

QcX  
Avro  
CF105  
R-7-0400-44  
Iss-7

FILE IN VAULT

C-105 MK II Rea 7-0400-44  
**UNCLASSIFIED**  
WEIGHT SUMMARY FIG. POSITION 28  
R.C.A.F. July 1/57

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Report no.: QCX - AVRO - CF105 - R-7-0400-44-155-7

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downgraded to: \_\_\_\_\_

☒

de-classified

by (Name): Michel W. Drapeau

(Dept.): A/DND Coordinator, Access to Information

Date: Dec. 7, 1992

R. Auger  
Signature

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Report # 7-0400-44 Issue 7

Date: July 1st, 1957

C-105 MK 1 WITH J75 P3 ENGINES 1st AIRCRAFT

I N D E X

| <u>Sheet #</u> | <u>Content</u>                                                                             |
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| 1-1 to 1-4     | Introductory notes and explanations of Weight Changes.                                     |
| 2-1 to 2-2     | Weight and C.G. Summaries.                                                                 |
| 3-1            | Horizontal C.G. Envelopes for Flight Conditions with fuel proportioners used.              |
| 3-2            | Horizontal C.G. Envelope for Flight Conditions with fuel sequencing for C.G. control used. |
| 4-1 to 4-15    | I.B.M. detail sheets of weight and C.G.'s.                                                 |

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*confirmed as*  
Classification ~~cancelled~~ / changed to: **UNCLASSIFIED**  
By authority of: DRDA 7/DARET 5-8/DAS Eng 6-4-5  
Date: 5 Nov 1992  
Signature: B. Aubrey  
Unit / Rank / Appointment: DAS 3, Secretary CRAD HQ DRP



47895

Aircraft: C-105 MK 1 with  
J75 P3 Engines  
1st Aircraft

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Date: July, 1st, 1957

#### INTRODUCTION & WEIGHT CHANGES

The following is a Weight and C.G. Summary for the 1st C-105 Aircraft, with J75 P3 Engines, based on the latest weight estimates currently available. All Weight and C.G. changes are relative to Issue 6 of June 1st, 1957.

Note: - This summary does not apply for the 2nd and subsequent MK 1 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 MK 1 Aircraft.  
(J75 P3 Engines = 6,175 lb. each: J75 P5 Engines = 5,950 lb. each.)
- b) An Instrument Package carrying Flight Test Instrumentation is installed, this also varies between packs 1 to 3 and those for 4th and 5th Aircraft. Information based on Flight Test Layout of June 18/57.  
A relatively detailed estimate of other Flight Test Installations throughout the Aircraft has been made. Twin shielded wire at 27 lb/1000 ft. is used, there being approximately 250 monitored points.. These installations amount to 1,323 lb (figure partially confirmed by actual weights of cable assys.)
- c) Emergency lowering for the Undercarriages and additional fire protection, to be installed on the 1st Aircraft, are allowed for in this summary. There is as yet, no provision to jettison any or all of the Instrument package in an emergency.
- d) An Interim Radio and Radar System is installed.
- e) It should be noted that due to material substitutions and concessions introduced by Planning or Production departments there is a weight penalty, to date, to the structure of 203 lb. This is all recorded in the structural weight breakdown. No account has been taken of variations on machinings etc. nor of shop repair schemes, since it is impossible to assess these, except where actual weights have been obtained.
- f) Pending Flight Test requirements a "Buzz Damping" system may be installed on the first Aircraft. Provisions for this installation are already included in the Structural Group as modifications to the Control Boxes. For the first flights the Control Surfaces will be unmodified, however, if the need for Dampers is proven a modified set of Control Surfaces will be made available. The following weight penalties ensue:-

|                   |               |
|-------------------|---------------|
| Ailerons          | +11.68 lb/A/C |
| Elevators         | +11.07 lb/A/C |
| Rudder            | + 8.50 lb     |
| Equipment & Inst. | +125.17 lb    |
|                   | <hr/>         |
|                   | +156.42 lb    |

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Aircraft: C-105 MK 1 With  
J75 P3 Engines  
1st Aircraft

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INTRODUCTION & WEIGHT CHANGES

- g) A considerable number of Actual Weights have now been obtained. Structural weights are showing very insignificant deviations from the calculated weights, but equipment shows a consistent increase averaging about 11% over manufacturers quotations or Specification Weights. Preceding the report titles on the I.B.M. tabulation sheets, will be found a number varying from 0 to 100, this is the percentage actual weight recorded within the report.

A summary of actual weights obtained so far is as follows: -

|                 |   |        |               |
|-----------------|---|--------|---------------|
| Structure       | - | 42.30% | Actual Weight |
| Undercarriage   | - | 70.07% | " "           |
| Power Plant     | - | 4.80%  | " "           |
| Flying Controls | - | 23.28% | " "           |
| Equipment       | - | 17.02% | " "           |

i.e. 26.53% of the Basic Weight of the Aircraft.

- h) The Aircraft is ballasted such that the C.G. on a flight Envelope does not travel aft. of 31% M.A.C.

1. STRUCTURE

a) Wing:

WEIGHT (lb)

|                                                                                         |   |                |
|-----------------------------------------------------------------------------------------|---|----------------|
| I/W Fuselage Hinge Joint - Actual wts of most hinges                                    | - | 11.84          |
| I/W Centre Trailing Edge - Actual wts of beams # 1 to 6, skins, panels, extrusions etc. | + | 0.74           |
| I/W Strut. Pick-up Fittings - over 70% actual weights                                   | - | 0.31           |
| Elevator Control Box - Actual Weights of ribs, spars, etc.                              | + | 1.21           |
| <u>WEIGHT DECREASE WING</u>                                                             |   | <u>- 10.20</u> |

b) Fin & Rudder

No WEIGHT CHANGE

c) Fuselage fwd. Sta 255 ins.

|                                                      |   |               |
|------------------------------------------------------|---|---------------|
| Pilot's Canopy - .04 AI Inner Skin replaces .051 Mg. |   |               |
| Skin due to forming difficulties                     | + | 0.73          |
| Top Longerons - Actual Weights of fitting etc.       | + | 0.78          |
| <u>FWD. FUSELAGE INCREASE</u>                        |   | <u>+ 1.51</u> |

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INTRODUCTION & WEIGHT CHANGES

d) Centre Fuselage Sta. 255 - 485"

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|                                                  |              |
|--------------------------------------------------|--------------|
| Formers - miscellaneous prod. dry changes        | +0.38        |
| * Skin - repair scheme at Stringer # 11 aft end  | +1.34        |
| Bulkhead Sta. 485 - minor equip. bracketry added | +1.16        |
| <u>CENTRE FUSELAGE INCREASE</u>                  | <u>+2.88</u> |

A Centre Fuselage less dorsal fairings and structure below the lower longerons was weighed. After allowing for shortages and equipment installed, the actual weight checked to within 0.2% of the estimate. Consequently all structural parts included in that section weighed are considered 100% Actual Weight.

e) Duct Bay Sta. 485 - 591.65

NO WEIGHT CHANGE

f) Engine Bay Sta. 591.65 - 742.5

NO WEIGHT CHANGE

g) Rear Fuselage Sta 742.5 aft

|                                                    |              |
|----------------------------------------------------|--------------|
| Rudder Fairing - Actual Weight of parabrake socket | +0.06        |
| Actual Weight of Upper I/B Longerons               | +0.04        |
| <u>REAR FUSELAGE INCREASE</u>                      | <u>+0.10</u> |

TOTAL STRUCTURAL DECREASE      -5.71

2. LANDING GEAR

|                                                 |              |
|-------------------------------------------------|--------------|
| Main U/C Doors - Actual Weights of 25% of parts | -0.88        |
| <u>TOTAL LANDING GEAR INCREASE</u>              | <u>-0.88</u> |

3. POWER PLANT & SERVICES

|                                                                                            |               |
|--------------------------------------------------------------------------------------------|---------------|
| Fuel System - general production drawing changes,<br>actual weights of some equipment etc. | +10.00        |
| <u>TOTAL POWER PLANT INCREASE</u>                                                          | <u>+10.00</u> |

4. FLYING CONTROLS GROUP

NO WEIGHT CHANGE

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Aircraft: C-105 MK 1 With  
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INTRODUCTION & WEIGHT CHANGES

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5. EQUIPMENT GROUP

|                                                                                                                                                                                                                                                                                    |         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| Instrument Pack Structure - proposed addition of access panels                                                                                                                                                                                                                     | + 2.00  |
| Pack Instrumentation - revised estimate by Flight Test                                                                                                                                                                                                                             | +689.00 |
| allowance for pack ejection deleted                                                                                                                                                                                                                                                | -100.00 |
| Flight Test Installations - previously an allowance of 710 lb was carried. Sufficient data has since become available to make a reasonable weight estimate - in some cases cable assys. were weighed - all estimates based on incomplete data have the concurrence of Flight Test. | +612.37 |

TOTAL EQUIPMENT INCREASE

+1203.37

SUMMARY

Weight Change - Aircraft Weight Empty

|              |                 |
|--------------|-----------------|
| Structure    | - 5.71          |
| Landing Gear | - 0.88          |
| Power Plant  | + 10.00         |
| Equipment    | +1,203.37       |
|              | <u>1,206.78</u> |

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

|           |           |                      |
|-----------|-----------|----------------------|
| Issue 6   | Issue 7 * |                      |
| 46,201.25 | 47,408.03 | <u>+ 1,206.78 lb</u> |

N.B.\* A/C in UNBALLASTED Condition. If ballasted such that aft. C.G. does not exceed 31% MAC a further 1,004 lb. of ballast are necessary.

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Aircraft: C-105 MK 1 with  
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1st Aircraft.

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WEIGHT & C.G. SUMMARY

| <u>Description</u>                | <u>WEIGHT</u><br><u>lb.</u> | <u>H. ARM</u><br><u>ins.</u> | <u>V. ARM</u><br><u>ins.</u> |
|-----------------------------------|-----------------------------|------------------------------|------------------------------|
| STRUCTURE                         | 18,495.53                   | 561.90                       | 137.59                       |
| Wings.                            | 9,965.10                    | 642.93                       | 112.25                       |
| Fin & Rudder                      | 1,025.85                    | 754.34                       | 209.31                       |
| Fuselage fwd. Sta. 255"           | 2,617.01                    | 181.50                       | 128.15                       |
| Sta. 255"-485"                    | 1,650.12                    | 379.76                       | 130.80                       |
| Sta. 485"-591.65"                 | 997.30                      | 533.97                       | 104.59                       |
| Sta. 591.65"- 742.5"              | 1,418.18                    | 660.80                       | 107.30                       |
| Sta. 742.5 Aft.                   | 769.39                      | 800.60                       | 129.11                       |
| " Marry Up "                      | 52.58                       | 468.91                       | 103.89                       |
| UNDERCARRIAGE RETRACTED           | 2,608.89                    | 488.46                       | 134.94                       |
| Main Undercarriages               | 1,959.62                    | 539.48                       | 141.00                       |
| Main U/C Doors & Fairings         | 290.92                      | 536.83                       | 138.49                       |
| Nose Undercarriage                | 333.81                      | 170.81                       | 99.70                        |
| Nose U/C Door & Fairing           | 24.54                       | 162.24                       | 88.23                        |
| POWER PLANT & SERVICES            | 14,320.35                   | 653.01                       | 120.25                       |
| Engines & Accessories J75 P3      | 12,560.22                   | 664.92                       | 119.78                       |
| Gear Box Installation on Fuselage | 275.54                      | 601.39                       | 102.98                       |
| Gear Boxes & Starters on Engine   | 259.65                      | 591.55                       | 104.52                       |
| Engine Controls                   | 32.43                       | 375.76                       | 118.62                       |
| Engine Nose Bullets               | 71.01                       | 562.74                       | 115.07                       |
| Fire Extinguishing System         | 70.46                       | 702.44                       | 134.83                       |
| Engine Mountings                  | 203.64                      | 609.88                       | 123.63                       |
| Fuel System                       | 847.40                      | 536.57                       | 136.16                       |
| FLYING CONTROLS GROUP             | 1,827.07                    | 686.88                       | 140.02                       |
| Mechanical Flying Controls        | 946.48                      | 687.84                       | 148.61                       |
| Hydraulic Flying Controls         | 880.59                      | 685.84                       | 130.78                       |
| EQUIPMENT FIXED & REMOVABLE       | 9,173.17                    | 402.30                       | 110.21                       |
| Instruments                       | 46.07                       | 163.68                       | 138.70                       |
| Probe                             | 18.50                       | 40.00                        | 108.00                       |
| Cockpit Pressure Sealing          | 5.00                        | 186.00                       | 130.00                       |
| Oxygen System                     | 23.59                       | 253.72                       | 156.43                       |
| Air Conditioning System           | 794.82                      | 336.05                       | 134.34                       |
| Surface Finish                    | 100.00                      | 591.52                       | 140.20                       |
| Hydraulics Main System            | 609.09                      | 500.86                       | 117.57                       |
| Cabin Insulation                  | 14.31                       | 187.48                       | 132.00                       |
| Brake Parachute                   | 62.38                       | 769.41                       | 143.24                       |
| Electrical System                 | 1,117.89                    | 417.17                       | 112.83                       |
| Low Pressure Pneumatics           | 53.15                       | 427.62                       | 124.55                       |
| Intake De-Icing Boots             | 51.84                       | 197.02                       | 118.00                       |
| Canopy Actuation                  | 62.05                       | 222.11                       | 154.47                       |
| Cabin Consoles                    | 17.45                       | 174.76                       | 124.34                       |
| Ejector Seats                     | 284.42                      | 202.80                       | 136.25                       |

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Aircraft: C-105 MK 1 with  
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WEIGHT & C.G. SUMMARY

| Description                                          | WEIGHT<br>lb. | H.ARM<br>ins. | V.ARM<br>ins. | M.A.C.<br>% |
|------------------------------------------------------|---------------|---------------|---------------|-------------|
| Interim Radio & Radar                                | 690.98        | 322.67        | 123.64        |             |
| Radome Anti-Icing                                    | 8.88          | 51.49         | 125.00        |             |
| Instrument Pack Structure                            | 686.80        | 385.81        | 94.68         |             |
| Pack Instrumentation 1st A/C                         | 3,036.00      | 395.45        | 95.00         |             |
| Flight Test Installations                            | 1,322.87      | 499.20        | 112.01        |             |
| Additional Fire Protection 1st A/C                   | 154.17        | 425.05        | 102.89        |             |
| Emergency Landing Gear Lowering                      | 12.91         | 458.83        | 128.60        |             |
| AIRCRAFT BASIC WEIGHT                                | 46,425.01     | 559.26        | 126.78        |             |
| USEFUL LOAD (LESS FUEL)                              | 983.02        | 353.44        | 132.63        |             |
| Crew                                                 | 430.00        | 194.00        | 136.50        |             |
| Oil                                                  | 134.23        | 608.92        | 115.68        |             |
| Alcohol - radome de-icing                            | 22.00         | 93.00         | 138.00        |             |
| Engine Fire Ext. 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                           | 140.00        | 268.00        | 132.00        |             |
| BALLAST                                              | 1,004.00      | 86.97         | 116.5         |             |
| Operational Wt. Empty                                |               |               |               |             |
| U/C Up                                               | 48,412.03     | 545.28        | 126.69        | 30.19       |
| U/C Down                                             |               | 547.30        | 123.34        | 30.74       |
| Maximum Internal Fuel (2,544 gals.<br>@ 7.8 lb/gal.) | 19,843.00     | 538.88        | 144.32        |             |
| A.U.W. maximum Int.Fuel                              |               |               |               |             |
| U/C Up                                               | 68,255.03     | 543.42        | 131.82        | 29.67       |
| U/C Down                                             |               | 544.85        | 129.44        | 30.07       |

N.B. 1) A/C Datum is considered to be 120 ins. above an arbitrarily chosen ground line.

- 2) The above figures are for the Aircraft in the BALLASTED condition such that the aft. C.G. on the Horizontal C.G. Flight Envelope does not exceed 31% M.A.C. i.e. 303 lb on Former Sta. 68.5 and 701 lb on the Shear Panel.

SECRET

REPORT NO: 7-2400-44-7

BY: Kathleen Lyngja

DATE: July 15, 1957

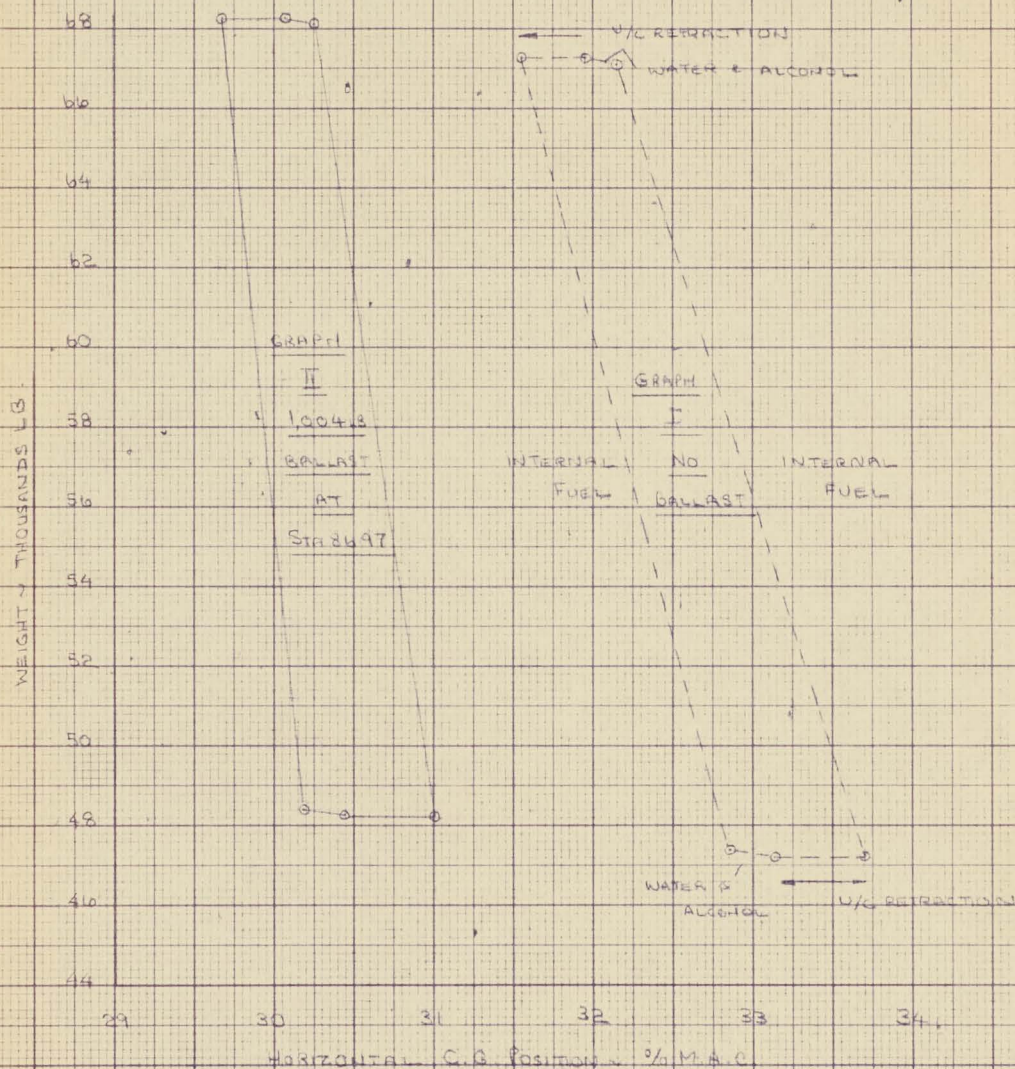
SHEET: 3-1

# HORIZONTAL C.G. ENVELOPE

CWS MK1A/C FLIGHT CONDITIONS

WITH J75P3 ENGINES (2ND SUBSEQUENT A/C 176PS)

- 1) INTERIM RADIO & RADAR
- 2) INSTRUMENT PACK & FLIGHT TEST INSTALLATIONS
- 3) FUEL SYSTEM PROPORTIONERS



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REPORT NO. 7-0450-44-7

BY: Malcolm Syggen

DATE: July 15, 57

SHEET: 3-2

HORIZONTAL C.G. ENVELOPE

CLOSURE 1ST A/C FLIGHT CONDITIONS

WITH

PROPOSED FUEL SYSTEM SEQUENCING

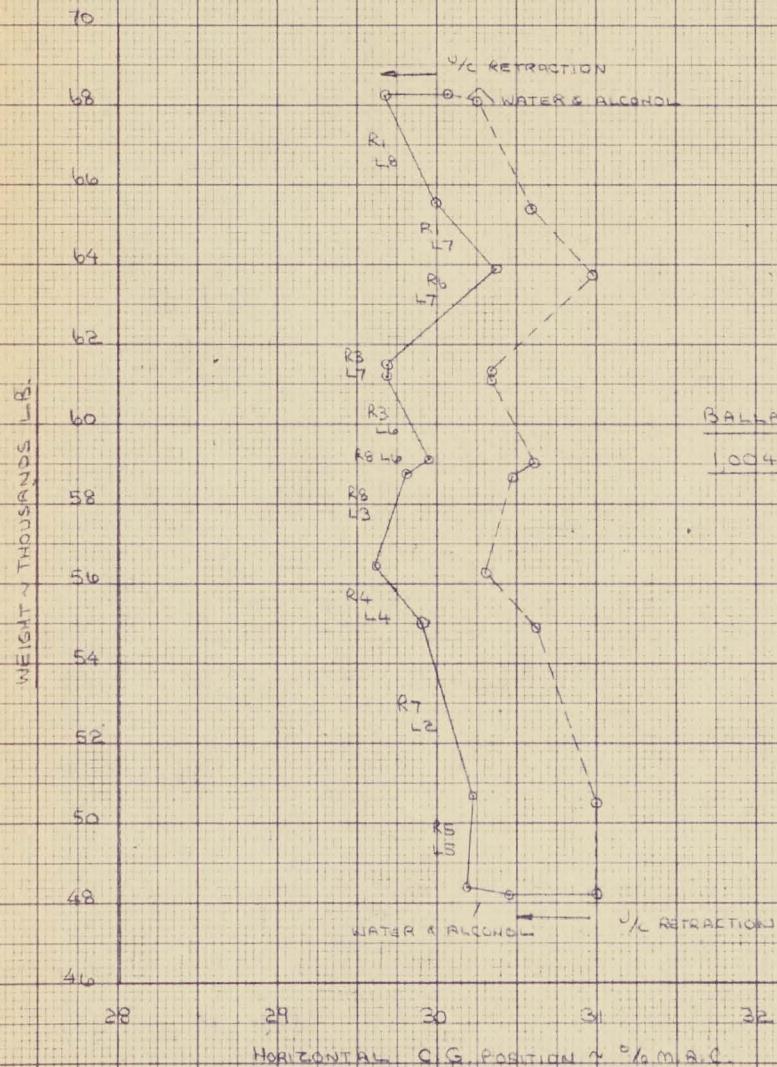
SEQUENCING ORDER: (W/ P/NH/121)

R.H.S. ~ 1, 6, 3, 2, 4, 7, 5 (NOTED R1, R6 etc)

L.H.S. ~ 8, 7, 6, 3, 4, 2, 5 (NOTED L8, L7 etc)

KEY:

----- 1/2 EXTENDED  
 ————— 1/2 RETRACTED



BALLAST INSTALLED  
1,004 L.B. AT STA 86.17 INS

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G9-12  
 10 X 10 TO THE 15 INCH  
 MADE IN CANADA

**AVRO AIRCRAFT LTD.**

MALTON, ONT.

**WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT**

PROJECT C-105 MK 1

| DESCRIPTION      |                            | REFERENCE NO. | COMP. NO. | WEIGHT | H.   |
|------------------|----------------------------|---------------|-----------|--------|------|
| TOTAL WING GROUP |                            | 10000000      |           |        |      |
| OUTER WING       |                            | 10100000      |           |        |      |
| 100              | OUTER WING SKINS           | 10100001      | 64        | 929    | 1070 |
| 100              | POSTS AND INTERCOSTALS     | 10100002      | 64        | 243    | 673  |
| 100              | OUTER WING SPARS           | 10100003      | 64        | 392    | 5870 |
| 100              | OUTER WING RIBS            | 10100004      | 64        | 134    | 5669 |
| 18               | AILERON CONTROL BOX        | 10100006      | 64        | 379    | 2077 |
| 100              | RIB 12                     | 10100007      | 64        | 76     | 2664 |
| 100              | O W AILERON JACK FITTING   | 10100009      | 64        | 10     | 4672 |
|                  | AILERON JOINTS AND FAIRING | 10100010      |           | 329    | 378  |
|                  | BUZZ DAMP STRUC PROV O W   | 10100011      | 64        | 8      | 0075 |
|                  |                            |               |           | 1987   | 45   |
| AILERON          |                            | 10200000      |           |        |      |
| 100              | AILERON STRUCTURE          | 10200001      | 74        | 336    | 0079 |
|                  |                            |               |           | 336    | 00   |
| 97               | ELEVATOR                   | 10300000      | 82        | 449    | 0075 |
| 97               | ELEVATOR MARRY UP          | 10300000      |           | 159    | 773  |
|                  |                            |               |           | 464    | 97   |
| INNER WING       |                            | 10400000      |           |        |      |
| 79               | MAIN U C STRUCTURE         | 10400001      | 62        | 330    | 7157 |
| 51               | FRONT SPAR I W             | 10400002      | 62        | 111    | 1048 |
| 51               | MAIN SPAR I W              | 10400003      | 62        | 151    | 0656 |
| 51               | FWD CENTRE SPAR I W        | 10400004      | 62        | 53     | 6460 |
| 51               | AFT CENTRE SPAR I W        | 10400005      | 62        | 36     | 6665 |
| 51               | REAR SPAR I W              | 10400006      | 62        | 76     | 6770 |
| 32               | I W STRUCTURE F S TO M S   | 10400007      | 62        | 1059   | 1849 |
| 64               | I W STRUCTURE M S TO R S   | 10400008      | 62        | 149    | 7960 |
| 74               | STRUCTURE AFT OF REAR SPAR | 10400009      | 62        | 323    | 8671 |
| 40               | ELEVATOR CONTROL BOX       | 10400010      | 62        | 428    | 3372 |
| 25               | TRANSP JOINT MARRY UP      | 10400011      |           | 70     | 6563 |
| 72               | CENTRE LINE JOINTS         | 10400012      | 62        | 634    | 7166 |
| 46               | INNER WING SKINS           | 10400013      | 62        | 2190   | 3862 |
| 72               | STRUT PICK UP FITTINGS     | 10400014      | 62        | 539    | 156  |
| 31               | RIBS 1 TO 9 INNER WING     | 10400016      | 62        | 512    | 0461 |
|                  | DORSAL FAIRINGS I W        | 10400017      | 62        |        | 9548 |
| 100              | RIB 10                     | 10400018      | 62        | 108    | 0063 |
| 49               | FUSELAGE HINGE JOINT I W   | 10400019      | 62        | 126    | 2861 |
| 25               | TRANSP JOINT               | 10400020      | 62        | 129    | 4263 |
| 49               | FUSELAGE HINGE JOINT       | 10400021      |           | 37     | 4052 |
|                  | BUZZ DAMP STRUC PROV I W   | 10400022      | 62        | 5      | 5274 |
|                  | DORSAL FAIRINGS            | 10400023      |           | 56     | 2957 |
|                  |                            |               |           | 6646   | 60   |











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MALTON, ONT.

WEIGHT AND C. OF G BY FUNCTIONAL  
COMPONENT

PROJECT \_\_\_\_\_

| DESCRIPTION              |                            | REFERENCE NO. | COMP. NO. | WEIGHT |
|--------------------------|----------------------------|---------------|-----------|--------|
| TOTAL FUSELAGE GROUP     |                            | 3000000       |           |        |
| FUSELAGE BASIC STRUCTURE |                            | 3010000       |           |        |
|                          | RADOME                     | 3010001       | 51        | 177.28 |
|                          | RADAR NOSE ACCESS DOORS    | 3010002       | 51        | 80.02  |
|                          | RADAR NOSE STRUCTURE       | 3010003       | 51        | 122.25 |
|                          | SKIN F F                   | 3010004       | 52        | 109.49 |
| 88                       | SKIN C F                   | 3010005       | 54        | 211.82 |
|                          | SKIN D B                   | 3010006       | 56        | 58.80  |
| 3                        | SKINS E B                  | 3010007       | 58        | 175.73 |
| 4                        | FORMERS F F                | 3010011       | 52        | 105.31 |
| 100                      | FORMERS C F                | 3010012       | 54        | 278.24 |
|                          | FORMER D B                 | 3010013       | 56        | 74.57  |
|                          | LIGHT FORMERS E B          | 3010014       | 58        | 135.01 |
| 13                       | HEAVY FORMERS F B          | 3010015       | 58        | 212.81 |
|                          | LOWER LONGERONS F F        | 3010016       | 52        | 68.46  |
|                          | LONGITUDINAL MEMBERS E B   | 3010017       | 58        | 110.66 |
|                          | LONGERON E B               | 3010018       | 58        | 69.05  |
|                          | TOP LONGERONS E B          | 3010019       | 58        | 6.38   |
|                          | LOWER SHEAR PANEL          | 3010020       | 52        | 29.88  |
|                          | TOP WING LONGERONS D B     | 3010021       | 56        | 49.88  |
|                          | LONGERONS C F              | 3010022       | 52        | 5.3    |
|                          | LONGERONS C F              | 3010023       | 54        | 138.13 |
| 43                       | LONGERONS F D B            | 3010024       | 54        | 12.58  |
| 43                       | LONGERONS A D B            | 3010025       | 56        | 8.55   |
|                          | ELECTRONICS BAY STRUCTURE  | 3010026       | 54        | 35.70  |
| 59                       | LONGITUDINAL BEAMS D B     | 3010027       | 56        | 65.70  |
|                          | RADAR ACCESS DOOR C F      | 3010028       | 54        | 21.08  |
| 72                       | MAIN FRAME AT STN 538 77   | 3010029       | 56        | 59.80  |
|                          | DIVE BRAKE ACCOM STRUCTURE | 3010030       | 56        | 36.34  |
| 30                       | TOP LONGERONS F F          | 3010031       | 52        | 186.49 |
| 100                      | DUCT C F                   | 3010032       | 54        | 332.86 |
|                          | DUCT D B                   | 3010033       | 56        | 315.04 |
|                          | CANOPY ARCHES              | 3010034       | 52        | 85.35  |
| 4                        | ACCESS PANEL STIFFENERS    | 3010036       | 56        | 38.65  |
| 66                       | NOSE U C SUPPORT STRUCTURE | 3010037       | 52        | 33.43  |
| 3                        | CREW BULKHEADS             | 3010038       | 52        | 122.72 |
| 51                       | EQUIPMENT BAY STRUCTURE    | 3010039       | 54        | 61.50  |
| 86                       | WINDSCREEN                 | 3010041       | 52        | 130.03 |
|                          | SERV ACCESS DOORS AND PNLS | 3010042       | 58        | 67.04  |
|                          | TORSION BOX E B            | 3010043       | 58        | 60.42  |
|                          | DORSAL FAIRING AIR OUTLET  | 3010044       | 54        | 20.61  |
|                          | INTERMEDIATE FORMERS       | 3010045       | 58        | 51.65  |
|                          | ENGINE ACCESS DOORS        | 3010046       | 58        | 146.59 |
|                          | SEALING MISSILE BAY        | 3010047       | 54        | 6.97   |
| 100                      | MISCELLANEOUS ITEM C F     | 3010048       | 54        | 3.92   |
| 98                       | ARMAMENT BAY ROOF          | 3010049       | 54        | 132.16 |
|                          | BULKHEAD AT STA 120        | 3010050       | 52        | 30.60  |
|                          | BULKHEAD AT STA 255        | 3010051       | 52        | 104.29 |
| 100                      | BULKHEAD AT STA 485        | 3010052       | 54        | 112.45 |
|                          | ENGINE TUNNEL E B          | 3010054       | 58        | 467.64 |



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WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT \_\_\_\_\_

|    | DESCRIPTION                | REFERENCE NO. | COMP. NO. | WEIGHT  | H. |
|----|----------------------------|---------------|-----------|---------|----|
|    | INTEGRAL FUS FUEL TANK     | 301005554     |           | 2035939 |    |
|    | COCKPIT FLOOR              | 301005652     |           | 574317  |    |
|    | CENTRE BEAM 697 28 717 36  | 301005958     |           | 55771   |    |
|    | DORSAL OVER FUEL TANK      | 301006154     |           | 509741  |    |
|    | SHIELD EXHAUST DEFLECTOR   | 301006254     |           | 196533  |    |
|    | SHEAR PANEL BELOW NAV ARCH | 301006352     |           | 207425  |    |
| 34 | PACK MTG STRUCTURE         | 301006454     |           | 204729  |    |
|    | ENG ACCESS DOORS R F       | 301006559     |           | 828477  |    |
|    | TUNNEL FIXED R F           | 301006659     |           | 978977  |    |
|    | SKIN AND STIFFENERS R F    | 301006759     |           | 512277  |    |
| 47 | FAIRING UNDER RUDDER       | 301006859     |           | 261678  |    |
|    | FORMERS FIXED R F          | 301006959     |           | 900177  |    |
|    | LONGERONS C BEAM FIXED R F | 301007059     |           | 279977  |    |
|    | NACELLES REMOVABLE R F     | 301007159     |           | 2798982 |    |
|    | CNTR STRUC STING REMOV R F | 301007259     |           | 1133983 |    |
|    | MISCELLANEOUS ITEMS E B    | 301007358     |           | 92366   |    |
|    | MTG BRKTS SIDE PANEL D B   | 301007556     |           | 21352   |    |
|    | FORMERS LOWER PANEL D B    | 301007656     |           | 760654  |    |
|    | LOWER PANEL D B            | 301007756     |           | 505455  |    |
|    | JOINT F F TO C F           | 3010078       |           | 85525   |    |
|    | JOINT AIR INTAKES TO F F   | 3010079       |           | 95222   |    |
|    | JOINT C F TO D B           | 3010080       |           | 50048   |    |
|    | JOINT D B TO E B           | 3010081       |           | 250858  |    |
|    | FUS JOINT AT STA 742 50    | 3010082       |           | 44374   |    |
|    | MISC STRUCTURE F F         | 301008552     |           | 55218   |    |
|    |                            |               |           | 624183  |    |
| 96 | DIVE BRAKES                | 302000072     |           | 1115050 |    |
| 96 | DIVE BRAKES C A            | 3020001       |           | 40648   |    |
|    |                            |               |           | 11556   |    |
|    | AIR INTAKES                | 3030000       |           |         |    |
| 18 | AIR INTAKES                | 303010055     |           | 7624821 |    |
|    |                            |               |           | 76248   |    |
|    | PILOTS AND NAVIG CANOPIES  | 3040000       |           |         |    |
| 76 | PILOTS CANOPY              | 304010053     |           | 2415417 |    |
|    |                            |               |           | 24154   |    |
| 48 | NAVIGATORS CANOPY          | 304020053     |           | 1431723 |    |
|    |                            |               |           | 14317   |    |







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# WEIGHT AND C. OF G BY FUNCTIONAL COMPON

PROJECT \_\_\_\_\_

| DESCRIPTION                   |                           | REFERENCE NO. | COMP. NO. | WEIGHT  |
|-------------------------------|---------------------------|---------------|-----------|---------|
| ENGINE GROUP                  |                           | 5000000       |           |         |
| ENGINE J 75                   |                           | 5010000       |           | 1252500 |
|                               |                           |               |           | 1252500 |
| J 75 ENGINE SERV ACCESS       |                           | 5010100       |           | 35220   |
|                               |                           |               |           | 35220   |
| 68                            | ACC GEAR BOXES ON FUS D B | 5020001       | 56        | 45245   |
| 68                            | ACC GEAR BOXES ON FUS E B | 5020002       | 58        | 230300  |
|                               |                           |               |           | 27554   |
| ENGINE CONTROLS               |                           | 5030000       |           |         |
| 36                            | ENGINE CONTROLS F F       | 5030001       | 52        | 14583   |
| 36                            | ENGINE CONTROLS C F       | 5030002       | 54        | 2641    |
| 36                            | ENGINE CONTROLS D B       | 5030003       | 56        | 5084    |
| 36                            | ENGINE CONTROLS E B       | 5030004       | 58        | 10136   |
|                               |                           |               |           | 3243    |
| 91 GEARBOX AND STARTER ON ENG |                           | 5040000       |           | 25965   |
|                               |                           |               |           | 25965   |
| 6 ENGINE ANTI ICING           |                           | 5050000       |           | 71015   |
|                               |                           |               |           | 7101    |
| FIRE EXT SYSTEM               |                           | 5060000       |           |         |
| FIRE EXT SYST ENG             |                           | 5060001       |           | 69007   |
| FIRE EXT SYST E B             |                           | 5060002       | 56        | 1465    |
|                               |                           |               |           | 7046    |
| ENGINE MTGS AND BRACKETS      |                           | 5070000       |           |         |
| 4                             | ENGINE MTGS AND BRACKETS  | 5070001       |           | 14396   |
| ENGINE MTGS ACCESSORIES       |                           | 5070002       |           | 52020   |
| ENGINE MTGS ACCESSORIES CA    |                           | 5070003       |           | 7660    |
|                               |                           |               |           | 20364   |
| FUEL SYSTEM                   |                           | 5080000       |           |         |



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# WEIGHT AND C. OF G BY FUNCTIONAL COMPONE

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# WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT \_\_\_\_\_

| DESCRIPTION              |                            | REFERENCE NO. | COMP. NO. | WEIGHT | H |
|--------------------------|----------------------------|---------------|-----------|--------|---|
| FIXED EQUIPMENT GROUP    |                            | 70000000      |           |        |   |
| INSTRUMENTS              |                            | 70100000      |           |        |   |
| INSTRUMENTS F F          |                            | 70100001      | 52        | 44071  |   |
| NAVIG TABLE AND STOWAGE  |                            | 70100004      | 52        | 2002   |   |
|                          |                            |               |           | 4007   |   |
| COCKPIT PRESSURE SEALING |                            | 70200000      | 52        | 5001   |   |
|                          |                            |               |           | 500    |   |
| OXYGEN SYSTEM            |                            | 70300000      |           |        |   |
| OXYGEN SYSTEM            |                            | 70300001      | 52        | 23592  |   |
|                          |                            |               |           | 2359   |   |
| AIR CONDITIONING SYSTEM  |                            | 70400000      |           |        |   |
| 45                       | AIRCONDITIONING SYSTEM F F | 70400001      | 52        | 35491  |   |
| 45                       | AIRCONDITIONING SYSTEM C F | 70400002      | 54        | 459672 |   |
| 45                       | AIRCONDITIONING SYSTEM D B | 70400003      | 56        | 11485  |   |
| 45                       | AIRCONDITIONING SYSTEM C A | 70400005      |           | 271824 |   |
| 45                       | AIRCONDITIONING SYSTEM ENG | 70400006      |           | 15566  |   |
| 45                       | AIRCONDITIONING SYSTEM I W | 70400007      | 62        | 805    |   |
|                          |                            |               |           | 79482  |   |
| HYDRAULICS MAIN SYSTEM   |                            | 70500000      |           |        |   |
| 14                       | UTILITY HYDRAULICS F F     | 70500001      | 52        | 84152  |   |
| 5                        | UTILITY HYDRAULICS C F     | 70500002      | 54        | 41624  |   |
| 9                        | UTILITY HYDRAULICS D B     | 70500003      | 56        | 244765 |   |
| 21                       | UTILITY HYDRAULICS E B     | 70500004      | 58        | 72406  |   |
| 23                       | UTILITY HYDRAULICS I W     | 70500005      | 62        | 133115 |   |
| 14                       | UTILITY HYDR NOSE U C      | 70500006      | 91        | 3251   |   |
| 23                       | UTILITY HYDR MAIN U C      | 70500007      | 92        | 29805  |   |
| 28                       | EMERGENCY LOWERING M U C   | 70500008      | 62        | 8535   |   |
| 35                       | EMERGENCY LOWERING N U C   | 70500009      | 52        | 4382   |   |
|                          |                            |               |           | 62200  |   |
| CABIN INSULATION         |                            | 70700000      | 52        | 14311  |   |
|                          |                            |               |           | 1431   |   |
| BRAKE PARACHUTE          |                            | 70800000      |           |        |   |











## WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT \_\_\_\_\_

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**MALTON, ONT.**

# WEIGHT AND C. OF G BY FUNCTIONAL COMPONENT

PROJECT

| DESCRIPTION                | REFERENCE NO. | COMP. NO. | WEIGHT | H |
|----------------------------|---------------|-----------|--------|---|
| OPERATIONAL LOAD           | 90000000      |           |        |   |
| CREW MEMBERS               | 901000052     |           | 430001 |   |
|                            |               |           | 43000  |   |
| ENGINE OIL                 | 90200000      |           |        |   |
| ENGINE OIL USABLE          | 90200001      |           | 88166  |   |
| ENGINE OIL TRAPPED ENG     | 90200002      |           | 17736  |   |
| ENGINE OIL TRAPPED D B     | 9020000356    |           | 19255  |   |
| ENGINE OIL TRAPPED E B     | 9020000458    |           | 9095   |   |
|                            |               |           | 13423  |   |
| OXYGEN CHARGE              | 90400000      |           |        |   |
| OXYGEN CHARGE F F          | 9040000152    |           | 722    |   |
| OXYGEN CHARGE C F          | 9040000254    |           | 12672  |   |
|                            |               |           | 1339   |   |
| ALCOHOL FOR RADOME DEICING | 905000051     |           | 2200   |   |
|                            |               |           | 2200   |   |
| ENGINE FIRE EXT FLUID      | 90600000      |           | 25007  |   |
|                            |               |           | 2500   |   |
| RESIDUAL FUEL              | 90700000      |           |        |   |
| RESIDUAL FUEL C F          | 9070000154    |           | 46803  |   |
| RESIDUAL FUEL I W          | 9070000262    |           | 171605 |   |
|                            |               |           | 21840  |   |
| WATER FOR AIR CONDITIONING | 9100000054    |           | 125002 |   |
| UNUSABLE WATER FOR AIRCOND | 9100000154    |           | 15002  |   |
|                            |               |           | 14000  |   |

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UNCLASSIFIED  
NON CLASSIFIED

|       | REFERENCE NO. | COMP. NO. | WEIGHT | H. ARM | V. ARM | H. MOMENT | V. MOMENT |
|-------|---------------|-----------|--------|--------|--------|-----------|-----------|
|       | 90000000      |           |        |        |        |           |           |
|       | 90100000      | 52        | 43000  | 19400  | 13650  | 8342000   | 5869500   |
|       |               |           | 43000  |        |        | 8342000   | 5869500   |
|       | 90200000      |           |        |        |        |           |           |
|       | 90200001      |           | 88166  | 1246   | 12186  | 5399447   | 1074318   |
| G     | 90200002      |           | 17736  | 2676   | 11640  | 1111245   | 206377    |
| B     | 90200003      | 56        | 19255  | 8034   | 9555   | 1118117   | 183934    |
| B     | 90200004      | 58        | 9095   | 9928   | 9704   | 544746    | 88209     |
|       |               |           | 13423  |        |        | 8173555   | 1552838   |
|       | 90400000      |           |        |        |        |           |           |
|       | 90400001      | 52        | 7220   | 493    | 13200  | 14755     | 9504      |
|       | 90400002      | 54        | 12672  | 6280   | 16150  | 332968    | 204621    |
|       |               |           | 1339   |        |        | 347723    | 214125    |
| ICING | 90500000      | 51        | 2200   | 9300   | 13800  | 204600    | 303600    |
|       |               |           | 2200   |        |        | 204600    | 303600    |
|       | 90600000      |           | 2500   | 73000  | 12900  | 1825000   | 322500    |
|       |               |           | 2500   |        |        | 1825000   | 322500    |
|       | 90700000      |           |        |        |        |           |           |
|       | 90700001      | 54        | 4680   | 39424  | 12300  | 1845043   | 575640    |
|       | 90700002      | 62        | 17160  | 59755  | 13705  | 10253958  | 2351778   |
|       |               |           | 21840  |        |        | 12099001  | 2927418   |
| ONING | 91000000      | 54        | 12500  | 26800  | 13200  | 3350000   | 1650000   |
| RCOND | 91000001      | 54        | 1500   | 26700  | 12700  | 400500    | 190500    |
|       |               |           | 14000  |        |        | 3750500   | 1840500   |

