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MONTHLY WEIGHT AND BALANCE REPORT

FOR THE APOLLO SPACECRAFT

CONTRACT NAS 9-150

(U)

PARAGRAPH 8.10 EXHIBIT I

1 JULY 1965

Prepared By

WEIGHT & ELECTRICAL POWER CONTROL

[redacted]

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TECHNICAL REPORT INDEX/ABSTRACT

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Monthly Weight and Balance Report for the Apollo Spacecraft	
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DESCRIPTIVE TERMS

ABSTRACT

The Monthly Weight and Balance Report for the Apollo Spacecraft is filed in accordance with Paragraph 8.10 Exhibit I and is a summary type weight report. This report reflects the current weight of a standard manned Block II vehicle as defined in SID 64-1345, CSM Master End Item Specification, and describes the changes in weight from the previous report. This report also reflects the mission weight, centers of gravity, inertia summary and dimensional diagrams.

For Block II Mass Properties Design Data refer to SID 64-2142 dated 15 February 1965.

FORM 131-V REV. 6-64

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INTRODUCTION

The July report incorporates the changes to the Block II standard manned LOR mission vehicle subsequent to the June Report. The change descriptions are included in the Current Weight Status Section and reflect changes prior to June 4, 1965. The current Block II status is based on estimated data consistent with the CSM Master End Item Specification SID 64-1345. The Block I status previously included in this report will be issued in the Bi-monthly End Item Weight and Balance Reports for CSM 012 and 014.

The Block II Service Module weight has exceeded the control weight. A weight reduction program is being initiated to offset this growth trend.

The Mission Weight, Center of Gravity and Inertia Summary Section reflects a Block II LOR Spacecraft launch weight consistent with a booster payload in orbit of 95,000 pounds per SID 64-1344, CSM Technical Specification. The SPS propellant weight reported is the available propellant within the noted booster capability. The SPS propellant will be revised in subsequent reports to reflect specific mission requirements consistent with the NASA-MSC directive P55/L203-65-613 (6746MA) received after the cutoff date of this report.

The Command Module entry center of gravity data reflects an unballasted condition at an L/D of 0.43. The basis for expressing L/D in terms of X and Z C.G. is contained herein.

The LEM weight utilized is 32,000 pounds, excluding crew, per CCA 290.

The current Block II status reflects an 8.3 day LOR Mission. The major changes in the Block II are:

Command Module - Incorporation of potential change item ECS-5 modifying the suit heat exchanger per CCA 308 and revised structure weights based on current drawing calculations.

Service Module - Incorporation of potential change item STR-5 replacing thixotropic paste with foaming paste and an increase in RCS quad panel wiring.

Launch Escape System - Increase in wiring based on actual weight and an increase in ballast consistent with the Command Module LES balance requirements.

BLOCK II

APOLLO LOR MISSION

WEIGHT, CENTER OF GRAVITY AND INERTIA SUMMARY

1 JULY STATUS

ITEM	WEIGHT POUNDS	CENTER OF GRAVITY*			MOMENTS OF INERTIA (SLUG-FT.^{2})		
		X	Y	Z	ROLL (X)	PITCH (Y)	YAW (Z)
COMMAND MODULE	10486	1042.1	-0.3	7.0	4860	4388	4044
SERVICE MODULE - Less Usable Propellant	10365	913.4	-4.1	9.0	6590	11331	11193
SLA Attachment Ring**	75	837.1	0.0	-1.8	93	48	46
TOTAL - Less SPS Usable Propellant	20926	977.6	-2.2	8.0	11566	34729	34256
SPS AVAILABLE PROPELLANT - S/M***	38554	902.2	2.0	-0.8	20092	18584	25528
TOTAL - With Usable Propellant	59480	928.7	0.5	2.3	31933	70190	76487
LUNAR EXCURSION MODULE	32000	586.5	0.0	0.0	21400	23350	23450
SLA - Less SM Attaching Ring	3520	643.3	1.8	-1.5	8463	11700	11384
TOTAL - Injected	95000	802.9	0.4	1.4	61829	651362	657416
LAUNCH ESCAPE SYSTEM	8170	1297.7	-0.1	-0.2	575	21119	21119
TOTAL - SPACECRAFT LAUNCH	103170	842.1	0.4	1.2	62408	1070069	1076120

NOTES: *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.
**The 75 pound SLA attachment ring is retained by the CSM after separation from the Adapter.
***The 38,554 pounds of SPS propellant is the available propellant consistent with the payload capability of the SV Booster.

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BLOCK II

APOLLO LAUNCH ABORT CONFIGURATION

WEIGHT, CENTER OF GRAVITY AND INERTIA SUMMARY

1 JULY STATUS

ITEM	WEIGHT POUNDS	CENTER OF GRAVITY*			MOMENTS OF INERTIA (SLUG-FT.^{2})		
		X	Y	Z	ROLL (X)	PITCH (Y)	YAW (Z)
COMMAND MODULE	10486	1042.1	-0.3	7.0	4860	4388	4044
LAUNCH ESCAPE SYSTEM	8170	1297.7	-0.1	-0.2	575	21119	21119
TOTAL - Launch Abort	18656	1154.0	-0.2	3.8	5486	90313	89918
LESS - MAIN AND PITCH MOTOR PROPELLANTS	-3198	1294.3	0.0	0.0	-71	-1285	-1285
TOTAL - LES Burnout	15458	1125.0	-0.3	4.6	5403	72625	72242

NOTES: *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.

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BLOCK II

COMMAND MODULE

WEIGHT, CENTER OF GRAVITY AND INERTIA SUMMARY

LUNAR ORBIT RENDEZVOUS MISSION

1 JULY STATUS

VEHICLE MODE	WEIGHT POUNDS	CENTER OF GRAVITY*			MASS INERTIA DATA (SLUG-FT.^{2})					
		X	Y	Z	Ixx	Iyy	Izz	Ixy	Ixz	Iyz
COMMAND MODULE, LAUNCH	10486	1042.1	-0.3	7.0	4860	4388	4044	8	-304	31
Less: Boost & Mission Water	-8	1022.6	-63.4	-16.4						
Food	-48	1049.0	-38.6	25.8						
Docking	-150	1110.0	0.0	-2.5						
PLSS (1)	-53	1009.4	-0.2	-6.5						
Add: Waste-Fecal	14	1039.0	47.0	12.0						
CO_2 Absorbed (17 Cart.)	39	1016.6	-4.2	27.5						
Potable Water	30	1022.6	-63.4	-16.4						
Waste Water	56	1022.5	-21.1	61.8						
PRIOR TO ENTRY	10366	1041.0	-0.3	7.4	4908	4263	3907	21	-304	31
Less: Propellant	-135	1022.6	-5.6	57.0						
Ablator Burnoff	-365	1016.2	-0.4	15.7						
Entry Coolant	-6	1022.6	-63.4	-16.4						
Forward Heat Shield	-300	1090.0	0.0	1.0						
Drogue Chutes	-58	1089.1	0.0	-21.1						
PRIOR TO MAIN CHUTE DEPLOYMENT	9502	1040.4	-0.2	6.8	4475	3693	3407	15	-226	37
Less: Main Chutes (3)	-419	1090.4	-1.2	7.5						
Propellant	-135	1022.6	-5.6	57.0						
LANDING	8948	1038.3	-0.1	6.0	4322	3353	3098	17	-206	45

NOTE: Mass inertia data are shown for accumulative totals only.

*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.

BLOCK II

COMMAND MODULE

WEIGHT, CENTER OF GRAVITY AND INERTIA SUMMARY

LOW ALTITUDE ABORT CONDITION

1 JULY STATUS

VEHICLE MODE	WEIGHT POUNDS	CENTER OF GRAVITY*			MASS INERTIA DATA (SLUG-FT.^{2})					
		X	Y	Z	Ixx	Iyy	Izz	Ixy	Ixz	Iyz
COMMAND MODULE, LAUNCH	10486	1042.1	-0.3	7.0	4860	4388	4044	8	-304	31
Less: Oxidant	-180	1022.6	14.6	62.7						
Forward Heat Shield	-300	1090.0	0.0	1.0						
Docking Provisions	-150	1110.0	0.0	-2.5						
Drogue Chutes	-58	1089.1	0.0	-21.1						
PRIOR TO MAIN CHUTE DEPLOYMENT	9798	1039.7	-0.6	6.5	4647	3860	3636	16	-209	-
Less: Main Chutes (3)	-419	1090.4	-1.2	7.5						
Fuel	-90	1022.6	-45.8	45.8						
LANDING	9289	1037.6	-0.1	6.0	4524	3561	3308	6	-203	34

NOTE: Mass inertia data are shown for accumulative totals only.

*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.

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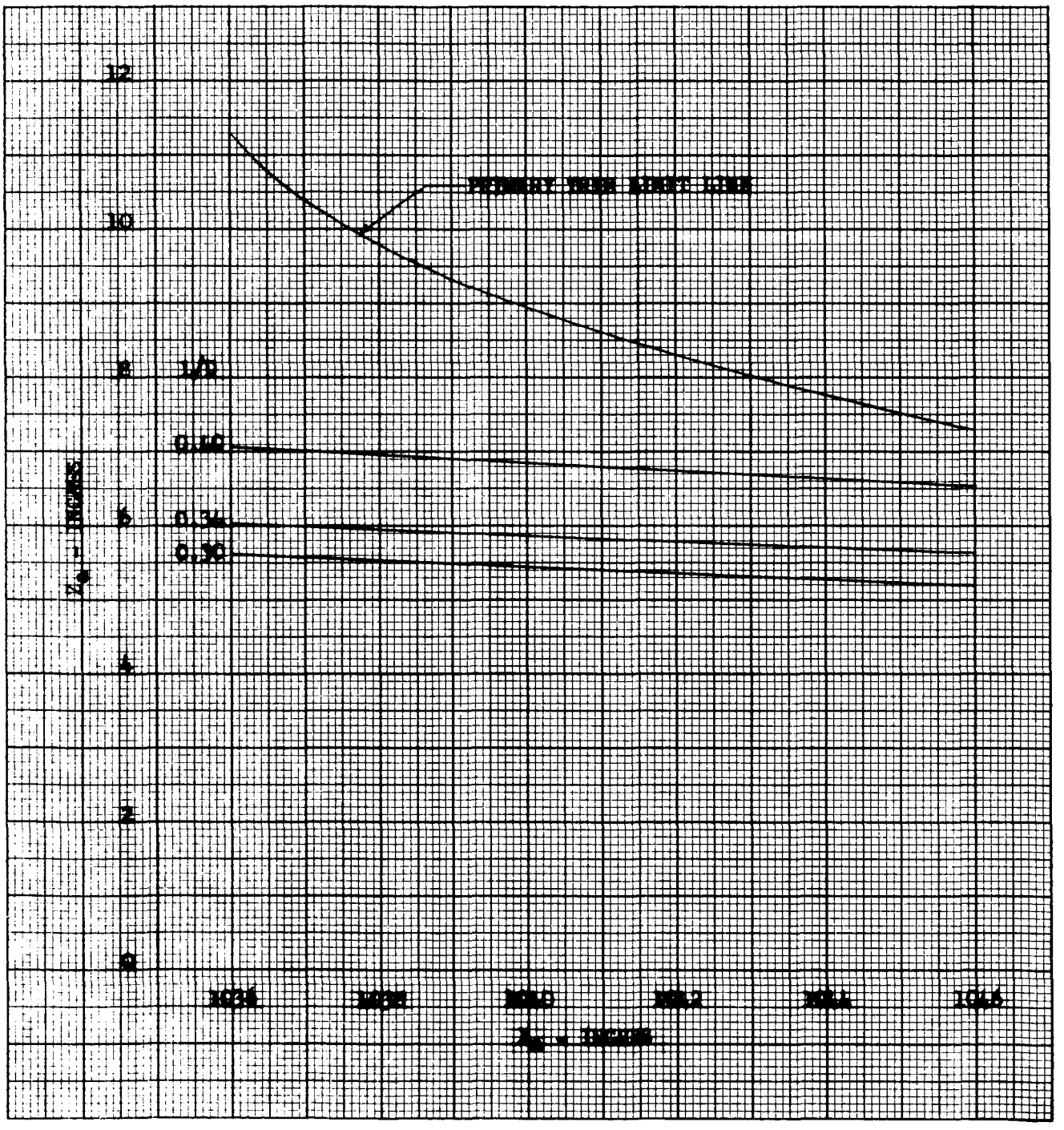
BLOCK II

COMMAND MODULE

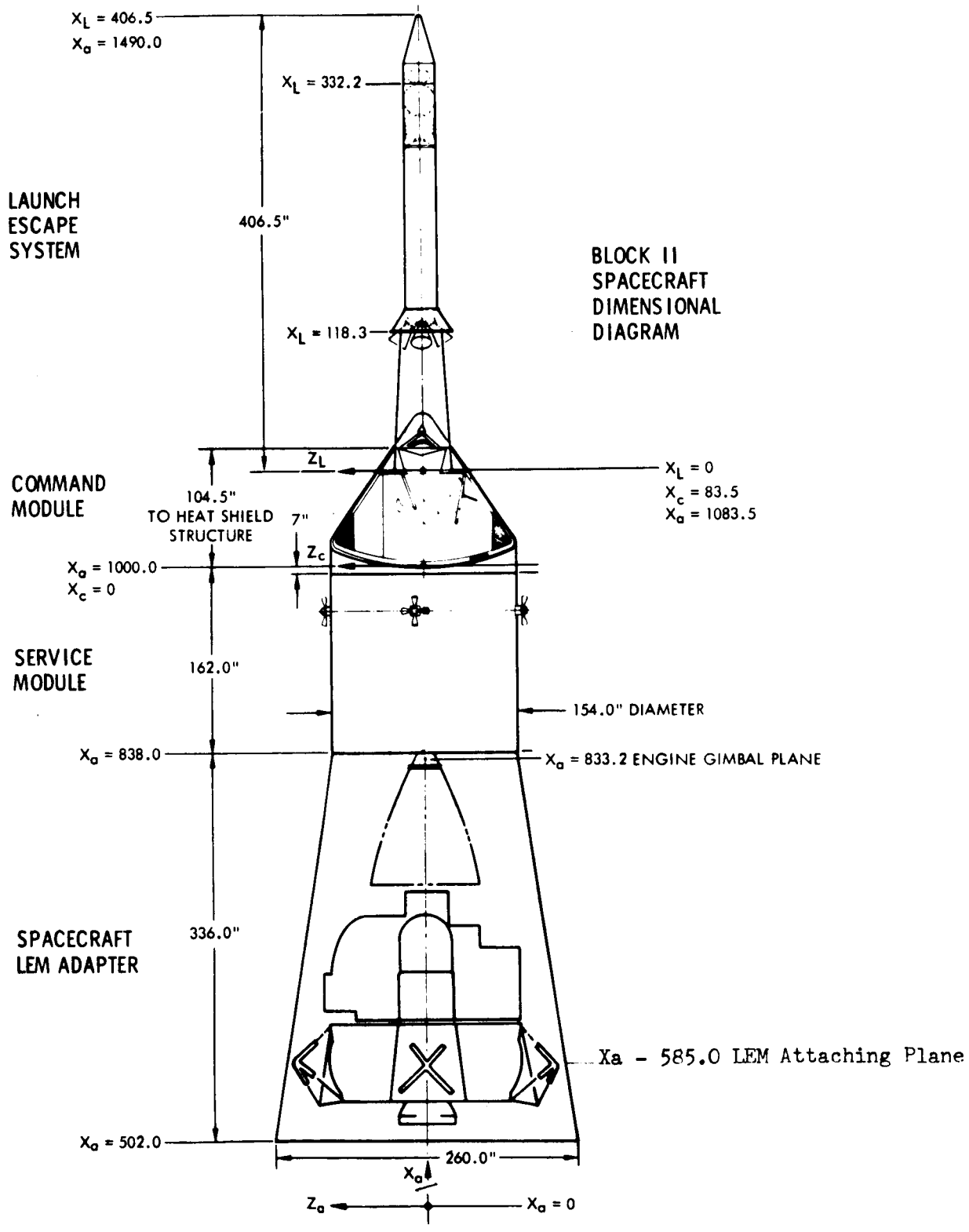
CENTER OF GRAVITY

REQUIREMENTS

AT ENTRY



[redacted]


X_L = 406.5
X_a = 1490.0
X_L = 332.2
LAUNCH ESCAPE SYSTEM
406.5"
BLOCK II SPACECRAFT DIMENSIONAL DIAGRAM
X_L = 118.3
Z_L
X_L = 0
X_c = 83.5
X_a = 1083.5
COMMAND MODULE
104.5" TO HEAT SHIELD STRUCTURE
7"
Z_c
X_a = 1000.0
X_c = 0
SERVICE MODULE
162.0"
154.0" DIAMETER
X_a = 838.0
X_a = 833.2 ENGINE GIMBAL PLANE
SPACECRAFT LEM ADAPTER
336.0"
Xa - 585.0 LEM Attaching Plane
X_a = 502.0
260.0"
X_a
Z_a
X_a = 0

SPACECRAFT WEIGHT STATUS

BLOCK II

JULY 1965

ITEM	PREVIOUS STATUS 6-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	POTENTIAL CHANGES	POTENTIAL TOTAL	CONTROL WEIGHT
COMMAND MODULE	10415	+71	10486	+278	10764	11000
SERVICE MODULE	10365		10365	+30	10395	10200
ADAPTER	3595		3595	+3	3598	3800
LEM	32000		32000		32000	32000
TOTAL LESS PROPELLANT	56375	+71	56446	+311	56757	54500
SPS PROPELLANT AVAILABLE	37625	+929	38554	-311	38243	38000
TOTAL INJECTED	94000	+1000	95000	-	95000	95000
LAUNCH ESCAPE SYSTEM	8140	+30	8170	+30	8200	8200
TOTAL SPACECRAFT AT LAUNCH	102140	+1030	103170	+30	103200	103200

NOTE: With the incorporation of the Heavy LEM, the SPS propellant listed above is the total propellant weight available within the constraints of the Saturn V Boost Capability. A redefinition of the delta V budget by NASA-MSC incorporating the Heavy LEM along with GFE carried in Section I of the Service Module is pending.

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BLOCK II

COMMAND MODULE WEIGHT STATUS

ITEM	CONTROL WEIGHT	PREVIOUS STATUS 6-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT BLOCK II STATUS		
					%EST	%CAL	%ACT
WEIGHT EMPTY	(9582)	(9013)	(+65)	(9078)	(64)	(35)	(1)
Structure	5687	5410	+47	5457	60	40	
Stabilization & Control	140	133		133	100		
Guidance & Navigation	400	354		354	100		
Crew Systems	94	86		86	71	26	3
Environmental Control	417	400	+5	405	62	38	
Earth Landing System	673	598	-5	593	14	74	12
Instrumentation	43	44		44	100		
Electrical Power	1120	1052	+3	1055	93	7	
Reaction Control	328	306		306	13	87	
Communication	358	334	-5	329	100		
Controls & Displays	322	296	+20	316	100		
USEFUL LOAD	(1418)	(1402)	(+6)	(1408)	(4)	(96)	
Scientific Equipment	80	80		80		100	
Crew Systems	953	951	+6	957	6	94	
Reaction Control	270	270		270		100	
Environmental Control	115	101		101		100	
GROSS WEIGHT	11000	10415	+71	10486	56	43	1

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BLOCK II

SERVICE MODULE WEIGHT STATUS

ITEM	CONTROL WEIGHT	PREVIOUS STATUS 6-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT BLOCK II STATUS		
					%EST	%CAL	%ACT
WEIGHT EMPTY	(8104)	(8024)		(8024)	(49)	(45)	(6)
Structure	4594	4496	-17	4479	65	35	
Environmental Control	104	134		134	35	65	
Instrumentation	46	46	+9	55	100		
Electrical Power	1572	1606		1606	37	33	30
Main Propulsion	1226	1250	+8	1258	10	90	
Reaction Control	358	375		375	20	80	
Communications & Rendezvous Radar	204	117		117	100		
USEFUL LOAD	(2096)	(2341)		(2341)		(100)	
Reaction Control	838	838		838		100	
Electrical Power	503	503		503		100	
Environmental Control	150	150		150		100	
Main Propulsion	605	850		850		100	
TOTAL SERVICE MODULE BURNOUT	10200	10365		10365	38	57	5

ITEM	RESIDUALS	
	SPS	RCS
Helium	(88.0)	(3.0)
Propellant	(762.0)	(45.0)
Trapped in System	251.8	4.0
Trapped in Engine	68.6	-
Mixture Ratio	205.0	9.0
Loading Tolerance	139.8	8.0
Expulsion Efficiency	96.8	-
TOTAL RESIDUALS	850.0	48.0

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BLOCK II

LAUNCH ESCAPE SYSTEM

WEIGHT STATUS

ITEM	CONTROL WEIGHT	PREVIOUS STATUS 6-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT BLOCK II STATUS		
					%EST	%CAL	%ACT
Structure	1537	1536	+2	1538		43	57
Ballast Installation Prov.	29	29		29		100	
Electrical	55	58	+15	73	33	62	5
Propulsion System							
Main Thrust	4826	4794		4794			100
Jettison	445	437		437			100
Jettison Motor Skirt	90	90		90			100
Pitch Control	49	49		49			100
Separation Provisions	15	15		15	53	47	
C/M Boost Protective Cover	539	580		580	100		
LES - NO BALLAST	7855	7588	+17	7605	8	10	82
BALLAST	615	552	+13	565		100	
TOTAL LAUNCH ESCAPE SYSTEM	8200	8140	+30	8170	8	16	76

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BLOCK II

ADAPTER WEIGHT STATUS

ITEM	CONTROL WEIGHT	PREVIOUS STATUS 6-1-65	CHANGES TO CURRENT	CURRENT STATUS 7-1-65	BASIS FOR CURRENT BLOCK II STATUS		
					%EST	%CAL	%ACT
Structure	3370	3193		3193	9	52	39
Electrical	70	90		90	38	62	
Separation System	360	312		312	21	79	
TOTAL ADAPTER	3800	3595		3595	11	54	35

COMMAND MODULE

CURRENT WEIGHT EMPTY CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
STRUCTURE	(+47.0)	
Increase the inner structure forward section based on calculations of current Block I drawing changes.	+5.4	NAA
Increase the inner structure center section based on calculation of current Block I drawing changes.	+3.5	NAA
Increase the right hand equipment bay secondary structure due to replacing rivets with screws and nutplates for ease of installation and removability.	+1.2	NAA
Increase the right hand forward equipment bay based on calculation of drawing changes adding brackets to support wire bundles.	+2.2	NAA
Transfer main display panel support structure to Controls and Displays due to recoding consistent with system design responsibility	-21.0	NAA
Increase the lower equipment bay secondary structure based on drawing calculations adding wiring supports and replacing rivets with screws and nutplates for ease of installation and removability.	+8.0	NAA
Increase the aft equipment bay secondary structure due to adding supports for the three communication helmets and the fecal canister in the stowed and use position.	+1.5	NAA
Increase the aft compartment area secondary structure due to redesigning the water tank supports utilizing steel in lieu of aluminum to allow capability to fill tanks at liftoff and due to an increase in the number of electrical wireway retainers and doublers based on drawing changes.	+8.0	NAA
Decrease the forward heatshield substructure due to deleting fabrication allowances based on Block I actual weighings.	-4.1	NAA

COMMAND MODULE

CURRENT WEIGHT EMPTY CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
STRUCTURE (Cont'd)		
Increase the aft heatshield substructure based on calculated in lieu of estimated values for the revised water impact design	+30.9	NAA
Increase the aft heatshield to inner structure attachments due to replacing rivets with screws in the toroidal section and miscellaneous drawing changes	+9.6	NAA
Increase the crew couches due to the addition of fittings to secure couches during ground handling.	+0.4	NAA
Increase the crushable ribs based on actual weight of core in lieu of calculated weight.	+1.2	NAA
Increase the crew couch attenuation based on calculated in lieu of estimated weights.	+1.2	NAA
Decrease the sea pick-up hook due to revised estimate based on the Block II design.	-7.0	NAA
Transfer the VHF recovery antenna erection mechanism from Communications due to recoding consistent with system design responsibility.	+2.5	NAA
Transfer the ejection mechanism for the sea dye marker and the swimmer umiblical from Earth Landing System due to recoding consistent system design responsiblity.	+3.5	NAA
ENVIRONMENTAL CONTROL	(+5.0)	
Modify the evaporator control of the suit heat exchanger to an automatic back pressure control system similar to that employed in the water glycol evaporator per CCA 308. This change incorporates potential item ECS-5.	+4.0	NASA
Increase the umbilical assembly plumbing due to replacing aluminum hardlines with steel based on umbilical separation system redesign per CCA 294.	+1.0	NASA

COMMAND MODULE

CURRENT WEIGHT EMPTY CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
EARTH LANDING SYSTEM	(-5.0)	
Transfer the ejection mechanism for the sea dye marker and swimmer umbilical to structure due to recoding consistent with system design responsibility.	-3.5	NAA
Decrease the flashing light due to a revised estimate based on current specification requirements.	-1.5	NAA
ELECTRICAL POWER	(+3.0)	
Add wiring provisions for the modification of the evaporator control of the ECS suit heat exchanger per CCA 308. This change incorporates a portion of potential item ECS-5.	+3.0	NASA
COMMUNICATIONS	(-5.0)	
Transfer the VHF recovery antenna erection mechanism to Structure due to recoding consistent with system design responsibility.	-2.5	NAA
Decrease the 2KMC Omni antenna power divider consistent with current requirements.	-2.5	NAA
CONTROLS AND DISPLAYS	(+20.0)	
Transfer main display panel support structure from Structure due to recoding consistent with system design responsibility.	+21.0	NAA
Decrease the caution and warning detector due to repackaging to reduced dimensions for Block II.	-1.0	NAA
TOTAL COMMAND MODULE CURRENT WEIGHT EMPTY CHANGES	+65.0	

COMMAND MODULE

CURRENT USEFUL LOAD CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
CREW SYSTEMS	(+6.0)	
Increase the waste management provision due to refined estimates based on current design requirements.	+6.0	NAA
TOTAL COMMAND MODULE CURRENT USEFUL LOAD CHANGES	+6.0	
TOTAL COMMAND MODULE CURRENT WEIGHT EMPTY CHANGES	+65.0	
TOTAL COMMAND MODULE CURRENT WEIGHT CHANGES	+71.0	

SERVICE MODULE

CURRENT WEIGHT EMPTY CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
STRUCTURE	(-17.0)	
Decrease the aft bulkhead due to replacing the thixotropic paste in the core edges of the fuel bay area with foaming paste based on current allowables. This change incorporates potential change item STR-5.	-17.0	NAA
INSTRUMENTATION	(+9.0)	
Transfer the fuel cell instrumentation from Electrical Power due to recoding consistent with system design responsibility.	+9.0	NAA
ELECTRICAL POWER SYSTEM	(-)	
Transfer the fuel cell instrumentation to Instrumentation due to recoding consistent with system design responsibility.	-9.0	NAA
Decrease the electrical power system space radiator based on calculation of drawings reflecting an increase in the amount of area chem-milled.	-4.0	NAA
Increase the RCS quad panel wiring based on revised wiring calculations.	+13.0	NAA
MAIN PROPULSION SYSTEM	(+8.0)	
Increase the propellant utilization and gauging system based on actual weights supplied at Simmonds.	+2.0	NAA
Increase the pressure regulators based on end item actual weights.	+4.0	NAA
Increase the main engine based on Aerojet status reflecting a revised estimate for the pneumatic valves.	+2.0	NAA
TOTAL SERVICE MODULE CURRENT WEIGHT CHANGES	-	

LAUNCH ESCAPE SYSTEM

CURRENT WEIGHT CHANGES

ITEM	WEIGHT POUNDS	CHANGE RESPONSIBILITY
STRUCTURE	(+2.0)	
Increase the tower structure due to adding fittings to support the optical aligning fixture.	+3.0	NAA
Decrease the canard based on calculation of miscellaneous drawing changes.	-1.0	NAA
ELECTRICAL POWER	(+15.0)	
Increase the wiring based on revised estimates utilizing Airframe 009 actual weights as a basis.	+15.0	NAA
BALLAST	(+13.0)	
Increase the ballast consistent with Command Module and LES balance requirements.	+13.0	NAA
TOTAL LAUNCH ESCAPE SYSTEM CURRENT WEIGHT CHANGES	+30.0	

COMMAND MODULE

POTENTIAL WEIGHT CHANGES

ITEM	BLOCK II WEIGHT	CENTER OF GRAVITY			EFFECTIVE DATE
		X	Y	Z	
STRUCTURE	(+20)				
Redesign the air vent based on heat sink requirements (Item STR-6, Dtd. 6-1-65)	+4	1025.8	-23.8	-30.0	8-1-65
Increase the crew couch based on calculation of released drawing reflecting 90 per cent of the released drawings. (Item STR-7, Dtd. 6-1-65)	+16	1040.5	0.0	-2.2	8-1-65
ENVIRONMENTAL CONTROL	(+5)*				
Add a suit compressor inverter to the pressure suit circuit due to Block II requirements to maintain an oxygen flow of 12 CFM/Man in lieu of 10 CFM/Man in a 3.5 psia (suited) condition per current specification requirements. (Item ECS-4, Dtd. 4-1-65)	+5	1027.8	-48.3	5.5	8-1-65
EARTH LANDING SYSTEM	(+15)				
Increase the parachute attach fittings due to a revised estimate based on preliminary drawings reflecting steel in lieu of titanium for the flower pot design. (Item ELS-3, Dtd. 7-1-65)	+15	1090.0	0.0	-22.0	8-1-65
ELECTRICAL POWER SYSTEM	(+172)				
Increase the wiring based on revised lengths due to rerouting required by EMI problems.	+172	1036.3	3.3	15.2	8-1-65

COMMAND MODULE

POTENTIAL WEIGHT CHANGES

ITEM	BLOCK II WEIGHT	CENTER OF GRAVITY			EFFECTIVE DATE
		X	Y	Z	
REACTION CONTROL SYSTEM	(+15)				
Incorporate an RCS rapid fuel dumping system. (Item RCS-2, Dtd. 5-1-65)	+15	1022.6	-5.6	57.0	8-1-65
COMMUNICATIONS	(+6)				
Increase the TV camera and equipment based on current estimates for the current GFE design. (Item COM-2, Dtd. 5-1-65)	+6	1064.7	14.3	-6.3	8-1-65
CONTROLS & DISPLAYS	(+7)				
Incorporate display functions of the launch vehicle oxidizer pressure. (Item C&D-5, Dtd. 5-1-65)	+2	1066.0	0.0	-20.0	8-1-65
Add a runaway RCS engine detection unit to detect possible failures within the SCS and RCS. This potential item was previously coded to Instrumentation. (Item C&D-6, Dtd. 7-1-65)	+5	1050.0	0.0	-25.0	8-1-65
TOTAL COMMAND MODULE POTENTIAL WEIGHT CHANGES	+278				

SERVICE MODULE

POTENTIAL WEIGHT CHANGES

ITEM	BLOCK II WEIGHT	CENTER OF GRAVITY			EFFECTIVE DATE
		X	Y	Z	
ELECTRICAL POWER	(+10)				
Increase fuel cell based on the addition of start-up potassium hydroxide wetting agent. (Item EPS-4, Dtd. 2-1-65)	+8	964.8	-33.1	42.7	8-1-65
Add wiring provisions for launch vehicle oxidizer pressure display function. (Item EPS-9, Dtd. 5-1-65)	+2	957.5	-8.5	18.7	8-1-65
PROPULSION	(+20)				
Add a flight combustion stability monitor system which would automatically shutdown the engine if divergent combustion pressure oscillation occurs during firing per CCA 347. (MPS-3, Dtd. 7-1-65)	+20	930.0	0.0	0.0	8-1-65
TOTAL SERVICE MODULE POTENTIAL WEIGHT CHANGES	+30				

LAUNCH ESCAPE SYSTEM

POTENTIAL WEIGHT CHANGES

ITEM	BLOCK II WEIGHT	CENTER OF GRAVITY			EFFECTIVE DATE
		X	Y	Z	
STRUCTURE	(+5)				
Add shrouds to protect wiring during harness transition from the tower to escape motor skirt. (Item LES-1, Dtd. 7-1-65)	+5	1205.0	0.0	-16.0	9-1-65
BOOST PROTECTIVE COVER	(+80)				
Increase the boost protective cover based on a revised estimate to reflect the strengthening of the "soft" to "hard" cover joint and the stiffening of the soft panels in the area covering the windows. (Item LES-2, Dtd. 7-1-65)	+40	1050.0	-1.8	-4.5	8-1-65
Add one thickness of "nomex" cloth plus adhesive on both sides to the soft portion of the boost cover to provide flexible strength. (Item LES-3, Dtd. 7-1-65)	+40	1050.0	-1.8	-4.5	9-1-65
BALLAST	(-55)				
Decrease the ballast based on constraining the LES to the 8200 pound control weight. (Item LES-4, Dtd. 7-1-65)	-55	1455.0	0.0	0.0	8-1-65
TOTAL LAUNCH ESCAPE SYSTEM POTENTIAL WEIGHT CHANGES	+30				

ADAPTER

POTENTIAL WEIGHT CHANGES

ITEM	BLOCK II WEIGHT	CENTER OF GRAVITY			EFFECTIVE DATE
		X	Y	Z	
ELECTRICAL POWER	(+3)				
Increase electrical provisions to provide for mounting the LEM pyrotechnic sequencer system on the SLA. This item includes boxes, structure and wire. (Item ADP-6, Dtd. 3-1-65)	+26	538.0	0.0	0.0	9-1-65
Reroute wiring from -Z axis to +Z axis to reduce length of wire. (Item ADP-9, Dtd. 4-1-65)	-25	835.0	49.3	0.0	8-1-65
Add wiring provisions for launch vehicle oxidizer display function. (Item ADP-11, Dtd. 5-1-65)	+2	670.0	0.0	-112.0	8-1-65
TOTAL ADAPTER POTENTIAL WEIGHT CHANGES	+3				

BLOCK II

GOVERNMENT FURNISHED EQUIPMENT

The following table reflects the GFE weights included in the current status and the Control Weight allowance associated with SID 64-1344 CSM Technical Specification.

ITEM	CONTROL WEIGHTS	CURRENT STATUS
GFE List		
LEM	(32000.0)	(32000.0)****
Guidance and Navigation	(400.0)	(354.0)***
Crew (50, 70, 90)	(528.0)	(528.0)
Crew Equipment	(371.0)	(371.0)
Pressure Garment Assembly (3) (Incl. Comm.)	102.0	102.0
Portable Life Support System (2) (Incl. Comm.)	106.0	106.0
Emergency Oxygen System (2)	6.5	6.5
Constant Wear Garments - Gas Cooled (7)	6.5	6.5
Liquid Cooled Garments (2)	9.0	9.0
External Thermal Garment	13.4	13.4
Radiation Dosimeters	5.0	5.0
Food Set (8.3 days)	49.5	49.5
Probe	0.5	0.5
Medical Kit-Emergency	2.8	2.8
Clinical Instrumentation	1.5	1.5
Biomedical Instrumentation	4.3	4.3
Spacesuit Assembly Spare Parts	4.0	4.0
Survival Equipment	60.0	60.0
TV Camera	(8.8)	(8.8)
Scientific Equipment	(80.0)	(80.0)
Rendezvous Radar	(106.0)	*(20.1)**
Q-Ball	(25.0)	(25.0)
TOTAL GFE	33511.8	33386.9

*Reduced to 84.4 pounds per NASA letter PPS1/L137-64-822.
**Reduced to 20.1 pounds per CCA 303 deleting rendezvous radar equipment.
***MIT Status Report dated 15 February 1965.
****Increased per CCA 290.