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CF105  
R-7-0400-44  
Iss-1

FILE IN VAULT

C-105 1st A/C  
F75 P3 Engines

Report # 7-0400-44  
Issue 1

WEIGHT SUMMARY & C.G. POSITION

R.C.A.F. 8

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Report no.: QCX-AVRO-CF105-R-7-0400-44-ISS-1

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de-classified

by (Name): Michel W. Drapeau

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

Date: Dec. 7, 1992

R. Auger  
Signature

Classification cancelled / changed to: UNCLASSIFIED

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

Date: 5 Nov 1992

Signature: B. Aubrey

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

Date: December 1st, 1956  
Aircraft: C-105 1st. A/C  
With J75 P3 Engines



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Report # 7-0400-44  
Sheet # 1 Issue 1  
Prepared By: K. Griffin  
Checked By: E. Burnett

### INTRODUCTION

The following is a preliminary Weight & C.G. Summary for the 1st C-105 Aircraft with J75 P3 Engines.

Information herein is based on Report # 7-0400-05 Issue 27, December 1st, 1956, Weight Summary for C-105 Production Aircraft with J75 P5 Engines as Interim Power Plant, with relevant changes made.

Note: This Summary does Not apply for the 2nd and subsequent aircraft - see context below:-

### 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 aircraft.
- (b) An instrument package carrying Flight Test Instrumentation will be installed, this also varies between first and subsequent aircraft.
- (c) An interim Radio & Radar System is installed.

### 1. STRUCTURE:

WEIGHT (lb)

Basically this is unchanged from the J75 P5 Production Aircraft, however, there are some changes as follows:-

Radome - Solid fibreglass laminate will be installed, the honeycomb laminate is unavailable for the early aircraft. + 103

Radar Nose Structure - Current weight recorded for Production Aircraft is actually that for the 1st Aircraft. The Production nose will be different, but no details yet available.

Centre Fuselage - Cover Panel replaces .28" thick fibreglass panel in Electronics Bay. - 7

Rear Fuselage - Stainless Steel of a similar gauge will replace titanium for the Nacelles, Stinger, & Slitter assemblies. The tunnel skins from Sta. 742.5" to 803" remain unchanged in titanium.

Weight penalties are as follows:	Nacelles	+	122
	Stinger	+	17
	Slitter	+	5

There will possibly be other substitutions of Steel for Titanium in the Engine Bay etc. but no details are yet known.

The first Aircraft will also have numerous salvage schemes, re-works etc. incorporated which will account for a weight increase the size of which it is impossible to currently assess.

Weight Change Structure Compared to 7-0400-05 Issue 27 + 240

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With J75 P3 Engines

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Sheet # 2 Issue 1  
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### INTRODUCTION

#### 2. LANDING GEAR

WEIGHT (lb)

Main Undercarriage - Tubeless Tyres will not be available for the early aircraft and conventional tyres & tubes will be fitted resulting in + 2 lb per wheel assy. + 8

Weight Changes Landing Gear compared to 7-0400-05 Iss. 27 + 8

#### 3. POWER PLANT & SERVICES

Engines - On the 1st Aircraft only, J75 P3 Engines will be installed, these weigh approximately 6,175 lb compared to the 5,950 lb of the J75 P5 Engines for the 2nd and subsequent aircraft. + 450

Fuel System - The 1st Aircraft will be fitted with fuel proportioners, 2nd Aircraft may have both proportioners and a selection system fitted. Production versions will probably only have a selection system. Since details of the selection system are not available, the weight currently carried for all versions of the C-105 J75 Aircraft is for a proportioner system.

Weight Change Power Plant compared to 7-0400-05 Iss. 27 + 450

#### 4. FLYING CONTROLS GROUP

This will remain as in Report 7-0400-05 Issue 27

#### 5. EQUIPMENT GROUP

The 1st Aircraft will carry an instrument package the structural weight of which is + 671  
This replaces the Missile Package - 1,893  
Flight Test Instrumentation + 2,322  
Pack Ejection - 1st A/C only + 100  
Telecommunication Pack - 1st A/C only + 25  
The Astra I Radar System is deleted - 2,850  
Interim Radio & Radar is installed + 757  
Additional Fire Protection is provided + 155

Weight Change Equipment compared to 7-0400-05 Iss. 27 - 713

#### 6. OPERATIONAL LOAD

All items as in Report 7-0400-05 Iss. 27 with the following alteration:

Missiles - these are Not carried - 1,728

Weight Change Operational Load compared to 7-0400-05/27 - 1,728

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INTRODUCTION

SUMMARY (All Changes Relative to Report 7-0400-05 Issue 27 C-105  
Production Aircraft with J75 P5 Engines as Interim  
Power Plant.)

Structure	+	240 lb.
Landing Gear	+	8 lb.
Power Plant	+	450 lb.
Equipment	-	713 lb.
	-	<u>15 lb.</u>

Weight Change - Operational Load - Less Fuel

Missiles - 1,728 lb.

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

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46,528

44,785 = - 1,743 lb.

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DATE: December 1st 1956  
 Aircraft: C-105 J75  
 P3. Engines

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 Prepared By: K. Griffin

WEIGHT AND C.G. SUMMARY

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	WEIGHT lb.	H. ARM ins.	V. ARM ins.
STRUCTURE	18,326.94	564.61	137.10
Wing	9,989.07	643.60	141.93
Fin and Rudder	999.96	754.27	201.96
Fuselage Structure Fwd. 255"	2,493.41	181.34	128.81
Sta. 255" - 485"	1,664.90	379.04	130.01
Aft. Sta. 485"	3,179.60	654.56	111.73
UNDERCARRIAGE - Up Position	2,612.33	488.80	134.66
Main Undercarriage	1,959.62	539.48	141.00
Main Undercarriage Doors & Fairings	294.36	539.29	136.01
Nose Undercarriage	333.81	170.80	99.70
Nose U/C Door & Fairing	24.54	162.24	88.23
POWER PLANT & SERVICES	14,168.53	654.68	120.21
Engines	12,672.03	663.97	119.76
Gear Box Installation on Fuselage	237.06	603.73	104.00
Gear Box & Starter on Engine	150.18	610.55	96.37
Engine Controls	29.19	377.46	118.91
Engine De-Icing	70.37	562.80	115.09
Fire Extinguisher System	70.52	701.99	127.72
Engine Mountings	189.19	633.40	127.82
Fuel System	749.99	542.97	135.70
FLYING CONTROLS GROUP	1,677.82	688.36	139.58
Mechanical Flying Controls	904.40	689.05	147.08
Hydraulic Flying Controls	773.42	687.56	130.81
EQUIPMENT - FIXED & REMOVABLE	7,033.27	377.92	110.22
Instruments	53.30	153.98	140.27
Probe	23.00	9.74	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Oxygen System	43.44	227.72	142.18
Air-Conditioning System	712.69	327.16	133.26
Surface Finish	100.00	591.52	140.20
Hydraulics Main System	588.36	501.22	117.38
Cabin Insulation	11.91	179.24	130.00
Brake Parachute	69.69	784.88	131.17
Electrical System	955.20	403.43	116.21
Low Pressure Pneumatics	39.01	478.47	127.28
Oil & Hydraulic Fluid Cooling	22.00	579.50	92.00
Intake De-icing	85.84	206.52	118.79
Canopy Actuation	54.41	222.04	154.40
Cabin Consoles	20.65	117.37	125.23
Radar Door Actuation	10.00	268.00	95.00
Ejector Seats	186.00	201.10	136.25
Interim Radio & Radar	756.70	297.30	118.00
Instrument Pack Structure	670.61	385.90	94.71
Instrumentation - 1st A/C	2,447.00	389.50	95.00
Additional Fire Protection	155.00	434.05	103.06
Radome Anti-icing	23.46	62.92	126.04
AIRCRAFT WEIGHT EMPTY	43,818.89	563.99	127.27

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 Aircraft: C-105 With J75  
 P3. Engines

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WEIGHT AND C.G. SUMMARY

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DESCRIPTION	WEIGHT lb.	H. ARM ins.	V. ARM ins.	C.G. POSITION % M.A.C.
USEFUL LOAD (Less Fuel)	964.18	353.79	132.91	
Crew	430.00	194.00	136.50	
Oil	130.39	609.19	117.17	
Alcohol - Radome De-Icing	22.00	93.00	138.00	
Engine Fire Extinguisher 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	125.00	268.00	132.00	
Operational Weight Empty				
U/C Up		559.46	127.39	34.10
U/C Down	44,783.07	561.63	123.79	34.70
Max. Internal Fuel (2,544 gal. @ 7.8 lb/gal.	19,843.00	538.88	144.32	
A.U.W. Max. Internal Fuel				
U/C Up		553.14	132.59	32.35
U/C Down	64,626.07	554.64	130.09	32.77
Max. External Fuel & Tank 500 gals. at 7.8 lb/gal	4,226.00	522.34	60.64	
A.U.W. Max. Internal & External Fuel				
U/C Up		551.92	128.17	32.02
U/C Down	68,852.07	552.66	125.83	32.22

N. B. Above figures are for the Aircraft in the unballasted condition.

If the most aft point on the flight G.G. Envelope is to be ballasted to 31% M.A.C. then 1,438 lb of ballast must be installed at A/C Sta. 100".

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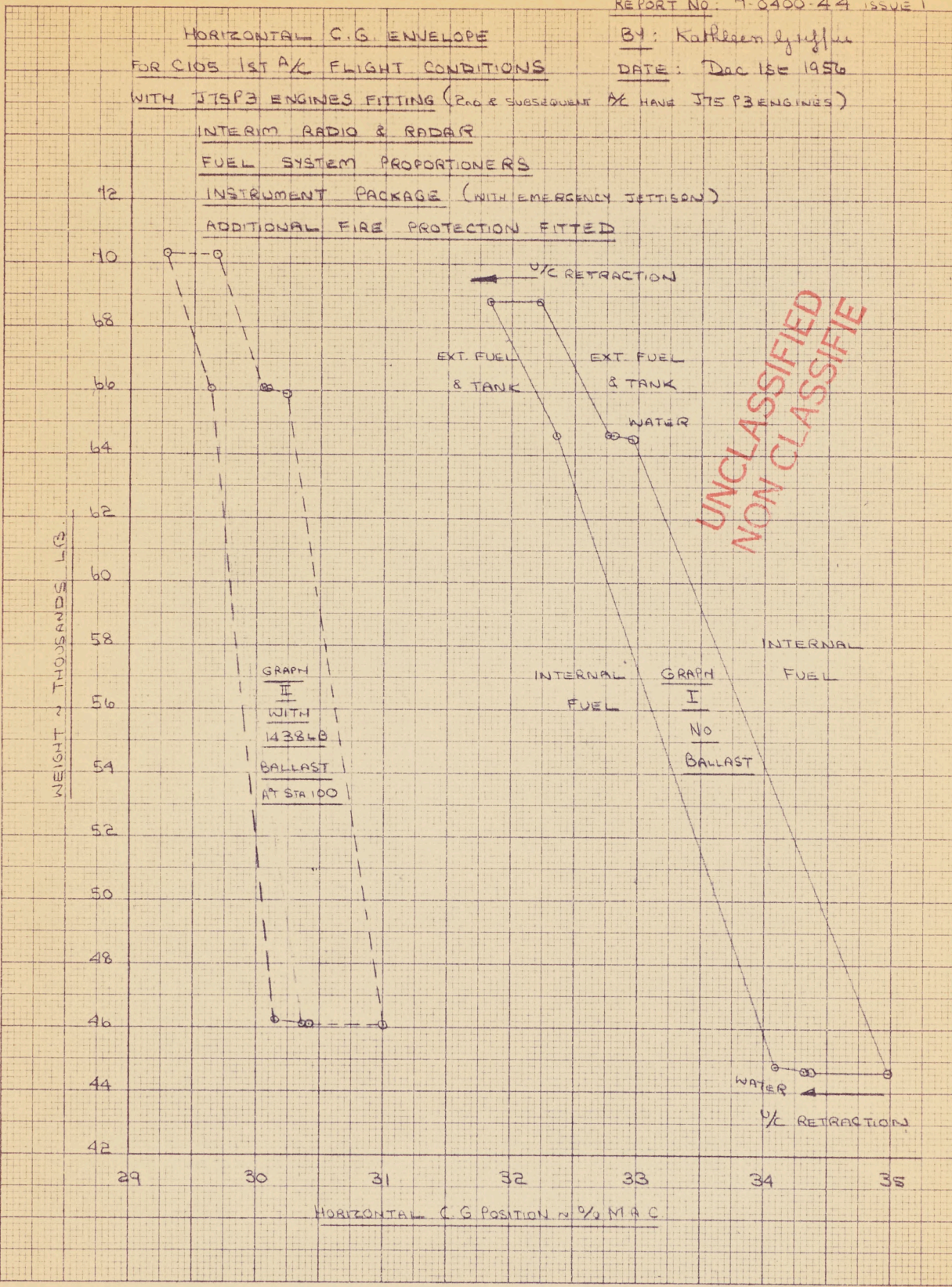
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REPORT NO: 7-0400-44 ISSUE 1

HORIZONTAL C.G. ENVELOPE  
 FOR C105 1ST A/C FLIGHT CONDITIONS  
 WITH JT5P3 ENGINES FITTING (2nd & SUBSEQUENT A/C HAVE JT5P3 ENGINES)  
INTERIM RADIO & RADAR  
FUEL SYSTEM PROPORTIONERS  
INSTRUMENT PACKAGE (WITH EMERGENCY JETTISON)  
ADDITIONAL FIRE PROTECTION FITTED

By: Kathleen Lyffler

DATE: Dec 15E 1956



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