

Date: August 1st, 1957
Aircraft: C-105 MK 2
Production A/C

76.113-57/08
UNCLASSIFIED
SECRET
Report # 7-10100-34 Iss. 10
Sheet # 1-2

INTRODUCTION

1. STRUCTURE

WEIGHT (lb)

b) Fin & Rudder

No Weight Change

c) Fuselage Fwd. Sta. 255"

No Weight Change

d) Centre Fuselage Sta. 255"-485"

Redesign of Deflector Shield, Fuel tank & skinning
for MK 2 Aircraft

+ 16

Total Centre Fuselage Increase
Ref. 2-1

+ 16

e) Duct Bay Sta. 485"-591.65"

No Weight Change

f) Engine Bay Sta. 591.65"- 742.5"

Production drawings of some formers, tunnel parts etc.

+ 11

Total Engine Bay Increase
Ref. 2-1

+ 11

g) Rear Fuselage

Engine Access Doors - production drawing estimates

+ 1

Total Rear Fuselage Increase
Ref. 2-1

+ 1

h) Fuselage Joints

No Weight Change

TOTAL STRUCTURAL INCREASE

+ 76

2. LANDING GEAR

No Weight Change

3. POWER PLANT & SERVICES

No Weight Change

4. FLYING CONTROLS GROUP

F/C Hydraulics - Alterations to pump & piping weights also
25 cu. in. accumulator replaces 100 cu. in.

- 21

TOTAL FLYING CONTROLS DECREASE

- 21

Date: August 1st, 1957
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Production A/C

UNCLASSIFIED
SECRET
Report # 7-0100-34 Iss. 10
Sheet # 1-3

INTRODUCTION

5. EQUIPMENT GROUP

WEIGHT (lb)

Alternator System - Lucas Rotax oil cooled 40 K.V.A. Alternator System introduced.	+ 25
Damping System - first estimate with vendors proposed weights	+ 79
Hydraulics Main System - 2 X 110 cu. in. accumulators replace 1 X 200 cu. in. etc.	+ 14
Windscreen De-misting - Airesearch Cont. units replace Westinghouse etc.	- 8
Miscellaneous small changes to Probe, Canopy Actuator, Missile Pack Mechanisms etc. etc.	- 3
<u>TOTAL EQUIPMENT INCREASE</u>	<u>+ 107</u>

Ref. 2-2

SUMMARY

Weight Change - Aircraft Basic Weight

Structure	+ 76 lb.
Flying Controls	- 21 lb.
Equipment	+ 107 lb.
	<u>+ 162 lb.</u>

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

<u>Issue 9</u>	<u>Issue 10</u>	
<u>44,354 lb</u>	<u>44,516 lb</u>	= <u>+ 162 lb.</u>

Date: August 1st, 1957
Aircraft: C-105 MK 2
Production A/C

UNCLASSIFIED
Report # 1-400-34 Iss. 10
Sheet 11
NON CLASSIFIED

DETAILED WEIGHT CHANGES TO I.B.M.
TABULATED DETAILS OF July 1st, 1957

WEIGHT CHANGES

Wing:

WEIGHT (LB)

- 27.99 I/W Strut Pick-ups - Front Centre Mounting Plates
now aluminum & titanium in lieu
of steel
Front I/B Mounting redesign
- + 75.94 I/W Skins M/S to R/S - Upper & lower skins rib # 3 to
5 increased by 0.10", also alter-
ations around front centre engine
mounting

- 28.12
+ 0.13
- 27.99

+ 47.95

Centre Fuselage Sta. 255" to 485"

- + 0.35 Deflector Shield - redesigned for MK 2 A/C, no inner
skins or unsulation, access door added etc.
- + 6.01 Fuse. Fuel Tank- first scheme drawing estimate of
MK 2 redesigned tank.
- + 9.95 Skin C.F. - estimated to MK 2 Production Drawings,
alterations to stiffeners, I/B Skin etc.

+ 16.31

Engine Bay Sta. 591.65 to 742.5"

- + 3.49 Heavy Formers E.B. - some production drawing estimates,
minor design changes etc.
- + 8.04 Engine Tunnel E.B. - production drawing estimates of
parts of tunnel assy.
- 0.05 Structure at Engine Doors - production drawing estimates
of tip frames etc.

+ 11.48

Rear Fuselage

- + 0.70 Engine Access Doors - production drawing estimates

+ 0.70

Flying Controls Group

- 20.81 Flying Control Hydraulics - Pumps based on MK 1 actual
weight-
100 cu. in. Accumulator replaced by
25 cu. in.; alterations to piping
pump mounting etc. etc.

+ 18.00

- 38.81
- 20.81

- 20.81

continued.

SECRET
Report # 2-1000-11 Iss. 10
Sheet # 2-2

SECRET
Report # 2-1000-11 Iss. 10
Sheet # 2-2

WEIGHT (lb)

WEIGHT (lb)

- WEIGHT (lb)

WEIGHT (lb)

WEIGHT (lb)

WEIGHT (lb)

Date: August 1st, 1957
Aircraft: C-105 MK 2
Production A/C

UNCLASSIFIED
SECRET
Report # 1-0-00-21 Iss. 10
Sheet # 5, 1
NONCLASSIFIED

WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT lb.	H. ARM ins.	V. ARM ins.
STRUCTURE	18,601.42	564.05	137.70
Wing	10,028.72	642.28	142.24
Fin & Rudder	1,024.00	754.25	209.28
Fuselage : fwd. Sta. 255"	2,493.62	186.93	129.08
Sta. 255" - 485"	1,704.75	377.60	129.87
Sta. 485" - 591.65"	1,045.19	536.96	105.11
Sta. 591.65" - 742.5"	1,553.26	660.59	110.64
Sta. 742.5" Aft.	699.55	796.04	129.01
"Marry-up"	52.33	467.60	103.84
UNDERCARRIAGE - Retracted	2,551.77	487.22	134.79
Main Undercarriages	1,901.62	539.31	141.00
Main U/C Doors & Fairings	291.80	537.10	138.40
Nose Undercarriage	333.81	170.80	99.70
Nose U/C Door & Fairing	24.54	162.24	88.23
POWER PLANT & SERVICES	10,628.54	674.64	121.36
Engines & Accessories PS 13	9,032.78	691.67	121.20
Gear Box & Drive on Fuselage	281.84	601.70	102.49
Engine Controls	32.43	375.76	118.61
Gear Box, Starter & Drives on Engine	315.45	615.98	105.24
Engine Nose Bullet (Orenda supplied)	70.00	587.17	116.00
Fire Extinguishing System	70.46	702.44	134.82
Engine Mountings	132.38	666.82	136.52
Fuel System	693.20	530.62	134.87
FLYING CONTROLS GROUP	1,780.64	685.55	140.51
Mechanical Flying Controls	946.48	687.84	148.61
Hydraulic Flying Controls	834.16	682.95	131.31
EQUIPMENT GROUP - Fixed & Removable	8,103.45	329.77	112.68
Instruments	46.07	163.68	138.70
Probe	15.00	-38.14	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Oxygen System	23.59	253.72	156.43
Ejector Seats	284.42	202.80	136.25
Air Conditioning System	856.00	333.49	134.98
Hydraulic Main System	623.15	502.78	117.75
Cabin Insulation	14.31	187.48	132.00
Brake Parachute	62.38	769.41	143.24
Electrical System	1,259.16	432.22	112.68
Low Pressure Pneumatics	55.70	416.79	123.99
Surface Finish	100.00	591.52	140.20
Intake De-icing Boots	51.84	197.02	118.00
Radome Anti-icing	8.88	51.49	125.00
Canopy Actuation	64.92	221.99	154.35
Cabin Consoles	17.45	174.76	124.34
Radar Door Actuation	10.00	268.00	95.00
MH 64 Damping System	139.13	449.26	135.57
Radio & Radar removable	1,850.50	178.50	104.46
Radio & Radar fixed	621.00	234.04	116.15
		continued.	

Date: August 1st, 1957
Aircraft: C-105 MK 2
Production A/C

UNCLASSIFIED
SECRET
Version 7-01-00-31, Iss. 10
Sheet 3-2
NOT CLASSIFIED

WEIGHT & C.G. SUMMARY

DESCRIPTION	WEIGHT lb.	H. ARM ins.	V. ARM ins.	M.A.C. %
<u>Equipment (Fixed & Removable) (cont'd)</u>				
Sparrow Pack Structure	870.70	389.60	96.00	
Sparrow Pack Mechanisms	582.57	379.30	99.04	
Sparrow Pack Hydraulics	331.94	373.52	99.00	
Sparrow Pack Electronics	143.00	332.00	100.00	
Sparrow Pack Electrics	64.10	362.29	95.00	
Sparrow Pack Air Conditioning	2.64	309.93	104.15	
AIRCRAFT BASIC WEIGHT	41,865.82	547.18	128.61	
USEFUL LOAD (less fuel)	2,850.76	372.91	105.43	
Crew	430.00	194.00	136.50	
Oil	138.97	636.92	110.57	
Alcohol	22.00	93.00	138.00	
Engine Fire Extinguishing Fluid	25.00	730.00	129.00	
Residual Fuel	218.40	553.98	134.04	
Missiles	1,728.00	389.29	88.30	
Oxygen Charge	13.39	259.68	159.91	
Water for Air Conditioning	275.00	268.00	131.75	
Operational Weight Empty U/C Up	44,516.58	536.03	127.12	27.64
U/C Down		538.18	123.57	28.23
Operational Weight Empty U/C Up	42,788.58	541.96	128.69	29.27
less Missiles U/C Down		544.20	125.00	29.89
Normal Combat Mission Fuel* (2,029 gals. @ 7.8 lb/gal.)	15,830.00	542.05	142.30	
Normal Combat Weight U/C Up	60,346.58	537.61	131.10	28.07
U/C Down		539.20	128.48	28.51
Half Combat Mission Fuel (1,015 gals. @ 7.8 lb/gal.)	7,915.00	543.20	139.55	
Combat Weight (half U/C Up	52,431.58	537.11	129.00	27.93
Mission Fuel) U/C Down		538.93	125.98	28.44
Maximum Internal Fuel (2,492 gals. @ 7.8 lb/gal.)	19,438.00	541.85	144.16	
A.U.W. Max. Internal Fuel U/C Up	63,954.58	537.80	132.30	28.12
U/C Down		539.30	129.83	28.54
Maximum External Fuel (500 gals. @ 7.8 lb/gal. + Drop Tank)	4,248.20	521.84	60.67	
A.U.W. Max. Internal and U/C Up	68,202.78	536.81	127.84	27.85
External Fuel U/C Down		538.21	125.92	28.24

N. B. 1) * New figures are being prepared by Aerodynamics for Mission Fuel in accordance with latest PS 13 data.

2) Aircraft Datum = 120" above an arbitrarily chosen ground line.