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Date: 1st, October 1955
Aircraft: C-105 With J75 Engines as Interim Power Plant

Report # 7-0400-05
Sheet # 001-1 Issue 19
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 September 30th, 1955. All Weight and C.G. changes are relative to Issue 18.

GENERAL:-

(a) As in Issue 18 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 subsequent to 15, the extended leading edge is recorded here.

1. STRUCTURE

	WEIGHT (lb)
(a) Wing:	
I/W Joints - alterations to end closing Centre Box	+ 3
Weight Change Increase	+ 3
Ref. 002-1	
(b) Fin and Rudder:	
Negligible Weight Change	0
Ref. 002-1	
(c) Fuselage to Sta. 255"	
Radome - added Mg. Mounting ring and refinement of estimate	+ 23
Nose Structure - estimate to preliminary scheme drawings	+ 16
Top Longeron - redesign to pressed plate construction previous forgings impractical	+ 9
Formers - Altered to accommodate above longeron	+ 11
Intake Ramp - various amendments	+ 4
Weight Change Increase	+ 63
Ref. 002- 1	
(d) Fuselage 255" - 485"	
Formers - miscellaneous changes	+ 3
Armament Provisions - previously considered equipment	+ 30
Weight Change Increase	+ 33
Ref. 002-1	

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INTRODUCTION

		WEIGHT (lb)
1.	STRUCTURE (Continued)	
	(e) Fuselage 485" Aft.	
	Duct D.B. - deletion of gill operating tube and redesign of gills	- 17
	Formers D.B. - Heat Exchanger Duct Mounting introduced	+ 10
	General amendments due to longeron redesign etc.	+ 16
	Longerons D.B. - Redesign of both longerons, aft splice now at forged former 591.65	- 18
	Top Longerons E.B. - Alteration to cross section, bearing plates for Wing attach. now removed	- 11
	Miscellaneous minor changes	0
	Weight Change Decrease	- 20
	Ref. 002-2	
	TOTAL STRUCTURE WEIGHT INCREASE	+ 79
2.	LANDING GEAR	
	a) Nose Undercarriage - Jarry estimate increase	+ 10
	Ref. 002-2	
	TOTAL LANDING GEAR INCREASE	+ 10
3.	POWER PLANT & SERVICES	
	a) Fuel System - complete revision of estimate see details	- 56
	b) Fire Extinguishing System - bottles moved aft - refined estimate	+ 14
	c) Fire Extinguisher Fluid - now Operational Load ref. C.A.P. 479	- 40
	Ref. 002-2	
	TOTAL POWER PLANT DECREASE	- 82
4.	FLYING CONTROLS	
	Rudder Hydraulics - refined estimate - Jarry Weight for Jack now available	- 26
	Ref. 002-3	
	TOTAL FLYING CONTROLS DECREASE	- 26

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INTRODUCTION

5. EQUIPMENT	WEIGHT (lb.)
Armament Provisions - now considered as structure see Centre Fuselage Group Ref. 002-3	- 31
TOTAL EQUIPMENT DECREASE	- 31

6. OPERATIONAL LOAD	
Fire Extinguisher Fluid - included here in accordance with C.A.P. 479 Ref. 002-3	+ 25
TOTAL WEIGHT INCREASE OF OPERATIONAL LOAD	+ 25

SUMMARY

Weight Change - Aircraft Weight Empty

Structure	+	79 lb.
Landing Gear	+	10 lb.
Power Plant	-	82 lb.
Flying Controls	-	26 lb.
Equipment	-	31 lb.
	-	50 lb.

Weight Change - Operational Load Less Fuel

Fire Extinguishing Fluid + 25 lb.

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

Issue 18	Issue 19		
43,685	43,660	=	- 25 lb.

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WEIGHT CHANGES TO 7-0400-05 ISSUE 18

WEIGHT CHANGES

Wing:

+ 2.73	I/W Joints - Alterations to end closing Wing Centre Box.	
+ 2.73		

Fin and Rudder:

+ 0.45	Rudder - 1st estimate to production drawings	
+ 0.45		

Front Fuselage (Fwd. Sta. 255")

+ 22.68	Radome - Mg. Mounting Ring added	+ 14.52
	General refinement of estimate	+ 8.16
		+ 22.68
+ 6.05	Radar Nose Structure - 1st estimate to preliminary scheme drawings	
+ 10.12	Radar Nose Access Doors - 1st estimate to preliminary scheme drawings	
+ 9.30	Top Longerons - complete redesign - previous forgings impractical now of pressed plate.	
+ 11.27	Formers - General amendments of production drawings including addition of longeron attach. angles and redesign of Former 228 for Top Longeron.	
+ 4.39	Intake Ramp - Top Outer Longeron - estimate to production drawings	+ 0.60
	Frame 237.5 - amends to fuselage tie-in etc. - production drawing estimate	+ 3.79
		+ 4.39
+ 63.81		

Centre Fuselage (Sta. 255" - 485")

+ 2.68	Formers - 1st estimate to production drawings of former 292, includes some fittings previously schemed as armament provision.
+ 30.32	Armament Provisions - these were previously considered as as equip., but since only basic structure is involved they will now be considered here, estimate now made to production drawings for tube and link assys. (see also Former 292.)
+ 33.00	

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WEIGHT CHANGES TO 7-0400-05 Issue 18

WEIGHT CHANGES

Aft. Fuselage (Sta. 485" Aft.)

+ 0.54	Dive Brake Accommodations - Minor amendments to floor		
- 18.05	Longerons D.B. - redesign Upper Longeron		- 3.88
	redesign Lower Longeron		- 6.63
	Alterations to Joint Sta. 485		+ 2.96
	Aft splice now with E.B. former 591.65"		- 7.00
	Former Joints now with formers		- 3.50
			- 18.05
+ 26.49	Formers D.B. - Mounting Heat Exchanger Duct added		+ 10.24
	General alterations - long. splices incl.		+ 16.25
			+ 26.49
- 0.48	Longitudinal Beams D.B. - redesign aft beams, weight allowance was previouly made		
- 0.62	Skin D.B. - 1st estimate to scheme drawings		
- 16.51	Duct D.B. - Removal rubber operating tube		- 13.76
	Redesign gill assys.		- 2.75
			- 16.51
- 11.47	Top Longerons E.B. - alteration to cross sectional area of Longeron, removal bearing plates at heavy formers which are now forged.		
- 20.10			

Undercarriage:

+ 9.66	Nose Undercarriage - Jarry estimate increase to 294 lb no detailed breakdown yet available.

Power Plant & Services:

- 56.47	Fuel System - Bag tank decrease in gauge		- 18.00
	Wing piping - gauge reduced etc.		- 18.02
	Condension drains added		+ 4.00
	Proportioner Unit alterations		- 3.70
	Fuel booster pump		- 9.00
	Miscellaneous changes		- 11.75
			- 56.47
+ 14.27	Fire Extinguisher System - bottles moved aft - also refinement of estimate		
- 40.00	Fire Extinguisher Fluid - now considered as Operational Load in accordance with C.A.P. 479.		
- 82.20			

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WEIGHT CHANGES TO 7-0400-05 ISSUE 18

WEIGHT CHANGES

Flying Controls Group:

-	25.96	Rudder Hydraulics - Too much weight previously allowed for jack (Jarry estimate now available)	-	20.00
		Miscellaneous changes to system	-	5.96
			-	25.96

Equipment - Fixed and Removable:

	0.00	Radar Removable - more realistic C.G. for items in Radar Nose
-	31.34	Armament Provisions - now considered as structure see Centre Fuselage Group.
-	31.34	

Operational Load:

+	25.00	Fire Extinguishers Fluid - see also Power Plant Services Group new weight of 12½ lb/bottle; included here in accordance with C.A.P. 497
+	25.00	
-	24.95	TOTAL WEIGHT CHANGE

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Report # 7-0400-05
Sheet # 003-1 Issue 19
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	16,872.08	564.19	138.76
1000000	Wing	9,532.11	642.18	142.58
2000000	Fin and Rudder	912.02	756.74	211.22
3000000	Fuselage Structure Fwd. 255"	2,205.90	182.35	129.70
	255" to 485"	1,529.81	370.33	131.74
	Aft. 485"	2,692.24	645.83	112.08
4000000	UNDERCARRIAGE - Up Position	2,853.63	484.40	133.98
4010100	Main Undercarriage	1,847.60	539.88	141.00
4010200	Main U/C Doors and Fairings	287.32	539.21	136.40
4010300	Main U/C Hydraulics	279.84	535.01	137.75
4020100	Nose Wheel Undercarriage	294.00	169.05	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	13,888.58	654.07	118.73
5010000	Engines J75	12,647.00	662.35	117.82
5020000	Gear Box and 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	64.27	700.07	123.00
5070000	Engine Mountings & Brackets	221.11	645.29	132.67
5080000	Fuel System	645.35	526.86	139.92
6000000	FLYING CONTROLS GROUP	1,712.30	650.20	139.42
6010000	Mechanical Flying Controls	773.43	679.76	145.88
6030000	Flying Controls Electronics	108.00	222.33	131.43
6000000	Flying Controls Hydraulics	830.87	678.31	134.44
	EQUIPMENT (FIXED AND REMOVABLE)	6,495.41	303.87	114.77
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
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 AND C.G. SUMMARY

REF. NO.	DESCRIPTION	WEIGHT lb.	H. ARM ins.	V. ARM ins.	C.G. POSITION % S.M.C.
	Equipment (Fixed & Remov.) Cont'd.				
8010100	Ejector Seats	204.00	200.10	136.25	
8010200	Emergency Provision	16.95	166.01	130.65	
8020000	Radar Removable	1,259.70	143.20	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	366.29	101.00	
8050400	Missile Pack Electronics	318.00	389.15	101.22	
	AIRCRAFT WEIGHT EMPTY	41,822.00	551.68	128.08	
9000000	USEFUL LOAD	17,135.67	521.88	140.24	
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	
9060000	Engine Fire Extinguisher Fluid	25.00	730.00	129.00	
9070000	Residual Fuel	219.80	536.70	135.07	
9090000	Fuel For Combat Mission	15,298.00	539.25	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	58,957.67	543.02	131.61	29.56
	Normal Combat Mission U/C Down		544.59	129.44	30.00
	Half Combat Mission Fuel 981 @ 7.8 lb./gal.	7,649.00	540.95	139.60	
	Combat Weight (Half Combat Mission Fuel) U/C Up	51,308.67	543.83	129.26	29.79
	Combat Weight (Half Combat Mission Fuel) U/C Down		545.64	126.76	30.29
	Operational Weight Empty U/C Up	43,659.67	544.34	127.45	29.93
	Operational Weight Empty U/C Down		546.46	124.52	30.51
	Operational Weight Empty (Less Missiles) U/C Up	42,617.27	547.89	128.23	30.91
	Operational Weight Empty (Less Missiles) U/C Down		550.07	125.23	31.51
	Maximum Internal Fuel 2,544 gal. @ 7.8 lb/gal.	19,843.00	538.88	144.33	
	Water (Air-Conditioning System)	125.00	268.00	95.00	
	A.U.W. Max. Internal Fuel U/C Up	63,627.67	542.09	132.65	29.31
	A.U.W. Max. Internal Fuel U/C Down		543.55	130.64	29.71
	Max. External Fuel, 500 gal. @ 7.8 lb/gal. and Drop Tank	4,210.00	528.88	62.00	
	A.U.W. Max. Internal & External Fuel U/C Up	67,837.67	541.27	128.27	29.08
	A.U.W. Max. Internal & External Fuel U/C Down		542.64	126.38	29.46

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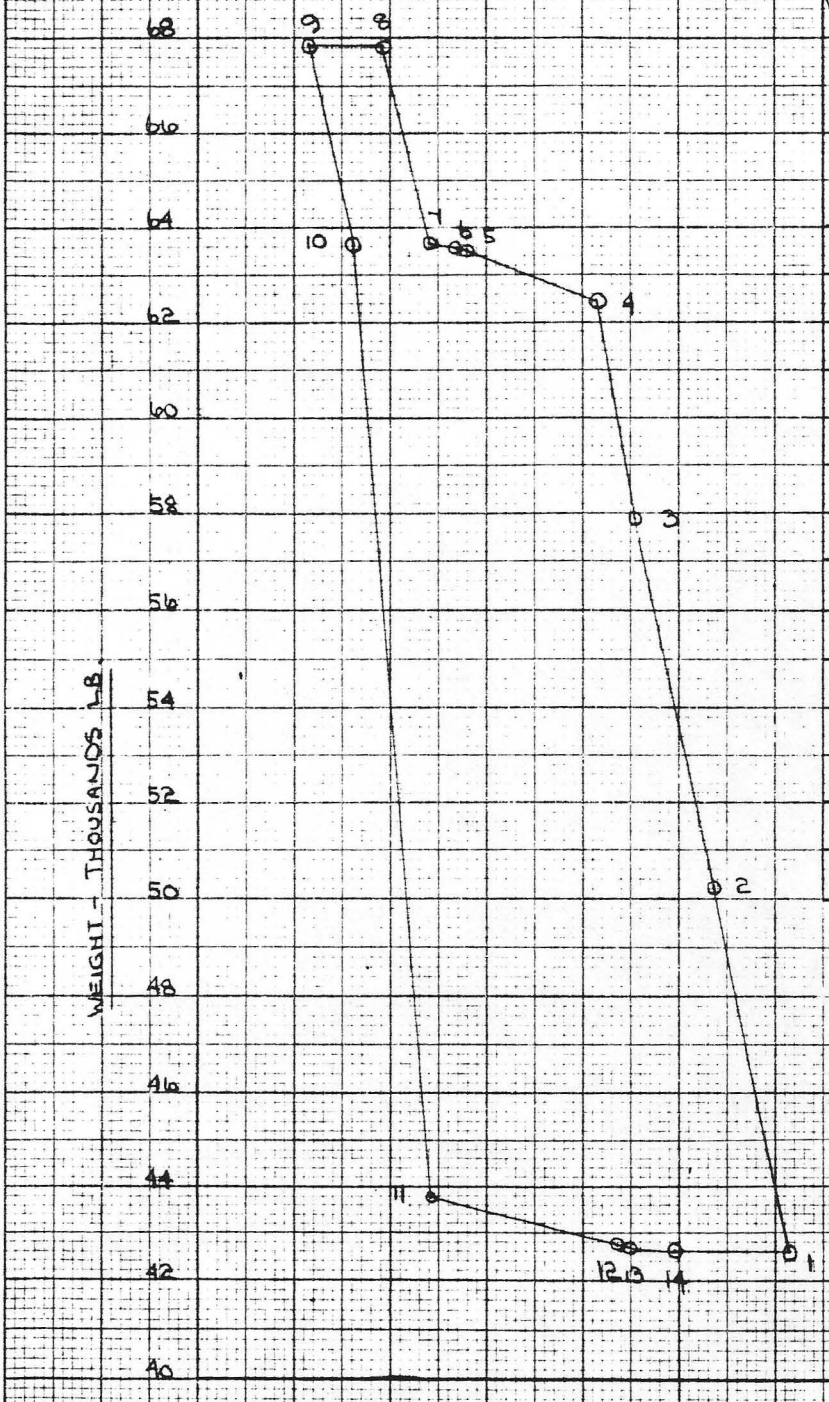
BY: Kathleen Burgum

DATE: SEPT 30TH 1955

C105 A/C C.G. ENVELOPE FOR A/C FLIGHT CONDITIONS WITH J75 A25 ENGINES



No.	CONDITION	COMBAT MISSION FUEL	NORMAL MISSION FUEL	MAX INTERNAL FUEL	EXT. FUEL TANKS	MISSILES	DEICING FLUID	WATER	W/C UP	W/C 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 IE 31% MAC 197 LB BALLAST MUST BE ADDED AT STA 120 INS.