[redacted]

Arrow 2
A/C 25206

Report: 7-0400-82
Issue : 3

WEIGHT & C.G. SUMMARY

[redacted]

1 Nov/58

(8)

[redacted]

AVRO AIRCRAFT LIMITED
INTER-DE[redacted]

ANALYZED

Classification cancelled / changed to Unclassified
By authority of AVRO Arrow Declassif. Board
Date 28 Jul 87
Signature [signature], Co-Chairperson
Unit / Rank / Appointment DSIS 3

Ref: 5289/11/J
Date: 1 November, 1958
To: See Distribution
From: E.F. Burnett - Weight Supervisor
Subject: Arrow 2 - A/C 25206 Weight & C.G. Summary Report: 7-0400-82 Issue 3

Attached is a copy of Weight and C.G. Summary, Report: 7-0400-82 Issue 3 for your retention.

This report will be revised and issued monthly until an actual weighing of the aircraft has been obtained.

E.F. Burnett

EFB/ag
cc: Messrs. J.C. Floyd, R.N. Lindley, C.V. Lindow, F.P. Mitchell, T. Higgins, B.C. Alford, D.N. Scard, R. Marshall, F. Brame, W. Czerwinski, J. Lucas, S. Kwiatkowski, A. Cornish, T. Roberts, D. Wade, C. Marshall, W. Potocki, A. Crust, (6 copies R.C.A.F.), A. Buley, D. Inglis, D. Moore, R. Cairns

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Aircraft: Arrow 2
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Sheet	Content
1-1 to 1-4	Introductory notes and explanations of weight changes relative to Mk 2 A/C 25206 defined in Weight Report 7-0400-82 Issue 2.
2-1 to 2-2	Weight and C.G. Summary
3-1	Horizontal C.G. Plot showing basic fixed points on flight envelope for ballasted Aircraft. The possible variations of C.G. with fuel used have been omitted until such time as a fully approved fuel sequencing is established.
4-1 to 4-15	I.B.M. detail sheets of Weights and C.G.'s.

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Aircraft: Arrow 2
A/C 25206
Date : 1 November, 1958

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Sheet : 1-1

Introduction and Weight Changes

The following is a weight and C.G. summary for Arrow 2 Aircraft No. 25206, based on the latest weight estimates available. All weight and C.G. changes are relative to issue 2 of this report dated October 1st, 1958.

Note:

1. This summary is for the Aircraft as at first flight. Future changes e.g. possible fitment of Weapons Pack etc. will be dealt with as Flight Test Statements at the applicable time, if required.

2. This statement is applicable to Aircraft 25206 only .

General:

a) Orenda PS 13 Engines comprise the Power Plant. These will be early production versions, weight 4835 lb each, ref. Orenda Engines Ltd. letter AWS/SAW dated, August 21, 1958.

b) An Instrument package containing Flight Test Instrumentation with an approximate weight complete of 3100 lbs is installed.

A detailed estimate of Flight Test Installations within the airframe has been made. This amounts to 624 lb including Auto-Observer.

c) A Partial Electronics System is installed as defined by Report: 72/AIREQ/13/2-7, dated October, 1958.

Minneapolis-Honeywell MH 64 Damping System is incorporated.

d) For early flights of A/C 25206 additional emergency fire extinguishing equipment will be installed.

e) Where actual weights of Arrow 1 parts that apply to Arrow 2 Aircraft have been obtained, these weights have been recorded in the Arrow 2 records. Some weights of Arrow 2 parts have also been obtained.

On I.B.M. sheets in the report, immediately preceeding the item title will be found a number varying from 0 to 100. This is the percentage actual weight recorded in the relevant item.

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1. Structure

	Weight lb
a) Wings	
Inner Wing Spars - actual weights incorporated	
1) Front Spar inb'd (2 x 2.9)	+ 8.05
2) Misc. 2.25)	
Centre Line Joints - actual weights incorporated	- 8.19
Strut Pick-Up Fittings	- 4.24
Structure for Main U/C	- 0.98
Ribs 1 - 9	- 1.02
Wing Weight Decrease	- 6.38
b) Fin & Rudder	
No Weight change	
c) Fuselage Fwd. of Sta. 255 ins	
Radar Nose Structure - deletion of Astra shockmounts (-9.00) add misc. items for improving cooling (+ 1.27)	- 7.73
Crew Bulkheads - add. brackets for pick-up of aileron servo and feel, trim and booster	+ 1.61
Shear Panel below Nav's Arch. mod to temp controller mounting	+ 0.31
Cockpit Formers - add. misc. brackets for air cond. & controls	+ 1.61
Misc. items F.F. - add. brackets for mounting panels, controls control lines and toe guards	+ 5.34
Front Fuselage Increase	+ 1.14
d) Centre Fuselage Sta. 255 - 485 ins	
Fuselage Fuel Tank - re-estimate - refinement of hardware	- 0.21
Structure below Lower Longeron - add. of accelerometer brackets	+ 0.51
Dorsal Fairing over Fuel Tank - add. pick-ups for air cond. exhaust cover	+ 0.47
Centre Fuselage Increase	+ 0.77
e) Duct Bay Sta. 485 - 591.65 ins	
Lower Panels Aft D.B. - actual wt. of exhaust ducts +2.06 additional brackets +0.86	+ 2.92
Heat Exchanger Mountings new report was included in Joint D.B. to E.B. see Fuselage Joints	+ 7.05
Duct Bay Increase	+ 9.97

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	Weight lb
1. Structure (Cont'd)	
f) Engine Bay Sta. 591.65 - 742.5 ins	
No Weight Change	
g) Rear Fuselage Sta. 742.5 in - aft	
Removable Nacelles R.F. (Tailcone) Assign X74.4158 introduces repair scheme which adds two new formers per side to prevent skin buckling	+ 42.98
h) Fuselage Joints	
Joint Duct Bay to Engine Bay add. electrics mtg. channel (+ 0.21) heat exchanger mountings now deleted see new report under Duct Bay Structure (- 1.05)	- 6.84
Fuselage Joints Decrease	- 6.84
Total Structural Increase	+ 41.64 lb
2. Landing Gear	
Main Landing Gear - MK 1A gear with light brakes now fitted to A/C 25206, Mk 2 was previously incorporated	- 100.00
Total Landing Gear Decrease	- 100.00
3. Power Plant & Services	
Gear Boxes & Drives on Engine - Increase of 3.5 lb each in weight of Constant Speed Drives	+ 7.00
Total Power Plant & Services Increase	+ 7.00
4. Flying Controls Group	
No weight change.	
5. Equipment Fixed and Removable	
Probe - incorporation of manufacturer's estimate	- 0.39
Cabin Consoles - add. brackets for Nav's foot guard	+ 0.40
Windscreen Demisting - target weight of system transformer increased due to failure on vibration	+ 1.40
Flight Test Installations - add. of gyro & accelerometer mounting in dorsal area (+26.71) add of Auto Observer (+80.17)	+ 106.88

5. Equipment Fixed and Removable (Cont'd)

	Weight lb
Pack Instrumentation incorporation of Flight Test Estimation of equipment and ballast for early flights	+ 682.00
◊ Partial Electronics - Electronic system ammended to agree with report 72/AIREQ/13/2/7, October, 1958.	- 75.60
Anti skid controls system deleted	- 37.68
Total Equipment Group Increase	+ 677.01

◊ Title change was "Partial Astra"

6. Trapped Fuel

No weight change.

7. Useful Load

Addition of Residual Fuel	+ 287.00

8. Ballast +1294.00

Summary

Weight Change - Aircraft Basic Weight

Structure	+ 41.64
Landing Gear	- 100.00
Power Plant	+ 7.00
Equipment	+ 677.01
Ballast	+ 1,294.00
Total	+ 1,919.65

Weight Change Operational Weight Empty

Useful Load

Water for Air Conditioning reduced by	- 60
Ballast deleted now part of Basic Weight	-1597
Residual Fuel added	+ 287
Total	-1370

Issue 2	Issue 3	
45,756.76	46,306.41	+ 549.65

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Aircraft: Arrow 2
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Weight & C.G. Summary

Description	Weight lb	H. Arm ins	S.M.C. %
Structure	19,257.74	566.95	137.20
Wings	10,032.41	642.79	142.18
Fin & Rudder	1,030.94	754.65	209.00
Fuselage Fwd Sta 255. ins	2,605.34	184.49	128.61
Sta 255 - 485 ins	1,715.90	375.75	129.89
Sta 485 - 591.65 ins	1,169.60	538.70	105.52
Sta 591.65 - 742.5 ins	1,576.20	659.72	110.61
Sta 742.5 ins aft	1,084.25	807.90	129.11
"Marry-Up"	43.10	468.39	109.67
Landing Gear Retracted	2,707.98	491.07	135.10
Main Landing Gear	2,058.67	540.76	141.00
Main Gear Doors & Fairings	287.98	538.52	138.40
Nose Landing Gear	333.81	170.81	99.70
Nose Gear Door & Fairing	27.52	162.22	88.66
Power Plant & Services	11,547.92	675.36	121.78
Engine Bare PS13	9,670.00	690.47	121.21
Engine Access. (Inlet Frame Etc)	388.05	683.99	121.73
Engine Instrumentation (Orenda Supplied)	100.00	690.00	121.25
Engine Controls	32.32	379.90	117.49
Gear Box & Drive on Fuselage	291.87	608.57	103.28
Gear Box & Starter on Engine	153.45	601.97	113.57
Fire Extinguisher System Basic	73.58	686.35	131.21
Engine Mountings	75.39	671.91	141.52
Fuel System	763.26	529.78	135.19
Flying Control Group	1,965.94	652.84	138.24
Mechanical Flying Controls	958.44	677.70	147.62
Hydraulic Flying Controls	1,007.50	629.19	129.32
Equipment Fixed & Removable	8,216.64	394.41	113.13
Instruments	34.61	167.52	138.92
Probe	14.86	-34.07	108.00
Cockpit Pressure Sealing	5.00	186.00	130.00
Oxygen System	21.16	259.40	156.88
Cabin Consoles	17.68	175.29	124.49
Ejector Seats	342.94	204.50	134.11
Air Conditioning System	874.00	339.80	135.32
Cockpit Insulation	14.31	187.48	132.00
Hydraulic Utility System	641.33	498.85	118.15
Mechanical Door Stops Main U/C Doors	3.02	516.00	120.00
Drag Chute	91.07	786.68	143.19
Electrical System	1,236.69	433.67	113.06
Low Pressure Pneumatics	50.08	394.66	126.02
Surface Finish	100.00	591.52	140.20
Intake De-icing Boots	88.00	195.82	118.00
Canopy Actuation	64.92	221.99	154.35
MH 64 Damping System	99.08	450.83	140.34
Partial Electronics	613.40	348.11	120.48
Instrument Pack Structure	692.00	384.86	93.56
Pack Instrumentation	2,408.00	382.28	95.00
Flight Test Installations	623.88	479.34	128.48
Additional Fire Protection	180.61	398.87	108.63

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Description	Weight lb	H. Arm ins	V. Arm ins	M.A.C. %
Trapped Fuel	213.80	548.26	141.79	
Ballast	1,294.00	100.00	114.00	
U/C Up		549.02	128.16	
Aircraft Basic Weight	45,204.02			
U/C Down		551.20	124.51	
Useful Load (less usable fuel)	1,102.39	369.12	131.54	
Crew	390.00	194.00	136.50	
Engine Fire Ext. Fluid	25.00	730.00	129.00	
Oil	162.00	638.31	110.89	
Residual Fuel	287.00	508.14	135.33	
Oxygen	13.39	259.68	159.91	
Water for Air Conditioning	225.00	267.91	131.56	
U/C Up		544.74	128.24	30.04
Operational Weight Empty	46,306.41			
U/C Down		546.87	124.68	30.63
Max. Internal Fuel (2455 gals @ 7.8 lb/gals)	19,146.00	542.36	144.29	
U/C Up		544.04	132.93	29.84
Gross Wt. (Max. Internal Fuel)	65,452.41			
U/C Down		545.55	130.42	30.26
Max. External Fuel (500 gal @ 7.8 lb/gal + drop tank	4,242.36	520.32	60.79	
U/C Up		542.60	128.54	29.45
Max. Gross Wt. (Int. & Ext. Fuel)	69,694.77			
U/C Down		544.01	126.18	29.84

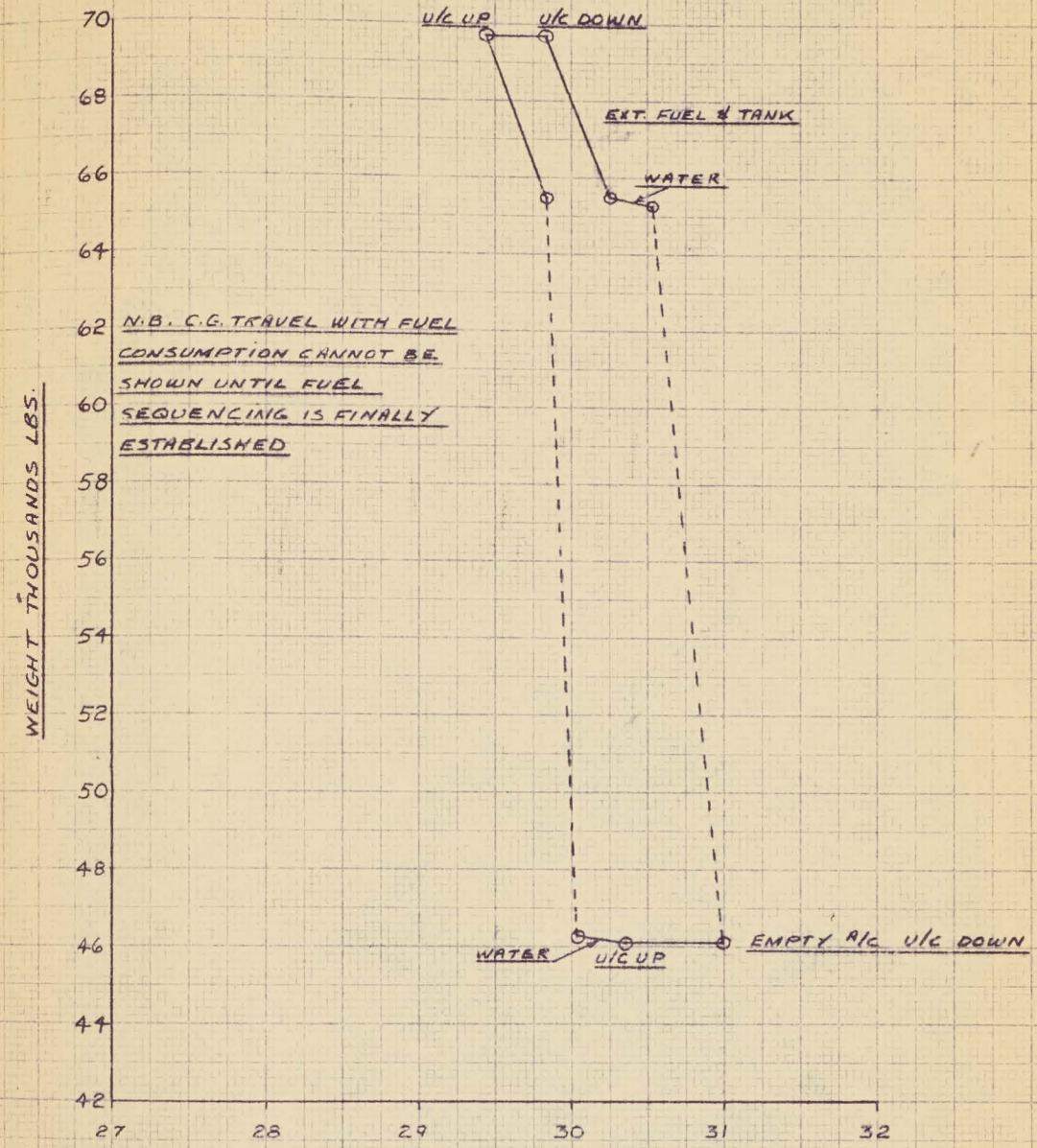
N.B. 1. Aircraft Datum = 120 in above an arbitrarily chosen ground line.

2. Aircraft is ballasted with 1294 lb at Sta. 100 in such that the aft C.G. on a typical flight envelope (see sheet 3) does not exceed 31% M.A.C.

REPORT NO. 7-0400-82-3
DATE NOV. 1ST. 1958
SHEET 3
BY J. MacLean

HORIZONTAL C.G. PLOT OF FIXED POINTS ON ARROW 2 A/C 25206 FLIGHT ENVELOPE

A/C WITH 1294 LBS. BALLAST AT STN. 100 INS.



AVRO AIRCRAFT LTD.
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PROJECT Arrow 2 A/C 25206

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V
	TOTAL WING GROUP	1000000				
	OUTER WING	1010000				
100	OUTER WING SKINS	1010001	64	92910	706461	
100	POSTS AND INTERCOSTALS	1010002	64	24367	323071	
100	OUTER WING SPARS	1010003	64	39258	706081	
100	OUTER WING RIBS	1010004	64	13456	695061	
18	AILERON CONTROL BOX	1010006	64	37920	774091	
100	RIB 12	1010007	64	7626	648731	
100	O W AILERON JACK FITTING	1010009	64	1046	727911	
	AILERON JOINTS AND FAIRING	101001	0	3293	787261	
				19794	5	
100	AILERON	1020000	74	33600	792131	
				33600		
20	ELEVATOR	1030000	82	44638	756181	
20	ELEVATOR MARRY UP	103000	1	1597	738101	
				46235		
	INNER WING	1040000				
81	MAIN U C STRUCTURE	1040000	162	33217	577481	
95	INNER WING SPARS	1040000	262	41917	579021	
5	I W STRUCTURE F S TO M S	1040000	762	109730	499241	
	I W STRUCTURE M S TO R S	1040000	862	15130	608681	
	STRUCT AFT OF REAR SPAR	1040000	962	31603	720411	
40	ELEVATOR CONTROL BOX I W	1040001	062	42838	724701	
25	TRANSP JOINT MARRY UP	104001	1	7065	636211	
61	CENTRE LINE JOINTS	1040001	262	58264	662331	
	INNER WING SKINS	1040001	362	225107	627271	
63	STRUC PICK UP FITTINGS	1040001	462	12316	616541	
62	RIBS 1 TO 9	1040001	662	48516	611331	
	DORSAL FAIRING I W	1040001	762	1134	827011	
100	RIB 10	1040001	862	10706	636831	
49	FUSELAGE HINGE JOINT I W	1040001	962	12628	616881	
25	TRANSP JOINT	1040002	062	12942	630711	
49	FUSELAGE HINGE JOINT	104002	1	3935	532341	
	DORSAL FAIRING C A	104002	3	5913	567401	
	SHUT OFF VALVE OPERAT MECH	1040002	462	513	549651	
	LEADING EDGE I W	1040002	562	22138	468411	
				69459	1	
	LEADING EDGE O W	1050000	65	30870	630131	
				30870		

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. 7-0400-82 Iss. 3

SHEET 5 to 15

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	1000000						
	1010000						
	1010000164		92910	70646	13597	65637199	12632973
S	1010002	64	2436	73207	13410	1783323	326668
	1010003	64	39258	70608	13579	27719289	5330844
	1010004	64	13456	69506	13650	9352727	1836744
	1010006	64	37920	77409	13508	29353493	5122234
	1010007	64	7626	64873	13832	4947215	1054828
TING	1010009	64	1046	72791	13670	761394	142988
AIRING	101001	0	329	37872	6 13224	2592447	435466
			19794	5		142147087	26882745
	1020000	74	33600	79213	13556	26615568	4554816
			3360	0		26615568	4554816
	1030000	82	44638	75618	14260	33754363	6365379
	103000	1	1597	73810	14260	1178746	227732
			4623	5		34933109	6593111
	1040000						
	1040000	162	33217	57748	13984	19182153	4645065
	1040000	262	41917	57902	14321	2427078	6002934
M S	1040000	762	109730	49924	14391	54781605	15791244
R S	1040000	862	15130	60868	14563	9209328	2203382
PAR	1040000	962	31603	72041	14887	22767117	4704739
I W	1040001	062	42838	72470	14328	31044699	6137829
	104001	1	706	56362	1 13876	4494824	980339
	1040001	262	58264	66233	15028	3858999	875591
	1040001	362	225107	62727	14469	141202868	32570732
GS	1040001	462	12316	61654	14580	7593307	1795673
	1040001	662	48516	61133	14513	29659286	7041127
	1040001	762	1134	82701	6150	54545	18250
	1040001	862	10706	63683	13835	6817902	1481175
I W	1040001	962	12628	61688	13790	7789961	1741401
	1040002	062	12942	63071	13710	8162649	1774348
	104002	1	3935	53234	14364	2094758	565223
	104002	3	5913	56740	15963	3355036	943892
T MECH	1040002	462	513	54965	14180	281970	72743
	1040002	562	22138	46841	14423	10369661	3192964
			69459	1		421722445	100418974
	1050000	065	30870	63013	13561	19452113	4186281
			3087	0		19452113	4186281

AVRO AIRCRAFT LTD.
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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. A
FIN AND RUDDER GROUP	2000000				
FIN	2010000	83	85517	75003	211
FIN TO WING MARRY UP	2010001		4943	68510	153
			90460		
94 RUDDER	2020000	84	12634	81316	213
			12634		

EIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO._____

SHEET_____

REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
2000000						
2010000	83	85517	75003	21150	64140316	18086846
2010001		4943	68510	15356	3386449	759047
		90460			67526765	18845893
2020000	84	12634	81316	21374	10273463	2700391
		12634			10273463	2700391

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM
	TOTAL FUSELAGE GROUP	3000000				
	RADAR NOSE STRUCTURE	3010000				
	RADOME	3010001	51	15958	3992	1107
	RADAR NOSE STRUCTURE C A	3010002		270	12000	1120
	RADAR NOSE STRUCTURE R N	3010003	51	16259	9517	1131
				32487		
	FRONT FUSELAGE STRUCTURE	3020000				
	SKIN F F	3020001	52	8264	19296	1230
	COCKPIT FORMERS	3020002	52	10724	18259	1202
	LOWER LONGERONS F F	3020003	52	6837	18460	904
31	TOP LONGERONS F F	3020004	52	18947	19430	1476
66	NOSE U C SUPPORT STRUCT	3020005	52	3343	21049	918
	CREW BULKHEADS	3020006	52	13224	20528	1237
	BULKHEAD STA 120	3020007	52	3110	12000	1147
	BULKHEAD STA 255	3020008	52	10921	25500	1192
	COCKPIT FLOOR	3020009	52	5881	17695	1156
	SHEAR PANEL BELOW NAV ARCH	3020010	52	2057	25706	1535
3	MISC STRUCTURE F F	3020011	52	1600	18821	1207
	LOWER SHEAR PANEL	3020012	52	3141	23423	890
22	CANOPY ARCHES	3020013	52	8553	22594	1602
58	WIND SCREEN	3020014	52	13285	13828	1500
				109887		
	CENTRE FUSELAGE STRUCTURE	3030000				
	SKIN C F	3030001	54	22112	36736	1442
	FORMERS C F	3030002	54	28749	37520	1331
5	BULKHEAD STA 485	3030003	54	12815	48500	1033
66	LONGERONS C F	3030004	54	14453	41038	1214
	STR BELOW LOWER LONGERONS	3030005	54	4887	27466	932
	RADAR ACCESS DOOR	3030006	54	2418	27908	901
	FWD DORSAL FAIRING	3030008	54	2969	28927	1640
	DEFLECTOR SHIELD	3030009	54	2045	33739	1640
	DORSAL OVER FUEL TANK	3030010	54	4185	41268	1420
	PACK MTG STRUCTURE	3030011	54	2280	29289	1028
	SEALING MISSILE BAY	3030012	54	559	29616	1107
	MISC ITEMS C F	3030013	54	12163	37000	1250
	ARAMENT BAY ROOF	3030014	54	12432	38370	1142
	FUSELAGE FUEL TANK	3030015	54	22644	39454	1453
	DUCT C F	3030016	54	31867	35898	1296
	EQUIPMENT BAY STRUCTURE	3030017	54	5959	28506	1354
				171590		
	DUCT BAY STRUCTURE	3040000				

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM
	SKIN D B	30400156		6227	53483	112
5	FORMERS D B	30400256		7335	53530	114
	TOP LONGERONS	30400356		498	53899	135
	MTG BRKTS SIDE PANEL	30400456		190	51866	130
	LOWER LONGERONS	30400556		10301	52236	99
72	MAIN FRAME STA 538 77	30400656		5980	53877	103
	ACCESS PANELS	30400756		3874	52818	99
	LOWER PANEL ASSY	30400856		217	54557	89
	DROP TANK MTG STRUCTURE	30400956		841	58554	88
20	LOWER SIDE PANELS FWD	30401056		10756	50854	92
	LOWER CENTRE PANEL FWD	30401156		2686	51389	88
16	LOWER SIDE PANELS AFT	30401256		6990	56790	88
	LOWER CENTRE PANEL AFT	30401356		2609	56600	87
	FLOATING DUCT D B	30401456		45555	55363	117
	HEAT EXCHANGER MTG	30401556		705	57950	90
				104764		
	ENGINE BAY	30500000				
100	TOP LONGERONS	30500158		674	66778	139
84	BOTTOM LONGERONS	30500258		8432	65911	99
	ENGINE ACCESS DOORS	30500358		13604	64040	90
	ENGINE TUNNEL	30500458		61324	65622	121
71	ENG RAILS ATTACH TO FORM	30500558		2906	68763	113
	PANELS AT ENG ACCESS DOORS	30500658		11117	65021	92
	BOTTOM CTR PANEL FWD	30500758		4610	61780	89
	BOTTOM CTR PANEL CENTRE	30500858		4120	67078	92
	BOTTOM CTR PANEL AFT	30500958		7666	72063	95
5	SIDE PANEL FRONT	30501058		8605	61609	116
5	SIDE PANEL CENTRE	30501158		7474	67063	119
32	SIDE PANEL AFT	30501258		7453	72146	121
41	HEAVY FORMERS	30501358		19635	66058	109
				157620		
	REAR FUSELAGE	30600000				
	OUTER SKINS FIXED	30600159		5658	77270	137
	FORMERS FIXED R F	30600259		10509	77990	137
	LONGERONS FIXED R F	30600359		2519	77159	128
	TUNNEL FIXED R F	30600459		10994	77552	132
	ENGINE ACCESS DOORS R F	30600559		9023	77505	98
	FAIRING UNDER RUDDER FIXED	30600659		2839	78214	155
	REMOV TAILCONES	30600759		5594	82637	127
	CENTRE STRUC AND STING REM	30600859		10935	83325	139
				108425		
	DIVE BRAKES	30700172		11790	50884	90
	D B JOINT TO FUSELAGE	3070002		406	48794	93
				12196		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. AR
AIR INTAKES	3080001	55	77039	21132	118
			77039		
FUSELAGE JOINTS	3090000				
JOINT AIR INTAKES TO F F	3090001		663	22000	120
JOINT F F TO C F	3090002		1028	25711	122
JOINT D B TO C F	3090003		428	47940	115
JOINT D B TO E B	3090004		1467	58957	91
JOINT AT STA 742 50	3090005		724	74250	115
			4310		
CANOPIES	3100000				
28 PILOTS CANOPY	3100001	53	24484	17693	159
NAVIGATORS CANOPY	3100002	53	16637	23248	162
			41121		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM
	UNDERCARRIAGE UP POSITION	4000000				
	MAIN UNDERCARRIAGE GROUP	4010000				
	MAIN UNDERCARRIAGE	401010092		211067	54012	1410
				211067		
80	MAIN U C DOORS FAIRINGS	401020062		28798	53852	1384
				28798		
	NOSE UNDERCARRIAGE GROUP	4020000				
100	NOSE UNDERCARRIAGE	402010091		33381	17080	997
				33381		
	NOSE U C DOOR AND FAIRING	402020052		2752	16222	886
				2752		

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
ITION	4000000						
ROUP	4010000						
	4010100	92	211067	54012	14100	114001508	29760447
			211067			114001508	29760447
NGS	4010200	62	28798	53852	13840	15508299	3985643
			28798			15508299	3985643
ROUP	4020000						
	4020100	91	33381	17080	9970	5701475	3328086
			33381			5701475	3328086
IRING	4020200	52	2752	16222	8866	446429	243992
			2752			446429	243992

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM
	ENGINE GROUP	5000000				
	PS 13 ENGINES	5010000		1005500	69023	1212
	ENGINE INSTRUMENTATION	5010001		10000	69000	1212
	PS 13 ENGINES C A	5010002		305	65853	1030
				1015805		
	ACC GEAR BOX ON FUS D B	5020001	56	3676	57768	944
	ACC GEAR BOX ON FUS E B	5020002	58	23533	61295	1030
	ACC GEAR BOX ON FUS C A	5020003		800	61550	970
	ACC GEAR BOX ON FUS I W	5020004	62	1178	61270	1395
				29187		
	ENGINE CONTROLS	5030000				
	ENGINE CONTROLS F F	5030001	52	1576	16723	1236
	ENGINE CONTROLS C F	5030002	54	109	26444	1180
	ENGINE CONTROLS E B	5030004	58	889	66633	990
	ENGINE CONTROLS I W	5030005	62	658	52142	1275
				3232		
	STARTER AND GEARBOX	5040000				
	STARTER AND GEARBOX ENG	5040001		14645	60197	1135
				14645		
	FIRE EXT SYSTEM	5060000				
	ENG FIRE EXT SYSTEM E B	5060001	58	5985	71074	1358
	ENG FIRE EXT SYSTEM D B	5060002	56	1231	56856	1123
	ENG FIRE EXT SYSTEM ENG	5060003		142	67960	997
				7358		
	ENGINE MTGS AND BRACKETS	5070000				
	ENGINE MOUNTS	5070001		7539	67191	1415
				7539		
	FUEL SYSTEM	5080000				
17	FUEL SYSTEM C F	5080001	54	11280	39995	1409
18	FUEL SYSTEM D B	5080002	56	15735	53738	1095
4	FUEL SYSTEM E B	5080003	58	1836	61392	1102
39	FUEL SYSTEM I W	5080004	62	47280	55432	1434

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	5000000						
	5010000		1005500	69023	12123	6940226265	1218967 65
ON	5010001		10000	69000	12125	690000 0	1212500
	5010002		305	65853	10306	200852	31433
			1015805			701127117	1231406 98
D B	5020001	56	3676	57768	9442	21233552	347088
E B	5020002	58	23533	61295	10307	144245 52	2425546
C A	5020003		800	61550	9700	492400	77600
I W	5020004	62	1178	61270	13950	721761	164331
			29187			177622 65	3014565
	5030000						
	5030001	52	1576	16723	12368	263554	194920
	5030002	54	109	26444	11800	28824	12862
	5030004	58	889	66633	9904	592367	88047
	5030005	62	658	52142	12751	343094	83902
			3232			1227839	379731
	5040000						
ENG	5040001		14645	60197	11357	88158 51	1663233
			14645			88158 51	1663233
	5060000						
E B	5060001	58	5985	71074	13583	425377 9	812943
D B	5060002	56	1231	56856	11237	699897	138327
ENG	5060003		142	67960	9970	96503	14157
			7358			5050179	965427
KETS	5070000						
	5070001		7539	67191	14152	5065529	1066919
			7539			5065529	1066919
	5080000						
	5080001	54	11280	39995	14090	45114 36	1589352
	5080002	56	15735	53738	10957	845567 4	1724084
	5080003	58	1836	61392	11024	1127157	202401
	5080004	62	47280	55432	14346	26208250	6782789

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. AR
FUEL SYSTEM C A	5080005		19568	630	99
			76326		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM
	FLYING CONTROLS GROUP	6000000				
	MECHANICAL CONTROLS	6010000				
60	MECHANICAL CONTROLS F F	601000152		10694	16454	1141
	MECHANICAL CONTROLS C F	601000254		1290	39654	1172
70	MECHANICAL CONTROLS FIN	601000583		12443	78819	2215
71	MECHANICAL CONTROLS I W	601000662		40234	71800	1438
80	MECHANICAL CONTROLS O W	601000764		30520	77053	1356
	MECHANICAL CONTROLS C A	6010008		663	70984	1433
				95844		
	FLYING CONTROLS HYDRAULICS	6020000				
	FLYING CONT HYDRAULICS D B	602000156		3184	56630	1011
	FLYING CONT HYDRAULICS E B	602000258		39853	64788	1116
	FLYING CONT HYDRAULICS R F	602000359		48	75875	1082
73	FLYING CONT HYDRAULICS I W	602000462		27988	70369	1471
66	FLYING CONT HYDRAULICS O W	602000564		13170	74034	1358
63	FLYING CONT HYDRAULICS FIN	602000683		5581	76008	2079
	FLYING CONT HYDRAULICS R N	602000751		3500	11309	1051
	FLYING CONT HYDRAULICS F F	602000852		5506	16928	1100
	FLYING CONT HYDRAULICS C F	602000954		1920	37329	1100
				100750		

VEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
P	6000000						
	6010000						
F F	601000152		10694	16454	11411	1759591	1220292
C F	601000254		1290	39654	11727	511537	151278
F I N	601000583		12443	78819	22157	9807448	2756996
I W	601000662		40234	71800	14382	28888012	5786454
O W	601000764		30520	77053	13561	23516576	4138817
C A	601000 8		663	70984	14338	470624	95061
			95844			64953788	14148898
A U L I C S	6020000						
C S D B	602000156		3184	56630	10114	1803099	322030
C S E B	602000258		39853	64788	11161	2581996 2	4447993
C S R F	602000359		48	75875	10824	36420	5196
C S I W	602000462		27988	70369	14716	19694876	4118714
C S O W	602000564		13170	74034	13586	9750278	1789276
C S F I N	602000683		5581	76008	20795	4242006	1160569
C S R N	602000751		3500	11309	10513	395815	367955
C S F F	602000852		5506	16928	11000	932056	605660
C S C F	602000954		1920	37329	11000	716717	211200
			100750			63391229	13028593

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V.
	FIXED EQUIPMENT GROUP	7000000				
	INSTRUMENTS	7010000				
	INSTRUMENTS	7010001	52	3261	16430	13
	NAVIG TABLE AND STOWAGE	7010004	52	200	22000	13
				3461		
	COCKPIT SEALING	7020000	52	500	18600	13
				500		
	OXYGEN SYSTEM	7030000				
	OXYGEN SYSTEM	7030001	52	2116	25940	15
				2116		
	AIR CONDITIONING SYSTEM	7040000				
	AIRCONDITIONING F F	7040001	52	4106	17798	11
	AIRCONDITIONING C F	7040002	54	52410	28838	13
	AIRCONDITIONING D B	7040003	56	1034	51762	12
	AIRCONDITIONING C A	7040005		28326	43447	13
	AIRCONDITIONING ENG	7040006		1453	67100	14
	AIRCONDITIONING I W	7040007	62	71	52247	15
				87400		
	HYDRAULICS MAIN SYSTEM	7050000				
28	UTILITY HYDRAULICS F F	7050001	52	9602	20241	10
4	UTILITY HYDRAULICS C F	7050002	54	4362	43003	10
19	UTIL&TY HYDRAULICS D B	7050003	56	21795	54920	10
68	UTILITY HYDRAULICS E B	7050004	58	10839	60754	11
30	UTILITY HYDRAULICS I W	7050005	62	14441	55240	14
28	UTILITY HYDR NOSE U C	7050006	91	1141	8860	9
30	UTILITY HYDR MAIN U C	7050007	92	2980	54325	14
	ANTI SKID SYSTEM C F	7050008	54	3134	47200	10
	ANTI SKID SYSTEM MUC	7050009	92	634	51500	14
				67901		
	MUC DOOR STOPS	7060000	56	302	51600	12
				302		
	CABIN INSULATION	7070000	52	1431	18748	13
				1431		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

	DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. A
	BRAKE PARACHUTE	7080000				
	BRAKE PARACHUTE F F	708000152		455	16913	128
	BRAKE PARACHUTE R F	708000559		8528	82205	143
	BRAKE PARACHUTE I W	708000662		124	62022	145
				9107		
	ELECTRICAL SYSTEM	7090000				
	ELECTRICAL WIRING R N	709000151		129	9285	120
	ELECTRICAL WIRING F F	709000252		2966	19977	112
	ELECTRICAL WIRING C F	709000354		2354	39703	110
	ELECTRICAL WIRING A I	709000455		1274	21984	120
	ELECTRICAL WIRING D B	709000556		9015	52769	99
	ELECTRICAL WIRING F B	709000658		64	59500	92
	ELECTRICAL WIRING I W	709000862		9236	53995	139
	ELECTRICAL WIRING FIN	709000983		352	79754	300
	ELECTRICAL WIRING NUC	709001091		330	18600	98
	ELECTRICAL WIRING ENG	709001		2002	60683	100
	ELECTRICAL WIRING C A	709001 2		13746	33473	112
	ELECTRICS F F	709001352		15240	15765	113
	ELECTRICS C F	709001454		7877	45178	101
	ELECTRICS E B	709001558		1020	64774	114
	ELECTRICS ENG	709001 6		18772	58913	115
	ELECTRICS C A	709001 7		718	61350	120
	ELECTRICS FIN	709001883		44	89050	288
	ELECTRICS I W	709001962		2275	62053	145
	ELECTRICS CAW	709002 0		120	67488	136
	ELECTRICS MUC	709002192		74	51600	137
20	ELECTRICS A I	709002255		4900	22079	139
	ELECTRICS D B	709002356		26710	51734	102
	ELECTRICS R F	709002459		176	80759	116
55	WINDSCREEN DEMISTING	709002552		3466	19954	106
	ELECTRICS TAILC PLUG JETT	709002 6		809	55200	110
				123669		
	L P PNEUMATICS	7100000				
	L P PNEUMATICS F F	710000152		1993	19586	122
	L P PNEUMATICS C F	710000254		796	32397	116
	L P PNEUMATICS FIN	710000583		414	74966	252
	L P PNEUMATICS R N	710000651		199	7067	92
	L P PNEUMATICS ENG	710000 8		1403	63897	99
	L P PNEUMATICS I W	710000962		203	52880	159
				5008		
	INTAKE DE ICING	71200000 55		8800	19582	118
				8800		
29	CANOPY ACTUATION	71600000 52		6492	22199	154
				6492		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. A
CABIN CONSOLES	7170000	52	1768	17529	124
			1768		
SURFACE FINISH F F	7190001	52	363	18744	122
SURFACE FINISH CANOPY	7190002	53	64	20218	159
SURFACE FINISH C F	7190003	54	1400	37197	124
SURFACE FINISH 2NTAKES	7190004	55	408	22798	120
SURFACE FINISH D B	7190005	56	377	53828	112
SURFACE FINISH E B	7190006	58	443	66701	112
SURFACE FINISH R F	7190007	59	648	80362	131
SURFACE FINISH I W	7190008	62	3151	60144	144
SURFACE FINISH O W	7190009	64	1067	70650	135
SURFACE FINISH O W L EDGE	7190010	65	319	63948	135
SURFACE FINISH AILERON	7190011	74	353	79190	135
SURFACE FINISH ELEVATOR	7190012	82	566	75523	142
SURFACE FINISH FIN	7190013	83	639	74663	208
SURFACE FINISH RUDDER	7190014	84	202	81279	214
			10000		
FLIGHT TEST INSTALLATION	7200000		62388	47934	128
			62388		

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PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. AR
REMOVABLE EQUIPMENT GROUP	8000000				
94 EJECTOR SEATS	8010100	52	34294	20450	134
			34294		
RADIO RADAR PART ELECT R N	8020101	51	118	10510	91
RADIO RADAR PART ELECT F F	8020102	52	13446	18164	116
RADIO RADAR PART ELECT C F	8020103	54	21484	27005	96
RADIO RADAR PART ELECT D B	8020104	56	3694	51681	114
RADIO RADAR PART ELECT F I N	8020105	83	3249	76179	251
RADIO RADAR PART ELECT C A	8020106		15505	40534	123
RADIO RADAR PART ELECT I W	8020108	62	2795	58836	154
RADIO RADAR PART ELECT O W	8020109	64	1049	74642	137
			61340		
DAMPING SYSTEM F F	8030101	52	784	17201	120
DAMPING SYSTEM C F	8030102	54	2303	32213	109
DAMPING SYSTEM E B	8030103	58	369	63242	134
DAMPING SYSTEM I W	8030104	62	6070	53781	157
DAMPING SYSTEM O W	8030105	64	95	74855	140
DAMPING SYSTEM R N	8030106	51	287	7350	93
			9908		
INSTRUMENTATION	8050900	94	240800	38228	95
			240800		
INSTRUMENT PACK STRUCTURE	8051000	54	69200	38486	93
			69200		
ADDITIONAL FIRE PROTECTION	8090000		18061	39887	108
			18061		

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WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

PROJECT_____

DESCRIPTION	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V
OPERATIONAL LOAD	9000000				
CREW MEMBERS	90100005	2	39000	194001	
			39000		
ENGINE OIL	9020000				
ENGINE OIL DRAINABLE ENG	9020001		92906400	01	
ENGINE OIL DRAINABLE E B	90200025	8	41106564	0	
ENGINE OIL TRAPPED D B	90200035	6	7535817	6	
ENGINE OIL TRAPPED E B	90200045	8	20476151	21	
			16200		
OXYGEN CHARGE	9050000				
OXYGEN CHARGE F F	90500015	2	722049	31	
OXYGEN CHARGE C F	90500025	4	12672628	01	
			1339		
ENGINE FIRE EXT FLUID	9060000		25007300	01	
			2500		
TRAPPED FUEL	9080000				
TRAPPED FUEL C F	90800015	4	24304142	61	
TRAPPED FUEL D B	90800025	6	690494	001	
TRAPPED FUEL I W	90800035	62	18260568	141	
			21380		
BALLAST	9090000		1318001	00001	
			131800		
WATER FOR AIR CONDITIONING	91000005	4	26000	26800	1
UNUSABLE WATER FOR AIRCOND	91000015	4	25000	26700	1
			28500		

WEIGHT AND C. OF G BY FUNCTIONAL GROUP COMPONENT

REPORT NO. _____

SHEET _____

	REFERENCE NO.	COMP. NO.	WEIGHT	H. ARM	V. ARM	H. MOMENT	V. MOMENT
	9000000						
	9010000	52	39000	19400	13650	75660000	5323500
			39000			75660000	5323500
	9020000						
E ENG	9020001		9290	64000	11940	5945600	1109226
E E B	9020002	58	4110	65640	9769	2697804	401506
D B	9020003	56	753	58176	9677	438065	72868
E B	9020004	58	2047	61512	10398	1259151	212847
			16200			10340620	1796447
	9050000						
	9050001	52	72	20493	13200	14755	9504
	9050002	54	1267	26280	16150	332968	204621
			1339			347723	214125
ID	9060000		2500	73000	12900	1825000	322500
			2500			1825000	322500
	9080000						
	9080001	54	2430	41426	13106	1006652	318476
	9080002	56	690	49400	13350	340860	92115
	9080003	62	18260	56814	14353	10374236	2620858
			21380			11721748	3031449
	9090000		131800	10000	11400	131800000	15025200
			131800			131800000	15025200
TIONING	9100000	54	26000	26800	13200	6968000	3432000
AIRCOND	9100001	54	2500	26700	12700	667500	317500
			28500			7635500	3749500