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36

BI-MONTHLY WEIGHT AND BALANCE STATUS REPORT FOR CSM 009

CONTRACT NAS 9-150

(U)

1 JULY 1965

Exhibit I, Paragraph 8.10

Prepared by

Weight and Electrical Power Control

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NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

FORM M158 VELLUM REV. 2-61

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TECHNICAL REPORT INDEX/ABSTRACT

[redacted]

ACCESSION NUMBER						DOCUMENT SECURITY CLASSIFICATION Confidential	

TITLE OF DOCUMENT	LIBRARY USE ONLY
Bi-Monthly Weight and Balance Status Report for CSM 009	
AUTHOR(S) D. D. Morgan	

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DESCRIPTIVE TERMS

ABSTRACT

The Weight and Balance Status Report for CSM 009 presents summary mass property data for each module in addition to the usable SPS propellant required for the nominal 190 second total burn time. Mass property data also includes the total vehicle from launch to CSM at SPS burnout, the LEV abort phase to CM at impact and the normal CM entry mission. The CM is ballasted to meet the required lift to drag ratio of 0.34 at entry. The LES is ballasted to 8320 pounds resulting in a center of gravity for the LEV at LEV burnout of X_a 1122.0.

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FORM 131-V REV. 6-64

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INTRODUCTION

The July report incorporates changes to the CSM 009 subsequent to the May report (SID 65-110-1) and the Appendix to the May report. The change descriptions are included in the current weight status section. The Command Module has exceeded the Block I control weight by 295 pounds. The CM status includes 443 pounds of aft heat shield ballast and 433 pounds of crew compartment simulated systems ballast to maintain the lift to drag ratio of 0.34 at entry. The primary reason for the CM weight increase was the necessity for additional ballast to meet the revised L/D data. Due to the Command Module exceeding the Block I control weight, action has been taken to provide relief for both the weight and center of gravity by off-loading the ballast installation for the platform. A cursory review indicates that this deletion is feasible without causing any major constraints.

As a result of the change in the CM weight and center of gravity, the Launch Escape System has exceeded the control weight in order to meet the minimum required LEV burnout X center of gravity (X_a 1122.0)

The Service Module weight status is currently 1047 pounds under the design weight of 9200 pounds. In order to achieve the Command and Service Module burnout weight consistent with the design weight of 20,200 pounds, 752 pounds of SPS propellant utilized as ballast is loaded in the Service Module. The fluid residuals, which are part of the burned out SM weight of 8905 pounds, include 0.5% loading tolerance and two start and restart losses.

The Adapter is currently 3625 pounds. The increase in the Adapter is the result of the addition of the wiring for the telemetry modification kit (SM) and increased panels based on actual in lieu of calculated weights.

A list of potential changes for each module is as follows:

	WEIGHT (LBS.)	ESTIMATED EFFECTIVE DATE
LAUNCH ESCAPE SYSTEM	(-10)	
Decrease ballast dependent on potential CM changes.	-50	7-15-65
Add one thickness of "nomex" cloth plus adhesive on both sides to the soft portion of the boost protective cover to provide flexible strength.	+40	8-1-65
COMMAND MODULE	(-249)	
Delete ballast installation from platform.	-370	7-15-65
Increase simulated systems ballast to maintain control weight and c.g. requirements.	+76	7-15-65
Increase wiring based on actual weighing of harnesses and wiring installations.	+45	8-1-65

The mass properties data reflected herein incorporates changes prior to 4 June 1965.

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CSM 009

MODULE MASS PROPERTIES SUMMARY

ITEM	CONTROL WEIGHT	WEIGHT	CENTER OF GRAVITY*			MOMENT OF INERTIA**			PRODUCT OF INERTIA**		
			X	Y	Z	Ixx	Iyy	Izz	Ixy	Ixz	Iyz
LAUNCH ESCAPE SYSTEM	8200	8320	1299.8	0.0	-0.4	603.5	22723.2	22718.6	20.7	207.8	0.2
COMMAND MODULE	11000	11295	1039.7	0.4	5.5	5580.7	4930.1	4358.0	-20.1	-327.6	-10.4
SERVICE MODULE***	9200	8905	905.2	2.2	-0.7	5577.1	9694.3	9820.0	-373.5	108.0	-36.7
ADAPTER	3600	3625	641.9	1.5	-3.0	8848.5	12306.4	11881.7	10.5	-49.0	-62.8

*Centers of gravity are in the NASA reference system except that the longitudinal axis has an origin 1000 inches below the tangency point of the Command Module substructure mold line.

**Moments and products of inertia units are slug feet squared about the center of gravity.

***Includes unusable SPS residuals and additional SPS propellant utilized as ballast to obtain the desired weight but excludes the usable SPS propellant.

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CSM 009 MISSION

VEHICLE MODE	WEIGHT	CENTER OF GRAVITY*			MOMENT OF INERTIA**			PRODUCT OF INERTIA**		
		X	Y	Z	Ixx	Iyy	Izz	Ixy	Ixz	Iyz
COMMAND MODULE	11295	1039.7	0.4	5.5	5580.7	4930.1	4358.0	-20.1	-327.6	-10.4
SERVICE MODULE ***	8905	905.2	2.2	-0.7	5577.1	9694.3	9820.0	-373.5	108.0	-36.7
SLA ATTACHMENT RING	62	837.1	0.0	-1.8	77.0	40.0	38.0	0.0	0.0	0.0
TOTAL - LESS PROPELLANT ***	20262	980.0	1.2	2.8	11279.9	34409.4	33923.1	-653.4	684.5	-59.1
PROPELLANT - SPS USABLE	13004	888.3	27.3	-11.5	4329.4	3848.1	4485.8	-13.0	-11.2	2141.1
TOTAL-WITH PROPELLANT	33266	944.1	11.4	-2.8	17121.7	52977.3	53946.3	-4758.3	2907.7	1445.8
ADAPTER-LESS ATTACHMENT RING	3563	638.5	1.5	-3.0	8771.5	11747.3	11324.7	14.4	-52.1	-62.8
TOTAL INJECTED	36829	914.6	10.4	-2.8	25961.8	129618.2	130233.3	-2641.9	2894.3	1384.3
LAUNCH ESCAPE SYSTEM	8320	1299.8	0.0	-0.4	603.5	22723.2	22718.6	20.7	207.8	0.2
TOTAL AT LAUNCH	45149	985.6	8.5	-2.4	26734.2	369733.5	370495.6	-8513.9	4476.4	1347.2

*Centers of gravity are in the NASA reference system except that the longitudinal axis has an origin 1000 inches below the tangency point of the Command Module substructure mold line.

**Moments and products of inertia units are slug feet squared about the center of gravity.

***Includes unusable SPS residuals and additional SPS propellant utilized as ballast to obtain the desired weight but excludes the usable SPS propellant.

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CSM 009

CM ENTRY MISSION

ITEM	WEIGHT	CENTER OF GRAVITY*			MOMENT OF INERTIA**			PRODUCT OF INERTIA**		
		X	Y	Z	Ixx	Iyy	Izz	Ixy	Ixz	Iyz
COMMAND MODULE	11295	1039.7	0.4	5.5	5580.7	4930.1	4358.0	-20.1	-327.6	-10.4
LESS: PROPELLANT	-100	1022.6	-5.6	57.0						
ABLATOR BURNOFF***	-96	1013.4	0.0	7.5						
FORWARD HEAT SHIELD	-395	1100.5	-0.4	1.3						
DROGUE CHUTES	-58	1089.1	0.0	-21.1						
COMMAND MODULE - PRIOR TO MAIN CHUTE DEPLOYMENT	10646	1037.6	0.5	5.3	5351.4	4394.1	3869.5	-17.7	-270.2	-8.8
LESS: MAIN CHUTES (3)	-409	1090.5	-0.8	6.4						
PROPELLANT	-170	1022.6	-5.6	57.0						
COMMAND MODULE - IMPACT	10067	1035.7	0.6	4.4	5163.2	4006.5	3533.6	-14.4	-250.7	-4.8

*Centers of gravity are in the NASA reference system except that the longitudinal axis has an origin 1000 inches below the tangency point of the Command Module substructure mold line.

**Moments and products of inertia units are slug feet squared about the center of gravity. Mass inertia data are shown for accumulative totals only.

***Ablator burnoff based on entry condition for CM 009 only.

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CSM 009

WEIGHT STATUS SUMMARY

ITEM	PREVIOUS STATUS 5-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT CSM 009 STATUS		
				%EST	%CALC	%ACT
LAUNCH ESCAPE SYSTEM	8200	+120	8320	0	22	78
COMMAND MODULE	11000	+295	11295	2	43	55
SERVICE MODULE	9200	-295	8905	1	50	49
ADAPTER	3600	+25	3625	3	20	77
TOTAL LAUNCH WEIGHT*	32000	+145	32145	1	37	62

*Less SPS usable propellant.

LAUNCH ESCAPE SYSTEM 009

WEIGHT STATUS

ITEM	PREVIOUS STATUS 5-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT LES 009 STATUS		
				%EST	%CALC	%ACT
Structure-Includes Q-Ball	1537.4	0	1537.4		25	75
Ballast-Installation Provisions	29.0		29.0		100	
Electrical	52.5	+19.8	72.3		100	
Propulsion System	5368.6	-38.1	5330.5			100
Separation Provisions	16.2	-1.0	15.2		100	
C/M Boost Protective Cover	580.0	+32.0	612.0		100	
LES-NO BALLAST	7583.7	+12.7	7596.4	0	15	85
BALLAST	616.3	+107.3	723.6		100	
TOTAL LAUNCH ESCAPE SYSTEM	8200.0	+120.0	8320.0	0	22	78

009 LAUNCH ESCAPE SYSTEM - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	ORD INSTL TWR-CM	4.60	0	1086.4	0.	2.0	21		1.220	0.560	0.660	0.
0 0	BOLT DUAL MODE XPL	10.60	0	1085.6	0.	0.	21		2.720	1.270	1.480	0.
0 0	ORDNANCE-CANARD	1.50	0	1436.6	0.	0.8	21		0.	0.	0.	0.
0 0	LES BODY GROUP INSTL	46.80	0	1379.1	0.	-0.7	21		1.260	96.340	96.300	0.
0 0	TOWER ASSY LES	50.90	0	1106.7	0.	-0.8	21		12.030	22.250	23.020	0.
0 0	TOWER INSULATION	111.30	0	1136.8	0.	0.9	21		12.870	27.320	28.100	0.
0 0	TOWER STRUCTURE	244.20	0	1143.4	0.	0.	21		37.870	71.830	73.260	0.
0 0	SKIRT LAUNCH ESCAPE MTR	217.80	0	1209.3	0.	-0.2	21		20.850	12.300	12.170	0.
0 0	Q BALL INSTL	25.00	0	1475.4	0.	0.	21		0.070	0.070	0.070	0.
0 0	BALLAST INSTL	723.60	0	1451.5	0.	0.	1		6.325	4.215	4.215	0.
0 0	BOOST PROTECTIVE COVER	612.00	0	1065.1	-0.7	-5.3	21		339.130	307.710	305.870	0.
0 0	CANARD INSTL LES	8.20	0	1441.3	0.	2.2	21		0.080	0.030	0.080	0.
0 0	LAUNCH ESCAPE 332-387	571.70	0	1439.9	0.	-0.6	21		9.400	24.870	23.440	0.
0 0	CANARD ASSY LH	109.80	0	1447.3	-7.6	5.3	21		1.090	4.440	4.170	0.
0 0	CANARD ASSY RH	109.80	0	1447.3	7.6	5.3	21		1.080	4.440	4.160	0.
0 0	ROCKET MOTOR SET	5330.50	0	1299.0	0.	0.	21		142.000	4129.900	4129.200	0.

009 LAUNCH ESCAPE SYSTEM - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	ELECT COMPLETE	0.30	0	1210.0	0.	0.	21		0.	0.	0.	0.
0 0	ELECT INSTL LES TOWER	5.70	0	1134.7	0.	-18.6	21		0.560	1.340	1.810	0.
0 0	ELECT INSTL LES MOTOR	23.60	0	1330.3	0.2	-10.5	21		0.300	39.080	39.200	0.
0 0	HARNESS LE TOWER LH	9.70	0	1131.4	-20.9	-20.5	21		0.180	3.070	3.070	0.
0 0	HARNESS LE TOWER RH	11.70	0	1136.4	21.2	-20.7	21		0.180	3.660	3.670	0.
0 0	HARNESS LE MOTOR LH	9.10	0	1273.6	-7.2	-8.3	21		0.020	14.350	14.350	0.
0 0	HARNESS LE MOTOR RH	12.40	0	1297.4	7.4	-8.4	21		0.010	17.390	17.380	0.
0 0	CANARD ACTUATING MECH	64.70	0	1438.9	0.	-0.6	21		0.960	0.960	0.180	0.
0 0	LATCH MECH INSTL CANARDS	3.40	0	1443.8	0.	8.7	21		0.	0.	0.010	0.
2 0	INSTR INSTL LES	1.10	0	1469.0	0.	0.	21		0.	0.	0.	0.
TOTAL LES 009												
	* FIRST LEVEL TOTAL	8320.00		1299.8	-0.0	-0.4			603.5 20.7	22723.2 207.8	22718.6 0.2	
	* SECOND LEVEL TOTAL	8320.00		1299.8	-0.0	-0.4			603.5 20.7	22723.2 207.8	22718.6 0.2	

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COMMAND MODULE 009

WEIGHT STATUS

ITEM	PREVIOUS STATUS 5-1-65	CHANGE TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT CM 009 STATUS		
				%EST	%CALC	%ACT
Structure	5583.6	-47.1	5536.5	2	39	59
Stabilization & Control	190.0	+8.9	198.9			100
Environmental Control	293.4	+2.6	296.0	1	39	60
Earth Recovery	603.1	-7.3	595.8		13	87
Instrumentation	244.0	-	244.0	15	71	14
Electrical Power	1336.5	+167.8	1504.3	2	28	70
Reaction Control	304.0	-	304.0		57	43
Communication	288.1	-0.1	288.0		28	72
Displays & Control	95.2	+14.9	110.1		2	98
Useful Load - Reaction Control	270.0	-	270.0		100	
Items for AFRM 009	101.1	+59.9	161.0		65	35
Platform	910.0	+0.3	910.3	2	70	28
Simulated Systems - Ballast	538.8	-106.0	432.8		40	60
Ballast Aft Heat Shield	242.2	+201.4	443.6		100	
TOTAL COMMAND MODULE	11000.0	+295.3	11295.3	2	43	55

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
STRUCTURE AND MECHANICAL SYSTEMS												
0 0	INNER STRUCT - FWD SECT	203.80	0	1094.0	0.	-7.0	20		67.084	33.585	33.585	1082.
0 0	INNER STRUCT - CTR SECT	701.70	0	1051.1	-0.1	-7.9	20		319.383	163.889	163.889	1014.
0 0	INNER STRUCT - AFT SECT	200.00	0	1011.2	0.	0.	20		71.422	35.722	35.722	1000.
0 0	SEC STRUCT RH EQ BAY/CP	103.30	0	1029.5	46.2	5.4	21		4.460	5.690	1.910	1014.
0 0	SEC STRUCT LH EQ BAY	97.20	0	1030.0	-45.5	3.7	20		1.079	2.202	1.079	1014.
0 0	SEC STRUCT FWD RH EQ CMP	22.00	0	1069.4	28.2	7.5	20		0.216	0.108	0.216	1066.
0 0	SEC STRUCT FWD LH EQ CMP	28.60	0	1070.7	-27.3	10.0	20		0.259	0.130	0.259	1066.
0 0	SEC STRUCT MAIN DISP PNL	99.20	0	1071.5	-5.3	-18.2	20		10.231	5.115	5.115	1058.
0 0	SEC STRUCT LWR EQUIP BAY	226.00	0	1035.0	3.8	42.9	20		29.700	16.598	44.485	1013.
0 0	SEC STRUCT AFT EQUIP BAY	52.70	0	1012.8	5.6	4.9	20		22.858	14.958	9.519	1005.
0 0	SEC STRUCT FWD COMPT	5.00	0	1080.3	1.6	6.9	0		0.	0.	0.	1014.
0 0	SEC STRUCT AFT COMPT	40.20	0	1024.6	-7.8	14.4	1	X	37.026	18.552	18.552	1019.
0 0	HEATSHIELD SUBSTRUCT FWD	190.00	0	1097.9	-0.2	-1.1	20		36.995	22.512	22.512	1082.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	HEATSHIELD SUBSTRUCT CTR	685.00	0	1049.2	-0.6	-19.7	20		725.102	440.039	440.039	1023.
0 0	HEATSHIELD SUBSTRUCT AFT	781.00	0	1008.2	-1.6	5.0	21		466.000	246.000	244.000	1000.
0 0	INSULATION FWD SECTION	17.00	0	1100.0	0.	0.	4	X	2.484	1.854	1.854	1082.
0 0	INSULATION CTR SECTION	80.00	0	1048.2	0.	0.	4	X	59.127	34.225	34.225	1014.
0 0	INSULATION-AFT INNER	11.00	0	1007.0	0.	-22.0	27	X	0.533	0.424	0.124	1004.
0 0	INSULATION-AFT OUTER	14.00	0	1014.0	0.	0.	1	X	14.882	7.439	7.439	1013.
0 0	INSULATION-AFT TORUS	15.50	0	1019.0	0.	0.	1	X	18.576	9.312	9.312	1014.
0 0	SEPARATION PROV	22.00	0	1026.2	0.9	2.1	1	X	16.534	8.296	8.296	1025.
0 0	ABLATOR NOSE CONE	39.50	0	1120.6	-0.1	0.6	21		1.100	0.700	0.700	1113.
0 0	ABLATOR FWD SECTION	138.60	0	1095.2	-0.2	3.3	21		23.200	12.700	14.400	1082.
0 0	ABLATOR CTR SECTION	575.70	0	1048.5	-0.3	9.5	21		436.000	240.000	258.000	1023.
0 0	ABLATOR AFT SECTION	782.00	0	1008.6	-0.1	6.1	21		450.000	231.000	230.000	999.
0 0	CRUSHABLE HONEYCOMB ELS	40.00	0	1025.4	3.0	58.0	21		3.491	0.387	3.491	1010.
0 0	FLOTATION BAG SYSTEM ELS	55.00	0	1062.6	-2.4	19.1	1	X	1.336	0.890	0.890	1065.
0 0	SEA HOOK PICKUP ELS	15.00	0	1090.0	0.	-20.0	1	X	0.364	0.189	0.189	1082.
0 0	PARACHUTE ATTACH FITTNGS	29.00	0	1094.6	0.3	-11.0	1	X	3.834	1.935	1.935	1082.
0 0	ATTENUATION SYSTEM	84.10	0	1046.8	0.	-20.8	21	0	17.150	18.430	13.420	1036.
0 0	STEEL CHANNELS - RACEWAY	10.00	0	1019.9	1.4	-22.1	2	X	7.665	3.833	3.833	1019.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	BUFFER - AFT HEAT SHIELD	108.80	0	1006.6	0.	18.7	27	X	5.275	4.219	1.248	1002.
0 0	POTTING - AIR LOCK	60.00	0	1097.5	0.	0.	1	X	1.457	1.833	1.833	1082.
2 0	MANUAL CONTROLS ECS	3.60	0	1042.0	-45.9	-24.9	0	0	0.	0.	0.	1030.
STRUCTURE AND MECHANICAL SYSTEMS TOTAL												
*	FIRST LEVEL TOTAL	5536.50		1040.0	-0.3	1.2			3203.0 -1.8	2828.2 -151.4	2716.9 13.0	
*	SECOND LEVEL TOTAL	5536.50		1040.0	-0.3	1.2			3203.0 -1.8	2828.2 -151.4	2716.9 13.0	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	STABILIZATION AND CONTROL											
0 0	RATE GYRO PACKAGE	7.50	0	1054.7	-14.7	40.3	2	Z	0.011	0.009	0.007	1051.
0 0	ATTITUDE GYRO ACCEL PKG	13.70	0	1048.0	-14.7	38.8	2	Z	0.025	0.032	0.025	1043.
0 0	ECA PITCH	33.60	0	1022.4	-15.6	43.6	2	Z	0.315	0.276	0.059	1021.
0 0	ECA ROLL	32.70	0	1027.5	-5.2	44.0	2	Z	0.386	0.348	0.057	1025.
0 0	ECA YAW	34.80	0	1034.2	-15.6	43.8	2	Z	0.327	0.286	0.061	1031.
0 0	ECA AUX	32.60	0	1027.5	-15.6	43.3	2	Z	0.282	0.244	0.057	1025.
0 0	DISPLAY ECA PKG	43.40	0	1039.3	-15.6	44.5	2	Z	0.441	0.390	0.076	1037.
2 0	SCS POWER J-BOX	0.60	0	1016.8	-37.8	37.0	0	0	0.	0.	0.	1016.
	STABILIZATION AND CONTROL TOTAL											
	* FIRST LEVEL TOTAL	198.90		1032.8	-13.9	43.4			2.6 -0.3	4.8 -0.3	4.1 0.0	
	* SECOND LEVEL TOTAL	5735.40		1039.7	-0.8	2.7			3286.9 1.9	2908.9 -164.2	2730.8 -10.7	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

GR CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	ENVIRONMENTAL CONTROL												
0 0	SUBCONT COMPONENTS	PSC	69.60	0	1027.6	-44.5	5.8	21		5.370	3.410	5.240	1022.
0 0	CO2 SENSOR	PSC	2.00	0	1022.0	-49.0	-11.4	1	X	0.000	0.000	0.000	1021.
0 0	DUCTING/CONN/CLAMPS	PSC	16.90	0	1035.4	-38.1	-26.7	1	X	0.022	0.284	0.284	1020.
0 0	SUBCONT COMPONENTS	H2O-G	30.60	0	1035.6	-49.0	3.0	21		3.000	3.000	1.000	1034.
0 0	PLUMBING ETC	H2O-G	13.40	0	1036.8	-13.2	9.9	0	0	0.	0.	0.	1020.
0 0	WATER GLYCOL	H2O-G	12.10	0	1028.0	-49.0	-2.0	1	X	0.003	0.023	0.023	1023.
0 0	WATER GLYCOL	H2O-G	12.30	0	1040.0	-49.0	40.0	1	X	0.003	0.024	0.024	1035.
0 0	SUBCONT COMPONENTS	P/T	14.30	0	1056.7	-32.7	-6.3	20	0	0.086	0.086	0.043	1035.
0 0	BLOWER SW/OUTLET VALVE		1.60	0	1076.0	-11.0	7.0	0	0	0.	0.	0.	1075.
0 0	DUCTING ETC	P/T	0.80	0	1033.9	-33.0	-14.4	1	X	0.000	0.000	0.000	1033.
0 0	SUBCONT COMPONENTS	O2	3.50	0	1034.9	-43.4	4.0	1	Z	0.001	0.001	0.001	1033.
0 0	OXYGEN SURGE TANK	O2	8.90	0	1032.7	-48.8	-16.1	3	X	0.049	0.049	0.049	1025.
0 0	PLUMBING ETC	O2	4.50	0	1025.8	-37.7	-11.0	1	X	0.003	0.010	0.010	1020.
0 0	SUBCONT COMPONENTS	H2O	25.40	0	1031.5	-37.4	25.6	1	X	0.617	0.491	0.491	1020.
0 0	PLUMBING ETC	H2O	3.60	0	1028.7	-38.1	1.2	0	0	0.	0.	0.	1020.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	SUBCONT COMMON ITEMS	ECS	34.40	0	1030.9	-40.6	15.5	1	X	1.207	1.160	1.160	1014.
0 0	WIRING HARNESS		9.10	0	1027.8	-48.3	5.5	2	X	0.001	0.017	0.017	1023.
0 0	N2 PURGE SYSTEM	ECS	1.40	0	1028.9	-37.5	5.1	0	0	0.	0.	0.	1025.
0 0	SUPPORTS	ECS	11.00	0	1029.0	-42.0	11.0	1	X	0.386	0.371	0.371	1014.
0 0	MISCELLANEOUS	ECS	0.60	0	1030.0	-48.0	0.	2	X	0.009	0.009	0.009	1020.
2 0	POST LANDING VENT SYSTEM		20.00	0	1080.0	15.0	15.0	2	X	0.018	0.018	0.018	1078.
	ENVIRONMENTAL CONTROL TOTAL												
	* FIRST LEVEL TOTAL		296.00		1036.0	-37.7	6.8			40.0 12.3	33.6 1.1	38.0 2.0	
	* SECOND LEVEL TOTAL		6031.40		1039.5	-2.6	2.9			3410.6 22.5	2944.3 -164.0	2852.3 -18.0	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
EARTH RECOVERY													
0 0	DROGUE SYST NV	ELS	71.00	1	1088.8	9.1	-20.8	20		0.306	0.335	0.335	1082.
0 0	MAIN CHUTE PACK	ELS	131.10	0	1090.6	22.5	2.5	20		2.569	3.065	2.202	1082.
0 0	MAIN CHUTE PACK	ELS	131.10	0	1090.6	-22.5	-2.5	20		2.569	2.202	3.065	1082.
0 0	MAIN CHUTE PACK	ELS	131.10	0	1090.6	-4.2	22.5	20		2.569	3.065	2.202	1082.
0 0	PACK ASSY - PILOT		8.30	0	1084.4	-20.2	12.0	20		0.031	0.007	0.031	1082.
0 0	PACK ASSY - PILOT		8.20	0	1084.4	12.7	20.0	20		0.025	0.023	0.007	1082.
0 0	PACK ASSY - PILOT		8.20	0	1084.4	19.9	-12.5	20		0.028	0.007	0.028	1082.
0 0	ATTACH PROVISIONS		2.60	0	1089.6	0.	0.	1	X	0.140	0.075	0.075	1082.
0 0	FLASHING LIGHT		0.20	0	1095.0	7.5	-18.5	2	X	0.000	0.000	0.000	1093.
0 0	FLASHING LIGHT - POWER		4.00	0	1095.0	-7.5	-18.5	2	X	0.002	0.004	0.004	1092.
0 0	SEA DYE MARKER		3.60	0	1083.8	10.7	21.7	2	X	0.005	0.004	0.003	1082.
0 0	FWD HS REL Y EJECT	ELS	37.00	3	1101.0	0.	0.	1	X	0.009	0.100	0.100	1095.
0 0	FWD HS REL PLUMBING	ELS	6.80	0	1086.5	0.	-8.0	1	X	0.463	0.233	0.233	1083.
0 0	FWD HS REL BREECH	ELS	2.10	1	1103.0	0.	-11.2	1	X	0.000	0.001	0.001	1101.
0 0	FWD HS REL CARTRIDGE		1.00	1	1105.0	12.1	-11.2	1	X	0.000	0.000	0.000	1103.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	FWD HS REL ATTACH	3.60	0	1099.9	0.	-0.4	1	X	1.007	0.504	0.504	1099.
0 0	UMBL TENS SEPR CYLINDER	4.70	0	1102.8	-17.6	13.6	2	X	0.002	0.013	0.013	1097.
0 0	HARNESS	17.90	0	1094.0	9.0	-18.0	20		0.103	0.049	0.134	1082.
0 0	DISCONNECT INSTL	5.50	0	1105.5	0.	-18.3	2	X	0.003	0.003	0.005	1103.
0 0	DROGUE DISC ORDNANCE	2.00	0	1104.4	0.	-16.9	1	Y	0.001	0.000	0.001	1104.
0 0	DEPLOY MECH-DYE MARKER	2.20	0	1082.9	10.4	-22.2	2	X	0.004	0.003	0.003	1081.
2 0	FITTING INSTL - ELS	13.60	1	1084.5	20.1	-17.6	20		0.010	0.012	0.004	1082.
	EARTH RECOVERY TOTAL											
	* FIRST LEVEL TOTAL	595.80		1091.1	-0.6	1.4			70.2 -0.3	38.0 -0.1	45.1 -0.5	
	* SECOND LEVEL TOTAL	6627.20		1044.2	-2.4	2.7			3481.5 34.3	3293.2 -172.6	3208.5 -18.8	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	INSTRUMENTATION												
0 0	SENSORS	LNS	35.00	0	1040.0	0.	0.	20	0	1.813	1.813	1.813	1014.
0 0	DATA DIST PANEL	LNS	4.00	0	1024.8	0.	-61.9	0	0	0.	0.	0.	1024.
0 0	PAM/FM/FM PKG R/D	INS	16.00	0	1034.1	15.6	43.5	2	Z	0.138	0.120	0.028	1032.
0 0	TAPE RECORDER R/D	LNS	50.00	0	1030.8	-34.9	37.0	2	X	0.134	0.441	0.486	1020.
0 0	COMMUTATORS 3 R/D	LNS	9.00	0	1024.8	0.	-61.9	2	X	0.011	0.019	0.024	1020.
0 0	DATA DIST PAN R/D	LNS	6.50	0	1056.0	16.0	37.0	2	Y	0.015	0.009	0.009	1054.
0 0	SENSORS R/D	LNS	98.00	0	1023.5	8.6	-32.5	20	0	1.813	1.813	1.813	1013.
0 0	SUPPORTS R/D	LNS	5.50	0	1030.3	-2.9	-36.3	2	X	0.044	0.068	0.048	1020.
2 0	SUPPORTS - INSTRUMENTN		20.00	0	1030.3	-2.9	-36.3	1	X	8.431	4.250	4.250	1025.
	INSTRUMENTATION TOTAL												
	* FIRST LEVEL TOTAL		244.00		1029.7	-2.6	-8.7			87.6 -0.7	70.8 7.5	26.8 -17.3	
	* SECOND LEVEL TOTAL		6871.20		1043.7	-2.4	2.3			3575.8 33.7	3381.3 -156.7	3245.9 -36.0	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
ELECTRICAL POWER													
0 0	BATTERY-RE ENTRY	EPS	28.00	0	1015.6	-1.5	41.8	2	Z	0.385	0.392	0.043	1012.
0 0	BATTERY-RE ENTRY	EPS	28.00	0	1015.6	-7.5	41.8	2	Z	0.385	0.392	0.043	1012.
0 0	BATTERY-POST LANDING	EPS	28.00	0	1015.6	-13.4	41.8	2	Z	0.385	0.392	0.043	1012.
0 0	BATTERY-PYROTECHNIC	EPS	5.60	0	1016.3	34.3	39.9	2	X	0.029	0.021	0.021	1008.
0 0	BATTERY VENT SYSTEM	EPS	1.50	0	1009.1	-20.0	35.1	0	0	0.	0.	0.	1015.
0 0	INVERTER/CONTROL	EPS	39.50	0	1015.4	-23.7	40.5	2	Y	0.452	0.348	0.174	1012.
0 0	INVERTER/CONTROL	EPS	39.50	0	1015.4	8.9	40.5	2	Y	0.452	0.348	0.174	1012.
0 0	INVERTER/CONTROL	EPS	39.50	0	1015.4	23.7	40.5	2	Y	0.452	0.348	0.174	1012.
0 0	DC POWER PAN ASSEM	EPS	7.60	0	1035.3	50.0	-3.0	20	0	0.002	0.002	0.002	1034.
0 0	AC POWER BOX ASSEM	EPS	10.60	0	1016.5	-7.5	50.8	20	0	0.021	0.012	0.023	1015.
0 0	MOTOR SWITCHES - LEB		5.60	0	1018.0	15.0	52.0	2	Y	0.029	0.018	0.018	1015.
0 0	BATTERY CIR BRK PAN	EPS	3.40	0	1016.1	34.9	38.9	2	X	0.012	0.010	0.005	1018.
0 0	CIR BRK PANEL EP	EPS	5.00	0	1039.2	44.0	3.1	2	Y	0.000	0.000	0.000	1038.
0 0	PHASE CORR CAPACITOR		4.00	0	1024.0	45.0	-30.9	2	X	0.004	0.012	0.012	1018.
0 0	TERM DIST BUS PANEL		10.90	0	1027.1	53.3	6.8	2	X	0.047	0.013	0.054	1024.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OB CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	INSTAL PROVISIONS	EPS	10.00	0	1016.8	5.1	44.1	2	Y	0.052	0.032	0.032	1012.
0 0	CIRCUIT INTERRUPTORS		12.00	0	1016.2	46.8	-19.2	2	X	0.043	0.043	0.043	1011.
0 0	WIRE RACEWAY		40.10	0	1019.9	1.4	-22.1	1	X	45.186	22.587	22.587	1019.
0 0	UMBILICAL HOUSING		34.00	0	1030.0	20.0	-70.0	2	X	0.245	0.401	0.333	1020.
0 0	RH CIR BREAKER PAN	EPS	18.30	0	1053.3	48.1	-10.4	2	Z	0.132	0.179	0.048	1047.
0 0	LH CIR BREAKER PAN	EPS	11.20	0	1053.0	-47.0	-11.0	2	Z	0.081	0.110	0.029	1047.
0 0	CIRCUIT UTIL PKG	EPS	6.50	0	1023.3	51.0	2.2	2	X	0.007	0.018	0.023	1017.
0 0	LIGHTING EQUIPMENT	EPS	7.40	0	1060.0	0.	0.	2	Y	1.501	0.615	0.992	1050.
0 0	HUMIDITY FIX	EPS	10.00	1	1030.0	21.0	40.0	2	Y	1.309	0.120	1.348	1021.
0 0	INSTAL PROVISIONS	EPS	25.80	3	1025.0	25.0	25.0	2	X	13.360	7.097	7.097	1010.
0 0	SEQUENCERS	EPS	61.40	0	1026.6	48.1	7.0	2	X	0.213	0.517	0.412	1018.
0 0	SEQUENCE CONTROL	ELS	11.30	0	1083.9	0.	-29.0	21		0.240	0.	0.240	1082.
0 0	INERTIA SWITCH - ELS		5.00	0	1020.0	59.3	-13.6	2	X	0.006	0.006	0.006	1017.
0 0	SEQUENCERS-RC		26.60	0	1024.5	36.0	-45.6	2	X	0.096	0.096	0.096	1020.
0 0	FUEL DUMP BOX		7.10	0	1017.0	44.0	-39.2	2	Y	0.037	0.022	0.022	1015.
0 0	PYRO BOX ASSY		3.40	0	1027.0	48.0	-9.0	2	X	0.005	0.007	0.010	1022.
0 0	WIRE-AFT COMPT		235.90	0	1025.0	0.	-20.0	27	X	35.088	29.504	5.618	1024.
0 0	WIRE-AFT H/S		60.00	0	1008.0	0.	0.	2	X	21.576	10.792	10.792	1007.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	WIRE-AFT H/S	2.50	0	1014.0	3.4	-24.3	1	X	2.212	1.106	1.106	1013.
0 0	WIRE-FWD COMPT	10.90	0	1085.0	4.0	-12.0	1	X	0.852	0.429	0.429	1083.
0 0	WIRE-FWD H/S	5.20	0	1100.0	-13.6	8.4	2	X	0.012	0.096	0.096	1085.
0 0	WIRE-CM TO SM	39.00	0	1025.4	19.9	-67.4	2	X	0.140	0.161	0.295	1018.
0 0	WIRE-CREW COMPT	36.30	0	1011.0	42.0	-5.0	2	Z	2.360	2.360	0.021	1009.
0 0	WIRE-CREW COMPT	14.60	0	1010.0	36.0	0.	2	Y	0.290	0.022	0.270	1009.
0 0	WIRE-CREW COMPT	9.10	0	1011.0	36.0	23.0	2	Y	0.097	0.005	0.097	1009.
0 0	WIRE-CREW COMPT	24.00	0	1010.0	13.0	-4.0	2	Z	3.659	3.668	0.022	1007.
0 0	WIRE-CREW COMPT	27.30	0	1010.0	-11.0	-18.0	2	Z	2.552	2.552	0.016	1008.
0 0	WIRE-CREW COMPT	9.10	0	1010.0	-24.0	22.0	2	Y	0.105	0.005	0.105	1008.
0 0	WIRE-CREW COMPT	21.30	0	1011.0	-36.0	0.	2	Z	1.837	1.829	0.020	1009.
0 0	WIRE-CREW COMPT	63.60	0	1028.0	-14.5	-47.0	2	Z	4.174	1.007	3.752	1020.
0 0	WIRE-CREW COMPT	30.90	0	1038.0	0.	-25.0	2	Z	0.231	0.231	0.018	1036.
0 0	WIRE-CREW COMPT	9.10	0	1074.8	24.8	-13.2	2	Z	0.079	0.050	0.035	1073.
0 0	WIRE-CREW COMPT	12.30	0	1045.0	50.0	18.0	2	Z	0.318	0.290	0.035	1043.
0 0	WIRE-CREW COMPT	8.00	0	1049.0	52.0	-3.2	2	X	0.003	0.029	0.029	1042.
0 0	WIRE-CREW COMPT	10.10	0	1011.0	48.0	-15.0	2	Z	0.224	0.225	0.005	1009.
0 0	WIRE-CREW COMPT	10.10	0	1028.0	48.0	20.0	2	X	0.003	0.144	0.144	1014.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	WIRE-CREW COMPT	18.20	0	1036.0	48.0	3.0	2	X	0.404	0.406	0.008	1034.
0 0	WIRE-CREW COMPT	26.70	0	1028.0	52.0	-7.0	2	X	0.009	0.381	0.381	1014.
0 0	WIRE-CREW COMPT	9.10	0	1028.0	48.0	-24.0	2	X	0.003	0.130	0.130	1014.
0 0	WIRE-CREW COMPT	16.60	0	1045.0	0.	17.0	2	Y	0.005	0.122	0.122	1035.
0 0	WIRE-CREW COMPT	27.30	0	1039.0	-48.0	-22.0	2	Z	0.314	0.291	0.039	1037.
0 0	WIRE-CREW COMPT	73.20	0	1028.0	-53.0	-13.9	2	X	0.024	1.044	1.044	1014.
0 0	WIRE-CREW COMPT	13.60	0	1076.0	6.0	-28.0	2	Y	0.100	0.006	0.102	1074.
0 0	WIRE-LWR EQUIP BAY	102.70	0	1031.9	5.4	36.5	2	X	6.677	1.093	7.711	1020.
0 0	INTER CABLES	21.40	0	1074.7	0.3	-18.0	2	Y	2.538	0.151	2.538	1068.
0 0	AFT COMPT COAX	5.90	0	1025.0	35.0	0.	1	Z	0.074	0.043	0.032	1024.
2 0	UMBILICAL COAX	3.50	0	1025.4	19.9	-67.4	1	X	0.000	0.025	0.025	1015.
	ELECTRICAL POWER TOTAL											
	* FIRST LEVEL TOTAL	1504.30		1026.7	6.6	-3.6			690.7 -1.0	468.7 -32.1	387.0 1.9	
	* SECOND LEVEL TOTAL	8375.50		1040.6	-0.8	1.3			4297.6 -8.0	3935.4 -162.2	3730.9 -48.3	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
REACTION CONTROL													
0 0	TANKS-FUEL SYST	RCS	6.70	0	1022.6	-54.0	37.1	3	Z	0.058	0.041	0.041	1016.
0 0	TANKS-FUEL SYST	RCS	6.70	0	1022.6	-39.0	52.6	3	Y	0.041	0.024	0.041	1016.
0 0	PLUMB + FITTGS FUEL	RCS	16.40	0	1032.8	-6.5	5.8	27	X	1.019	0.914	0.341	1015.
0 0	VALVES/REGS FUEL	RCS	9.70	0	1033.8	-46.0	47.9	2	X	0.349	0.436	0.227	1015.
0 0	SENSORS-FUEL SYST	RCS	1.00	0	1028.0	-48.0	50.0	0	0	0.	0.	0.	1028.
0 0	SUPPORTS-FUEL SYSTEM		5.90	0	1032.1	-26.2	33.9	2	X	0.021	0.021	0.021	1027.
0 0	TANKS-OXIDIZER	RCS	7.20	0	1022.6	27.7	59.4	3	Y	0.051	0.026	0.051	1016.
0 0	TANKS-OXIDIZER	RCS	7.20	0	1022.6	3.4	65.4	3	Y	0.051	0.026	0.051	1016.
0 0	PLUMB + FITTGS OXID	RCS	21.90	0	1023.7	7.1	11.1	27	X	1.361	1.221	0.455	1010.
0 0	VALVES/REGS-OXID	RCS	12.30	0	1032.6	44.1	43.7	27	X	0.764	0.686	0.255	1015.
0 0	SENSORS-OXID SYST	RCS	1.00	0	1019.0	16.0	65.0	0	0	0.	0.	0.	1019.
0 0	SUPPORTS-OXIDIZER SYSTEM		8.10	0	1028.7	23.6	41.5	2	X	0.029	0.029	0.029	1024.
0 0	TANKS-PRESS SYST	RCS	5.20	0	1022.6	54.9	33.0	3	X	0.009	0.009	0.009	1018.
0 0	TANKS-PRESS SYST	RCS	5.20	0	1023.6	-61.2	18.7	3	X	0.009	0.009	0.009	1018.
0 0	PLUMBING-PRESS SYST	RCS	8.40	0	1025.0	4.2	18.8	27	X	0.371	0.355	0.137	1018.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	VALVES/REGS-PRESS	RCS	28.60	0	1028.6	-6.5	6.5	27	X	0.938	0.823	0.218	1024.
0 0	SENSORS-PRESS SYS	RCS	2.00	0	1029.0	0.	0.	1	Y	0.000	0.000	0.000	1029.
0 0	SUPPORTS-PRESSURE SYSTEM		7.30	0	1030.4	1.9	5.4	2	X	0.026	0.026	0.026	1025.
0 0	ENGINES 1	RCS	8.10	0	1085.5	0.	-29.0	1	Z	0.017	0.017	0.005	1083.
0 0	ENGINES 1	RCS	8.10	0	1091.1	0.	-25.0	1	Z	0.017	0.017	0.005	1089.
0 0	ENGINES 2	RCS	16.20	1	1023.0	4.0	-68.0	1	Z	0.035	0.040	0.016	1020.
0 0	ENGINES 2	RCS	16.20	2	1023.0	68.0	4.0	1	Y	0.035	0.016	0.040	1020.
0 0	ENGINES 2	RCS	16.20	1	1032.3	-50.4	-40.9	1	Z	0.035	0.035	0.011	1030.
0 0	ENGINES 2	RCS	16.20	1	1032.3	-39.4	-51.9	1	Y	0.035	0.011	0.035	1030.
0 0	ENGINES 2	RCS	16.20	2	1023.0	-68.0	4.0	1	Z	0.029	0.018	0.033	1020.
0 0	ABLAT EXTENSIONS 1	RCS	3.70	0	1085.5	0.	-33.0	1	Z	0.007	0.007	0.005	1083.
0 0	ABLAT EXTENSIONS 1	RCS	3.70	0	1091.1	0.	-29.0	1	Z	0.007	0.007	0.005	1088.
0 0	ABLAT EXTENSIONS 2	RCS	4.40	1	1027.7	4.0	-72.0	1	Z	0.009	0.012	0.009	1024.
0 0	ABLAT EXTENSIONS 2	RCS	5.60	2	1027.7	72.0	4.0	1	Y	0.012	0.011	0.016	1024.
0 0	ABLAT EXTENSIONS 2	RCS	13.20	1	1032.3	-50.4	-46.9	1	Z	0.024	0.024	0.019	1029.
0 0	ABLAT EXTENSIONS 2	RCS	9.80	1	1032.3	-45.4	-51.9	1	Y	0.018	0.014	0.018	1029.
2 0	ABLAT EXTENSIONS 2	RCS	5.60	2	1027.7	-72.0	4.0	1	Z	0.013	0.011	0.017	1024.
REACTION CONTROL TOTAL													
	* FIRST LEVEL TOTAL		304.00		1032.4	-1.4	-1.9			193.5 0.4	112.8 -10.3	119.1 -1.5	

* SECOND LEVEL TOTAL	8679.50	1040.3	-0.8	1.2	4491.8	4053.1	3854.3
					-7.4	-170.9	-49.7

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
COMMUNICATIONS													
0 0	PCM UNIT NO 1	INS	19.00	0	1039.3	15.6	43.5	2	Z	0.178	0.156	0.033	1037.
0 0	PCM UNIT NO 2	INS	19.00	0	1039.3	26.0	41.3	2	Z	0.126	0.104	0.033	1037.
0 0	C-BAND TRANSPONDER	COM	24.30	0	1022.4	15.6	39.5	2	Z	0.109	0.081	0.042	1020.
0 0	VHF FM XMTR/HF XCVR	COM	15.60	0	1022.4	26.0	39.0	2	Z	0.063	0.045	0.027	1020.
0 0	VHF AM XCVR/VHF BEAC	COM	16.50	0	1027.5	26.0	38.9	2	Z	0.067	0.047	0.029	1025.
0 0	MULTIPLEXER	COM	11.40	0	1034.2	26.0	40.5	2	Z	0.063	0.049	0.020	1032.
0 0	SIGNAL CONDITIONER	COM	36.20	0	1045.7	21.8	40.5	2	Z	0.293	0.157	0.157	1043.
0 0	RECORDER	COM	33.00	0	1053.1	22.2	35.4	2	Y	0.252	0.063	0.285	1048.
0 0	AUDIO CENTER	COM	7.80	0	1027.5	36.4	35.9	2	Y	0.016	0.007	0.014	1025.
0 0	PREMOD PROCESS	COM	14.70	0	1034.2	36.4	37.1	2	Y	0.038	0.021	0.026	1031.
0 0	CENTRAL TIMING EQUIP	COM	9.90	0	1022.4	36.4	36.9	2	Y	0.026	0.014	0.017	1020.
0 0	VHF-HF REC ANT/LINES	COM	25.10	0	1056.7	20.8	-1.4	20	0	0.011	0.065	0.065	1040.
0 0	C-BAND ANT/LINES	COM	19.70	0	1022.9	-1.2	-0.8	1	X	20.540	10.266	10.266	1022.
0 0	VHF-2 KMC ANT/LINES	COM	33.20	0	1041.5	8.4	4.9	20	0	0.022	0.130	0.130	1025.
0 0	DATA DIST PAN	COM	1.50	0	1024.8	0.	-61.9	0	0	0.	0.	0.	1022.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	EVENT CONDITIONER	0.40	0	1056.1	21.1	42.3	2	X	0.000	0.000	0.000	1054.
2 0	SUPPORTS-COMM	0.70	0	1040.5	1.6	26.7	0	0	0.	0.	0.	1040.
COMMUNICATIONS TOTAL												
	* FIRST LEVEL TOTAL	288.00		1037.9	20.1	28.3			47.9	40.0	25.2	
									0.3	-2.2	6.7	
	* SECOND LEVEL TOTAL	8967.50		1040.2	-0.1	2.0			4610.4	4138.0	3906.1	
									-10.1	-177.0	-8.8	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
DISPLAYS AND CONTROLS												
0 0	PANEL 01	0.50	0	1064.4	-20.8	-35.1	6	X	0.001	0.000	0.001	1063.
0 0	PANEL 02	1.40	0	1067.0	-23.8	-29.3	2	Y	0.006	0.001	0.005	1066.
0 0	PANEL 03	2.10	0	1064.5	-32.8	-20.7	2	Y	0.006	0.003	0.004	1063.
0 0	PANEL 05	1.40	0	1064.0	-19.6	-18.5	2	Z	0.005	0.004	0.001	1063.
0 0	PANEL 06 - GPAS	5.40	0	1065.5	-31.0	-14.2	2	Y	0.013	0.006	0.012	1063.
0 0	PANEL 07 - DELTA V INDC	3.50	0	1066.8	-25.5	-14.2	2	Y	0.005	0.004	0.005	1064.
0 0	PANEL 08	0.60	0	1061.0	-37.6	-9.7	2	Y	0.001	0.000	0.001	1060.
0 0	PANEL 10	0.90	0	1069.3	-3.5	-37.3	2	Z	0.002	0.001	0.001	1068.
0 0	PANEL 11	1.20	0	1069.0	5.0	-36.1	2	Y	0.004	0.001	0.002	1068.
0 0	PANEL 12	3.90	0	1067.7	-9.1	-30.3	2	Y	0.020	0.003	0.018	1067.
0 0	PANEL 13	6.10	0	1065.9	8.8	-24.8	2	Y	0.064	0.030	0.037	1064.
0 0	PANEL 15	3.70	0	1065.4	-3.7	-20.9	2	X	0.002	0.001	0.003	1063.
0 0	PANEL 16	2.00	0	1062.1	-13.8	-13.6	6	X	0.006	0.003	0.004	1061.
0 0	PANEL 17	1.40	0	1068.9	19.3	-32.4	6	X	0.003	0.001	0.002	1068.
0 0	PANEL 18	15.20	0	1065.4	24.8	-23.3	2	Z	0.123	0.075	0.075	1062.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	PANEL 19	1.60	0	1062.3	13.8	-13.5	6	X	0.005	0.002	0.003	1061.
0 0	PANEL 20	9.40	0	1064.1	29.3	-11.7	2	Y	0.093	0.015	0.086	1062.
0 0	PANEL 21	4.60	0	1048.8	45.3	-6.4	6	Z	0.008	0.019	0.021	1040.
0 0	PANEL 22	17.90	0	1053.1	48.2	-10.3	2	Z	0.129	0.175	0.047	1047.
0 0	PANEL 23	1.40	0	1060.7	39.5	-21.5	2	Z	0.007	0.005	0.005	1057.
0 0	PANEL 24	7.20	0	1048.4	-45.3	-6.4	6	Z	0.013	0.030	0.034	1040.
0 0	PANEL 25	15.00	0	1053.0	-47.0	-11.0	2	Z	0.108	0.147	0.039	1047.
0 0	PANEL 26	1.40	0	1060.7	-39.5	-21.5	2	Z	0.007	0.005	0.005	1057.
0 0	CWDU SUB	1.60	0	1075.0	7.5	-23.5	2	Y	0.003	0.002	0.004	1072.
2 0	C/D SCS/GN DISP J-BOX	0.70	0	1045.1	-42.0	35.0	2	Z	0.002	0.001	0.001	1042.
	DISPLAYS AND CONTROLS TOTAL											
	* FIRST LEVEL TOTAL	110.10		1059.8	2.6	-15.8			31.7 0.5	3.5 -1.1	30.9 -0.6	
	* SECOND LEVEL TOTAL	9077.60		1040.5	-0.1	1.8			4649.7 -8.4	4157.9 -186.4	3946.1 -10.5	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
USEFUL LOAD-REACTION CONTROL PROP												
0 0	OXIDIZER	90.00	0	1022.6	22.7	59.4	23	0	0.	0.	0.	1016.
0 0	OXIDIZER	90.00	0	1022.6	3.4	65.4	23	0	0.	0.	0.	1016.
0 0	FUEL	44.50	0	1022.6	-54.0	37.1	23	0	0.	0.	0.	1016.
0 0	FUEL	44.50	0	1022.6	-39.0	52.6	23	0	0.	0.	0.	1016.
0 0	HELIUM	0.50	0	1022.6	54.9	33.0	23	0	0.	0.	0.	1018.
2 0	HELIUM	0.50	0	1023.6	-61.2	18.7	23	0	0.	0.	0.	1019.
USEFUL LOAD-REACTION CONTROL PROP TOTAL												
	* FIRST LEVEL TOTAL	270.00		1022.6	-6.6	56.5			56.7 -0.0	5.7 -0.0	51.0 13.5	
	* SECOND LEVEL TOTAL	9347.60		1040.0	-0.3	3.4			4877.9 -1.7	4350.8 -241.7	4017.7 -17.3	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OR CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
ITEMS FOR AFRM 009												
0 0	ATTITUDE REF SYSTEM-LEB	37.40	0	1048.0	0.	40.0	2	Y	0.393	0.285	0.543	1026.
0 0	COMPT ASSY-PWR PROGRMR	48.30	0	1047.8	-24.8	40.1	2	X	0.695	0.543	0.543	1040.
0 0	RADIO COMMAND - INSTRU	6.40	0	1021.6	-25.6	42.0	2	Y	0.013	0.007	0.008	1020.
0 0	AMPLIFIER-VIBR + ACCEL	8.00	0	1040.5	-24.0	38.0	2	X	0.021	0.016	0.008	1039.
0 0	CO2 ABSORBERS	9.20	0	1031.0	-48.4	19.6	2	X	0.065	0.049	0.049	1026.
0 0	CO2 ABSORBERS	9.20	0	1013.6	-3.8	26.6	2	X	0.013	0.023	0.031	1008.
0 0	CAMERA INSTL	17.00	0	1067.5	-12.6	-21.3	2	X	0.038	0.038	0.015	1065.
0 0	HDWR - CAMERA INSTL	1.00	0	1067.5	-12.6	-21.3	2	X	0.000	0.000	0.000	1066.
0 0	FIBRE OPTICS	1.00	0	1063.7	-18.6	-30.6	1	Y	0.023	0.000	0.023	1062.
0 0	LENS	1.50	0	1059.9	-24.5	-39.9	2	X	0.000	0.000	0.000	1059.
0 0	HDWR OPTICS	1.00	0	1059.9	-24.5	-39.9	2	X	0.000	0.000	0.000	1059.
0 0	CONTROL UNIT	4.00	0	1012.1	0.	-32.8	2	X	0.002	0.002	0.002	1010.
0 0	BATTERY - EP 4090-11	7.50	0	1012.1	7.0	-32.8	2	X	0.015	0.011	0.009	1010.
0 0	PULSE GENERATOR	2.00	0	1012.1	-7.0	-32.8	2	X	0.001	0.001	0.001	1010.
0 0	FLOOR PLATE	4.00	0	1010.5	0.	-32.8	2	X	0.058	0.029	0.029	1010.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
2 0	CABLING - CAMERA INSTL	3.50	0	1040.0	-5.0	-32.0	2	X	0.001	0.191	0.191	1013.
	ITEMS FOR AFRM 009 TOTAL											
	* FIRST LEVEL TOTAL	161.00		1041.9	-14.4	20.1			38.7 -1.3	41.0 2.4	17.7 -3.9	
	* SECOND LEVEL TOTAL	9508.60		1040.0	-0.5	3.7			4933.0 -4.0	4401.4 -238.2	4042.3 -29.2	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
PLATFORM												
0 0	PLATFORM AND FITTINGS	237.80	0	1035.3	0.	-15.1	2	Y	31.212	9.154	22.271	1034.
0 0	AUTO COMMAND CONTROL	83.50	0	1045.5	-24.4	-11.3	2	Y	0.751	0.404	0.854	1039.
0 0	RADIO COMMAND CONTROL	80.30	0	1041.9	21.8	-15.5	2	Y	0.982	0.770	0.354	1038.
0 0	SEQUENCE TIMER ASSY	16.80	0	1040.5	-22.8	-22.9	2	Y	0.079	0.018	0.076	1039.
0 0	POST LANDING SEQ CNTRLR	44.30	0	1044.0	-20.8	1.5	2	X	0.159	0.194	0.194	1038.
0 0	SURVIVAL BEACON	5.00	0	1039.8	0.	-22.9	2	X	0.009	0.005	0.007	1038.
0 0	SUPPORT - COOLANT INSTL	2.50	0	1041.2	24.9	-33.1	2	X	0.024	0.007	0.023	1037.
0 0	SUPPORT - COOLANT INSTL	2.50	0	1041.2	-24.9	-33.1	2	X	0.024	0.007	0.023	1037.
0 0	COOLANT INSTL	5.00	0	1044.0	24.9	-33.1	2	X	0.049	0.010	0.041	1042.
0 0	COOLANT INSTL	5.00	0	1044.0	-24.9	-33.1	2	X	0.049	0.010	0.041	1042.
0 0	COLDPLATE - ACC	1.90	0	1037.3	-24.4	-11.3	2	X	0.017	0.003	0.014	1037.
0 0	COLDPLATE - RCC	2.40	0	1037.4	21.8	-15.5	2	X	0.029	0.021	0.009	1037.
0 0	COLDPLATE - STA	1.20	0	1037.8	-22.8	-22.9	2	X	0.006	0.001	0.005	1037.
0 0	WIRING - PLATFORM	25.00	0	1039.5	0.	-15.0	2	Y	2.341	0.022	2.341	1037.
0 0	CABLE - ACC TO STA	6.90	0	1050.0	-23.0	-16.0	2	X	0.013	0.013	0.001	1049.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	MOUNT - ACC	3.70	0	1047.7	-28.0	-8.0	2	X	0.033	0.046	0.020	1040.
0 0	BACKUP ENTRY SENSOR INST	1.00	0	1038.7	34.1	4.7	2	X	0.001	0.000	0.000	1038.
0 0	TERMINAL STRIP PANEL	0.60	0	1037.7	30.0	6.0	2	X	0.002	0.000	0.002	1037.
0 0	Y-Y ATTENUATION STRUTS	14.10	1	1033.0	32.0	-3.3	1	Y	0.084	0.005	0.085	1031.
0 0	PANEL - BALLAST STRUCT	24.20	0	1042.3	-11.8	-10.5	2	X	0.196	0.290	0.102	1035.
0 0	PANEL - BALLAST STRUCT	29.80	0	1043.0	11.9	-10.5	2	X	0.241	0.357	0.125	1035.
0 0	BOX - BALLAST STRUCT	36.00	0	1046.8	0.	-10.5	2	X	0.628	0.327	0.384	1043.
0 0	PANEL - BALLAST STRUCT	2.90	0	1047.3	0.	-0.8	2	X	0.028	0.005	0.033	1042.
0 0	PANEL - BALLAST STRUCT	2.90	0	1047.4	0.	-20.8	2	X	0.028	0.005	0.033	1042.
0 0	BALLAST - PLATFORM	70.00	0	1049.1	5.8	-10.4	2	X	0.214	0.082	0.172	1047.
0 0	BALLAST - PLATFORM	75.00	0	1049.2	5.8	-3.4	2	X	0.229	0.088	0.185	1047.
0 0	BALLAST - PLATFORM	20.00	0	1047.1	13.0	-3.4	2	X	0.018	0.061	0.044	1042.
0 0	BALLAST - PLATFORM	60.00	0	1047.1	13.9	-10.4	2	X	0.063	0.183	0.140	1042.
0 0	BALLAST - PLATFORM	25.00	0	1048.3	-5.8	-10.4	2	X	0.076	0.026	0.058	1047.
0 0	BALLAST - PLATFORM	15.00	0	1047.1	12.8	-17.4	2	X	0.013	0.046	0.033	1042.
2 0	BALLAST - PLATFORM	10.00	0	1052.6	-5.8	-17.3	2	X	0.031	0.009	0.022	1052.
TOTAL PLATFORM INCLUDING BALLAST												
	* FIRST LEVEL TOTAL	910.30		1042.7	0.2	-11.8			83.7 0.1	24.7 2.5	72.6 -1.6	
	* SECOND LEVEL TOTAL	10418.90		1040.2	-0.5	2.3			5059.6	4470.3	4116.4	

-3.5 -243.2 -32.9

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION		WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
BALLAST - AFT HEATSHIELD													
0 0	AFT H/S BALLAST	1	35.50	0	1016.5	43.5	50.5	2	X	0.440	0.225	0.296	1013.
0 0	AFT H/S BALLAST	2	91.60	0	1016.6	26.5	59.5	2	X	1.135	0.581	0.764	1013.
0 0	AFT H/S BALLAST	3	89.70	0	1016.6	3.0	65.9	2	X	1.111	0.569	0.748	1013.
0 0	AFT H/S BALLAST	4	73.40	0	1016.7	-20.0	63.0	2	X	0.909	0.466	0.612	1013.
0 0	AFT H/S BALLAST	5	70.90	0	1016.2	-39.2	52.0	2	X	0.878	0.450	0.591	1013.
0 0	AFT H/S BALLAST	17	16.50	0	1016.1	62.0	-25.6	7	X	0.060	0.029	0.046	1014.
0 0	AFT H/S BALLAST	18	16.50	0	1016.1	66.2	-10.7	7	X	0.060	0.029	0.046	1014.
0 0	AFT H/S BALLAST	19	16.50	0	1016.1	66.2	10.7	7	X	0.060	0.029	0.046	1014.
0 0	AFT H/S BALLAST	20	16.50	0	1016.1	62.0	25.6	7	X	0.060	0.029	0.046	1014.
2 0	AFT H/S BALLAST	21	16.50	0	1016.1	54.2	39.2	7	X	0.060	0.029	0.046	1014.
TOTAL BALLAST - AFT HEATSHIELD													
	* FIRST LEVEL TOTAL		443.60		1016.5	11.5	49.8			170.4 -0.2	53.4 0.4	118.0 -46.8	
	* SECOND LEVEL TOTAL		10862.50		1039.3	0.0	4.3			5450.6 -29.9	4783.1 -346.6	4299.5 -27.3	

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
SIMULATED SYSTEMS - BALLAST												
0 0	POWER PROGMR - DELETED	15.00	0	1025.0	39.9	23.2	2	X	0.009	0.009	0.009	1023.
0 0	S-BAND PWR AMPLIF COM	20.00	0	1027.5	15.6	39.5	2	Z	0.090	0.067	0.035	1025.
0 0	UP DATA LINK/PROV COM	19.50	0	1022.4	5.2	43.5	2	Z	0.183	0.160	0.034	1020.
0 0	C/D G/N DISPLAY CONT COM	20.40	0	1066.2	14.5	37.0	2	X	0.160	0.324	0.191	1055.
0 0	S-BAND TRANSPONDER COM	27.60	0	1027.5	5.2	43.9	2	Z	0.124	0.092	0.048	1025.
0 0	MEDICAL EQUIP + CONT	4.80	0	1050.0	36.0	40.0	2	X	0.013	0.025	0.026	1043.
0 0	MEDICAL EQUIP + CONT	4.90	0	1061.9	25.3	37.0	2	X	0.025	0.010	0.024	1059.
0 0	SURVIVAL KIT NO 2	26.20	0	1072.2	28.0	5.0	2	Y	0.144	0.144	0.212	1064.
0 0	SURVIVAL KIT NO 3	26.20	0	1071.2	27.0	16.5	2	Y	0.163	0.149	0.198	1064.
0 0	SEXTANT	15.10	0	1069.6	0.5	31.1	1	Z	0.070	0.093	0.056	1066.
0 0	TELESCOPE	14.30	0	1069.6	0.5	31.1	1	Z	0.055	0.074	0.028	1066.
0 0	OPTICAL BASE	17.00	0	1069.6	0.5	31.1	2	Y	0.130	0.061	0.130	1066.
0 0	COMPUTER	85.00	0	1037.8	1.3	46.1	20		1.150	0.922	0.410	1035.
0 0	WORK SHELF + TOOLS	7.70	0	1033.0	5.2	38.0	2	X	0.028	0.014	0.014	1032.
0 0	BATTERY CHARGER/CONT EPS	4.00	0	1017.0	6.7	50.4	2	Y	0.004	0.002	0.004	1015.

SC 009 COMMAND MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	BALLAST/PWR SERVO AREA	30.00	0	1044.0	9.0	38.0	2	X	0.067	0.056	0.016	1032.
0 0	BALLAST/GN CNTL PNL AREA	20.00	0	1052.4	11.3	37.0	2	X	0.023	0.046	0.023	1048.
0 0	NAVIGATION BASE	25.00	0	1064.3	-0.1	41.3	20		0.248	0.306	0.395	1058.
0 0	BELLOWS ASSEMBLY	13.50	0	1064.3	-0.1	41.3	20		0.222	0.276	0.356	1060.
3 4	CABLING MIT	36.60	0	1053.1	-1.1	46.8	20	X	0.986	0.850	1.330	1030.
TOTAL SIMULATED SYSTEMS - BALLAST												
	* FIRST LEVEL TOTAL	432.80		1049.3	8.9	36.8			27.9 1.9	42.9 -10.2	42.4 -8.9	
	* SECOND LEVEL TOTAL	11295.30		1039.7	0.4	5.5			5580.7 -20.1	4930.1 -327.6	4358.0 -10.4	

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SERVICE MODULE 009

WEIGHT STATUS

ITEM	PREVIOUS STATUS 5-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT SM 009 STATUS		
				%EST	%CALC	%ACT
Structure	2496.6	-20.1	2476.5		43	57
Environmental Control	69.8	0.0	69.8		99	1
Instrumentation	241.5	+55.8	297.3	5	85	10
Electrical Power	569.4	0.0	569.4	2	33	65
Service Propulsion	2907.5	+50.7	2958.2	3	16	81
Reaction Control	343.0	0.0	343.0	2	59	39
Fluid Residuals	649.2	-24.4	*624.8		100	
Usable Fluids	790.0	+24.2	814.2		100	
TOTAL SERVICE MODULE (STATUS)	8067.0	+86.2	8153.2	1	45	54
SPS Propellant (Ballast)	1133.0	-381.2	751.8		100	
TOTAL SERVICE MODULE	9200.0	-295.0	8905.0	1	50	49

*Propulsion Residuals		576.8
Helium	(99.0)	
Propellant	(477.8)	
Trapped In System	240.7	
Trapped In Engine	68.6	
Mixture Ratio Tolerance	123.6	
Loading Tolerance-Oxidizer Only	44.9	
RCS Residuals		48.0
Helium	(3.0)	
Propellant	(45.0)	
Trapped In System	4.0	
Mixture Ratio	9.0	
Expulsion Efficiency	24.0	
Loading Tolerance	3.0	
Total Fluid Residuals		624.8
Additional Propellant Utilized as Ballast		751.8

AERM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	STRUCTURE											
0 0	RADIAL WEBS	341.90	0	929.0	-0.9	1.1	21		233.870	283.420	263.670	841.
0 0	INTERNAL PARTITIONS	20.00	0	882.2	-0.8	0.9	21		2.300	10.470	9.420	841.
0 0	OUTER PANELS + PAINT	792.00	0	918.0	1.0	-0.5	21		999.900	841.700	841.700	841.
0 0	C/M TO S/M FAIRING	162.00	0	1005.3	1.7	-5.1	21		204.520	104.050	104.050	993.
0 0	FORWARD BULKHEAD	171.00	0	993.3	0.	-0.1	21		128.380	70.420	57.950	993.
0 0	AFT BULKHEAD	325.60	0	839.4	0.	0.	21		253.030	138.920	114.340	838.
0 0	SEPARATION	30.50	0	1006.0	0.	0.	21		25.030	13.710	11.640	1000.
0 0	TANK SUPPORT SHELF	29.00	0	916.0	32.7	-42.5	21		2.820	1.410	1.410	915.
0 0	SPS ENGINE SUPPORTS	54.00	0	844.3	0.6	-0.4	21		5.640	2.960	2.960	840.
0 0	INSULATION - RCS PANELS	6.20	0	958.9	0.	0.	1	X	8.038	4.029	4.029	954.
0 0	INSULATION - AFT H/S	91.20	0	830.1	-0.6	-1.4	1	X	58.356	29.822	29.822	820.
0 0	MTG PROV - INSULATION	6.90	0	830.5	0.9	0.8	2	X	0.	0.003	0.003	828.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	AFT HEAT SHIELD + N2 SYS	55.00	0	830.7	0.6	-0.8	21		26.420	13.270	13.270	826.
0 0	FITTINGS AND ATTACH PART	53.00	0	955.3	0.1	-0.2	21		69.760	58.720	58.720	875.
0 0	SPS ENGINE BOOT	27.80	0	828.0	0.	0.	20		3.620	1.860	1.860	823.
0 0	SPS FUEL SYS SUPTS	10.90	0	840.0	0.	0.	21		3.090	1.610	1.610	830.
0 0	SPS OXIDIZER SYS SUPTS	11.40	0	840.0	0.	0.	21		2.410	1.250	1.250	830.
0 0	SPS PRESSURE SYS SUPTS	11.90	0	890.0	-50.0	30.0	21		9.340	6.910	6.910	830.
0 0	RCS FUEL AND OX SUPTS	6.50	0	958.0	64.0	-24.0	20		0.024	0.250	0.250	928.
0 0	RCS FUEL AND OX SUPTS	6.50	0	960.0	-7.0	68.0	20		0.024	0.250	0.250	928.
0 0	RCS FUEL AND OX SUPTS	6.50	0	958.0	-64.0	24.0	20		0.024	0.250	0.250	928.
0 0	RCS FUEL AND OX SUPTS	6.50	0	960.0	7.0	-68.0	20		0.024	0.250	0.250	928.
0 0	RCS PRESSURE SYS SUPTS	2.80	0	961.0	75.0	-15.0	20		0.009	0.018	0.018	950.
0 0	RCS PRESSURE SYS SUPTS	2.80	0	961.0	0.	75.0	20		0.009	0.018	0.018	950.
0 0	RCS PRESSURE SYS SUPTS	2.80	0	961.0	-75.0	15.0	20		0.009	0.018	0.018	950.
0 0	RCS PRESSURE SYS SUPTS	2.80	0	961.0	0.	-75.0	20		0.009	0.018	0.018	950.
0 0	RCS ENG SUPTS AND INSUL	15.25	0	952.0	77.0	-10.0	20		2.665	9.504	7.505	870.
0 0	RCS ENG SUPTS AND INSUL	15.25	0	952.0	10.0	77.0	20		2.665	7.505	9.504	870.
0 0	RCS ENG SUPTS AND INSUL	15.25	0	952.0	-77.0	10.0	20		2.665	9.504	7.505	870.
0 0	RCS ENG SUPTS AND INSUL	15.25	0	952.0	-10.0	-77.0	20		2.665	7.505	9.504	870.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG. X STA
0 0	RCS QUAD CLOSEOUTS	23.00	0	959.0	78.0	-10.0	20		0.334	2.496	2.496	925.
0 0	RCS QUAD CLOSEOUTS	23.00	0	959.0	10.0	78.0	20		0.334	2.496	2.496	925.
0 0	RCS QUAD CLOSEOUTS	23.00	0	959.0	-78.0	10.0	20		0.334	2.496	2.496	925.
0 0	RCS QUAD CLOSEOUTS	23.00	0	959.0	-10.0	-78.0	20		0.334	2.496	2.496	925.
0 0	EPS OX TANK SUPT SHELF	13.40	0	971.5	23.0	-29.7	20		0.245	0.287	0.287	959.
0 0	EPS OX TANK SUPT SHELF	13.40	0	895.5	23.0	-29.7	20		0.245	0.287	0.287	883.
0 0	FUEL CELL ATTACHMENT	1.50	0	853.0	-32.7	41.3	20		0.136	0.082	0.082	842.
0 0	STABILIZING WEBS	3.90	0	858.0	-33.6	42.8	20		0.031	0.122	0.122	841.
0 0	INSTALLATION PROV - EPS	10.50	0	929.0	12.0	0.	20		7.759	8.079	8.079	850.
0 0	POWER DIST BOX SUPT *	22.30	0	924.5	-9.8	28.0	20		0.116	0.276	0.171	913.
0 0	COMMON SUPPORTS - ECS	18.00	0	895.0	-41.0	-33.0	20		2.553	2.775	1.221	870.
3 0	SUPPORTS - INSTR	3.00	0	905.0	0.	0.	21		1.820	2.330	2.330	835.
	STRUCTURE TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	2476.50		915.8	0.3	-1.0			2358.3 16.0	3263.5 -16.3	3194.4 -21.5	
	* SECOND LEVEL TOTAL	2476.50		915.8	0.3	-1.0			2358.3 16.0	3263.5 -16.3	3194.4 -21.5	

AERM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	ENVIRONMENTAL CONTROL											
0 0	PLUMBING AND HARDWARE	19.40	0	972.8	6.8	-14.3	20		18.270	7.496	19.446	916.
0 0	HEAT TRANSFER FLUID	8.00	0	896.0	6.8	19.3	20		6.164	2.618	5.123	860.
0 0	SPACE RADIATOR	32.60	0	893.4	0.	0.	21		43.560	10.100	38.100	855.
0 0	VALVES	6.50	0	996.4	16.4	-38.8	20		4.701	0.412	4.310	993.
3 0	PLUMBING AND HARDWARE	3.30	0	894.0	-53.0	-45.0	20		0.764	0.430	0.658	870.
	ENVIRONMENTAL CONTROL TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	69.80		925.4	1.7	-7.5			80.3 3.8	51.1 -6.7	96.1 0.8	
	* SECOND LEVEL TOTAL	69.80		925.4	1.7	-7.5			80.3 3.8	51.1 -6.7	96.1 0.8	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	INSTRUMENTATION											
0 0	INSTR INSTL FRNG CM-SM	0.30	0	1004.0	-40.0	-59.0	21		0.	0.	0.	0.
0 0	CABLE INSTL RF SYSTEM	6.40	0	964.0	-27.0	4.0	21		0.480	1.380	1.340	0.
0 0	INSTR INSTL TENSION TIE	3.20	0	1002.0	0.	0.	21		2.420	1.210	1.210	0.
0 0	INSTR INSTL SECT 1 PANEL	4.00	0	953.0	35.0	-66.0	21		0.	0.010	0.010	0.
0 0	INSTR INSTL FWD PANEL 6	0.40	0	885.0	65.0	33.0	21		0.	0.	0.	0.
0 0	INSTR INSTL H2 SHLF-SC 1	5.60	0	914.0	20.4	-26.6	21		0.020	0.020	0.	0.
0 0	INSTR INSTL RCS PNL 8	1.10	0	939.0	10.0	75.0	21		0.	0.010	0.010	0.
0 0	INSTR INSTL SIGNAL COND	7.30	0	926.7	-5.7	30.2	21		0.360	1.660	1.430	0.
0 0	INSTR INSTL HE PRESS SYS	1.50	0	906.0	-45.0	27.0	21		0.	0.010	0.010	0.
0 0	INSTR INSTL SIG CND FTQ	4.50	0	883.5	-11.9	15.0	21		0.130	1.760	1.890	0.
0 0	INSTR INSTL RCS PNL A	2.10	0	939.0	-10.0	-75.0	21		0.	0.020	0.020	0.
0 0	INSTR INSTL SPS ENGINE	0.90	0	835.0	0.	0.	21		0.070	0.040	0.040	0.
0 0	INSTR INSTL GIMBAL RING	0.60	0	840.5	9.5	0.	21		0.	0.010	0.010	0.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	INSTR INSTL SP ENG FTQ	1.20	0	858.0	0.	0.	21		0.090	0.070	0.070	0.
0 0	INSTR INSTL FO FTQ	1.10	0	830.0	0.	0.	21		0.330	0.160	0.160	0.
0 0	INSTR INSTL STRUCT TEMP	1.60	0	918.0	0.	0.	21		0.	0.	0.	0.
0 0	INSTR INSTL HE PRESS SYS	1.40	0	906.0	-45.0	27.0	21		0.010	0.010	0.010	0.
0 0	INSTR INSTL-SIG CND EQPT	4.80	0	932.3	-5.1	28.7	21		0.100	0.110	0.110	0.
0 0	INSTR INSTL SPS ENGINE	0.80	0	835.0	0.	0.	21		0.	0.010	0.010	0.
0 0	TRANSD INSTL HE PRS RCS	2.20	0	959.0	0.	0.	21		0.	0.020	0.020	0.
0 0	INSTR INSTL-RCS PANEL	6.20	0	959.0	0.	0.	21		0.100	0.220	0.220	0.
0 0	INSTRU INSTL-STRUCT TEMP	1.90	0	918.0	0.	0.	21		2.280	1.140	1.140	0.
0 0	TRANSD INSTL HE PRESS	2.20	0	959.0	0.	0.	21		2.570	1.280	1.280	0.
0 0	TRANSD INSTL FUEL	1.10	0	959.0	0.	0.	21		1.320	0.660	0.660	0.
0 0	INSTRU INSTL-RCS PANEL	9.80	0	959.0	0.	0.	21		11.740	5.870	5.870	0.
0 0	INSTRU INSTL-SM COMPLETE	9.40	0	906.0	0.	0.	21		0.770	0.390	0.390	0.
0 0	WRING DIAG SM INSTR	150.00	0	950.0	0.	0.	21		0.600	28.000	28.000	0.
0 0	INSTR INSTL-BEAM 4	9.00	0	961.0	-55.0	30.0	21		0.	0.010	0.010	0.
0 0	INSTR INSTL-FWD BLKHD	5.50	0	995.0	0.	0.	21		2.910	1.450	1.450	0.
0 0	INSTR PAM/FM/FM AND HDWR	29.00	0	916.9	-45.0	37.0	21		0.220	0.060	0.190	0.
0 0	INSTR INSTL-INNER STRUCT	3.40	0	852.6	-4.6	5.4	21		0.670	0.740	1.210	0.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG. X STA
0 0	INSTR INSTL-RCS PANEL	5.60	0	971.9	-10.0	-75.0	21		0.	0.170	0.170	0.
0 0	INSTR INSTL-RADIATOR	3.70	0	923.0	-75.0	6.0	21		0.040	0.020	0.020	0.
0 0	INSTR INSTL-SECT 2 PANEL	1.30	0	928.0	75.0	12.0	21		0.	0.	0.	0.
0 0	INSTR INSTL-OTR SHELL 3	1.00	0	915.0	-45.0	60.0	21		0.050	0.030	0.030	0.
0 0	INSTR INSTL-OTR SHELL 6	6.40	0	908.0	-18.0	-75.0	21		0.	0.470	0.470	0.
0 0	INSTR INSTL-STRN GGE 1-4	0.40	0	917.0	-65.0	35.0	21		0.	0.	0.	0.
3 0	INSTR INSTL-STRN GGE 1-4	0.40	0	917.0	65.0	-35.0	21		0.	0.	0.	0.
	INSTRUMENTATION TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	297.30		940.7	-8.0	2.0			91.7 6.3	127.7 -7.0	117.5 -14.2	
	* SECOND LEVEL TOTAL	297.30		940.7	-8.0	2.0			91.7 6.3	127.7 -7.0	117.5 -14.2	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	ELECTRICAL POWER											
	ELECTRICAL POWER EQUIPMENT											
0 0	SPACE RADIATORS	40.50	0	920.0	4.3	-1.4	21		51.160	35.720	24.790	885.
0 0	POWER DIST BOX AND SUPT	32.20	0	924.5	-9.8	28.0	20		0.197	0.468	0.289	913.
0 0	EQUIPMENT INSTAL PROV	22.40	0	930.8	-9.1	-18.1	2	X	0.	0.161	0.161	920.
0 0	TERM DISTR PANELS	14.80	0	954.3	4.9	0.7	2	X	0.213	0.109	0.109	954.
0 0	BATTERY	28.00	0	854.7	-25.7	26.3	2	X	0.083	0.057	0.075	851.
0 0	BATTERY	28.00	0	854.7	-50.4	37.1	2	X	0.083	0.057	0.075	851.
0 0	BATTERY	28.00	0	854.7	-21.6	54.7	2	X	0.074	0.086	0.037	851.
0 0	BATTERY MOUNT	15.00	0	851.9	-27.6	56.1	1	X	0.388	0.325	0.325	841.
0 0	BATTERY MOUNT	15.00	0	851.9	-24.2	31.3	1	X	0.388	0.325	0.325	841.
1 0	BATTERY MOUNT	15.00	0	851.9	-47.4	40.8	1	X	0.388	0.325	0.325	841.
	ELECTRICAL POWER EQUIPMENT TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	238.90		888.0	-18.8	23.8			97.1 29.1	138.7 -35.6	117.2 -14.3	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	ELECTRICAL POWER CONTINUED											
	ELECTRICAL WIRING AND CONNECTORS											
0 0	WIRE AND CONNECTORS	20.00	0	954.0	-23.9	18.2	2	X	0.006	2.191	2.191	915.
0 0	WIRE AND CONNECTORS	15.00	0	914.0	-25.7	33.2	2	X	0.863	0.433	0.433	913.
0 0	WIRE AND CONN	20.00	0	936.5	-6.8	27.2	2	X	0.024	4.615	4.593	880.
0 0	WIRE AND CONN	15.00	0	879.5	-17.5	70.0	2	X	0.005	1.364	1.361	844.
0 0	WIRE AND CONN	10.00	0	837.0	0.	0.	1	X	5.289	2.644	2.644	836.
0 0	WIRE AND CONN	20.00	0	931.0	21.0	-11.6	2	X	0.006	5.532	5.532	869.
0 0	WIRE AND CONN	25.00	0	917.5	6.6	-26.4	2	X	0.033	10.278	10.253	842.
0 0	WIRE AND CONN	2.00	0	843.4	10.8	-43.5	2	X	0.063	0.058	0.005	843.
0 0	WIRE AND CONN	30.50	0	995.5	-14.4	18.9	2	X	4.563	2.848	1.725	994.
0 0	WIRE AND CONN	31.70	0	954.0	-20.3	10.8	2	X	0.010	3.473	3.473	914.
0 0	WIRE AND CONN	15.00	0	995.5	18.4	-41.7	2	X	0.743	0.677	0.071	994.
0 0	WIRE AND CONN	20.00	0	995.0	-14.4	18.9	2	X	0.288	0.288	0.288	985.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
1 0	WIRE AND CONN	85.30	0	909.6	0.8	-1.3	0	X	0.	0.	0.	890.
	ELECTRICAL WIRING AND CONNECTORS TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	309.50		934.9	-5.4	6.6			60.8 -7.4	175.9 -2.4	149.6 -16.2	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	ELECTRICAL POWER CONTINUED											
	AUTOMATED SEQUENCE CONTROL											
0 0	SEQ CONT BATTERIES	5.60	0	991.0	-25.7	33.2	2	X	0.005	0.003	0.003	990.
0 0	SEQ CONTROLLER	6.80	0	990.7	-20.5	40.7	2	X	0.023	0.024	0.005	988.
0 0	SEQ CONTROLLER	6.80	0	990.7	-35.1	29.1	2	X	0.023	0.005	0.024	988.
3 0	PYROTECHNIC INITIATION	1.80	0	1009.7	12.0	-16.0	1	X	1.520	0.760	0.760	1008.
	AUTOMATED SEQUENCE CONTROL TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	21.00		992.4	-23.8	30.1			3.3 0.3	1.9 -0.3	1.6 -0.6	
	* SECOND LEVEL TOTAL	569.40		917.3	-11.7	14.7			176.7 35.9	417.0 -56.4	365.1 -38.7	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	SERVICE PROPULSION											
0 0	OXIDIZER TANK 2 SUMP	274.50	0	909.2	48.3	6.6	21		34.750	149.380	149.380	832.
0 0	OXIDIZER TANK 5 STORAGE	274.50	0	909.2	-48.3	-6.6	21		34.750	149.380	149.380	832.
0 0	TANK SUPT UPPER - OXID 2	13.60	0	986.7	48.3	6.6	20		1.909	1.017	1.017	977.
0 0	SKIRT LOWER - OXIDIZER 2	17.90	0	846.0	48.3	6.6	20		2.512	1.302	1.302	841.
0 0	TANK SUPT UPPER - OXID 5	13.60	0	986.7	-48.3	-6.6	20		1.909	1.017	1.017	977.
0 0	SKIRT LOWER - OXIDIZER 5	17.90	0	846.0	-48.3	-6.6	20		2.512	1.302	1.302	841.
0 0	FUEL TANK 6 SUMP	224.00	0	908.3	-14.8	-47.8	21		21.950	122.450	122.450	832.
0 0	FUEL TANK 3 STORAGE	224.00	0	908.3	14.8	47.8	21		22.440	122.450	122.450	832.
0 0	TANK SUPT UPPER - FUEL 6	6.60	0	986.0	-14.8	-47.8	20		0.721	0.378	0.378	981.
0 0	SKIRT LOWER - FUEL 6	10.90	0	846.4	-14.8	-47.8	20		1.191	0.617	0.617	841.
0 0	TANK SUPT UPPER - FUEL 3	6.60	0	986.0	14.8	47.9	20		0.721	0.378	0.378	981.
0 0	SKIRT LOWER - FUEL 3	10.90	0	846.4	14.8	47.9	20		1.191	0.617	0.617	841.
0 0	PLUMBING FITTINGS INSUL	84.00	0	840.0	0.	0.	21		30.290	11.980	18.700	826.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	VALVES - PROPELLANT	5.00	0	828.0	35.0	33.0	20		0.019	0.014	0.011	824.
0 0	SUPPORTS-PLUMBING+EQUIP	46.40	0	880.0	0.	0.	21		18.360	9.570	9.570	870.
0 0	RETENTION RESERVOIRS	48.00	0	860.0	20.4	-17.4	21		18.610	10.000	12.610	835.
0 0	HELIUM TANK 1	392.00	0	967.5	0.	0.	21		23.350	23.350	23.350	947.
0 0	HELIUM TANK 2	392.00	0	924.5	0.	0.	21		23.350	23.350	23.350	904.
0 0	SUPPORTS HELIUM TANK 1	2.70	0	967.5	0.	0.	20		0.265	0.122	0.149	965.
0 0	SUPPORTS HELIUM TANK 2	2.70	0	924.5	0.	0.	20		0.265	0.122	0.149	922.
0 0	PLUMBING FITTINGS INSUL	39.10	0	869.9	-18.7	13.4	21		14.860	21.500	21.500	800.
0 0	VALVES REG HEAT EXCHGRS	52.10	0	890.0	-20.0	5.0	21		40.520	29.980	29.980	830.
0 0	SUPPORTS PLUMB + EQUIP	10.90	0	890.0	-50.0	30.0	21		8.480	6.270	6.270	830.
0 0	ENGINE AND NOZZLE EXTN	780.30	0	829.7	0.1	0.3	21		66.100	242.000	241.100	721.
3 0	ENGINE DRAIN	8.00	0	828.0	-4.0	-39.0	20		1.804	1.104	0.728	823.
	SERVICE PROPULSION TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	2958.20		893.2	-0.4	0.1			977.6 -5.3	2654.3 1.8	2757.4 107.0	
	* SECOND LEVEL TOTAL	2958.20		893.2	-0.4	0.1			977.6 -5.3	2654.3 1.8	2757.4 107.0	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	REACTION CONTROL											
0 0	TANKS EXPULSION 2	15.75	0	958.0	64.0	-24.0	20		0.141	1.233	1.233	928.
0 0	TANK SUPPORTS	2.00	0	958.0	64.0	-24.0	20		0.026	0.270	0.270	928.
0 0	PLUMBING FITTINGS INSUL	3.00	0	948.0	70.0	-16.0	20		0.026	0.355	0.355	928.
0 0	VALVES	7.10	0	948.0	75.0	-12.0	20		0.024	0.130	0.130	928.
0 0	QUANTITY GAGING	8.40	0	969.0	18.0	-7.0	20		0.067	0.658	0.658	939.
0 0	HELIUM TANK	5.20	0	961.0	68.0	-24.0	20		0.022	0.022	0.022	956.
0 0	PLUMBING FITTINGS INSUL	1.80	0	961.0	71.0	-15.0	20		0.019	0.035	0.035	950.
0 0	VALVES AND REGULATORS	12.20	0	961.0	75.0	-15.0	20		0.083	0.274	0.274	951.
0 0	SENSORS	1.75	0	961.0	75.0	-15.0	20		0.010	0.021	0.021	950.
0 0	PLUMBING-EQUIPMENT SUPTS	3.35	0	961.0	75.0	-15.0	20		0.013	0.027	0.027	950.
0 0	ENGINES RCS 4	20.20	0	959.0	82.0	-11.0	20		0.574	0.895	0.735	940.
0 0	ENGINE MOUNTS	3.50	0	959.0	82.0	-11.0	20		0.029	0.045	0.037	940.
0 0	ENGINE VALVE HEATERS	1.50	0	959.0	82.0	-11.0	20		0.001	0.001	0.001	958.

AERM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	TANKS EXPULSION 2	15.75	0	960.0	-7.0	68.0	20		0.141	1.233	1.233	928.
0 0	TANK SUPPORTS	2.00	0	960.0	-7.0	68.0	20		0.026	0.270	0.270	928.
0 0	PLUMBING FITTINGS INSUL	3.00	0	970.0	4.0	74.0	20		0.026	0.355	0.355	945.
0 0	VALVES	7.10	0	970.0	2.0	74.0	20		0.024	0.130	0.130	953.
0 0	QUANTITY GAGING	8.40	0	969.0	18.0	-7.0	20		0.067	0.658	0.658	939.
0 0	HELIUM TANK	5.20	0	957.0	-7.0	71.0	20		0.022	0.022	0.022	952.
0 0	PLUMBING FITTINGS INSUL	1.80	0	961.0	0.	74.0	20		0.019	0.035	0.035	950.
0 0	VALVES AND REGULATORS	12.20	0	961.0	0.	74.0	20		0.083	0.274	0.274	951.
0 0	SENSORS	1.75	0	961.0	0.	74.0	20		0.010	0.021	0.021	950.
0 0	PLUMBING-EQUIPMENT SUPTS	3.35	0	961.0	0.	75.0	20		0.013	0.027	0.027	950.
0 0	ENGINES RCS 4	20.20	0	959.0	11.0	82.0	20		0.574	0.735	0.895	940.
0 0	ENGINE MOUNTS	3.50	0	959.0	11.0	82.0	20		0.029	0.037	0.045	940.
0 0	ENGINE VALVE HEATERS	1.50	0	959.0	11.0	82.0	20		0.001	0.001	0.001	958.
0 0	TANKS EXPULSION 2	15.75	0	958.0	-64.0	24.0	20		0.141	1.233	1.233	928.
0 0	TANK SUPPORTS	2.00	0	958.0	-64.0	24.0	20		0.026	0.270	0.270	928.
0 0	PLUMBING FITTINGS INSUL	3.00	0	948.0	-70.0	16.0	20		0.026	0.355	0.355	928.
0 0	VALVES	7.10	0	948.0	-75.0	12.0	20		0.024	0.130	0.130	928.
0 0	QUANTITY GAGING	8.40	0	969.0	18.0	-7.0	20		0.067	0.658	0.658	939.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	HELIUM TANK	5.20	0	961.0	-68.0	24.0	20		0.022	0.022	0.022	956.
0 0	PLUMBING FITTINGS INSUL	1.80	0	961.0	-71.0	15.0	20		0.019	0.035	0.035	950.
0 0	VALVES AND REGULATORS	12.20	0	961.0	-75.0	15.0	20		0.083	0.274	0.274	951.
0 0	SENSORS	1.75	0	961.0	-75.0	15.0	20		0.010	0.021	0.021	950.
0 0	PLUMBING-EQUIPMENT SUPTS	3.35	0	961.0	-75.0	15.0	20		0.013	0.027	0.027	950.
0 0	ENGINES RCS 4	20.20	0	959.0	-82.0	11.0	20		0.574	0.895	0.735	940.
0 0	ENGINE MOUNTS	3.50	0	959.0	-82.0	11.0	20		0.029	0.045	0.037	940.
0 0	ENGINE VALVE HEATERS	1.50	0	959.0	-82.0	11.0	20		0.001	0.001	0.001	958.
0 0	TANKS EXPULSION 2	15.75	0	960.0	7.0	-68.0	20		0.141	1.233	1.233	928.
0 0	TANK SUPPORTS	2.00	0	960.0	7.0	-68.0	20		0.026	0.270	0.270	928.
0 0	PLUMBING FITTINGS INSUL	3.00	0	970.0	-4.0	-74.0	20		0.026	0.355	0.355	945.
0 0	VALVES	7.10	0	970.0	-2.0	-74.0	20		0.024	0.130	0.130	953.
0 0	QUANTITY GAGING	8.40	0	969.0	18.0	-7.0	20		0.067	0.658	0.658	939.
0 0	HELIUM TANK	5.20	0	957.0	7.0	-71.0	20		0.022	0.022	0.022	952.
0 0	PLUMBING FITTINGS INSUL	1.80	0	961.0	0.	-74.0	20		0.019	0.035	0.035	950.
0 0	VALVES AND REGULATORS	12.20	0	961.0	0.	-74.0	20		0.083	0.274	0.274	951.
0 0	SENSORS	1.75	0	961.0	0.	-74.0	20		0.010	0.021	0.021	950.
0 0	PLUMBING-EQUIPMENT SUPTS	3.35	0	961.0	0.	-75.0	20		0.013	0.027	0.027	950.

AERM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	ENGINES RCS 4	20.20	0	959.0	-11.0	-82.0	20		0.574	0.735	0.895	940.
0 0	ENGINE MOUNTS	3.50	0	959.0	-11.0	-82.0	20		0.029	0.037	0.045	870.
3 0	ENGINE VALVE HEATERS	1.50	0	959.0	-11.0	-82.0	20		0.001	0.001	0.001	958.
	REACTION CONTROL TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	343.00		960.4	1.8	-0.7			391.6 1.1	216.4 -0.4	205.6 -33.6	
	* SECOND LEVEL TOTAL	343.00		960.4	1.8	-0.7			391.6 1.1	216.4 -0.4	205.6 -33.6	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	FLUID RESIDUALS											
0 0	RCS RESIDUAL PROPELLANT	11.25	0	958.0	64.0	-24.0	23	X	0.	0.	0.	928.
0 0	RCS RESIDUAL PROPELLANT	11.25	0	960.0	-7.0	68.0	23	X	0.	0.	0.	928.
0 0	RCS RESIDUAL PROPELLANT	11.25	0	958.0	-64.0	24.0	23	X	0.	0.	0.	928.
0 0	RCS RESIDUAL PROPELLANT	11.25	0	960.0	7.0	-68.0	23	X	0.	0.	0.	928.
0 0	HELIUM RCS	0.75	0	961.0	68.0	-24.0	23	X	0.	0.	0.	956.
0 0	HELIUM RCS	0.75	0	957.0	7.0	-71.0	23	X	0.	0.	0.	952.
0 0	HELIUM RCS	0.75	0	961.0	-68.0	24.0	23	X	0.	0.	0.	956.
0 0	HELIUM RCS	0.75	0	957.0	-7.0	71.0	23	X	0.	0.	0.	952.
0 0	HELIUM SPS	49.50	0	967.5	0.	0.	23	X	0.	0.	0.	947.
0 0	HELIUM SPS	49.50	0	924.5	0.	0.	23	X	0.	0.	0.	904.
0 0	ENGINE LINES SPS	68.60	0	845.0	-5.2	-2.3	20		3.627	3.720	2.733	830.
0 0	SYSTEM LINES SPS	52.70	0	831.0	0.	0.	21		21.330	7.770	13.750	826.
0 0	FUEL VAPOR	5.00	3	915.4	-14.8	-47.8	23	X	0.	0.	0.	832.

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	OXIDIZER VAPOR	72.00	3	914.7	48.3	6.6	23	X	0.	0.	0.	832.
0 0	FUEL 6 RESIDUAL SPS	93.00	0	835.9	-14.8	-47.8	24	X	0.	0.844	0.844	832.
4 0	OXIDIZER 2 RESIDUAL SPS	186.50	0	836.1	48.3	6.6	24	X	0.	2.092	2.092	832.
	FLUID RESIDUALS TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	624.80		873.2	11.6	-5.4			237.5 -58.8	431.9 26.9	501.4 25.2	
	* SECOND LEVEL TOTAL	624.80		873.2	11.6	-5.4			237.5 -58.8	431.9 26.9	501.4 25.2	
	* THIRD LEVEL TOTAL	7339.00		906.4	-0.2	0.4			4385.1 -74.2	7812.4 -20.8	7896.0 -6.0	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
	USEABLE FLUIDS											
0 0	PROPELLANT RCS	197.50	0	958.0	64.0	-24.0	20		0.	15.450	15.450	928.
0 0	PROPELLANT RCS	197.50	0	960.0	-7.0	68.0	20		0.	15.450	15.450	928.
0 0	PROPELLANT RCS	197.50	0	958.0	-64.0	24.0	20		0.	15.450	15.450	928.
0 0	PROPELLANT RCS	197.50	0	960.0	7.0	-68.0	20		0.	15.450	15.450	928.
0 0	FUEL RESTART LOSSES	8.00	0	835.9	-14.8	-47.8	24	X	0.	0.073	0.073	832.
5 0	OXIDIZER RESTART LOSSES	16.20	0	836.1	48.3	6.6	24	X	0.	0.182	0.182	832.
	USABLE FLUIDS TOTAL WEIGHT											
	* FIRST LEVEL TOTAL	814.20		955.3	0.8	-0.3			809.2 -17.1	586.3 7.1	500.7 -169.2	
	* SECOND LEVEL TOTAL	814.20		955.3	0.8	-0.3			809.2 -17.1	586.3 7.1	500.7 -169.2	
	* THIRD LEVEL TOTAL	8153.20		911.3	-0.1	0.3			5194.6 -83.4	8777.9 -19.2	8776.0 -175.3	

AFRM 009 SERVICE MODULE WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
SPS BALLAST												
0 0	SPS BALLAST	751.80	0	839.6	27.3	-11.5	21		250.300	132.400	169.200	0.
5 0		0.	0	0.	0.	0.	21		1.700	1.500	186.600	0.
TOTAL SPS BALLAST												
	* FIRST LEVEL TOTAL	751.80		839.6	27.3	-11.5			250.3 1.7	132.4 1.5	169.2 186.6	
	* SECOND LEVEL TOTAL	751.80		839.6	27.3	-11.5			250.3 1.7	132.4 1.5	169.2 186.6	
	* THIRD LEVEL TOTAL	8905.00		905.2	2.2	-0.7			5577.1 -373.5	9694.3 108.0	9820.0 -36.7	

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ADAPTER 009

WEIGHT STATUS

ITEM	PREVIOUS STATUS 5-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT ADP 009 STATUS		
				%EST	%CALC	%ACT
Structure (Includes Stabilizing Members)	3163.7	+109.6	3273.3*	2	13	85
Electrical	61.0	-1.5	59.5	6	94	
Separation System	255.3	+36.9	292.2	15	85	
Growth or Ballast	120.0	-120.0	0.0			
TOTAL ADAPTER	3600.0	+25.0	3625.0	3	20	77

*Includes 139.2 pounds for the telemetry modification kit wiring and instrumentation installation.

SC 009 ADAPTER WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	PLATFORM HARD POINTS	19.40	0	663.0	4.1	0.5	21		43.720	24.270	32.790	0.
0 0	HOLDER ASSY-INTRCN BOOST	1.30	0	740.3	0.	0.	21		2.430	3.330	3.330	0.
0 0	LEM SUPPORT	23.80	0	585.7	0.	0.	21		69.070	34.560	34.560	0.
0 0	SITE INSTL-SLA SEP SYS	22.30	0	672.5	1.9	1.3	21		51.450	60.310	59.810	0.
0 0	SITE INST-SLA-S/M UMBSEP	3.20	0	797.8	0.7	-74.7	21		0.620	1.150	1.590	0.
0 0	ADAPTER ASSY COMPLETE	74.20	0	583.9	0.	1.0	21		2.990	127.580	1.610	0.
0 0	COVER ASSY LEM ATTACH	11.00	0	585.8	0.	0.	21		32.920	16.510	16.510	0.
0 0	ADAPTER ASSY-AFT SECTION	71.50	0	569.9	0.	0.	21		216.060	119.210	119.210	0.
0 0	QUARTER PANEL-AFT SECT	489.00	0	539.2	0.	0.	21		1615.800	1425.300	365.200	0.
0 0	QUARTER PANEL-AFT SECT	487.50	0	539.2	0.	0.	21		1610.400	364.300	1420.900	0.
0 0	BRKT ASSY-REEL + PULLEY	3.80	0	515.7	0.	0.	21		12.860	6.490	6.490	0.
0 0	STABILIZING DEVICE ASSY	33.40	0	585.2	0.	0.	21		79.190	31.410	47.830	0.
0 0	TRUSS ASSY	43.20	0	584.1	0.	0.	21		47.830	24.110	24.110	0.
0 0	ADAPTER ASSY-FWD SECTION	94.90	0	707.0	0.2	0.6	21		195.080	211.200	208.580	0.
0 0	QUARTER PANEL NO.1 FWD	435.70	0	701.4	0.3	-88.0	21		179.920	593.960	734.370	0.

SC 009 ADAPTER WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	QUARTER PANEL NO.2 FWD	419.00	0	703.4	87.5	1.1	21		180.060	715.670	570.960	0.
0 0	QUARTER PANEL NO.3 FWD	439.50	0	699.0	0.	88.4	21		181.350	587.940	729.660	0.
0 0	QUARTER PANEL NO.4 FWD	428.00	0	703.6	-87.1	0.2	21		187.320	718.360	567.300	0.
0 0	DOOR ASSY-S/M ACCESS	3.00	0	826.3	-23.4	-74.5	21		0.010	0.010	0.020	0.
0 0	DOOR ASSY-S/M ACCESS	3.00	0	826.3	77.7	10.5	21		0.010	0.020	0.010	0.
0 0	COVER-THRUSTER ATT.	10.40	0	585.8	0.	0.	21		31.040	15.580	15.570	0.
0 0	DOOR-LEM ENTRANCE	25.30	0	634.5	0.	0.	21		64.840	65.000	1.260	0.
0 0	SYSTEMS SUPPORT INSTL	11.60	0	642.4	47.9	-72.2	21		16.060	40.590	38.940	0.
0 0	PLATE ASSY-FLY-AWAY UMB	2.80	0	607.2	88.8	-66.9	21		0.	0.010	0.010	0.
0 0	MECH INSTL-SLA SEP SYS	43.80	0	655.9	0.3	3.3	21		105.260	150.080	150.210	0.
0 0	MECH INS-SLA-S/M UMB SEP	3.20	0	831.0	23.0	-64.0	21		0.010	0.	0.	0.
0 0	HOLDER ASSY FWD CIR JOIN	3.70	0	837.0	0.	0.	21		4.770	0.950	3.820	0.
0 0	HOLDER ASSY FWD CIR JOIN	3.70	0	837.0	0.	0.	21		4.770	3.820	0.950	0.
0 0	HOLDER ASSY AFT CIR JOIN	6.40	0	583.9	0.	0.	21		19.240	9.620	9.620	0.
0 0	HOLDER ASSY AFT CIR JOIN	6.40	0	583.9	0.	0.	21		19.240	9.620	9.620	0.
0 0	HOLDER ASSY FWD IN LONG	3.90	0	775.7	0.	60.2	21		3.090	1.220	4.280	0.
0 0	HOLDER ASSY AFT IN LONG	3.40	0	649.0	0.	74.3	21		4.080	1.120	5.180	0.
0 0	HOLDER ASSY FWD IN LONG	2.20	0	771.3	60.7	-60.7	21		0.020	0.760	0.760	0.

SC 009 ADAPTER WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	HOLDER ASSY FWD IN LONG	2.20	0	771.3	-60.7	-60.7	21		0.020	0.760	0.760	0.
0 0	HOLDER ASSY AFT IN LONG	1.80	0	655.9	73.8	-73.8	21		0.010	0.630	0.630	0.
0 0	HOLDER ASSY AFT IN LONG	1.80	0	655.9	-73.8	-73.8	21		0.010	0.630	0.630	0.
0 0	HOLDER ASSY FWD OUT LONG	8.00	0	775.6	0.	0.	21		13.080	8.990	8.990	0.
0 0	HOLDER ASSY AFT OUT LONG	6.70	0	649.2	0.	0.	21		16.540	10.460	10.460	0.
0 0	DEFLECTOR, FWD IN LONG	17.00	0	773.0	0.	0.	21		27.280	18.270	18.270	0.
0 0	DEFLECTOR, AFT IN LONG	15.70	0	645.7	0.	0.	21		38.370	23.390	23.390	0.
0 0	DEFLECTOR, FWD CIR JOINT	4.90	0	836.9	0.	0.	21		6.130	5.090	1.050	0.
0 0	DEFLECTOR, FWD CIR JOINT	5.00	0	836.9	0.	0.	21		6.260	1.070	5.190	0.
0 0	THRUSTER ASSY PNL DEPLOY	11.40	0	584.9	0.	0.	21		33.400	16.710	16.710	0.
0 0	REEL ASSY, PANEL DEPLOY	32.80	0	530.6	0.	0.	21		103.140	55.430	55.430	0.
0 0	ATTENUATOR ASSY	11.00	0	575.5	0.	0.	21		32.890	16.600	16.600	0.
0 0	HARNESS ASSY-SM-IU A15W1	10.70	0	655.1	44.5	-88.7	21		3.310	23.240	23.900	0.
0 0	HARNESS ASSY-SM-IU A15W2	36.50	0	643.4	28.3	-99.3	21		8.550	68.470	72.590	0.
0 0	HARNESS ASSY-SM-IU A15W3	7.10	0	661.1	42.3	-85.8	21		2.850	17.160	16.090	0.
0 0	HARNESS INSTL	5.20	0	662.7	21.8	-50.1	21		8.530	15.750	14.900	0.
0 0	S/M-SLA ATTACH	7.50	0	838.0	0.	0.	21		9.400	4.700	4.700	0.
0 0	INSULATION-STA 838	1.80	0	836.7	0.	0.	21		2.290	1.150	1.150	0.

SC 009 ADAPTER WEIGHT CG AND INERTIA STATUS - 1 JULY 1965

OP CODE	DESCRIPTION	WEIGHT	S M	CENTER OF GRAVITY X	Y	Z	SH FA	A X	MOMENTS OF INERTIA X	Y	Z	BEG X STA
0 0	CORK INSULATION	20.95	3	584.0	105.5	0.	14	X	10.690	10.406	0.586	0.
0 0	CORK INSULATION	20.95	3	584.0	0.	105.5	14	X	10.690	0.586	10.406	0.
0 0	PAINT	11.65	3	656.2	95.6	0.	14	X	7.394	30.739	23.950	0.
0 0	PAINT	11.65	3	656.2	0.	95.6	14	X	7.394	23.950	30.739	0.
2 0	MODIFICATION KIT	139.20	0	652.7	19.6	-36.0	21		279.200	390.700	354.600	0.
TOTAL SC 009 ADAPTER												
	* FIRST LEVEL TOTAL	3625.00		641.9	1.5	-3.0			8848.5 10.5	12306.4 -49.0	11881.7 -62.8	
	* SECOND LEVEL TOTAL	3625.00		641.9	1.5	-3.0			8848.5 10.5	12306.4 -49.0	11881.7 -62.8	

[redacted]

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CSM 009

LAUNCH ESCAPE VEHICLE

VEHICLE MODE	WEIGHT	CENTER OF GRAVITY*			MOMENT OF INERTIA**			PRODUCT OF INERTIA**		
		X	Y	Z	I_{xx}	I_{yy}	I_{zz}	I_{xy}	I_{xz}	I_{yz}
COMMAND MODULE	11295	1039.7	0.4	5.5	5580.7	4930.1	4358.0	-20.1	-327.6	-10.4
LAUNCH ESCAPE SYSTEM	8320	1299.8	0.0	-0.4	603.5	22723.2	22718.6	20.7	207.8	0.2
TOTAL - ABORT INITIAL	19615	1150.0	0.2	3.0	6220.9	97647.5	97035.5	-107.0	-1706.7	-7.8
LESS: MAIN AND PITCH MOTOR PROPELLANTS	-3177	1295.2	0.0	0.0	71.4	1277.9	1277.8	0.0	0.0	0.0
TOTAL LEV AT BURNOUT	16438	1122.0	0.3	3.6	6142.1	79116.7	78512.2	-79.6	-1350.5	-8.3

*Centers of gravity are in the NASA reference system except that the longitudinal axis has an origin 1000 inches below the tangency point of the Command Module substructure mold line.

**Moments and products of inertia units are slug feet squared about the center of gravity.

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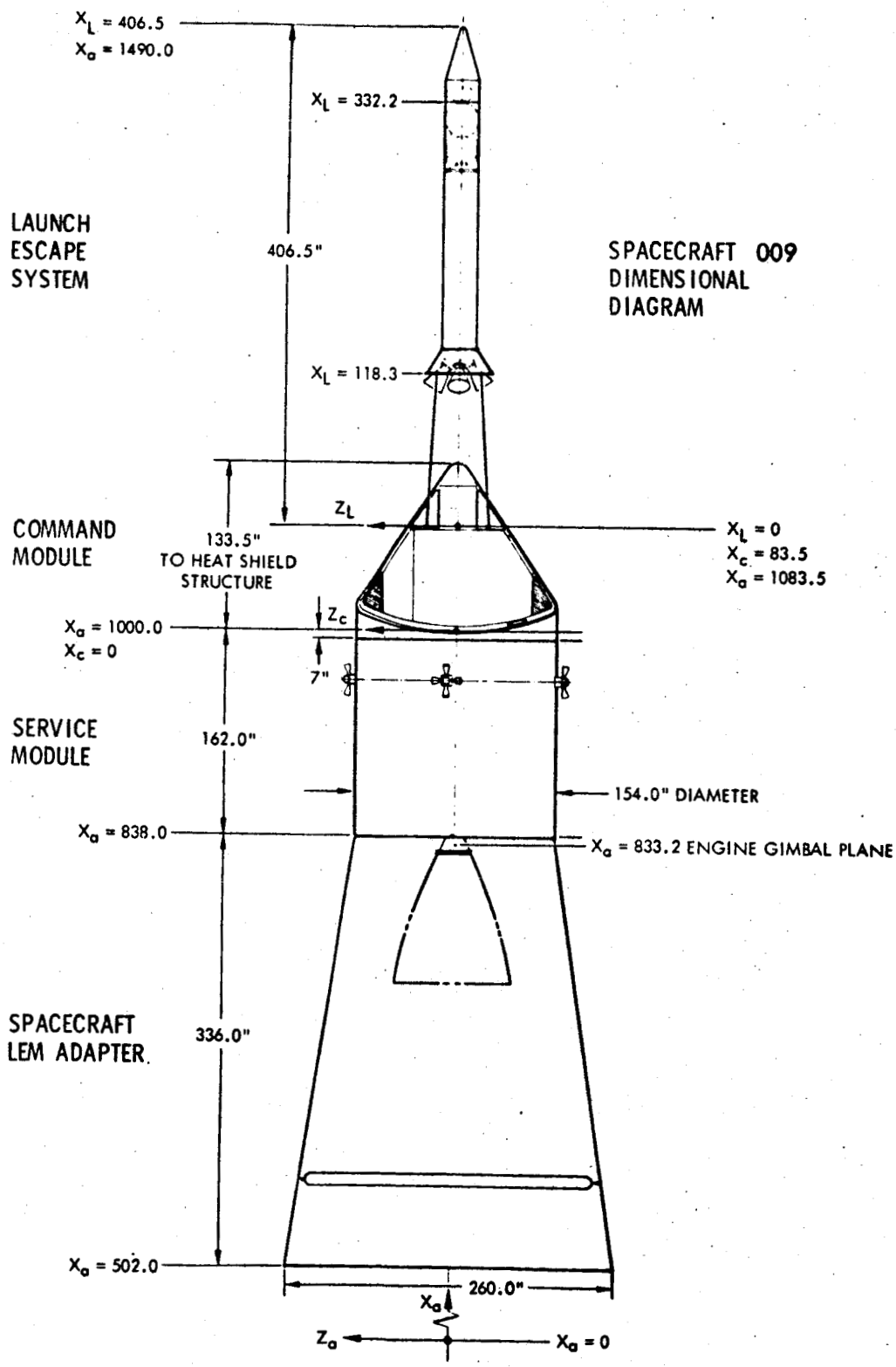
CSM 009

CM LOW ALTITUDE ABORT CONFIGURATION

VEHICLE MODE	WEIGHT	CENTER OF GRAVITY*			MOMENT OF INERTIA**			PRODUCT OF INERTIA**		
		X	Y	Z	I_{xx}	I_{yy}	I_{zz}	I_{xy}	I_{xz}	I_{yz}
COMMAND MODULE	11295	1039.7	0.4	5.5	5580.7	4930.1	4358.0	-20.1	-327.6	-10.4
LESS: RCS OXIDIZER	-180	1022.6	14.5	62.6						
FORWARD HEAT SHIELD	-395	1100.5	-0.4	1.3						
DROGUE CHUTES	-58	1089.1	0.0	-21.1						
COMMAND MODULE - PRIOR TO MAIN CHUTE DEPLOYMENT	10662	1037.5	0.2	4.8	5361.0	4369.4	3920.7	-7.4	-254.8	-41.0
LESS: RCS FUEL	-90	1022.6	-45.8	45.8						
MAIN CHUTES (3)	-409	1090.5	-0.8	6.4						
COMMAND MODULE - IMPACT	10163	1035.5	0.6	4.4	5234.8	4052.9	3579.7	-14.1	-252.1	-4.9

*Centers of gravity are in the NASA reference system except that the longitudinal axis has an origin 1000 inches below the tangency point of the Command Module substructure mold line.

**Moments and products of inertia units are slug feet squared about the center of gravity. Mass inertia data are shown for accumulative totals only.


X_L = 406.5
X_a = 1490.0
X_L = 332.2
LAUNCH ESCAPE SYSTEM
406.5"
SPACECRAFT 009 DIMENSIONAL DIAGRAM
X_L = 118.3
Z_L
COMMAND MODULE
133.5" TO HEAT SHIELD STRUCTURE
X_L = 0
X_c = 83.5
X_a = 1083.5
Z_c
X_a = 1000.0
X_c = 0
7"
SERVICE MODULE
162.0"
154.0" DIAMETER
X_a = 838.0
X_a = 833.2 ENGINE GIMBAL PLANE
SPACECRAFT LEM ADAPTER
336.0"
X_a = 502.0
260.0"
X_a
Z_a
X_a = 0

LAUNCH ESCAPE SYSTEM

CURRENT WEIGHT CHANGES

Decrease bolt installation separation system, tower to CM based on calculated in lieu of estimated.	-1.0
Increase tower assembly based on revised drawings.	+1.0
Decrease tower structure based on incorporating revised structures drawings.	-1.8
Increase the boost protective cover based on a revised estimate to reflect the strengthening of the "soft" to "hard" cover joint.	+32.0
Decrease rocket motor based on receipt of vendor actual weight.	-38.1
Increase tower wiring based on calculated in lieu of estimated.	+3.2
Increase motor wire harness based on calculated in lieu of estimated and the receipt of additional drawings.	+16.5
Decrease ordnance installation canard thruster based on calculated in lieu of estimated.	-0.5
Increase ballast installation to maintain LEV burnout center of gravity requirement.	+107.3
Add miscellaneous for electrical installation complete.	+0.3
Add instrumentation installation based on receipt of new drawings.	+1.1
TOTAL LAUNCH ESCAPE SYSTEM CURRENT WEIGHT CHANGES	+120.0

COMMAND MODULE

CURRENT WEIGHT CHANGES

STRUCTURE	(-47.1)
Increase secondary structure - right hand equipment bay due to revised drawings.	+4.3
Increase secondary structure - left hand equipment bay due to revised drawings.	+1.2
Increase secondary structure - forward right hand equipment bay based on calculation of drawings changes adding brackets to support wire bundles.	+2.5
Increase secondary structure - forward left hand equipment bay based on calculation of drawing changes adding brackets to support wire bundles.	+5.4
Increase secondary structure - main display panel based on calculations of current drawing changes.	+2.5
Decrease secondary structure - lower equipment bay based on drawing calculations adding wiring supports and replacing rivets with screws and nutplates for ease of handling.	-2.4
Decrease secondary structure - forward compartment based on calculations of current drawing changes.	-0.5
Decrease secondary structure - aft compartment based on calculations of current drawing changes.	-3.8
Decrease insulation (forward, center, and aft) based on replacing "Q" felt with TG 15000 insulation and the deletion of insulation - aft on the +Z side.	-57.5
Decrease ablator - nose cone based on actual weight in lieu of calculated.	-8.5
Decrease ablator - forward section based on actual weight in lieu of calculated.	-3.4
Increase ablator - center section based on actual weight in lieu of calculated.	+61.7
Increase ablator - aft section based on revised calculations by vendor.	+9.0

COMMAND MODULE

CURRENT WEIGHT CHANGES

STRUCTURE (CONT.)	
Decrease aft heat shield buffer based on deletion of potting from the -Z side.	-71.2
Increase potting - air lock based on revised estimates of volume and density.	+10.0
Transfer manual controls from ECS.	+3.6
STABILIZATION AND CONTROL	(+8.9)
Decrease rate gyro package based on actual weight.	-0.2
Increase attitude gyro accelerometer package based on actual weight.	+0.2
Increase ECA pitch package based on actual weight.	+2.3
Increase ECA roll package based on actual weight.	+0.1
Increase ECA yaw package based on actual weight.	+2.7
Increase ECA auxillary package based on actual weight.	+0.5
Increase display ECA package based on actual weight.	+3.3
ENVIRONMENTAL CONTROL	(+2.6)
Decrease nitrogen purge system based on revised drawings.	-1.3
Transfer manual controls to structure.	-3.6
Increase post landing vent system based on revised estimate.	+7.5
EARTH RECOVERY	(-7.3)
Decrease the Earth Recovery based on Northrop-Ventura report, dated 28 April 1965.	-7.3

COMMAND MODULE

CURRENT WEIGHT CHANGES

ELECTRICAL POWER	(+167.8)
The wiring breakdown was completely revised to reflect and correspond to the wiring bundles and harness installations that have been actually weighed. The increase in the Electrical Power is based on actual wiring weights in lieu of the calculated.	+167.8
COMMUNICATIONS	(-0.1)
Decrease the Communications based on vendor actual weights in lieu of calculated.	-0.1
DISPLAYS AND CONTROLS	(+14.9)
Increase the Displays and Controls based on incorporating detail actual weights in lieu of calculated.	+14.9
ITEMS FOR AFRM 009	(+59.9)
Increase attitude reference system based on incorporating actual weight.	+2.4
Decrease the power programmer based on revised calculations.	-3.4
Add the camera installation and associated items.	+42.5
Add lithium hydroxide cartridges based on receipt of new drawings which add the requirement.	+18.4
PLATFORM	(+0.3)
Increase the platform based on revised drawings and adjusting the ballast installation.	+0,3
SIMULATED SYSTEMS - BALLAST	(-106.0)
Decrease the crew compartment ballast consistent with maintaining minimum weight and center of gravity requirements.	-106.0

COMMAND MODULE

CURRENT WEIGHT CHANGES

AFT HEAT SHIELD BALLAST	(+201.4)
Increase the aft heat shield ballast to reflect a permanent ballast arrangement and maintain center of gravity requirements.	+201.4
TOTAL CM CURRENT WEIGHT CHANGES	+295.3

SERVICE MODULE

CURRENT WEIGHT CHANGES

STRUCTURE	(-20.1)
Decrease radial beams based on actual weight in lieu of calculated.	-13.1
Decrease internal partitions based on incorporating revised drawings.	-2.0
Decrease aft bulkhead based on actual weight in lieu of calculated.	-11.4
Increase SPS engine boot and SPS-RCS supports based on incorporating revised drawings.	+6.4
INSTRUMENTATION	(+55.8)
Increase the instrumentation wiring and installation provisions associated with the telemetry modification kit.	+55.8
SERVICE PROPULSION	(+50.7)
Increase the SPS engine and extention based on receipt of actual weight in lieu of calculated.	+50.7
FLUID RESIDUALS	(-24.4)
Transfer start and restart losses to usable fluids section.	-24.2
Miscellaneous changes.	-0.2
USABLE FLUIDS	(+24.2)
Transfer start and restart losses from fluid residuals section.	+24.2
SPS PROPELLANT - BALLAST	(-381.2)
Decrease SPS propellant - ballast consistent with maintaining the total CSM design weight of 20,200 pounds.	-381.2
TOTAL SM CURRENT WEIGHT CHANGES	-295.0

ADAPTER

CURRENT WEIGHT CHANGES

Increase the Adapter weight due to the incorporation of the telemetry modification kit wiring and instrumentation installation.	+139
Delete growth or ballast.	-120
Incorporate miscellaneous drawing changes.	+6
TOTAL ADAPTER CURRENT WEIGHT CHANGES	+25