

UNCLASSIFIED
NON CLASSIFIED

Date: 1st Sept., 1955

Aircraft: C-105 With J75 Engines
as Interim Power Plant

72.113-55/09
Report # 7-0400-05

Sheet # 001-1 Issue 18

Prepared By K. Griffin

Checked By: E. Burnett

INTRODUCTION

This summary is a revised Weight and C.G. estimate of the C-105 Aircraft, based on the latest design information in being on Aug. 31st, 1955. All Weight and C.G. changes are relative to Issue 17.

GENERAL:

- (a) As in Issue 17, Pratt and Whitney J75 Engines comprise the Interim Power Plant (6,175 lb. each)
- (b) The weight of Radio and Radar carried in this issue is 2,908 lb. The system is described as "Integrated Electronic System for C-105 Aircraft with certain deviations". The breakdown into items is given in Weight Summary Issue 14.
- (c) As in Issues 15, 16, and 17 the extended leading edge is recorded in this issue.

1. STRUCTURE

WEIGHT (lb)

(a) Wing:

L/W Joints - Elevator Jack fittings changed to Steel from Al.	+ 32
L/W Structure M/S to R/S - Skin thickness reduced	- 50
Ribs - redesigned	- 18
Stringer posts - redesigned	- 71
Weight Change Decrease	- 107

Ref. 002-1

(b) Fin and Rudder:

No Weight Change 0

(c) Fuselage to Sta. 255":

Intake Ramp - L/Edge Tip and Support - Mg. were Al.	- 17
Miscellaneous other changes	- 2
Navigator's Canopy - redesign of window; skinning now Al. was Mg., etc.	+ 6
Weight Change Decrease	- 13

Ref. 002-1

(d) Fuselage Sta. 255" to 485":

Miscellaneous Structural Changes	+ 4
Weight Change Increase	+ 4

Ref. 002-1

(e) Fuselage Sta. 485" Aft.

Rear Fuselage - completed redesign 0

Ref. 002-1

TOTAL STRUCTURE WEIGHT DECREASE

- 116



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INTRODUCTION

2. <u>LANDING GEAR</u>	<u>WEIGHT (lb)</u>
(a) Main Undercarriage - Increase in Weight of Dowty parts Ref. 002-2	+ 70
<u>TOTAL LANDING GEAR INCREASE</u>	<u>+ 70</u>
3. <u>POWER PLANT & SERVICES</u>	
No Weight Change	0
4. <u>FLYING CONTROLS</u>	
No Weight Change	0
5. <u>EQUIPMENT</u>	
No Weight Change	0

SUMMARY

Weight Change - Aircraft Weight Empty

Structure	- 116 lb.
Landing Gear	+ 70 lb.
	<u>- 46 lb.</u>

Weight Change - Operational Load Less Fuel

Nil.

Weight Change - Operational Weight Empty - (Aircraft Less Fuel).

<u>Issue 17</u>	<u>Issue 18</u>	
43,731	43,685	= <u>- 46 lb.</u>

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0.00	Rear Fuselage - Redesign completely		
	T/Edge Extrusion - unnecessary	-	7.00
	Latches - none previously	+	18.00
	Torque Box - redesign	+	3.00
	Longerons & streaming Fittings - redesign	-	13.00
	Skins, fillets & doors - Al. & Steel		
	were Al. & titanium	-	8.00
	Chute container & centre struct. redesign	+	14.00
	Tunnel - part steel & $\frac{1}{2}$ " insulation added	+	30.00
	Formers - redesigned entirely	-	54.00
	Stinger - was tatanium now 'Inconel X'	+	1.00
	Miscellaneous Items	+	16.00
			0.00

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WEIGHT CHANGES TO 7-0400-05 Issue 17

WEIGHT CHANGES

No estimate has been made for the deletion of the Gill Inflation Bag.

Undercarriage

+	0.02	Main U/C Doors - C.G. Changes to linkage
+	70.00	Main U/C - inc. in Dowty parts from 590 to 625 lb/assy.
+	70.02	
=	45.50	<u>TOTAL WEIGHT CHANGE</u>

S E C R E T

UNCLASSIFIED

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Report # 7-0400-05

Sheet # 003-1 Issue 18

Prepared By: J. Murphy

Checked By: E. Burnett

WEIGHT AND C. G. SUMMARY

Ref. No.	Description	WEIGHT lb.	H. ARM ins.	V. ARM ins.
	STRUCTURE	16,792.19	566.33	138.88
1000000	Wing	9,529.38	642.15	142.58
2000000	Fin and Rudder	911.57	756.76	211.28
3000000	Fuselage Structure Fwd. 255"	2,142.09	184.05	129.83
	255" to 485"	1,501.32	371.63	132.24
	Aft. 485"	2,707.83	645.75	112.30
4000000	UNDERCARRIAGE - Up Position	2,843.97	485.08	134.10
4010100	Main Undercarriage	1,847.60	539.88	141.00
4010200	Main U/C Doors & Fairings	287.32	539.21	136.40
4010300	Main U/C Hydraulics	279.84	535.01	137.75
4020100	Nose Wheel Undercarriage	284.34	165.18	100.04
4020200	Nose U/C Doors & Fairings	25.92	163.71	89.22
4020300	Nose U/C Hydraulics	118.95	220.34	103.95
5000000	POWER PLANT & SERVICES	13,970.78	653.53	119.06
5010000	Engines J75	12,647.00	662.35	117.82
5020000	Gear Box & Drive	150.00	606.00	94.66
5030000	Engine Controls	25.10	356.68	119.39
5040000	Pneumatic Starting System	70.00	610.00	94.75
5050000	Engine De-Icing	65.75	564.53	114.37
5060000	Fire Extinguishing System	90.00	610.65	129.00
5070000	Engine Mountings & Brackets	221.11	645.29	132.67
5080000	Fuel System	701.82	536.24	143.92
6000000	FLYING CONTROLS GROUP	1,738.26	652.07	140.52
6010000	Mechanical Flying Controls	773.43	679.76	145.88
6030000	Flying Controls Electronics	108.00	222.33	131.43
6000000	Flying Controls Hydraulics	856.83	681.24	136.83
	EQUIPMENT FIXED & REMOVABLE	6,526.75	303.70	114.72
7010000	Instruments	57.30	146.41	137.04
7010003	Probe	15.00	-18.00	108.00
7030000	Oxygen System	46.12	220.36	138.15
7040000	Air Conditioning System	624.95	326.22	134.63
7050000	Hydraulic Main System	215.66	591.04	117.41
7060000	Armament Provisions	31.34	327.65	104.45
7080000	Brake Parachute	68.03	794.01	126.23
7090000	Electrical System	779.19	402.81	121.36
7100000	Low Pressure Pneumatics	16.60	217.17	133.41
7110000	Oil & Hydraulic Fluid Cooling	119.80	567.91	104.22
7120000	Intake De-Icing	50.60	204.55	113.76
7000000	Radio & Radar Fixed, Power Supplies	921.10	220.05	111.00
7160000	Canopy Actuation	47.00	223.43	156.83
7170000	Cabin Consoles	20.85	177.01	125.38
7180000	Radar Door Actuation	10.00	268.00	95.00
7190000	Radome Anti-icing	16.80	66.35	124.40
7200000	Cabin Insulation	11.91	179.24	130.00
7210000	Cockpit Pressure Sealing	20.00	186.01	130.00

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WEIGHT & C.G. SUMMARY

Ref. No.	Description	WEIGHT lb.	H. ARM ins.	V. ARM ins.	C.G. POSITION % M.A.C.
	<u>EQUIPMENT (Fixed & Remov. (Cont'd.))</u>				
8010100	Ejector Seats	204.00	200.10	136.25	
8010200	Emergency Provision	16.95	166.01	130.65	
8020000	Radar Removable	1,259.70	141.75	114.53	
8000000	Radio Removable & I.F.F.	276.20	284.51	123.98	
8050100	Missile Pack Structure	676.17	385.26	95.61	
8050200	Missile Pack Mechanisms	410.48	373.88	102.86	
8050300	Missile Pack Hydraulics	293.00	336.29	101.00	
8050400	Missile Pack Electronics	318.00	389.15	101.22	
	AIRCRAFT WEIGHT EMPTY 38,271.25	41,871.95	552.53	128.24	
9000000	USEFUL LOAD	17,692.67	522.11	140.37	
9010000	Crew	430.00	194.00	136.50	
9020000	Oil	85.08	611.71	135.00	
9050000	Alcohol for Radome De-Icing	22.00	93.00	138.00	
9070000	Residual Fuel	219.80	536.70	135.07	
9090000	Fuel for Combat Mission	15,880.00	539.20	143.50	
9030000	Missiles (Armament)	1,042.40	399.12	95.60	
9040000	Oxygen Charge	13.39	259.69	159.91	
	Normal Combat Mission U/C Up.	59,564.62	543.49	131.85	29.69
	U/C Down		545.06	129.69	30.13
	Half Combat Mission Fuel 1011 @ 7.85 lb/gal.	7,940.00	540.85	139.60	
	Combat Weight(Half Combat Mission Fuel) U/C Up	51,624.62	544.40	129.45	29.94
	U/C Down		546.21	126.97	30.44
	Operational Weight Empty U/C Up	43,684.62	545.05	127.61	30.12
	U/C Down		547.19	124.67	30.71
	Operational Weight Empty (Less Missiles) U/C Up	42,642.22	548.62	128.39	31.11
	U/C Down		550.81	125.38	31.71
	Maximum Internal Fuel 2,544 gal. @ 7.85 lb/gal. Water (Air-Conditioning System)	19,970.00 125.00	538.88 268.00	144.33 95.00	
	A.U.W. Max. Internal Fuel U/C Up	63,779.62	542.58	132.78	29.44
	U/C Down		544.04	130.77	29.84
	Max. External Fuel, 500 gal. @ 7.85 lb/gal. & Drop Tank	4,235.00	528.90	62.00	
	A.U.W. Max. Internal & External Fuel U/C Up	68,014.62	541.73	128.37	29.21
	U/C Down		543.10	126.49	29.59

BY: Kathleen Griffin

DATE: Aug 29th 1988

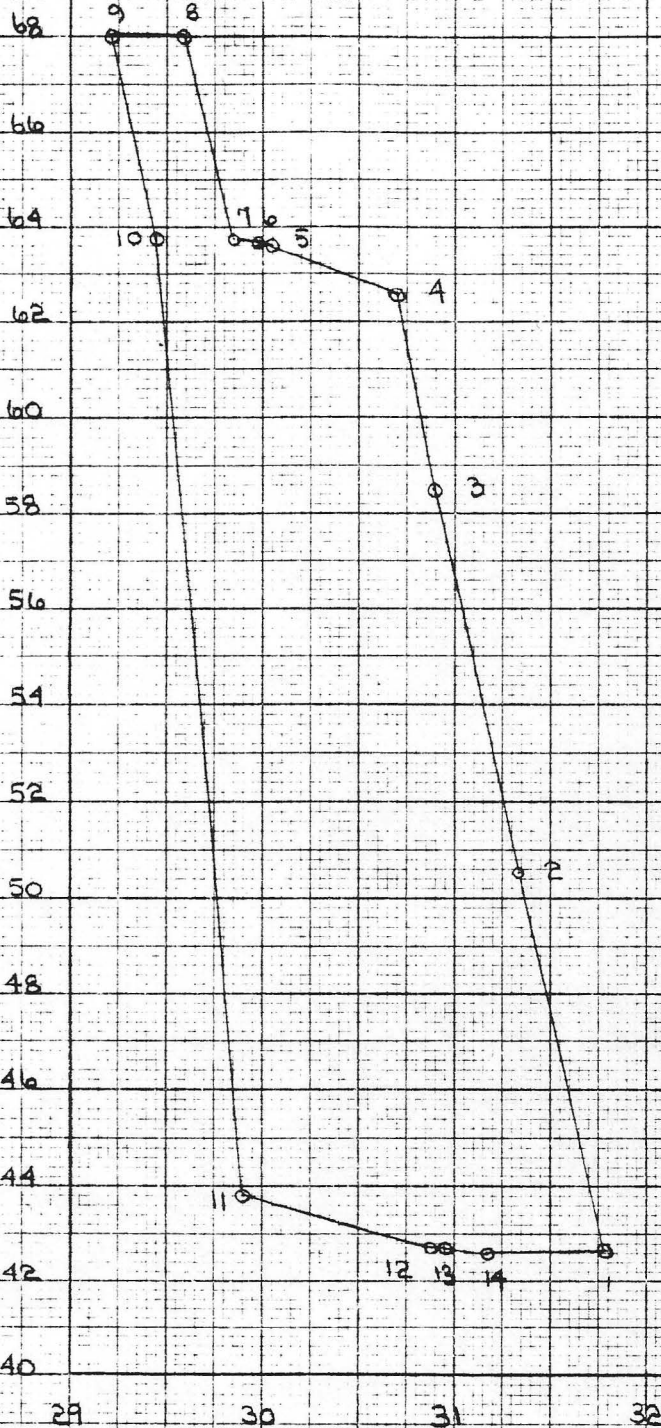
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A/C C.G. ENVELOPE

FOR A/C FLIGHT CONDITIONS

WITH J75 ENGINES (A25)

WEIGHT - THOUSANDS LB.



No.	CONDITION	CONSTANT MISSION FUEL	NORMAL MISSION FUEL	MAX. INTERNAL FUEL	FUEL & EXT. TANKS	MISSILES	DEICING FLUID	WATER	1/2 UP	1/2 DOWN
1										*
2	*									*
3			*							*
4				*						*
5				*		*				*
6				*		*	*			*
7				*		*	*	*		*
8				*	*	*	*	*	*	*
9				*	*	*	*	*	*	*
10				*		*	*	*	*	*
11						*	*	*	*	*
12							*	*	*	*
13								*	*	*
14									*	*

N.B. IN ORDER TO BRING POINT ①
TO THE AFT LIMIT IF 31%MAC
280 LB BALLAST MUST BE
ADDED AT STA 120INS.

C.G. Position - % M.A.C.