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

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 doen 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

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

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.
	-	15 lb.

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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WEIGHT AND C.G. SUMMARY

	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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P3. Engines

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WEIGHT AND C.G. SUMMARY

SECRET

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	44,783.07	559.46	127.39	34.10
Operational Weight Empty U/C Down		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	64,626.07	553.14	132.59	32.35
A.U.W. Max. Internal Fuel U/C Down		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	68,852.07	551.92	128.17	32.02
A.U.W. Max. Internal & External Fuel U/C Down		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 C.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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REPORT NO. 4-0490-44 ISSUE 1

BY: Kathleen Griffin

DATE: Dec 15th 1956

HORIZONTAL C.G. ENVELOPE

FOR C105 1ST A/C FLIGHT CONDITIONS

WITH J75P3 ENGINES FITTING (2nd & SUBSEQUENT A/C HAVE J75 P3 ENGINES)

INTERIM RADIO & RADAR

FUEL SYSTEM PROPORTIONERS

INSTRUMENT PACKAGE (WITH EMERGENCY JETTISON)

ADDITIONAL FIRE PROTECTION FITTED