

C-105 With J67 Engines      Report #  
Preproduction & Production      7-C400-05

WEIGHT SUMMARY

SECRET

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No 7-C400-05

SHEET No 001 Issue 2

AIRCRAFT:  
C-105 With J67 Engines

INTRODUCTION

**SECRET**

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

This Weight Summary represents a revised Weight Estimate of the C-105 Aircraft based on all drawings and stress information in being on the 5th May 1954.

NOTES ON ESTIMATES:-

1. STRUCTURE AND LANDING GEAR:-

These weights are based on the latest design ideas under consideration by the Design Office with sizes derived from preliminary stressing.

2. ENGINE AND EQUIPMENT SYSTEMS

These figures are based on actual layout proposals by the Design Office and on lists of Equipment prepared by AVRO Specialist Engineer. Weights for piping, wiring and mountings based on statistical information have been added.

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT:

C-105 With J67 Engines  
PRODUCTION

WEIGHT AND C. G.  
SUMMARY

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

PAGE No.	DESCRIPTION	WEIGHT lb	H. ARM X ins.	V. ARM Z ins.	WEIGHT CHANGES
	STRUCTURE	16,111.0	15,605	+ 506	
10	Wing	9,560.0	8557	+ 1,003	
20	Fin & Rudder	791.0	900	- 109	
30	Body	5,760.0	6148	- 388	
40	LANDING GEAR	2,105.0	2109	- 1	
41	Main Undercarriage	1,780.0			
42	Nose Wheel	325.0			
50	POWER PLANT AND SERVICE	11,616.0	10,329	+ 1,291	
51	Engines	10,464.0			
52	Pneumatic Engine Starting System	70.0	9502		
53	Engine Mountings	125.0			
54	Engine Controls	20.0	20		
55	Accessory Gear & Drive	150.0	15		
56	Fuel Tanks	177.0	1720		
57	Fuel Systems	545.0			
58	Fire Extinguishers	65.0	65		
60	EQUIPMENT	6,522.5	5,632	+ 890.5	
61	Instruments	49.0	50		
62	Probe	15.0	50		
63	Surface Controls	750.0	700		
64	Hydraulic Systems	1,295.0	680		
65	Electrical System	781.2	700		
66	Radar and Electronics	2,112.0	1,800		
67	Armament Provisions	184.0	410		
68	Ejector Seats	221.0	132		
69	Emergency Provisions	16.8	15		
610	Oxygen System	53.5	20		
611	Air Conditioning	605.0	625		
612	Anti-Icing System	300.0	300		
613	Brake Parachute	65.0	75		
615	Furnishings	75.0			
	Exh. Finish		75		
	AIRCRAFT WEIGHT EMPTY	36,354.5	33,668	+ 2,686.5	

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO. 003 Issue 2

AIRCRAFT:

C105 With J67 Engines

WEIGHT AND C. G.  
SUMMARY

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

PAGE No.		WEIGHT lb	H. ARM X ins. <i>Brochure 64</i>	C.G. POSITION % M.A.C. <i>cut</i>	V. ARM Z ins.
70	USEFUL LOAD	14,301.0	14,707	- 406	
71	Crew	430.0	230		
72	Oil	40.0	40		
73	Residual Fuel	225.0	225		
74	Fuel For Combat Mission	12,550.0	12,900		
75	Missiles (Armament)	1,056.0	1,312	<i>No rockets!</i>	
	A.U.W. Normal Combat Mission	50,655.0	48,375	+ 22 80.5	
C-105 With J 67 Engines PRODUCTION	Combat Weight (Half Combat Mission Fuel)	44,380.0	41,925	2,455	<i>ΔMact = .13 incl. 2/6 change 2-24/50 - Prev 2.01 N.M.P. 1.92</i>
	Operational Weight Empty	38,105.0			
	Operational Weight Empty (Less Missiles)	37,049.0			
	A.U.W. Maximum Internal Fuel (20,210 lb)	58,315.0			
	A.U.W. Maximum Internal and External Fuel	62,680.0			
	A.U.W. Normal Combat Mission	51,710.0			
C-105 With J 67 Engines PREPRODUCTION	Combat Weight (Half Combat Mission Fuel)	45,348.0			
	Operational Weight Empty	38,985.0			
	Operational Weight Empty (Less Missiles)	37,929.0			
	A.U.W. Maximum Internal Fuel (20,210 lb.)	59,195.0			
	A.U.W. Maximum Internal and External Fuel	63,560.0			

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 10-1 Issue 2

AIRCRAFT:

C105 With J67 Engines

WING

PREPARED BY

DATE

J. Daniels

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

WING WEIGHT SUMMARY ( BOTH SIDES)

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>V. ARM</u> <u>ins.</u>
<u>Inner Wing</u>			
Leading Edge	332.40		
Main Undercarriage Doors	219.88		
Main Undercarriage Mountings	104.00		
Front Spar to Main Spar Structure	690.50		
Front Spar	199.20		
Main Spar to Rear Spar			
a) Skin	2,120.00		
b) Stringers	487.30		
c) Spars	437.00		
d) Ribs	403.00		
Transverse Spar	129.00		
Re-inforcement of skin 57.4 Station Rib	67.00		
Elevator Control Box	405.10		
Elevators	436.00		
Structure after Rear Spar inside Fuselage	346.70		
<u>Outer Wing</u>			
Leading Edge	100.60		
Skin	906.53		
Stringers	207.56		
Spars	217.10		
Ribs	65.41		
Ailerons Control Box	244.86		
Ailerons	252.00		
Fuselage Fairing (dorsal)	75.00		
Wing Jointing	1,063.20		
Engine Mounting Brackets	50.00		
	9,559.40	637.5	+ 22.2

A. V. ROE CANADA LIMITED  
MALTON, ONTARIO  
**TECHNICAL DEPARTMENT (Aircraft)**

REPORT No. 7-C400-05  
SHEET NO. 20-1 Issue 2

AIRCRAFT:

C105 With J67 Engines

FIN AND RUDDER

PREPARED BY

DATE

P. J. C. King

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

The figures below constitute a summary of all relevant information available up to May 1st, 1954. The Fin Weight includes the Hinge Pin for Fin/Rudder Tie-Up.

<u>ITEM</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>Z ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
1. Fin	690.00	736.13	507,922.80	86.31	59,553.90
2. Rudder	101.00	806.20	81,429.60	92.20	9,311.11
TOTAL	791.00	745.0	589,352.40	87.0	68,865.01

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-0400-05

SHEET No. 20-2 Issue 2

AIRCRAFT:

C-105 With J67 Engine

FIN

PREPARED BY

DATE

D. Gildea

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

FIN WEIGHT SUMMARY

<u>ITEM</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>V. ARM</u> <u>ins.</u>
Spars No. 1 to 15	146.80		
Front Spar	34.80		
Rear Spar	17.10		
Skin	358.30		
Tip	19.50		
Tip Rib and Attachments	4.00		
Root Rib	33.20		
Ribs	14.40		
Fairing Under Rudder	10.00		
Jack Attachment & Access Panel	10.00		
Leading Edge Formers	8.20		
Shear Plate at Bottom of Fin	22.70		
Hinges	11.00		
TOTAL	690.00	736.12	86.31

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 20-23

AIRCRAFT:  C105 With J67 Engines	RUDDER	PREPARED BY	DATE
		P.J.C. King	April 1954
		CHECKED BY	DATE
		P. Kubicki	April 1954

The following set of calculations is based on drawing No. 7-0184-0001 correct to the latest issue. i.e. To information available to May 1st.

This weight of 101 lb. can be considered to be pessimistic.  
All hinges, bolts etc. for mating with Fin are included in Fin figures.

<u>ITEM</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>Z ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Skins	45.89	809.0	37,125.01	91.0	4,175.99
Root Rib.	1.05	773.8	812.49	45.0	47.25
Outer Rib.	0.20	859.0	171.80	158.0	31.60
Intermediate Ribs	8.80	809.0	7,119.20	91.0	800.80
Control No. 1	3.26	777.6	2,534.98	67.0	218.42
Control No. 2	2.50	794.0	1,985.00	87.0	217.50
Control No. 3	1.99	817.0	1,625.83	115.5	229.85
Main Spar	3.70	815.5	3,017.35	99.8	369.26
T/E Extrusion	6.38	838.0	5,346.44	96.0	612.48
L/E Extrusion	25.62	796.0	20,393.52	96.0	2,459.52
Allowance for bolts & Misc. Brackets.	1.61	806.2	1,297.98	92.2	148.44
	101.00	806.2	81,429.60	92.2	9,311.11

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7 C400-05

SHEET No 30-1 Issue 2

AIRCRAFT:

C-105 With J67 Engine

FUSELAGE

PREPARED BY

DATE

D. Gildea

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

SUMMARY OF FUSELAGE WEIGHT

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Front Fuselage	4,500.0		
Rear Fuselage	920.0		
Detachable Rear Fairing	315.0		
Transport Joint Bolts	25.0		
	5,760.0		

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 30-2 Issue 2

AIRCRAFT:

C-105 With J67 Engine

FRONT FUSELAGE

PREPARED BY

DATE

D. Gildea

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

Front Fuselage Structure Complete from Nose to  
Transport Joint (Station 564)

<u>ITEMS</u>	<u>WEIGHT</u> <u>LB.</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Skins	462		
Stringers	111		
Longerons	216		
Formers and Bulkheads	794		
Cockpit Decking and Flooring	107		
Missile Bay Flooring	110		
Nose Wheel Pick Up and Doors	87		
Equipment Doors (front fuselage)	62		
Misc. Structure	64		
Air Ducts Arrangement	1,067		
Windscreen	150		
Pilot Canopy and Support Structure	252		
Navigator Canopy and Support Structure	148		
Radar Nose	74		
Sealing Compound (Cockpit)	20		
Missile Bay Structure and Doors	599		
Joint and Strap Plates	50		
Dive Brakes	110		
Structure to Accommodate Dive Brakes	20		
<b>FRONT FUSELAGE TOTAL</b>	<b>4,500</b>		

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 30-3 Issue 2

AIRCRAFT:

C-105 With J67 Engine

REAR FUSELAGE

PREPARED BY

DATE

CHECKED BY

DATE

P. Kubicki

May 1954

Based on actual design and stress sizes.

REAR FUSELAGE

(From Station 564 to Station 742.65)

<u>ITEMS</u>	<u>WEIGHT</u> lb	<u>H. ARM</u> X ins.	<u>V. ARM</u> Z ins.
Outer Skin .051 & .032 thick	168.0		
Light Formers .04 & .032 thick	167.0		
Strong Frames Angles	103.0		
" " Webs	26.0		
" " Wing Aft. Fittings	16.0		
" " Struts	12.0		
Top Wing Member	25.0		
Longerons & Stringers	70.0		
Titanium Tunnels Skin	145.0		
Top Re-inforcing Rings	33.0		
Access Doors Allowances	80.0		
Engine Duct (564 St. to Engine Entry)	40.0		
Structure to Accommodate Bumper	35.0		
<b>REAR FUSELAGE</b>	<b>920.0</b>		

DETACHABLE FUSELAGE END

(From Station 742.65)

<u>ITEMS</u>	<u>WEIGHT</u> lb	<u>H. ARM</u> X ins.	<u>V. ARM</u> Z ins.
Outer Skin .032 thick	65.0		
Frames & Stringers	115.0		
Inner Skin Titanium	82.0		
Detachable Joint Arrangement.	28.0		
Structure to Accommodate Parachute	25.0		
<b>DETACHABLE FUSELAGE END</b>	<b>315.0</b>		

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO 7-C400-05

SHEET NO 40-1

AIRCRAFT:

C105 With J67 Engine

LANDING GEAR

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

WEIGHT SUMMARY OF LANDING GEAR

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Nose Wheel Main Undercarriage	1,780 325		
LANDING GEAR U/C Up U/C Down	2,105		

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 41-1 Issue 2

AIRCRAFT:

C105 J67 Engine

MAIN UNDERCARRIAGE

PREPARED BY

DATE

CHECKED BY

DATE

WEIGHT SUMMARY OF MAIN UNDERCARRIAGE

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Rear Wheel Lever	75		
Front Sliding Member	85		
Torque Members	15		
Axis & Bolts	25		
Main Leg	180		
Leg Shortening Mechanism	15		
Shock Absorber Assy.	60		
Braking Strut	35		
Main Leg Fairing	45		
Main Undercarriage Pivot Assy.	35		
Wheels Assy.	320		
U/C Up			
MAIN UNDERCARRIAGE TOTAL	890		
U/C Down			



A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO. 51 Issue 2

AIRCRAFT:

C-105 With J67 Engine

J 67 PRODUCTION  
ENGINES

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
J67 Engine Production	5,060.0		
Thermal Blanketing	155.0		
Thermo Couples & Harness	5.0		
Fuel Flow Meter Transmitter	12.0		
	5,232.0	671.3	

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-5

SHEET No. 53-1

AIRCRAFT:

C105 With J67 Engines

ENGINE MOUNTINGS

PREPARED BY

DATE

P.J.C. King

April 1954

CHECKED BY

DATE

The following summary is the result of a Preliminary Investigation of the J67 Engine Mountings.

It incorporates the latest information available up to May 1st.

<u>ITEM</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>H. MOMENT</u> <u>ins. lb</u>	<u>V. ARM</u> <u>Z ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Rear Engine Mountings	22.50	706.26	15,890.85	+ 21.0	+ 472.50
Front Engine Mountings	16.00	626.0	10,016.00	+ 14.0	+ 224.00
Main Engine Mounting	43.00	626.0	26,918.00	+ 19.5	+ 838.50
Guide Rails	40.00	666.0	26,640.00	+ 21.0	+ 840.00
Rollers and Mounting	3.50	666.0	2,331.00	+ 19.0	+ 66.50
TOTAL ENGINE MOUNTINGS	125.00	654.40	81,795.85	+ 19.50	+ 2,441.50

It is possible that the Guide Rails might be charged to the Wing Weight at a later date.

An allowance has been made in the Wing Weight of 50 lb for Engine Mounting Brackets.

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO. 56-1 Issue 3

AIRCRAFT:

0105 With J67 Engines

FUEL TANKS

PREPARED BY

DATE

D. Waltman

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

WEIGHT SUMMARY OF TANKS

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z-ins.</u>
Fuselage Tanks Structure	140.0	389.13	24.00
Fuselage Tanks Fittings	17.0	393.84	23.46
Tank Seal (Scotch Weld)	20.0	594.58	27.95
TOTAL TANKS	177.0	412.80	24.39

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO  
**TECHNICAL DEPARTMENT (Aircraft)**

REPORT NO. 7-C400-05

SHEET NO. 57-1 Issue 3

AIRCRAFT:

C105 With J67 Engines

FUEL SYSTEMS

PREPARED BY

DATE

D. Waltman

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

SUMMARY OF SYSTEM

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>V. Arm</u> <u>ins.</u>
Equipment in Wing	237.75	572.00	24.44
Piping in Wing	122.25	594.96	25.39
Equipment in Fuselage	72.75	507.82	24.96
Piping in Fuselage	112.25	527.13	27.74
TOTAL FUEL SYSTEM	545.00	559.34	25.40

A. V. ROE CANADA LIMITED  
MALTON ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO. 57-2 Issue 2

AIRCRAFT:

C-105 With J67 Engine

FUEL SYSTEM

PREPARED BY

DATE

D. Waltman

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

EQUIPMENT SUMMARY

	WEIGHT lb		
	WING	FUSELAGE	TOTAL
<u>SUPPLY &amp; TRANSFER:</u>			
Slide Valves	-	28.50	28.50
Check Valves (Include in Fuel-No-Foam Valves)			
Fuel-No-Foam Valves	37.60	9.40	47.00
Fuel Booster Pumps	96.00		96.00
Flow-Proportioning Valves	9.00		9.00
<u>REFUELING:</u>			
Refueling Adaptor, Cap & Tee Equip		3.50	3.50
Servo-Operated Shut-Off Valve	14.28	4.76	19.04
Servo-Valves	21.60	7.20	28.80
Refueling-By-Pass Valves	3.00		3.00
Gravity Filler Cap	3.00		3.00
<u>PRESSURIZATION:</u>			
Automatic Restrictors	5.00	2.00	7.00
Pressure Reducing Valves		3.20	3.20
Float Operated Vent Valve	4.50		4.50
<u>MISCELLANEOUS</u>			
Access Doors, Clamp, Brackets, Gaskets, Mountings, Seal	28.77	8.94	37.71
Bolts, Nuts, Rivets, etc.	11.00	4.00	15.00
<u>DEVELOPMENT ALLOWANCE</u>			
	4.00	1.25	5.25
TOTAL EQUIPMENT	237.75	72.75	310.50

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 61-1

AIRCRAFT  
C-105  
With J 67 Engines

INSTRUMENTS

PREPARED BY	DATE
P.E. French	Jan. 15/54
CHECKED BY	DATE
P. Kubicki	Jan. 19/54

	WEIGHT <u>lb</u>	H. ARM <u>Ins.</u>	V. ARM <u>Ins.</u>
<u>MAIN INSTRUMENT PANEL</u>			
Trim Indicator	1.0		
Altimeter	1.3		
Air Speed Indicator	1.2		
Rate of Climb Indicator	1.2		
Canopy Lock Indicator	0.6		
Machmeter	1.8		
Radar Control Indicators	1.0		
Accelerometer	0.7		
Cross-Point Indicator	1.2		
Turn and Bank Indicator	1.6		
Clock	0.8		
Tachometer (2)	1.8		
Oil Temperature Indicator (2)	1.2		
Oil Pressure Indicator (2)	1.2		
Fuel Contents	1.5		
Exhaust Temperature (2)	1.5		
Fuel Pressure Indicator	1.2		
Fuel Booster Pumps Indicators	1.0		
Main Panel and Fittings	3.0		
Sub-Total	24.8	143.0	+ 21
<u>L. H. Console</u>			
Hydraulic, Pneumatic Pressured Panel and Fittings	3.6 2.5		
Sub-Total	6.1	150.0	+ 16
<u>R. H. Console</u>			
Electrical Power Indicators	1.0		
Cabin Pressure Indicator Panel and Fittings	1.0 2.5		
Sub-Total	4.5	150.0	+ 16
<u>Navigators Panel</u>			
Altimeter	1.3		
Outside Air Temperature Indicator Panel and Fittings	0.8 3.5		
Sub-Total	5.6	200.0	+ 21
<u>Pitot System</u>	4.0	48.0	- 12
<u>Contingency Allowance</u>	4.0	150.0	+ 16
<u>INSTRUMENTS TOTAL</u>	49.0	143.8	+ 16.8
H. MOMENT	7,048.4 in. lb.		
V. MOMENT	824.0 in. lb.		

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C400-05

SHEET NO. 62 Issue 2

AIRCRAFT:

C-105 With J67 Engines

PROBE

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

Incorporate

H. ARM  
ins.

V. ARM  
ins.

15 lb.

- 29.4

- 16

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-0400-05

SHEET No 63-1 Issue 2

AIRCRAFT:  
C-105 With J67 Engines

FLYING CONTROLS

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

Flying Controls from Pilot, Cockpit to Jacks.

<u>ITEM</u>	<u>WEIGHT</u> <u>lb.</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Control Column and Pedals	27.0		
Quadrants in Pilot's Cockpit	28.0		
Cables	22.0		
Pulleys & Brackets & Bolts	26.0		
Quadrants at Jacks	31.0		
Sub-Total	134.0		

Feeling System

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Feel Units Assy.	12.0		
Trim Actuator & Wiring	11.0		
Trim Actuator Assy. Brackets	4.0		
Sub-Total	27.0		

Total Flying Controls System Less Jacks

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>X ins.</u>	<u>V. ARM</u> <u>Z ins.</u>
Flying Controls from Pilot's Cockpit to Jacks	134.0		
Feeling Systems	27.0		
Mechanical Linkage between Jacks and Control Surfaces	589.0		
TOTAL	750.0		

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C100-05

SHEET NO. 63-2 Issue 2

AIRCRAFT:

C-105 With J67 Engine

FLYING CONTROLS SYSTEM

PREPARED BY

DATE

P. Kubicki

May 1954

CHECKED BY

DATE

Mechanical Linkage between Jacks and Control Surfaces.

<u>ITEM</u>	<u>ELEVATOR WEIGHT lb</u>	<u>AILERON WEIGHT lb</u>	<u>RUDDER WEIGHT lb</u>
Levers	46	60	5.5
Control Links	32	23	5.5
Push Rod Assy.	40	40	18.0
Bolts, Nuts etc.	16	22	2.0
TOTAL WEIGHT	134	145	31.0

Total Weight of Linkage (per aircraft)

<u>ITEM</u>	<u>WEIGHT lb</u>	<u>H. ARM Xins.</u>	<u>V. ARM Z ins.</u>
Elevator Linkage per aircraft	268.0		
Aileron Linkage per aircraft	290.0		
Rudder Linkage per aircraft	31.0		
TOTAL LINKAGE WEIGHT	589.0	754.5	+ 20.69

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C400-05

SHEET NO. 64-1

AIRCRAFT:

C105 With J67 Engine

HYDRAULIC SYSTEM

PREPARED BY

DATE

P.J.C. King

May. 1954

CHECKED BY

DATE

P. Kubicki

The following summary embodies all information available up to May 1st. 1954

All the Jacks are included with the exception of the Steering Motor for the Nose-Wheel.

The Brake Units are not included.

	WEIGHT <u>lb.</u>
1. Total Fuselage Hydraulics	601.5
2. Total Wing Hydraulics	650.5
3. Hydraulics in Fin	48.0

TECHNICAL DEPARTMENT (Aircraft) .

REPORT No 7-C400-05

SHEET No 64-2 Issue 2

AIRCRAFT:

C105 With J67 Engines

HYDRAULICS

PREPARED BY

DATE

P.J.C. King

May 1954

CHECKED BY

DATE

1. Fuselage Hydraulics  
Comprising:-

601.5 lb

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>
Nose Wheel Undercarriage Jack (1 off)	12.5
Canopy Jacks (2 off)	11.0
Tail Bumper Jack (1 off)	6.5
Missile Jacks (8 off)	66.0
Dive Brake (2 off)	30.0
Total Jacks in Fuselage (14 off)	126.0
Pumps for Flying Controls (4 off)	88.0
Pump for Missiles (1 off)	20.5
Pump for Utilities (1 off)	20.5
Total Pumps (6 off)	129.0
Total Equipment in Fuselage	212.0
Total Piping (inc. Fittings & Fluid) In Fuselage	134.5

2. Wing Hydraulics  
Comprising:-

650.5 lb.

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>
Main Undercarriage Jacks (2 off)	50.0
Main Undercarriage Door Jacks (4 off)	40.0
Aileron Jacks (2 off)	120.0
Elevator Jacks (2 off)	150.0
Total Jacks in Wing (10 off)	360.0
Total Equipment in Wing	49.5
Total Piping (Inc. Fittings & Fluid) in Wing	241.0

3. Hydraulics in Fin  
Comprising:-

43.0 lb.

<u>ITEMS</u>	<u>WEIGHT</u> <u>lb</u>
Rudder Jack (1 off)	30.0
Total Piping (Inc. Fittings & Fluid)	13.0

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C400-05

SHEET NO. 65-1 Issue 2

AIRCRAFT:

C105 With J67 Engine

ELECTRICS

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>GROUP</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins. lb</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
<u>POWER CIRCUIT</u>					
Alternator System	527.9	449.41	263,638.5	- 4.96	
<u>LIGHTING</u>					
Landing	5.6	135.0	756.0	- 18.0	
Navigation	8.0	175.0	1,400.0	+ 25.2	
Cockpit	12.8	598.0	7,654.0	+ 30.0	
<u>INSTRUMENTS</u>					
Turn & Bank	2.0	134.0	268.0	+ 9.0	
Artificial Horizon	2.0	134.0	268.0	+ 9.0	
Ice Warning	2.1	115.0	241.5	- 10.0	
Heated Pressure Heads	6.0	160.0	960.0	0	
Outside Air Temp.	1.0	105.0	105.0	- 10.00	
<u>FLYING CONTROLS</u>					
U/C Indication & Warning	9.1	396.4	3,361.5	+ 12.0	
Aileron Actuation	3.5	450.0	1,575.0	+ 24.0	
Brace Parachute	3.3	631.0	2,082.3	+ 12.0	
Nose Wheel Steering	7.5	163.0	1,225.5	- 18.0	
Canopy Actuation	4.6	163.0	749.8	+ 30.0	
<u>ENGINE</u>					
Tachometer	2.2	392.2	863.5	0	
Exhaust Temp.	3.5	451.0	1,578.5	0	
Fire Detection	6.0	560.0	3,360.0	6.0	
Fire Extinguisher	3.0	392.5	1,177.5	6.0	
Oil Pressure Indication	2.2	392.5	863.5	0	
<u>FUEL SYSTEM</u>					
Fuel Contents	20.0	510.0	10,200.0	+ 30.0	
Pressure Refueling	10.0	500.0	5,000.0	+ 30.0	
Fuel Pressure Indication	2.0	392.5	785.0	0	
Low Level Fuel Warning	1.5	392.5	588.8	0	

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C400-05

SHEET NO. 65-2 Issue 2

AIRCRAFT:

C105 With J67 Engine

ELECTRICS

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>GROUP</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
<u>AIR CONDITIONING</u>					
a) General	20.0	285.0	5,700.0	+ 4.0	
b) Cabin Pressure Warning	3.0	165.0	495.0	+ 6.0	
<u>JUNCTION BOXES</u>					
	62.5	284.0	17,750.0	+ 12.0	
<u>PANELS (Cockpit)</u>					
	10.0	163.0	1,630.0	0	
<u>STRUCTURE CONTINGENCY</u>					
a)	20.0	340.0	6,800.0	+ 24.0	
b)	20.0	512.0	10,240.0	+ 6.0	
	781.3	449.96	351,559.4	+ 0.65	509.22

Notes:

Afterburner Controls considered as included in J67 Engine Weight.

Alternator System (40 KVA + 5 KVA) Located by J67 Engine Installation.

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C4-00-05

SHEET No. 65-3 Issue 2

AIRCRAFT:

C105 2 Crew  
with J 67 Engine

ELECTRICS

PREPARED BY

DATE

P. E. French

April 1954

CHECKED BY

DATE

P. Kubicki

April 1954

ALTERNATOR SYSTEM FOR J67 Engine

<u>UNIT</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Alternator 40 K.V.A.	90.0	577.0		- 6.0	
Sundstrand Drive	90.0	577.0		- 6.0	
1.5 gal. Oil Reservoir & Piping	15.0	591.0		- 25.5	
Alternator 5 K.V.A.	30.0	577.0		- 6.0	
Sundstrand Drive	30.0	577.0		- 6.0	
.75 gal. Oil Reservoir & Piping	11.0	591.0		- 25.5	
Balance of Control Equip.	261.9	419.21	109,791.0	- 1.97	
Totals	527.9	499.41	263,637.1	- 4.96	- 2,618.9

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO 66-1 Issue 2

AIRCRAFT:

C-105 With J67 Engine

RADIO AND RADAR

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>GROUP</u>	<u>WEIGHT</u>
<u>RADAR AND FIRE CONTROL</u>	
a) Radar	322.0
b) Computer & Fire Control	153.3
c) Missile Equipment	1) 293.7
(054)	2) 200.0
d) Auto-Pilot Tie-In	67.0
e) Power Supplies	114.0
f) Control & Display	
1. Front Cockpit	25.8
2. Rear Cockpit	28.5
g) Optical Fire Control	42.1
h) Misc. Components	15.0
<u>IDENTIFICATION SYSTEMS</u>	
a) Air to Air Interrogator	43.5
b) Air to Air Transponder	46.0
c) Air to Ground Transponder	58.7
<u>NAVIGATION / COMMUNICATION</u>	
ARC 34 a) U.H.F.	60.0
AIC 10 b) Interphone	15.0
c) Data Link	34.0
ARN 21 d) OMNI DME	39.0) Alternatives
h) Rθ & Doppler	135.0)
e) Flare Out Altimeter	15.5
ARN 6 f) Radio Compass	76.5
j) Auto Pilot	65.5
<u>EQUIPMENT TOTAL</u>	
a) With Rθ & Doppler	1,831.7
b) With ARN 21	1,735.7
<u>SYSTEM TOTALS</u>	
a) With Rθ & Doppler	
Fuselage Door & Rack	50.0
Equipment	1,831.7
Cable & Structure	326.0
	20.0
	<u>2,227.7</u>
b) With ARN 21	
Fuselage Door & Rack	50.0
Equipment	1,735.0
Cable & Structure	326.0
	20.0
	<u>2,112.0</u>

Note:

This estimate based on allowance of Cables & Mountings as 20% of Equipment Weight

Allowance for Cables Connectors and Mountings =  
20% of (Equipment Total  
- 200 lb for  
Missile Equipment  
(054) on Missile)  
+ 20 lb = 10% of 200 lb  
for wiring on 054 Units.

FUSELAGE DOOR & RACK 50 lb.

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-04-00-05

SHEET NO 67-1

AIRCRAFT

Q-105  
2 Crew  
With J67 Engines

ARMAMENT PROVISIONS.

PREPARED BY

DATE

P. E. French

Jan./54

CHECKED BY

DATE

P. Kubicki

Jan./54

<u>ITEM</u>	<u>WEIGHT</u> <u>lb.</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins. lb</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Levers	52.0	383.9	14,462.8	- 13.5	- 702.0
Struts	8.0	350.6	2,804.8	- 17.5	- 140.0
Bolts	22.0	368.2	8,100.4	- 16.3	- 358.6
Door Actuators	36.0	350.6	12,621.6	- 17.5	- 630.0
Brackets	40.0	328.1	13,524.0	- 14.6	- 584.0
Misc.	26.0	360.8	9,380.0	- 15.2	- 395.2
	184.0	360.8	66,394.4	- 15.2	-2,809.8

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 68-1

AIRCRAFT:

C-105 J67 Engine

EJECTOR SEAT

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>ITEM</u>	<u>WEIGHT</u> <u>lb.</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Pilot's Seat	50.0	180.0		+ 13.5	
Pilot's Chute	23.5	180.0		+ 13.5	
Pilot's Emergency Pack	37.0	180.0		+ 13.5	
Navigator's Seat	50.0	234.0		+ 13.5	
Navigator's Chute	23.5	234.0		+ 13.5	
Navigator's Emergency Pack	37.0	234.0		+ 13.5	
TOTAL	221.0	207.0	45,747.0	+ 13.5	2,983.5

A. V. ROE CANADA LIMITED  
 MALTON - ONTARIO  
**TECHNICAL DEPARTMENT (Aircraft)**

REPORT NO. **7-04-00-01**

SHEET NO. **69-1**

AIRCRAFT:

C-105

EMERGENCY PROVISIONS

PREPARED BY

DATE

P.E. French

Jan./54

CHECKED BY

DATE

P. Kubicki

Jan./54

<u>ITEM</u>	WEIGHT lb	H. ARM ins.	H. MOMENT ins.lb.	V. ARM ins.	V. MOMENT ins. lb.
Fire Extinguisher	6.5	156.0	1,014.0	9.0	58.5
Hatchet	5.0	156.0	780.0	9.0	45.0
Very Pistol	3.3	156.0	514.0	9.0	29.7
Signal Cartridges	2.0	156.0	312.0	9.0	18.0
TOTAL	16.8	156.0	2,620.0	9.0	151.2

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO 7-C4-00-05

SHEET NO 610 Issue 2

AIRCRAFT:

C105 With J67 Engines  
2 Crew

OXYGEN SYSTEM

PREPARED BY

DATE

P. E. French

Apr. 7/54

CHECKED BY

DATE

P. Kubicki

Apr. 1954

ITEM	No. Off	WEIGHT	H. ARM	H. MOMENT	V. ARM	V. MOMENT
		lb	X ins.	lb. ins.	Z ins.	lb ins.
Converter & Charge	1	28.5	237.0			
Filler Valve	1	0.8	237.0			
Vent Valve (Filling)	1	0.9	237.0			
Vent Valve (Relief)	1	0.3	237.0			
Quantity Guage	2	2.0	188.5			
Pressure Guage	2	1.0	188.5			
Seat to Aircraft Discon	2	1.2	188.5			
Seat to Man Discon	2	1.2	188.5			
3 Way Valve	2	0.6	188.5			
Auto Regulator	2	7.0	188.5			
Misc. Piping and Clips		10.0	188.5			
TOTAL		53.5	216.2	11,564.0	+ 6.0	321.0

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT:  
C-105 With J67 Engine

AIR CONDITIONING  
& LOW PRESSURE  
PNEUMATICS

PREPARED BY . DATE

P. E. French May 1954

CHECKED BY DATE

P. Kubicki May 1954

Case 1.

Normal Mission

<u>UNIT</u>	<u>WEIGHT</u> lb	<u>H. ARM</u> ins.	<u>H. MOMENT</u> ins. lb.	<u>V. ARM</u> ins.	<u>V. MOMENT</u> ins. lb.
<u>Air Conditioning</u>					
Equipment	255.0	293.0	7,471.5	+ 9.22	2,352.0
Valves	55.0	327.2	17,955.0	0	0
Temp. Controls	5.0	190.0	950.0	+ 15.0	75.0
Rubber Fittings	5.0	290.0	1,450.0	0	0
Piping	85.0	380.6	32,351.0	- 6.0	- 510.0
Mountings	40.0	295.5	11,820.0	+ 7.7	+ 308.0
Clamps	25.0	380.6	9,515.0	- 6.0	- 150.0
<u>L. P. Pneumatics</u>					
Canopy Seal	20.0	190.0	3,800.0	+ 30.0	+ 600.0
Anti. G	10.0	190.0	1,900.0	+ 12.0	+ 120.0
Misc. Piping	20.0	230.0	4,600.0	0	0
Windscreen, Demist	10.0	125.0	1,250.0	+ 18.0	+ 180.0
Cooling Equipment					
For Fuel, Oil, Pneumatics	75.0	550.0	41,250.0	0	0
TOTAL	605.0	333.2	201,575.0	+ 4.28	2,696.9

Case 2

For Mission assuming 20 min. at 70,000 ft. Requiring 6 lb Water/min.

Add:

Water	130.0	300.0	39,000.0	+ 5.0	+ 6,500
TOTAL	735.0	327.3	240,570.0	+ 4.55	3,347.0

For Landing Condition in Case 2, assume all water as expendable and discharged from aircraft, therefore, use figures for Case 1.

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. 7-C400-05

SHEET No. 612

AIRCRAFT:

C105 With J67 Engine

ANTI-ICING SYSTEM

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>GROUP</u>	<u>WEIGHT</u> lb	<u>H. ARM</u> ins.	<u>H. MOMENT</u> ins. lb	<u>V. ARM</u> ins.	<u>V. MOMENT</u> ins. lb.
Engine Intake	60.0	200.0	12,000.0	0	0
Wing	191.0	550.0	105,050.0	18.0	3,438.0
Fin	49.0	712.2	34,897.8	108.0	5,292.0
	300.0	506.5	151,947.8	29.1	8,730.0

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-04-00-05

SHEET NO. 615

AIRCRAFT

C105 With J67 Engines FURNISHINGS  
Crew

PREPARED BY

DATE

P.E. French

Jan. 22/54

CHECKED BY

DATE

P. Kubicki

Jan. 23/54

	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins.lb.</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins.lb.</u>
<u>Misc. Structure</u>					
Pilot's R.H. Console	15.0	156.0	2,340.0	12.0	180.0
Pilot's L.H. Console	15.0	156.0	2,340.0	12.0	180.0
Nav.'s R. H. Console	15.0	207.0	3,105.0	12.0	180.0
Nav.'s L. H. Console	15.0	207.0	3,105.0	12.0	180.0
Rear of Pilot's Seat	5.0	196.0	980.0	12.0	60.0
Forward Cockpit	10.0	144.0	1,440.0	12.0	120.0
TOTAL	75.0	177.5	13,310.0	12.0	900.0

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-0400-05

SHEET NO. 71-1

AIRCRAFT:

C-105 With J67 Engine

CREW

PREPARED BY

DATE

P. E. French

May 1954

CHECKED BY

DATE

P. Kubicki

May 1954

<u>ITEM</u>	<u>WEIGHT</u> <u>LB</u>	<u>H. ARM</u> <u>X ins.</u>	<u>H. MOMENT</u> <u>ins. lb.</u>	<u>V. ARM</u> <u>Zins.</u>	<u>V. MOMENT</u> <u>ins. lb.</u>
Pilot	210.0	168.0		+ 16.5	
Pilot's O <sub>2</sub> Bottle	5.0	168.0			
Navigator	210.0	219.0		+ 16.5	
Navigator's O <sub>2</sub> Bottle	5.0	219.0			
	430.0	193.5	83,205.0	+ 16.5	7,095.0

A. V. ROE CANADA LIMITED  
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. 7-C4-00-105

SHEET NO. 75-1

AIRCRAFT:

C-105  
2 Crew  
With J67 Engines

MISSILES

PREPARED BY

DATE

P.E. French

Jan./54

CHECKED BY

DATE

P. Kubicki

Jan./54

<u>ITEM</u>	<u>WEIGHT</u> <u>lb</u>	<u>H. ARM</u> <u>ins.</u>	<u>H. MOMENT</u> <u>ins.lb</u>	<u>V. ARM</u> <u>ins.</u>	<u>V. MOMENT</u> <u>ins.lb.</u>
Falcon Model 'D' (4 off)	528.0	347.0	183,216.0	- 23.3	12,302.4
Falcon Model 'D' (4 off)	528.0	449.2	237,177.6	- 23.3	12,302.4
TOTAL	1,056.0	398.1	420,393.6	- 23.3	24,604.8

0000 TANG  
NO. 1533  
MADE IN U.S.A.