The Aircraft is ballasted such that the C.G. on a flight envelope (using fuel proportioners) does not travel aft of 31.0% M.A.C.
For first flight the Aft restriction is 30% M.A.C.- this may be achieved by maximum ballast.
C.G. Envelopes showing fuel sequencing have currently been omitted until a fully approved sequencing is established.

1. STRUCTURE

a) Wing:

WEIGHT (lb)

No Weight Change.

b) Fin & Rudder

No Weight Change.

Date: September 1st, 1957
Aircraft: C-105 MK 1 with
J75 P3 Engines
1st Aircraft.

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INTRODUCTION & WEIGHT CHANGES

1. STRUCTURE (Cont'd)

<u>c) Fuselage Fwd. Sta. 255"</u>	<u>WEIGHT (lb)</u>
Cockpit Floor - Production Drawing re-issues, addition of systems bracketry etc.	+ 1.61
Canopy Arches - some actual weights of fittings etc.	= 0.74
Navigator's Canopy - Actual Weights obtained.	+ 9.80
<u>WEIGHT INCREASE FRONT FUSELAGE</u>	<u>+ 10.67</u>
 <u>d) Centre Fuselage Sta. 255" - 485"</u>	
No Weight Change	
 <u>e) Duct Bay Sta. 485" - 591.65"</u>	
No Weight Change	
 <u>f) Engine Bay Sta. 591.65" - 742.5"</u>	
Lower Longerons - actual Weight obtained	= 0.63
<u>WEIGHT DECREASE ENGINE BAY</u>	<u>= 0.63</u>
 <u>g) Rear Fuselage Sta. 742.5" Aft.</u>	
Centre Fairing & Stinger - actual weight obtained	+ 1.26
<u>WEIGHT INCREASE REAR FUSLAGE</u>	<u>+ 1.26</u>
 <u>TOTAL STRUCTURAL INCREASE</u>	<u>+ 11.30</u>

2. LANDING GEAR

No Weight Change.

3. POWER PLANT & SERVICES

Fuel System - Actual Weight of pumps in the collector tanks (were manufacturer's quotes)	+ 8.00
Production drawings of filter installation	+ 2.50
Addition of collector tank vent extractor	+ 1.70
Miscellaneous other changes	+ 1.68
 <u>TOTAL POWER PLANT & SERVICES INCREASE</u>	<u>+ 13.88</u>

4. FLYING CONTROLS GROUP

Mechanical Flying Controls - addition of emergency release mechanism aft attach. elevator feel and trim unit	+ 2.94
Alterations to rudder feel and trim	= 0.71
Stick force transmitter added.	+ 0.33

continued.

Date: September 1st, 1957
Aircraft: C-105 MK 1 A/C with
J75 P3 Engines
1st Aircraft.

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INTRODUCTION & WEIGHT CHANGES

<u>4. FLYING CONTROLS GROUP (Continued.)</u>	<u>WEIGHT (lb)</u>
Hydraulic Flying Controls I/Wing - actual weights of complete elevator jack assys.	+ 16.66
Hydraulic Flying Controls O/Wing - Actual Weight of complete aileron jack assys.	- 6.30
<u>TOTAL FLYING CONTROLS GROUP INCREASE</u>	<u>+ 12.92</u>
<u>5. EQUIPMENT GROUP</u>	
Low Pressure Pneumatics - re-routing of piping, alterations to Fin pitot heads etc.	+ 1.24
Air Conditioning - fuel pressurization outlet added	+ 3.05
Actual weights of some equipment	+ 2.08
Utility Hydraulics F.F. - minor changes, some equipment weighed	- 0.03
Utility Hydraulics C.F. - some equipment weighed	+ 1.10
Utility Hydraulics D.B. - Addition of surge damping accumulator	+ 3.70
Actual weights of some parts	+ 1.55
Miscellaneous alterations	+ 3.24
Electrics Air Intakes - Actual Weight of De-icing Controller	+ 2.13
Brake Parachute - Manufacturer now quoting their actual weight, previously their estimate was recorded	+ 28.40
Flight Test Installations - Production Drawing estimates of Installations in Duct & Engine Bays completed	+ 1.22
<u>TOTAL EQUIPMENT GROUP INCREASE</u>	<u>+ 47.68</u>

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+ 11.30 lb
Power Plant	+ 13.88 lb
Flying Controls	+ 12.92 lb
Equipment	+ 47.68 lb
	<u>+ 85.78 lb</u>

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

UNBALLASTED CONDITION

Issue 9

47,673.51 lb

Issue 10

47,759.29 lb = + 85.78

N.B. If Aircraft Ballasted such that the C.G. in any flight envelope (excluding some suggested fuel sequencings) does not exceed 31% M.A.C. a further 959 lb of ballast are necessary.

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Aircraft: C-105 MK 1 with
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WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT lb	H. ARM ins.	V. ARM ins.
STRUCTURE	18,531.50	561.88	137.56
Wings	9,959.46	642.86	142.25
Fin & Rudder	1,025.85	754.34	209.31
Fuselage: Fwd. Sta. 255"	2,630.03	181.62	128.25
Sta. 255"-485"	1,650.12	379.76	130.80
Sta. 485"-591.65"	998.59	534.01	104.59
Sta. 591.65-742.5	1,428.53	661.00	107.32
Sta. 742.5 Aft	786.34	800.61	129.05
"Marry-up"	52.58	468.91	103.89
UNDERCARRIAGE - Retracted	2,609.85	488.48	134.94
Main Undercarriages	1,959.62	539.48	141.00
Main U/C Doors & Fairings	291.88	536.80	138.48
Nose Undercarriage	333.81	170.81	99.70
Nose U/C Door & Fairing	24.54	162.24	88.23
POWER PLANT & SERVICES	14,365.59	652.98	120.35
Engines & Accessories J75 P3	12,562.29	664.92	119.78
Gear Box Installation on Fuselage	275.54	601.39	102.98
Gear Box & Starters on Engines	259.65	591.55	104.52
Engine Controls	32.43	375.76	118.62
Engine Nose Bullets	71.01	562.74	115.07
Fire Extinguishing System	65.46	700.45	134.21
Engine Mountings	206.21	635.04	127.71
Fuel System	893.00	536.67	136.12
FLYING CONTROL GROUP	1,857.18	686.26	139.66
Mechanical Flying Controls	949.04	687.85	148.43
Hydraulic Flying Controls	908.14	684.60	130.50
EQUIPMENT FIXED & REMOVABLE	9,412.21	403.04	112.92
Instruments	46.07	163.68	138.70
Probe	15.00	-38.14	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Ejector Seats	284.42	202.80	136.25
Oxygen System	23.59	253.72	156.43
Air Conditioning System	812.41	335.87	134.32
Surface Finish	100.00	591.52	140.20
Hydraulics Main System	638.84	504.20	117.72
Cabin Insulation	14.31	187.48	132.00
Brake Parachute	90.78	786.65	143.16
Electrical System	1,113.23	418.50	112.83
Low Pressure Pneumatics	54.39	432.75	129.22
Intake De-icing Boots	51.84	197.02	118.00
Canopy Actuation	64.92	221.99	154.35
Cabin Consoles	17.45	174.76	124.34
MH 64 Damping System	139.13	449.26	135.57
Interim Radio & Radar	642.98	301.79	120.28
Radome Anti-icing	8.88	51.49	125.00
Instrument Pack Structure	686.80	385.81	94.68
Pack Instrumentation 1st A/C	3,036.00	395.45	95.00
		continued.	

Date: October 1st, 1957
Aircraft: C-105 MK 1 with
J75 P3 Engines

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WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT lb	H. ARM ins.	V. ARM ins.	M.A.C. %
Equipment (Fixed & Removable) (Continued)				
Flight Test Installations	1,324.09	500.54	129.75	
Additional Fire Protection 1st A/C	154.17	425.05	102.89	
Emergency Landing Gear Lowering	12.91	458.83	128.60	
Emergency Ram Air Turbine	75.00	265.00	100.00	
AIRCRAFT BASIC WEIGHT	46,776.33	558.74	127.25	
USEFUL LOAD (less Fuel)	983.02	353.44	132.63	
Crew	430.00	194.00	136.50	
Alcohol - radome de-icing	22.00	93.00	138.00	
Engine Fire Extinguishing Fluid	25.00	730.00	129.00	
Residual Fuel	218.40	553.98	134.04	
Oxygen Charge	13.39	259.69	159.91	
Water for Air Conditioning	140.00	268.00	132.00	
Oil	134.23	608.92	115.68	
BALLAST	959.00	86.60	116.50	
Operational Weight Empty	U/C Up 48,718.35	545.30	127.13	30.19
	U/C Down	547.31	123.80	30.75
Maximum Internal Fuel (2,544 gal. @ 7.8 lb/gal.)	19,843.00	538.88	144.32	
A.U.W. Maximum Internal Fuel	U/C Up 68,561.35	543.44	132.11	29.68
	U/C Down	544.87	129.74	30.07

- N. B. 1) A/C Datum is considered to be 120" above an arbitrarily chosen ground line.
- 2) The above figures are for the Aircraft in the BALLASTED Condition such that the Aft C.G. on the horizontal C.G. Envelope does not exceed 31% M.A.C. i.e. 303 lb on Former Sta. 68.5 and 656 lb on the Shear Panel.

REPORT NO. 7-9402-44-10

BY: Kathleen Gaffin

DATE: Oct 15, 1957

SHEET: 3

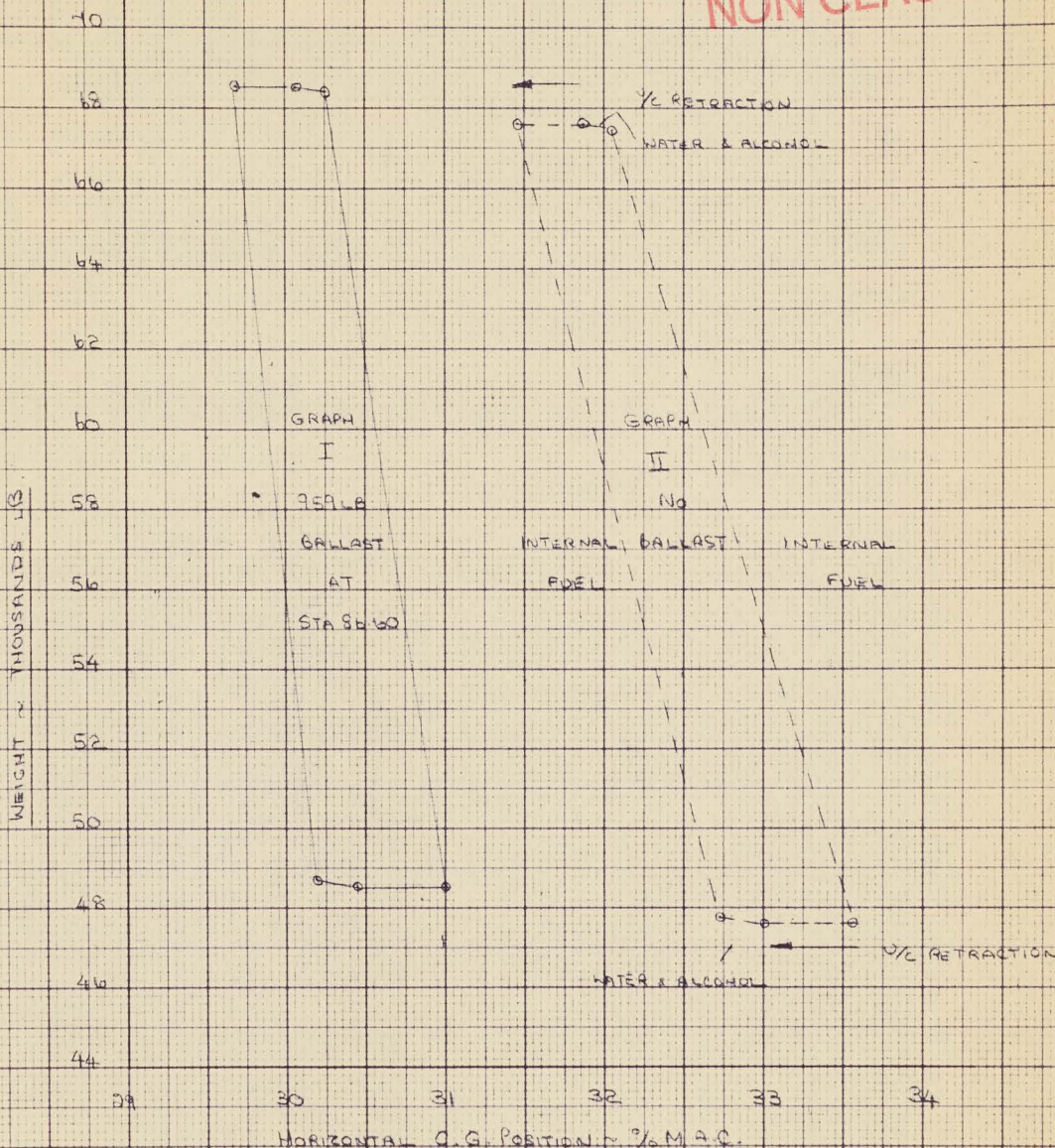
HORIZONTAL C.G. ENVELOPE

0.05 MK 1 1/2 NORMAL FLIGHT CONDITION

FOR 1ST A/C (1ST FLIGHT DIFFERS)

FUEL SYSTEM PROPORTIONERS USED

UNCLASSIFIED
NON CLASSIFIED



G9-12
10 X 10 TO THE 1/2 INCH
MADE IN CANADA

AVRO AIRCRAFT LTD.

MALTON, ONT.

C-100 MK 1

PROJECT

WEIGHT AND C. OF G BY

FUNCTIONAL COMPONENT

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H.
	TOTAL WING GROUP	10000000			
	OUTER WING	10100000			
100	OUTER WING SKINS	10100001	64	9291070	
100	POSTS AND INTERCOSTALS	10100002	64	243673	
100	OUTER WING SPARS	10100003	64	3925870	
100	OUTER WING RIBS	10100004	64	1345669	
98	AILERON CONTROL BOX	10100006	64	3753077	
100	RIB 12	10100007	64	762664	
100	O W AILERON JACK FITTING	10100009	64	104672	
	AILERON JOINTS AND FAIRING	10100010		329378	
	BUZZ DAMP STRUC PROV O W	10100011	64	80075	
				198355	
	AILERON	10200000			
100	AILERON STRUCTURE	10200001	74	3360079	
				33600	
97	ELEVATOR	10300000	82	4490075	
97	ELEVATOR MARRY UP	10300000		159773	
				46497	
	INNER WING	10400000			
96	MAIN U C STRUCTURE	10400001	62	3307157	
100	FRONT SPAR I W	10400002	62	1111048	
100	MAIN SPAR I W	10400003	62	1510656	
100	FWD CENTRE SPAR I W	10400004	62	536460	
100	AFT CENTRE SPAR I W	10400005	62	366665	
100	REAR SPAR I W	10400006	62	766770	
94	I W STRUCTURE F S TO M S	10400007	62	10591849	
100	STRUCTURE MS TO R S	10400008	62	1497960	
100	STRUCTURE AFT OF REAR SPAR	10400009	62	3221271	
40	ELEVATOR CONTROL BOX	10400010	62	4283872	
25	TRANSP JOINT MARRY UP	10400011		706563	
100	INNER WING JOINTS	10400012	62	6347166	
100	SKINS M S TO R S	10400013	62	21903862	
100	STRUT PICK UP FITTINGS	10400014	62	539156	
100	RIBS 1 TO 9 INNER WING	10400016	62	5120461	
	DORSAL FAIRINGS I W	10400017	62	9548	
100	RIB 10	10400018	62	1080063	
77	FUSELAGE HINGE JOINT	10400019	62	1262861	
65	TRANSPORT JOINT O W TO I W	10400020	62	1294263	
42	FUSELAGE HINGE JOINT	10400021		374052	
	BUZZ DAMP STRUC PROV I W	10400022	62	55274	
	DORSAL FAIRINGS	10400023		562957	
				664486	

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WEIGHT AND C. OF G BY FUNCTIONAL COMPOSE

PROJECT _____

[illegible]

PROJECT

WEIGHT AND C. OF G BY

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
TOTAL FUSELAGE GROUP		30000000			
FUSELAGE BASIC STRUCTURE		30100000			
	RADOME	30100001	51	17728	1
100	RADAR NOSE ACCESS DOORS	30100002	51	8000	1
	RADAR NOSE STRUCTURE	30100003	51	12454	1
	SKIN F F	30100004	52	10949	1
88	SKIN C F	30100005	54	21182	37
	SKIN D B	30100006	56	5880	51
3	SKINS E B	30100007	58	17573	66
4	FORMERS F F	30100011	52	10531	18
100	FORMERS C F	30100012	54	27824	37
	FORMER D B	30100013	56	7457	51
	LIGHT FORMERS E B	30100014	58	13501	66
64	HEAVY FORMERS E B	30100015	58	21582	66
	LOWER LONGERONS F F	30100016	52	6846	18
	LONGITUDINAL MEMBERS E B	30100017	58	11067	0
75	LOWER LONGERON E B	30100018	58	6842	68
	TOP LONGERONS E B	30100019	58	6386	66
	LOWER SHEAR PANEL	30100020	52	2988	22
	TOP WING LONGERONS D B	30100021	56	4985	1
	LONGERONS C F	30100022	52	532	1
	LONGERONS C F	30100023	54	1381	34
43	LONGERONS F D B	30100024	54	1258	48
43	LONGERONS A D B	30100025	56	8655	58
	ELECTRONICS BAY STRUCTURE	30100026	54	3570	2
59	LONGITUDINAL BEAMS D B	30100027	56	6570	5
	RADAR ACCESS DOOR C F	30100028	54	2108	2
72	MAIN FRAME AT STN 538 77	30100029	56	5980	5
	DIVE BRAKE ACCOM STRUCTURE	30100030	56	3634	5
30	TOP LONGERONS F F	30100031	52	1864	21
100	DUCT C F	30100032	54	3328	63
97	DUCT D B	30100033	56	3163	35
22	CANOPY ARCHES	30100034	52	8461	2
4	ACCESS PANEL STIFFNERS	30100036	56	3865	5
66	NOSE U C SUPPORT STRUCTURE	30100037	52	3343	2
3	CREW BULKHEADS	30100038	52	1227	28
51	EQUIPMENT BAY STRUCTURE	30100039	54	6150	2
86	WINDSCREEN	30100041	52	1300	31
33	SERVICE ACCESS DOORS	30100042	58	6704	6
	TORSION BOX E B	30100043	58	6042	6
	DORSAL FAIRING AIR OUTLET	30100044	54	2061	2
66	INTERMEDIATE FORMERS	30100045	58	5154	6
	ENGINE ACCESS DOORS	30100046	58	1465	96
	SEALING MISSILE BAY	30100047	54	6973	3
100	MISCELLANEOUS ITEM C F	30100048	54	3923	3
98	ARMAMENT BAY ROOF	30100049	54	1321	63
	BULKHEAD AT STA 120	30100050	52	3060	1
	BULKHEAD AT STA 255	30100051	52	1042	92
100	BULKHEAD AT STA 485	30100052	54	1124	54
13	ENGINE TUNNEL	30100054	58	4757	26

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WEIGHT AND C. OF G BY FUNCTIONAL
COMPONE

PROJECT _____

DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H
INTEGRAL FUS FUEL TANK		301005554		20359	39
COCKPIT FLOOR		301005652		5904	17
CENTRE BEAM 697 28 717 36		301005958		557	71
DORSAL OVER FUEL TANK		301006154		5097	41
SHIELD EXHAUST DEFLECTOR		301006254		1965	33
SHEAR PANEL BELOW NAV ARCH		301006352		2074	25
34	PACK MTG STRUCTURE	301006454		2047	29
88	ENG ACCESS DOORS R F	301006559		8457	77
99	TUNNEL FIXED R F	301006659		10403	77
100	SKIN AND STIFFENERS R F	301006759		5122	77
100	FAIRING UNDER RUDDER R F	301006859		2616	79
100	FORMERS FIXED R F	301006959		9001	77
100	LONGERONS C BEAM FIXED R F	301007059		2799	77
NACELLES REMOVABLE R F		301007159		2847	682
100	CNTR STRUC STING REMOV R F	301007259		11760	83
MISCELLANEOUS ITEMS E B		301007358		923	66
MTG BRKTS SIDE PANEL D B		301007556		213	52
FORMERS LOWER PANEL D B		301007656		7606	54
LOWER PANEL D B		301007756		5054	55
JOINT F F TO C F		3010078		855	25
JOINT AIR INTAKES TO F F		3010079		952	22
JOINT C F TO D B		3010080		500	48
JOINT D B TO E B		3010081		2508	58
FUS JOINT AT STA 742 50		3010082		443	74
MISC STRUCTURE F F		301008552		552	18
				6273	64
96	DIVE BRAKES	302000072		11150	50
96	DIVE BRAKES C A	3020001		406	48
				115	56
AIR INTAKES		3030000			
18 AIR INTAKES		303010055		7624	821
				7624	8
PILOTS AND NAVIG CANOPIES		3040000			
76 PILOTS CANOPY		304010053		24154	17
				24154	
100	NAVIGATORS CANOPY	304020053		15297	23
				15297	

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WEIGHT AND C. OF G BY FUNCTIONAL
COMPONENT

PROJECT _____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
ENGINE GROUP	5000000			
99 ENGINE J 75	5010000		1252707	66
			1252707	
J 75 ENGINE SERV ACCESS	5010100		3522	63
			3522	
68 ACC GEAR BOXES ON FUS D B	5020001	56	4524	57
68 ACC GEAR BOXES ON FUS E B	5020002	58	23030	60
			27554	
ENGINE CONTROLS	5030000			
36 ENGINE CONTROLS F F	5030001	52	1458	16
36 ENGINE CONTROLS C F	5030002	54	2643	30
36 ENGINE CONTROLS D B	5030003	56	5084	9
36 ENGINE CONTROLS E B	5030004	58	1013	63
			3243	
91 GEARBOX AND STARTER ON ENG	5040000		25965	59
			25965	
6 ENGINE ANTI ICING	5050000		7101	50
			7101	
FIRE EXT SYSTEM	5060000			
55 FIRE EXT SYSTEM D B	5060002	56	1465	55
55 FIRE EXT SYSTEM E B	5060003	58	6400	70
			6546	
ENGINE MTGS AND BRACKETS	5070000			
64 ENG MOUNTING AND BRKTS	5070001		1465	362
ENGINE MTGS ACCESSORIES	5070002		5202	66
ENGINE MTGS ACCESSORIES CA	5070003		7666	64
			20621	
FUEL SYSTEM	5080000			

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SHEET 4-7

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	50000000						
	50100000		1252707	665021	11983	833075209	150111880
			1252707			833075209	150111880
SS	5010100		3522	63097	10341	2222276	364210
			3522			2222276	364210
S D B	502000156		4524	57875	9607	2618265	434621
S E B	502000258		23030	60584	10434	13952495	2402950
			27554			16570760	2837571
	50300000						
	503000152		1458	16129	12476	235161	181900
	503000254		264	30813	11798	81346	31147
	503000356		508	49991	113459	253954	68372
	503000458		1013	63982	10194	648138	103265
			3243			1218599	384684
ON ENG	50400000		25965	59185	10452	15359596	2713862
			25965			15359596	2713862
	50500000		7101	56274	11507	3996017	817112
			7101			3996017	817112
	50600000						
	506000256		14655	3181	13749	80764	20074
	506000358		6400	70381	113414	4504384	858496
			6546			4585148	878570
KETS	50700000						
TS	50700001		14653	62504	12935	9158711	1895366
ES	50700002		5202	66213	12248	3444400	637141
ES CA	50700003		766	64236	13192	492048	101051
			20621			13095159	2633558
	50800000						

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SHEET 4-9

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	6000000						
	6010000						
F	6010001	52	8759	15807	11543	1384535	1011051
F	6010002	54	885	33920	11526	300192	102005
B	6010003	56	350	48699	11880	170447	41580
IN	6010005	83	12626	78803	22173	9949667	2799563
W	6010006	62	41202	71739	14350	29557903	5912487
W	6010007	64	30436	77075	13561	23458547	4127426
A	6010008		646	70982	14338	458544	92623
			94904			65279835	14086735
ULICS	6020000						
S D B	6020001	56	2391	57395	9691	1372314	231712
S E B	6020002	58	43629	65387	11067	28527694	4828421
S R F	6020003	59	48758	75108	24	36420	5196
T I W	6020004	62	27294	70358	14721	19203513	4017950
T O W	6020005	64	11930	74056	13580	8834881	1620094
	6020006	83	5522	75996	20784	4196499	1147692
			90814			62171321	11851065

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
FIXED EQUIPMENT GROUP	70000000			
INSTRUMENTS	70100000			
INSTRUMENTS F F	7010000152		4407	10
NAVIG TABLE AND STOWAGE	7010000452		20022	
			4607	
COCKPIT PRESSURE SEALING	7020000052		500	18
			500	
OXYGEN SYSTEM	70300000			
OXYGEN SYSTEM	7030000152		2359	25
			2359	
AIR CONDITIONING SYSTEM	70400000			
54 AIR CONDITIONING F F	7040000152		3549	17
54 AIR CONDITIONING C F	7040000254		4721	22
54 AIR CONDITIONING D B	7040000356		1148	51
54 AIR CONDITIONING C A	70400005		2736	33
54 AIR CONDITIONING ENG	70400006		1889	64
54 AIR CONDITIONING I W	7040000762		8051	
			8124	1
HYDRAULICS MAIN SYSTEM	70500000			
32 UTILITY HYDRAULICS F F	7050000152		8418	20
31 UTILITY HYDRAULICS C F	7050000254		4272	43
20 UTILITY HYDRAULICS D B	7050000356		2733	85
21 UTILITY HYDRAULICS E B	7050000458		7240	60
23 UTILITY HYDRAULICS I W	7050000562		1331	15
32 UTILITY HYDR NOSE U C	7050000691		3251	9
23 UTILITY HYDR MAIN U C	7050000792		2280	54
28 EMERGENCY LOWERING M U C	7050000862		853	58
35 EMERGENCY LOWERING N U C	7050000952		4382	1
			6517	5
RAM AIR TURB EMERG POWER	7060000054		7500	26
			7500	
CABIN INSULATION	7070000052		1431	18
			1431	

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DESCRIPTION					REFERENCE NO.	COMP. NO.	WEIGHT	H.
BRAKE PARACHUTE					70800000			
BRAKE PARACHUTE F F					708000152		45516	
BRAKE PARACHUTE R F					708000559		849982	
BRAKE PARACHUTE I W					708000662		12461	
							9078	
ELECTRICAL SYSTEM					70900000			
ELECTRICAL WIRING					70914000			
33	ELECTRICAL	WIRING	R	N	709140151		1299	
33	ELECTRICAL	WIRING	F	F	709140252		296619	
33	ELECTRICAL	WIRING	C	G	709140354		130441	
33	ELECTRICAL	WIRING	A	I	709140455		127421	
33	ELECTRICAL	WIRING	D	B	709140556		651553	
33	ELECTRICAL	WIRING	E	B	709140658		6459	
33	ELECTRICAL	WIRING	I	W	709140862		890954	
33	ELECTRICAL	WIRING	FIN		709140983		35279	
33	ELECTRICAL	WIRING	NUC		709141091		33018	
33	ELECTRICAL	WIRING	ENG		70914111		200258	
33	ELECTRICAL	WIRING	C	A	7091412		1374633	
							37591	
59	ELECTRICS	F	F		709150052		1524815	
							15248	
26	ELECTRICS	C	F		709160054		735945	
							7359	
85	ELECTRICS	E	B		709170058		67067	
85	ELECTRICS	ENG			7091701		1163256	
85	ELECTRICS	C	A		7091702		71861	
							13020	
ELECTRICS FIN					709180083		8389	
							83	
ELECTRICS I W					709190062		233662	
ELECTRICS C A					7091901		11262	
ELECTRICS M U C					709190292		7451	
							2522	
19	ELECTRICS	A	I		709200055		530322	
							5303	

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DESCRIPTION		REFERENCE NO.	COMP. NO.	WEIGHT	H.
93	ELECTRICS D B	709210056		27132	51
				27132	
	WINDSCREEN DEMISTING	709220052		2929	19
				2929	
	ELECTRICS R F	709230059		13680	
				136	
	L P PNEUMATICS	71000000			
26	L P PNEUMATICS F F	7100000152		2060	19
18	L P PNEUMATICS C F	7100000254		67133	
	L P PNEUMATICS D B	7100000356		41855	
	L P PNEUMATICS E B	7100000458		152665	
	L P PNEUMATICS FIN	7100000583		64075	
	L P PNEUMATICS R N	7100000651		124	7
				5439	
	INTAKE DEICING	7120000055		5184	19
				5184	
	RADOME ANTI ICING	7130000051		888	5
				888	
5	RADIO RADAR INT SYST R N	7150000151		1979	10
5	RADIO RADAR INT SYST F F	7150000252		9908	19
5	RADIO RADAR INT SYST C F	7150000354		3314	127
5	RADIO RADAR INT SYST I W	7150000562		4397	55
5	RADIO RADAR INT SYST O W	7150000664		8073	
5	RADIO RADAR INT SYST FIN	7150000783		3201	76
5	RADIO RADAR INT SYST C A	71500008		11579	27
5	RADIO RADAR INT SYST D B	7150000959		1374	
				64298	
29	CANOPY ACTUATION	7160000052		6492	22
				6492	
	CABIN CONSOLES	7170000052		1745	17
				1745	

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DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H
OPERATIONAL LOAD	9000000			
CREW MEMBERS	9010000	52	43000	19
			43000	
ENGINE OIL	9020000			
ENGINE OIL USABLE	9020001		88166	61
ENGINE OIL TRAPPED ENG	9020002		17736	62
ENGINE OIL TRAPPED D B	9020003	56	19255	58
ENGINE OIL TRAPPED E B	9020004	58	90959	
			13423	
OXYGEN CHARGE	9040000			
OXYGEN CHARGE F F	9040001	52	7220	
OXYGEN CHARGE C F	9040002	54	12672	6
			1339	
ALCOHOL FOR RADOME DEICING	9050000	51	2200	9
			2200	
100 ENGINE FIRE EXT FLUID	9060000		2500	73
			2500	
RESIDUAL FUEL	9070000			
RESIDUAL FUEL C F	9070001	54	46803	39
RESIDUAL FUEL I W	9070002	62	17160	59
			21840	
WATER FOR AIR CONDITIONING	9100000	54	12500	26
UNUSABLE WATER FOR AIRCOND	9100001	54	1500	26
			14000	

