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PARAMETRIC STUDY OF OPTIMIZED LIQUID-
HYDROGEN THERMAL PROTECTION SYSTEMS FOR
NUCLEAR INTERPLANETARY SPACECRAFT

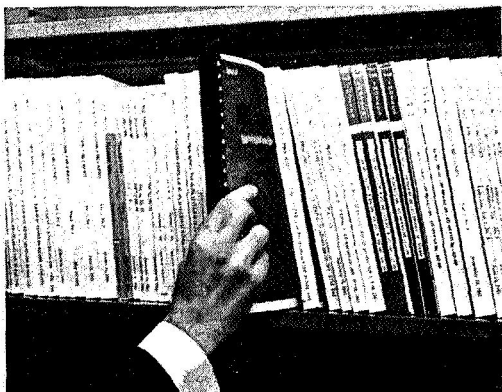
D. G. Barry

General Dynamics
Fort Worth Division

31 August 1968

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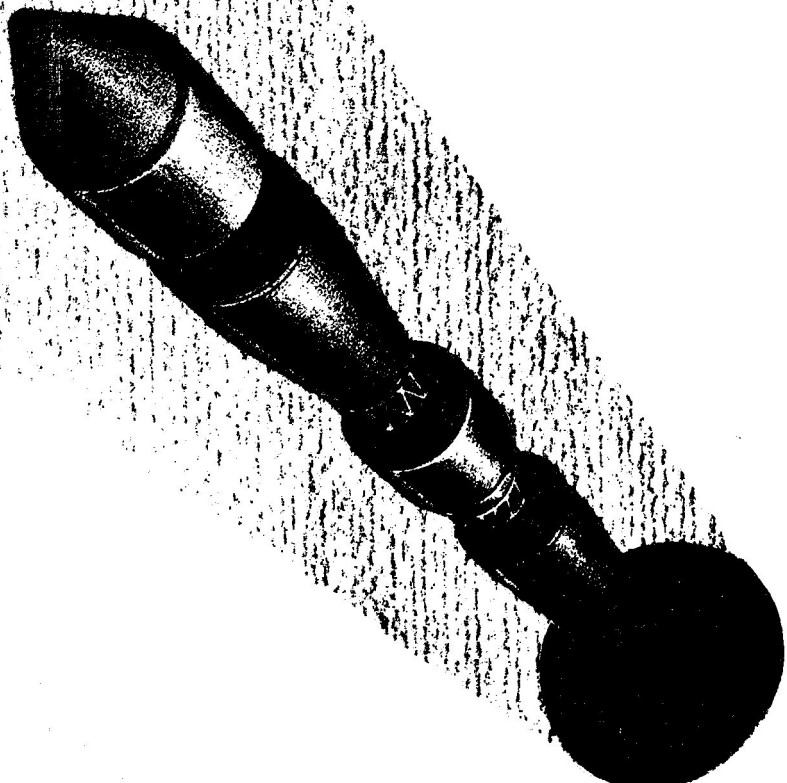
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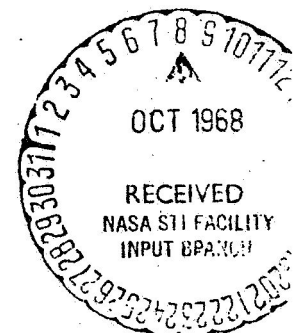
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**PARAMETRIC STUDY of
OPTIMIZED LIQUID-HYDROGEN
THERMAL PROTECTION SYSTEMS
for NUCLEAR INTERPLANETARY
SPACECRAFT**

GENERAL DYNAMICS
Fort Worth Division



FZA-434-3
31 August 1968

PARAMETRIC STUDY OF OPTIMIZED
LIQUID-HYDROGEN THERMAL PROTECTION SYSTEMS
FOR NUCLEAR INTERPLANETARY SPACECRAFT

Volume 3. Numerical Data

Prepared for the
George C. Marshall Space Flight Center
National Aeronautics and Space Administration
Huntsville, Alabama

under

Contract NAS8-21080

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F O R E W O R D

This document is Volume 3 of the final report on Contract NAS8-21080, "An Analytical Study of Storage of Liquid-Hydrogen Propellant for Nuclear Interplanetary Spacecraft." The study was performed by the Fort Worth Division of General Dynamics Corporation for the George C. Marshall Space Flight Center of the National Aeronautics and Space Administration. The program was conducted under the technical direction of Mr. D. Price of the MSFC Propulsion and Vehicle Engineering Laboratory. His assistance in the performance of the study is gratefully acknowledged.

The final report comprises three volumes:

Volume 1. Results and Summary

Volume 2. Technical Details

Volume 3. Numerical Data

Volume 1 contains a complete presentation and discussion of the results together with a summary of the important findings of the study. Volume 2 contains a description of the methods of analysis and the computer programs used in the study. Volume 3 contains a tabulation of the numerical data, including both the thermal protection system optimization results and the mass-buildup data.

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S E C T I O N 1

I N T R O D U C T I O N

This volume of the final report contains the salient numerical data generated during the study. The purpose of documenting these data is to (1) provide additional detailed data that are not of sufficient general interest to be presented in the summary and discussion of Volume 1, and (2) furnish data for analyses beyond the scope of those considered in this study.

The data are presented as a reproduction of the actual computer output of the thermal protection system optimization program. Two different types of data are presented on facing pages for each of the cases investigated. The first page contains thermal protection system data such as insulation thickness, propellant storage system component masses, tank length and area, and propellant loading. The second, facing, page is a mass summary of each of the stages; the "Total Initial Stage Masses" can be summed to obtain the Initial Mass In Earth Orbit (IMIEO). Note that the stages other than the one being optimized are defined in terms of nominal mass fractions. Thus, the IMIEO values will not correspond exactly to those presented in Subsection 4.1 of Volume 1, where all stages of the vehicle are defined in terms of the optimized mass fractions. The data presented here correspond to the IMIEO data presented in the remainder of Volume 1.

The physical arrangement of the two types of data has been planned for ease of use. When the volume is opened to a particular page and laid flat, the thermal protection system data printout will be on the left page and the corresponding mass-buildup data printout will be on the right (facing) page. The arrangement is such that both pages are read from the same position. The set of parameters that defines the conditions for each case is identified by a seven-place code number located under the title on the thermal protection system data page and in the upper left-hand corner of the mass summary page. The first place will contain either an S or a U in all cases, denoting whether or not the stage is shielded. The second place is the stage number. The third and fourth places contain the Earth orbit staytime in

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tens of days. Next in order is the propellant storage mode symbol, coded as follows:

- N - nonvent mode
- V - vent mode
- P - partial recondensation mode
- C - combination mode
- T - tanking mode

The digit in the sixth place is the first digit of the Mars orbit altitude. This digit will be a 2, 3, or 9 representing altitude of 216, 3238, or 9203 nautical miles, respectively. The seventh and final place indicates the value of the $k\rho$ product (insulation performance) as high (H), intermediate (I), or low (L).

An explanation of the notation and definition of the units for the thermal protection system data page is contained in the following list. The data are presented on a per-tank basis.

<u>Computer Notation</u>	<u>Description</u>	<u>Unit</u>
INS. TKNESS	Optimum insulation thickness	in.
INS. MASS	Insulation mass	lb _m
INSUL. MF	Insulation mass fraction with respect to propellant loading	-
TANK MASS	Mass of the tank excluding the contingency factor	lb _m
TANK MF	Tank mass fraction with respect to propellant loading	-
VENT PRESS	Vent pressure	psia
COAT MASS	Mass of thermal control coating	lb _m
COAT MF	Coating mass fraction with respect to propellant loading	-
PRES MASS	Pressurant mass	lb _m

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<u>Computer Notation</u>	<u>Description</u>	<u>Unit</u>
PRES MF	Pressurant mass fraction with respect to propellant loading	-
TOT EFF MAS	Propellant storage system effective mass	lb _m
TOT EF MF	Propellant storage system effective mass fraction with respect to propellant loading	-
EF MP MAS	Meteoroid protection effective mass	lb _m
EFF MP MF	Meteoroid protection effective mass fraction with respect to propellant loading	-
MP MASS	Meteoroid protection mass	lb _m
BOILOFF MAS	Propellant boiloff mass	lb _m
EF BO MAS	Propellant boiloff effective mass	lb _m
WALL TKNS	Average tank wall thickness	in.
LENGTH	Total tank length	ft
VOLUME	Tank volume	ft ³
WBOACT(1)	Earth orbit boiloff mass	lb _m
WBOACT(2)	Mars transfer boiloff mass	lb _m
WBOACT(3)	Mars orbit boiloff mass	lb _m
WBOACT(4)	Not used	-
AFACT(1)	Earth orbit "a" factor	-
AFACT(2)	Mars transfer "a" factor	-
AFACT(3)	Mars orbit "a" factor	-

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<u>Computer Notation</u>	<u>Description</u>	<u>Unit</u>
AFACT(4)	Not used	-
DFACT	"d" factor	-
TMAX	Maximum Earth orbit staytime for combination or tanking mode	days
TDU	Time at which the vent pressure is reached. -1 indicates no boiloff.	days
TDUX	Time at which the vent pressure is reached in the combination mode with maximum excess propellant loading	days
BOMAX	Maximum boiloff mass in the combination mode	lb _m
EPTH	Stage mass fraction with respect to propellant loading	-
N-J PSSM	Mass of the nonjettisoned propellant storage system components	lb _m
PROP MASS	Propellant loading	lb _m
TANK AREA	Total tank surface area	ft ²
NO OF TNK	Number of tanks per stage	-
IMIEO	Initial mass in Earth orbit; "old value" is from previous iteration.	lb _m

The notation of the mass summary data page is largely self-explanatory, although two of the items on that page require more definition. "Propellant tank dry mass" comprises the nonjettisoned propellant storage system components. The interplanetary meteoroid shield mass and the orbital-assembly interstage mass are included in the item "expendable propellant subsystem mass."

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Data are included for over 300 different cases. Those cases of the vent and the partial recondensation modes where the vent pressure is not reached have not been included since the results are the same as in the corresponding nonvent mode case.

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S E C T I O N 2

E A R T H D E P A R T U R E S T A G E D A T A

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THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109M2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNESS	9.1317	INS. MASS	16405.	INSUL. MF	8.02879E-02	TANK MASS	9210.1	TANK MF	7.88897E-02
VENT PRESS	15.590	COAT MASS	0.0	COAT MF	0.0	PRES MASS	704.03	PRES MF	3.44588E-03
TOT EFF MAS	33226.	TOT FF MF	1.62617E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.89008E-01	LENGTH	68.131	VOLUME	48731.
WROACT(1)	0.0	WROACT(2)							
AFACT(1)	7.00199E-01	AFACT(2)							
OFACT	5.26270E-01	TMAX	0.0	YDU	-1.0000	TDUX	0.0	BOMAX	0.0
EPTH	1.62617E-01	N-J PSSM	33226.	PROP MASS	2.04323E 05	TANK AREA	7185.8	NO OF TNK	4.0000

**** RESULTS ****

THE OLD VALUE OF TIME IS 2005037.0

THE NEW VALUE OF TIME IS 2005701.0

GENERAL DYNAMICS
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MASS SUMMARY (lb_m)

01100474

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	114135.2	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	817541.7	241035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	817541.75	241035.19	80337.25
PROPELLANT TANK DRY MASS	132949.4	24103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	132949.56	24103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROJECTION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	15497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	63506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	172500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UIC9N2I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	0.59215	INS. MASS	1001.3	INSUL. MF	5.20213E-03	TANK MASS	8200.0	TANK MF	7.45558E-02
VENT PRESS	12.196	COAT MASS	0.0	COAT MF	0.0	PRES MASS	584.60	PRES MF	3.03730E-03
TOT EFF MAS	15936.	TUT EF MF	8.27951E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILFF MAS	0.0	EF BL MAS	0.0	WALL TKNS	0.84192E-01	LENGTH	63.932	VOLUME	45354.
MBUACT(1)	0.0	MBUACT(2)							
AFACT(1)	6.52314E-01	AFACT(2)							
CFACT	5.58667E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BDMAX	0.0
EPTH	6.27951E-02	N-J PSSM	15936.	PROP MASS	1.92474E 05	TANK AREA	6763.7	NO OF TNK	4.0000

**** RESULTS ****

THE OLD VALUE OF IMIEC IS 1886765.0

THE NEW VALUE OF IMIEC IS 1888881.0

GENERAL DYNAMICS
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MASS SUMMARY (lb_m)

U109N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STACK MASS	1045534.	557388.	286860.
INITIAL INITIAL PROPELLANT MASS	769943.7	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	769943.65	281035.19	80337.25
PROPELLANT TANK DRY MASS	63747.6	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	63747.60	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	4044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	5139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	142100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109M2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THNESS	0.14634	INS. MASS	239.75	INSUL. MF	1.25234E-03	TANK MASS	7859.8	TANK MF	7.18486E-02
VENT PRESS	4.9993	COAT MASS	0.0	COAT MF	0.0	PRES MASS	412.49	PRES MF	2.15466E-03
TOT EFF MAS	14407.	TOT EF MF	7.52556E-02	EF MF MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.83290E-01	LENGTH	61.838	VOLUME	43670.
WFACT(1)	0.0	WBOACT(2)							
AFACT(1)	6.47852E-01	AFACT(2)							
DFACT	5.61687E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BOMAX	0.0
EPH	7.52556E-02	N-J PSSM	14407.	PROP MASS	1.91440E 05	TANK AREA	6553.2	NO OF TMK	4.0000

**** RESULTS ****

THE OLD VALUE OF IMIED IS 1878612.0

 THE NEW VALUE OF IMIED IS 1878577.0

GENERAL DYNAMICS
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MASS SUMMARY (lb_m)

UNION

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1034200.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	765731.4	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	765731.37	281035.19	80337.25
PROPELLANT TANK DRY MASS	57625.6	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	57625.55	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	18200.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
011912H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000 INITIAL ENERGY C.O

***** RESULTS *****

INS. TKNFSS	13.500	INS. MASS	27063.	INSUL. MF	1.21754E-01	TANK MASS	16610.	TANK MF	1.30773E-01
VENT PRESS	30.409	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1183.6	PRES MF	5.32491E-03
TOT EFF MAS	57314.	TOT EF MF	2.57852E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	C.O	FF RO MAS	C.O	WALL TKNS	0.14385	LENGTH	76.415	VOLUME	55394.
WBFACT(1)	0.0	WBFACT(2)		TDU	-1.0000	TOUX	0.0	ROMAX	0.0
AFACT(1)	7.63015E-01	AFACT(2)		PROP MASS	2.22273E 05	TANK AREA	8018.7	NO OF TMK	4.0000
DFACT	4.83770E-01	TMAX	C.O						
EPTH	2.57852E-01	N-J PSSM	57314.						

THE OLD VALUE OF IMIEN IS 2181180.0

THE NEW VALUE OF IMIEN IS 2165480.0

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MASS SUMMARY (lb_m)

U1112424

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1321141.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	982694.4	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	882694.37	281035.19	80337.25
PROPELLANT TANK DRY MASS	227634.9	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	227634.87	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDE CORRECTION SUBSYSTEM MASS	67906.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	7139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U118N2I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
*** RESULTS ****			
INS. THICKNESS	1.6339	INSUL. MF	1.44493E-02
VFNT PRESS	14.639	COAT MF	0.0
TOT EFF MAS	18061.	EF MP MAS	0.0
ROILOFF MAS	0.0	WALL TKNS	0.84588E-01
WFACT(1)	0.0	FF RO MAS	
AFACT(1)	6.58178E-01	WFACT(2)	
		AFACT(2)	
DFACT	5.54701E-01	TMAX	0.0
EPFH	9.31700E-02	N-J PSSM	18061.
		TDU	-1.0000
		PROP MASS	1.93851E 05
		TANK MASS	8352.7
		PRES MASS	642.81
		EFF MP MF	0.0
		TANK MF	7.54048E-02
		PRES MF	3.31601E-03
		MP MASS	0.0
		VOLUME	46103.
		TDUX	0.0
		TANK AREA	6857.4
		BOMAX	0.0
		NO OF TMK	4.0000

THE OLD VALUE OF IMIEO IS 1902271.0

 THE NEW VALUE OF IMIEO IS 1903291.0

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MASS SUMMARY (lb_m)

U119N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	105894.3	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	775817.4	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	775817.44	281035.19	80337.25
PROPELLANT TANK DRY MASS	72282.9	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	72282.94	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	142100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U118N2L

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. THNESS	0.21383	INS. MASS	358.86	INSUL. MF	1.86995E-03	TANK MASS	8117.8	TANK MF	7.60258E-02
VENT PRESS	10.594	COAT MASS	0.0	COAT MF	0.0	PRES MASS	547.09	PRES MF	2.85076E-03
TOT EFF MAS	15112.	TOT EF MF	7.87465E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.83976E-01	LENGTH	63.428	VOLUME	44948.
WFACT(1)	0.0	WFACT(2)							
AFACT(1)	6.49882E-01	AFACT(2)							
DFACT	5.60313E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BOMAX	0.0
EDTH	7.87465E-02	N-J PSSM	15112.	PROP MASS	1.91909E 05	TANK AREA	6713.1	NO OF TANK	4.0000

THE OLD VALUE OF IM1FD IS 1883218.0

THE NEW VALUE OF IM1ED IS 1883349.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0118N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1038971.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	767676.5	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	767676.50	281035.19	80337.25
PROPELLANT TANK DRY MASS	60451.8	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	60451.83	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
INS. THICKNESS	20.225	INSUL. MF	1.82675E-01
VENT PRESS	35.980	COAT MF	0.0
TOT EFF MAS	83600.	TOT EF MF	3.40877E-01
BOILOFF MAS	0.0	EF BO MAS	0.0
WROACT(1)	0.0	WROACT(2)	0.0
AFACT(1)	8.30008E-01	AFACT(2)	0.0
DEACT	4.38445E-01	TMAX	0.0
EPH	3.40877E-01	N-J PSSM	83600.
		TDU	-1.0000
		PROP MASS	2.45251E 05
		WALL TKNS	0.16714
		TDUX	0.0
		TANK AREA	8860.4
		TANK MASS	21325.
		PRES MASS	1479.7
		EFF MP MF	0.0
		LENGTH	84.788
		VOLUME	62127.
		BOIMAX	0.0
		NO OF TNK	4.0000
		TANK MF	1.52168E-01
		PRES MF	6.03931E-03
		MP MASS	0.0

***** RESULTS *****

THE OLD VALUE OF IMTED IS 2406665.0

THE NEW VALUE OF IMTED IS 2327112.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01127924

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1492764.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	948575.0	281035.2	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	948575.00	281035.19	80337.25
PROPELLANT TANK DRY MASS	323347.1	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	323347.12	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127M2I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. TKNESS	3.5147	INS. MASS	6203.9	INSUL. MF	3.12829E-02	TANK MASS	10080.	TANK MF	8.89451E-02
VENT PRESS	18.701	COAT MASS	0.0	COAT MF	0.0	PRES MASS	761.93	PRES MF	3.94202E-03
TOT EFF MAS	24605.	TOT FF MF	1.24079E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
ROILOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.99138E-01	LENGTH	66.885	VOLUME	47729.
WBOACT(1)	0.0	WBOACT(2)							
AFACT(1)	6.76638E-01	AFACT(2)							
DFACT	5.42210E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BOMAX	0.0
EPTH	1.24070E-01	N-J PSSH	24605.	PROP MASS	1.99316E 05	TANK AREA	7060.6	NO OF TNK	4.0000

THE OLD VALUE OF IMIED IS 1946091.0

THE NEW VALUE OF IMIED IS 1947536.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11127N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1103188.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	793952.6	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	793952.62	281035.19	80337.25
PROPELLANT TANK DRY MASS	98493.3	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98493.31	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 3.0

***** RESULTS *****

INS. THICKNESS 0.52195	INS. MASS 889.47	INSUL. MF 4.62189E-03	TANK MASS 8286.0	TANK MF 7.53478E-02
VENT PRESS 14.677	COAT MASS 0.0	COAT MF 0.0	PRES MASS 638.81	PRES MF 3.31940E-03
TOT EFF MAS 16029.	TOT EF MF 8.32890E-02	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
RILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.84415E-01	LENGTH 64.457	VOLUME 45776.
WROACT(1) 0.0	WROACT(2)			
AFACT(1) 6.52201E-01	AFACT(2)			
DFACT 5.58744E-01	TMAX 0.0	TDU -1.0000	TDUX 0.0	BOMAX 0.0
EPH 8.32890E-02	N-J PSSM 16029.	PROP MASS 1.92448E 05	TANK AREA 6816.5	NO OF TANK 4.0000

THE OLD VALUE OF IMIED IS 1888506.0

THE NEW VALUE OF IMIED IS 7889562.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11177N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1045215.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	770221.2	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	770221.25	281035.19	80337.25
PROPELLANT TANK DRY MASS	64151.0	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	64150.98	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
OTHER PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UIQVZH

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	7.8999	INS. MASS	14249.	INSUL. MF	6.92186E-02	TANK MASS	8943.3	TANK MF	7.60304E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	685.56	PRES MF	3.33042E-03
TOT EFF MAS	32849.	TOT FF MF	1.59577E-01	FF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	3241.3	FF RT MAS	2263.8	WALL TKNS	0.86074E-01	LENGTH	68.426	VOLUME	48968.
WRNACT(1)	3241.3	WRNACT(2)							
AFACT(1)	6.98413E-01	AFACT(2)							
DFACT	5.27479E-01	TMAX	0.0	TDU	79.140	TDUX	0.0	BOMAX	0.0
EPTH	1.48579E-01	N-J PSSW	30585.	PROP MASS	2.05849E 05	TANK AREA	7215.5	NO OF TNK	4.0000

THE OLD VALUE OF IMIED IS 2000443.0

THE NEW VALUE OF IMIED IS 2000993.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

01-0024

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1156644.	57788.	286960.
TOTAL INITIAL PROPELLANT MASS	923454.2	291035.2	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	923454.25	281035.19	80337.25
PROPELLANT TANK DRY MASS	122348.2	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	122348.25	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	135000.0	35000.0	35000.0
INTER STAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U11AV2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. TKNSS	11.117	INS. MASS	21871.	INSUL. MF	9.59901E-02	TANK MASS	10051.	TANK MF	7.71949E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	761.97	PRES MF	3.34418E-03
TOT EFF MAS	53901.	TOT FF MF	2.36565E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	18403.	EF RO MAS	13679.	WALL TKNS	0.88691E-01	LENGTH	74.934	VOLUME	54202.
WFACT(1)	18403.	WFACT(2)							
AFACT(1)	7.43296E-01	AFACT(2)							
DFACT	4.97111E-01	TMAX	0.0	TDU	105.47	TDX	0.0	BOMAX	0.0
EPFH	1.76529E-01	N-J PSSM	40222.	PROP MASS	2.27850E 05	TANK AREA	7869.7	NO OF TNK	4.0000

THE OLD VALUE OF IMIEO IS 2127643.0

THE NEW VALUE OF IMIEO IS 2127855.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0111072H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1283578.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	911721.1	291035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	911721.06	281035.19	80337.25
PROPELLANT TANK DRY MASS	160945.3	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	160945.31	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETEN PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MINDRIFT CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNSS	14.157	INS. MASS	29927.	INSUL. MF	1.20884E-01	TANK MASS	11075.	TANK MF	7.82844E-02
VENT PREFS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	930.76	PRES MF	3.35574E-03
TOT FFF MAS	74666.	TOT EF MF	3.01602E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	31417.	EF BO MAS	24529.	WALL TKMS	0.90950E-01	LENGTH	80.765	VOLUME	5.8891.
WFOACT(1)	31417.	WFOACT(2)							
AFACT(1)	7.80716E-01	AFACT(2)							
DFACT	4.71794E-01	TMAX	0.0	TDU	127.85	TDOX	0.0	BOMAX	0.0
EPH	2.02524E-01	N-J PSSM	50139.	PROP MASS	2.47565E 05	TANK AREA	8455.9	NO OF TANK	4.0000

***** RESULTS *****

THE OLD VALUE OF IMIEN IS 2736546.0

 THE NEW VALUE OF IMIEN IS 2248683.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01127024

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1404335.	55738R.	286960.
TOTAL INITIAL PROPELLANT MASS	992490.0	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	992490.00	281035.19	80337.25
PROPELLANT TANK DRY MASS	201003.4	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	201003.37	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	14497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	3.0375	INS. MASS	5333.7	INSUL. MF	2.67483E-02	TANK MASS	8625.9	TANK MF	7.57020E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	663.33	PRES MF	3.32652E-03
TOT EFF MAS	23846.	TOT FF MF	1.19585E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	4104.6	EF RO MAS	2753.5	WALL TKNS	0.85284E-01	LENGTH	66.520	VOLUME	47435.
WROACT(1)	4104.6	WROACT(2)							
AFACT(1)	6.70815E-01	AFACT(2)							
DFACT	5.46152E-01	TMAX	0.0	TDU	229.22	TDOUX	0.0	BOUMAX	0.0
EDTH	1.05777E-01	N-J PSSM	21092.	PROP MASS	1.99405E 05	TANK AREA	7023.9	NO OF TMK	4.0000

**** RESULTS ****

THE OLD VALUE OF TIME IS 1932049.0

THE NEW VALUE OF TIME IS 1941097.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01127V21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1096751.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	801164.7	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	801164.69	281035.19	80337.25
PROPELLANT TANK DRY MASS	84744.6	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	84744.56	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
DETON PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109P2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS 4.9359	INS. MASS 8877.5	INSUL. MF 4.32769E-02	TANK MASS 8907.8	TANK WF 7.59935E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 683.03	PRES WF 3.32972E-03
TOT EFF MAS 29455.	TOT FF MF 1.43590E-01	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
ROIL OFF MAS 6245.5	EF RO MAS 4305.6	WALL TKNS 0.85986E-01	VOLUME 48797.	
WROACT(1) 6245.5	WROACT(2)			
AFACT(1) 6.80394E-01	AFACT(2)			
DFACT 5.33581E-01	TMAX 0.0	TDU 54.110	TDUX 0.0	BOMAX 0.0
EPTH 1.22600E-01	N-J PSSM 25149.	PROP MASS 2.05132E 05	TANK AREA 7194.2	NO OF TMR 4.0000

THE OLD VALUE OF IMIFO IS 1977564.0

THE NEW VALUE OF IMIFO IS 1976542.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01100024

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1132194.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	827730.7	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	820730.69	281035.19	80337.25
PROPELLANT TANK DRY MASS	100621.6	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	100621.56	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U11RP2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	6.9642	INS. MASS	13160.	INSUL. MF	6.05362E-02	TANK MASS	9519.9	TANK MF	7.64339E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	725.58	PRES MF	3.33760E-03
TOT EFF MAS	41012.	TOT EF MF	1.88653E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	14619.	EF RO MAS	10467.	WALL TKNS	0.87461E-01	LENGTH	71.841	VOLUME	51715.
WBOACT(1)	14619.	WBOACT(2)							
AFACT(1)	7.15961E-01	AFACT(2)							
DFACT	5.15605E-01	TMAX	0.0	TDU	72.973	TANK AREA	0.0	ROMAX	0.0
EPTH	1.40508E-01	N-J PSSH	30546.	PROP MASS	2.17395E 05	TANK AREA	7558.8	NO OF TANK	4.0000

**** RESULTS ****

THE OLD VALUE OF IMIEN IS 204506.0

THE NEW VALUE OF IMIEN IS 204704.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11110094

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1202667.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	869635.1	291035.2	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	869635.06	291035.19	80337.25
PROPELLANT TANK DRY MASS	122190.3	28103.5	8837.1
OXIDIZED TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	122190.31	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROVISION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTE STAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUPSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U111P21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNFSS	1.5663	INS. MASS	2687.7	INSUL. MF	1.38526E-02	TANK MASS	8363.3	TANK MF	7.54329E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	644.72	PRES MF	3.32294E-03
TOT EFF MAS	18058.	TOT EF MF	9.30700E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	135.98	FF RO MAS	89.560	WALL TKNS	0.84615E-01	LENGTH	64.928	VOLUME	46155.
WBOACT(1)	135.98	WBOACT(2)							
AFACT(1)	6.58574E-01	AFACT(2)							
DFACT	5.54432E-01	TMAX	0.0	TDU	177.31	TDUX	0.0	BOMAX	0.0
EPH	9.26083E-02	N-J PSSM	17968.	PROP MASS	1.94023E 05	TANK AREA	6863.8	NO OF TANK	4.0000

**** RESULTS ****

THE OLD VALUE OF IMIEN IS 1903192.0

THE NEW VALUE OF IMIEN IS 1903199.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0118021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	105802.0	557388.	286966.
TOTAL INITIAL PROPELLANT MASS	776087.4	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	776087.44	281035.19	80337.25
PROPELLANT TANK DRY MASS	71872.1	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	71872.12	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROPHONE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	102100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127P2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. THNESS	9.4028	INS. MASS	16732.	INSUL. MF	7.33169E-02	TANK MASS	10069.	TANK MF	7.72147E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	763.19	PRES MF	3.34422E-03
TOT EFF MAS	51441.	TOT EF MF	2.25408E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
ROILOFF MAS	22120.	FF B0 MAS	16325.	WALL TKNS	0.88733E-01	LENGTH	75.041	VOLUME	54288.
WFACT(1)	22120.	WFACT(2)							
AFACT(1)	7.38011E-C1	AFACT(2)							
DFACT	5.00688E-01	TMAX	G.C	TDU	86.694	TDUX	0.0	80MAX	0.0
EPTH	1.53876E-01	N-J PSSM	35116.	PROP MASS	2.29213E 05	TANK AREA	7880.5	NO OF TNK	4.0000

THE OLD VALUE OF IMIEN IS 2107481.0

THE NEW VALUE OF IMIEN IS 2108316.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11127024

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1263998.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	912694.6	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	912686.56	281035.19	80337.2
PROPELLANT TANK DRY MASS	140440.2	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	140440.25	28103.51	8837.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.8
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5900.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127P21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 1.9125	INS. MASS 3340.5	INSUL. MF 1.68580E-02	TANK MASS 8564.6	TANK MF 7.56389E-02
VENT PRFSS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 658.99	PRES MF 3.32568E-03
TOT EFF MAS 21330.	TOT EF MF 1.07644E-01	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
BOILOFF MAS 3510.7	EF BO MAS 2342.4	WALL TKNS 0.85129E-01	LENGTH 66.149	VOLUME 47137.
WBOACT(1) 3510.7	WBOACT(2)			
AFACT(1) 6.67196E-01	AFACT(2)			
DFACT 5.48598E-01	TMAX 0.0	TDU 195.17	TDUX 0.0	BOMAX 0.0
EPTH 9.58226E-02	N-J PSSM 18987.	PROP MASS 1.98152E 05	TANK AREA 6986.6	NO OF TMK 4.0000

THE OLD VALUE OF IMIED IS 1923429.0

THE NEW VALUE OF IMIED IS 1923763.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1117021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1079417.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	792623.5	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	792623.50	281035.19	80337.25
PROPELLANT TANK DRY MASS	75951.2	28103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	75951.25	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127P2L

** INPUT ITEMS **

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.49355	INS. MASS	841.33
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	16025.	TOT EF MF	8.32445E-02
INSUL. MF	4.37055E-03	INSUL. MF	4.37055E-03
COAT MF	0.0	COAT MF	0.0
EF MF MAS	0.0	EF MF MAS	0.0
EF BO MAS	37.391	WALL TKNS	0.84424E-01
WFACT(1)	57.328	TDU	268.28
AFACT(1)	6.52178E-01	PROP MASS	1.92500E 05
DFACT	5.58760E-01	TANK MASS	8289.3
FPTH	9.30503E-02	PRES MASS	639.48
		EFF MP MF	0.0
		TANK MASS	64.478
		PRES MASS	0.0
		EFF MP MF	0.0
		LENGTH	64.478
		TANK AREA	0.0
		TDUX	0.0
		TANK AREA	6818.5
		VOLUME	45792.
		BDMAX	0.0
		NO OF TMK	4.0000

THE OLD VALUE OF IMIED IS 188454.0

THE NEW VALUE OF IMIED IS 188450.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

011702

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1045153.	557388.	286960.
TOTAL INITIAL PROPELLANT MASS	770333.0	281035.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	770333.94	281035.19	80337.25
PROPELLANT TANK DRY MASS	63976.4	78103.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	63976.43	28103.51	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12071.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12071.59	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60506.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9139.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UIC9N3M

*** INPUT ITEMS ***

DESIGN PRESSURE	19.700CF	INITIAL ENERGY	0.0				
INS. THICKNESS	8.0818	INSUL. MF	7.73995E-02	TANK MASS	10194.	TANK MF	7.73315E-02
VENT PRESS	14.444	COAT MF	0.0	PRES MASS	770.44	PRES MF	3.33959E-03
TOT EFF MASS	36467.	TOT EF MF	1.58071E-01	EFF MP MF	0.0	MP MASS	0.0
		EF BO MAS	0.0	LENGTH	75.762	VOLUME	54868.
WFACT(1)	0.0	WFACT(2)					
AFACT(1)	6.07359E-01	AFACT(2)					
DFACT	5.28192E-01	TMAX	0.0	TDUX	0.0	BOMAX	0.0
FPTH	1.58071E-01	N-J PSSM	36467.	TANK AREA	7953.0	NO OF TANK	4.0000
		TDU	-1.0000				
		PROP MASS	2.30699E 05				
		WALL TKNS	0.89017E-01				

***** RESULTS *****

THE OLD VALUE OF LIMED IS 2263871.0

THE NEW VALUE OF LIMED IS 2264914.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1290739.	700998.	273208.
TOTAL INITIAL PROPELLANT MASS	923221.9	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	923221.94	329824.56	68338.12
PROPELLANT TANK DRY MASS	145934.2	32982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	145934.25	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109A31

*** INPUT ITEMS ***

DESIGN PRESSURE 19.76000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNFSS	C.6CC5E	INS. MASS	1125.4	INSUL. MF	5.1569CE-C3	TANK MASS	9413.3	TANK MF	7.54818E-02
VENT PRESS	11.CEE	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	638.12	PRES MF	2.92395E-03
TOT EFF MAS	18237.	TCT EF MF	8.35626E-02	EF MF MAS	0.0	EFF MP MF	0.0	MP PASS	0.0
PCLOFF MAS	0.0	EF RC MAS	C.C	WALL TKAS	C.87209E-01	LENGTH	71.214	VOLUME	51210.
WROACT(1)	C.C	WROACT(2)							
AFACT(1)	6.5275CE-C1	AFACT(2)							
TFACT	5.5E346E-C1	TPAX	C.C	TCU	-1.000C	TANK AREA	G.C	BOMAX	0.0
EPTH	8.35626E-C2	N-J PSSM	18237.	PREP MASS	2.1824CE 05	TANK AREA	7495.8	NO OF TAN	4.0000

THE OLD VALUE OF IMIEC IS 2141609.0

THE NEW VALUE OF IMIEC IS 2141709.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UIC:0421

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1167504.	700598.	273208.
TOTAL INITIAL PROPELLANT MASS	873001.2	325824.6	68338.1
TOTAL OXIDIZER MASS	C.O	C.O	C.O
TOTAL FUEL MASS	873001.19	325824.56	68338.12
PROPELLANT TANK DRY MASS	72950.2	22582.4	7517.2
OXIDIZER TANK DRY MASS	C.O	C.O	C.O
FUEL TANK DRY MASS	72950.25	22582.44	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	O.O	C.O
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	C.O	C.O
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	13263.6	8483.1
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	13263.62	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PFTO PROPELLSION SUBSYSTEM MASS	C.O	C.O	C.O
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	69811.9	O.O	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1062.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.O	C.O	C.O
PAVLAB	C.O	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109N3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TANK MASS	0.14820	INSUL. MF	1.24062E-03
VENT PRESS	4.4565	COAT MF	0.0
TOT EFF MAS	16522.	EF MP MAS	0.0
BOJLFF MAS	0.0	WALL TKNS	6.86280E-01
WBCACT(1)	0.0	TDU	-1.0000
AFACT(1)	0.48391E-01	PKOP MASS	2.17083E 05
UFACT	5.61322E-01	TANK MASS	9027.4
EPH	7.61682E-02	EFF MP MF	0.0
		TANK PRES	454.60
		TANK AREA	7265.9
		TDUX	0.0
		BO MAX	0.0
		NO OF TNK	4.0000
		VOLUME	49371.
		TANK MP	7.27734E-02
		PRES MF	2.09415E-03
		MP MASS	0.0

THE OLD VALUE OF IMIEG IS 2130255.0

THE NEW VALUE OF IMIEG IS 2130117.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U10543L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1155511.	700978.	273208.
TOTAL INITIAL PROPELLANT MASS	868270.1	329824.6	68338.1
TOTAL LAUNCHER MASS	0.0	0.0	0.0
TOTAL FULL MASS	868270.0	329824.56	68338.12
PROPELLANT TANK DRY MASS	66082.9	32982.4	7517.2
LAUNCHER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	66082.87	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105600.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69811.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
TOTAL	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
0111813H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000	INITIAL ENERGY	0.0
INS. TRNESH	14.433	INS. MASS	29600.
VENT PRESS	28.353	COAT MASS	0.0
TOT EFF MAS	62000.	TOT FF MF	2.48663E-01
		INSUL. MF	1.18710E-01
		COAT MF	0.0
		EF MP MAS	0.0
		WALL TKNS	0.14018
		EF BO MAS	0.0
		WBFACT(1)	
		AFACT(2)	
		TMAX	0.0
		N-J PSSM	62000.
		TDU	-1.0000
		PROP MASS	2.49347E 05
		TANK MASS	17792.
		PRES MASS	1267.6
		EFF MP MF	0.0
		LENGTH	84.326
		VOLUME	61750.
		TANK MF	1.24870E-01
		PRES MF	5.08308E-03
		MP MASS	0.0
		BO MAX	0.0
		NO OF TNK	4.0000
		TDUX	0.0
		TANK AREA	8814.0

***** RESULTS *****

THE OLD VALUE OF TIME IS 2446862.0

THE NEW VALUE OF TIME IS 2435248.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

111 041 34

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1461042.	700998.	273208.
TOTAL INITIAL PROPELLANT MASS	992653.2	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	992653.25	329824.56	68338.12
PROPELLANT TANK DRY MASS	246836.5	32982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	246836.50	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
DETON PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MINDOORSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0119031

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1180975.	700998.	273208.
TOTAL INITIAL PROPELLANT MASS	878492.6	325824.6	68338.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	878492.62	325824.56	68338.12
PROPELLANT TANK DRY MASS	80930.1	32582.4	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	90930.12	32582.44	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	C.C	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	13263.62	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19760.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RFTRD PROPELLSION SUBSYSTEM MASS	0.0	0.0	C.C
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	69811.9	C.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	C.C	C.C
PAYLOAD	C.C	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U118A3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C

INITIAL ENERGY C.C

*** RESULTS ***

INS. THNESS 0.21719	INS. MASS 403.34	INSUL. MF 1.85377E-03	TANK MASS 9299.6	TANK MF 7.47980E-02
VENT PRESS 5.0127	CCAT MASS C.C	CCAT MF 0.0	PRES MASS 583.94	PRES MF 2.68305E-03
TOT EFF MAS 17261.	TGT EF MF 7.93356E-02	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
BOILOFF MAS C.C	FF RC MAS C.C	WALL TKNS 0.86538E-01	LENGTH 70.543	VOLUME 50671.
MPACT(1) C.C	MPACT(2)			
AFACT(1) 6.50268E-C1	AFACT(2)			
DFACT 5.6053E-31	TMAX C.C	YDU -1.0000	TDUX 0.C	BOFAX 0.0
EPTH 7.93356E-22	N-J PSSW 17261.	PRCP MASS 2.17575E C5	TANK AREA 7428.3	NO OF TANK 4.0000

THE OLD VALUE OF IMIEC IS 2135084.0

THE NEW VALUE OF IMIEC IS 2135120.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UTILIZATION

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1160915.	703558.	273208.
TOTAL INITIAL PROPELLANT MASS	870315.4	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	870315.37	329824.56	68338.12
PROPELLANT TANK DRY MASS	69047.0	22982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	69047.00	22982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.C								
INS. TKNSS	19.202	INS. MASS	46427.	INSUL. MF	1.73969E-01	TANK MASS	23257.	TANK MF	1.49878E-01		
VENT PPRESS	34.931	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1607.0	PRES MF	5.91799E-03		
TOT EFF MAS	88734.	TOT EF MF	3.26765E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0		
ROIOFF MAS	0.0	FF RD MAS	0.0	WALL TKNS	0.16699	LENGTH	92.856	VOLUME	68616.		
WROACT(1)	0.0	WROACT(2)									
AFACT(1)	8.14809E-01	AFACT(2)									
DEACT	4.49728E-01	TMAX	0.0	TDU	-1.0000	TANK AREA	9671.5	BO MAX	0.0		
FPTH	3.26765E-01	N-J PSSM	88734.	PROP MASS	2.71553E 05	TANK AREA	9671.5	NO OF TNK	4.0000		

***** RESULTS *****

THE OLD VALUE OF IMFD IS 2664772.0

THE NEW VALUE OF IMFD IS 2604885.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1117474

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1623970.	703999.	273208.
TOTAL INITIAL PROPELLANT MASS	1061474.0	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1061474.00	329824.56	68338.12
PROPELLANT TANK DRY MASS	346852.2	32982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	346852.19	32987.44	7517.19
NDP-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19790.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
REFUEL PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS

Fort Worth Division

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N31

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C						
**** RESULTS ****									
INS. THICKNESS	3.4700	INS. MASS	6735.2	INSUL. MF	3.01570E-02	TANK MASS	10301.	TANK MF	8.08187E-02
VENT PRESS	15.000	CCAT MASS	C.C	CCAT MF	0.0	PRES MASS	779.57	PRES MF	3.49520E-03
TOT EFF MAS	25541.	TCT EF MF	1.14511E-01	EF MP MAS	C.C	EFF MP MF	C.C	MF MASS	0.0
POLIOFF MAS	C.C	EF RO MAS	0.0	WALL TRNS	0.92305E-01	LENGTH	73.737	VOLUME	53240.
WFACT(1)	C.C	WFACT(2)							
AFACT(1)	6.70551E-01	AFACT(2)							
EFACT	5.46328E-01	TMAX	C.C	TDU	-1.0000	TDUX	C.C	BOMAX	0.0
EPT	1.14511E-01	N-J PSSH	25541.	FACP MASS	2.23041E 05	TANK AREA	7745.4	NO CF TANK	4.0000

THE OLD VALUE OF IMIEC IS 2186717.0

THE NEW VALUE OF IMIEC IS 2191219.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01127-51

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1217314.	700599.	273206.
TOTAL INITIAL PROPELLANT MASS	893182.4	325824.6	68338.1
TOTAL OXIDIZER MASS	C.C.	C.C.	C.C.
TOTAL FUEL MASS	893182.44	325824.56	68338.12
PROPELLANT TANK DRY MASS	102276.1	32582.4	7517.2
OXIDIZER TANK DRY MASS	C.C.	C.C.	C.C.
FUEL TANK DRY MASS	102279.06	32582.44	7517.15
VTE-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C.	C.C.	C.C.
OXIDIZER SUBSYSTEMS MASS	C.C.	C.C.	C.C.
FUEL SUBSYSTEMS MASS	C.C.	C.C.	C.C.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C.	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C.	C.C.	C.C.
FUEL SUBSYSTEMS MASS	C.C.	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	15497.0	9044.0	5140.0
RFTRD PROPULSION SUBSYSTEM MASS	C.C.	C.C.	C.C.
MICROUSE CORRECTION SUBSYSTEM MASS	63811.9	C.C.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C.	C.C.	C.C.
PAVLOAP	C.C.	273700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY C.O

**** RESULTS ****

INS. TKNESS 0.29224	INS. MASS 553.60	INSUL. MF 2.53873E-C3	TANK MASS 9551.6	TANK MF 7.66530E-02
VENT PRESS 14.891	COAT MASS 0.0	COAT MF 0.0	PRES MASS 726.76	PRES MF 3.33281E-03
TOY EFF MAS 17596.	TCT FF MF 8.25245E-02	EF MP MAS 0.0	EFF MP MF 0.0	PF MASS 0.0
ROILOFF MAS C.O	FF BO MAS C.O	WALL TKNS 0.87536E-01	LENGTH 72.027	VOLUME 51864.
WBOACT(1) 0.0	WBOACT(2)			
AFACT(1) 6.52120E-01	AFACT(2)			
DFACT 5.58799E-C1	TMAX 0.0	TDU -1.000C	TDUX 0.0	BOMAX 0.0
FPTH 8.25245E-C2	N-J PSSH 17996.	PRCP MASS 2.18063E C5	TANK AREA 7577.5	NO CF TAK 4.0000

THE OLD VALUE OF IMIED IS 2139872.0

THE NEW VALUE OF IMIED IS 2140098.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11/27/71

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1165887.	716598.	273208.
TOTAL INITIAL PROPELLANT MASS	877340.4	325824.6	68338.1
TOTAL OXIDIZER MASS	C.O	C.O	C.O
TOTAL FUEL MASS	872340.44	325824.56	68338.12
PROPELLANT TANK DRY MASS	71989.4	32582.4	7517.2
OXIDIZER TANK DRY MASS	C.O	C.O	C.O
FUEL TANK DRY MASS	71989.44	32582.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	C.O	C.O
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	C.O	C.O
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	13263.4	8483.1
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.C	9100.C	5360.C
ENGINE GPM MASS	105000.C	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.C	5044.C	5146.C
RETRO PROPULSION SUBSYSTEM MASS	C.O	C.O	C.O
MICROUSE CORRECTION SUBSYSTEM MASS	69811.9	C.O	9495.C
ATTITUDE CONTROL SUBSYSTEM MASS	17545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.O	C.O	C.O
PAYLOAD	C.O	270700.C	132500.C

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

111 0730

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1287345.	700098.	273208.
TOTAL INITIAL PROPELLANT MASS	927683.4	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	927683.44	329824.56	68338.12
PROPELLANT TANK DRY MASS	138113.3	32982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	138113.31	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INOFF-STAGE STRUCTURE MASS	16497.0	9044.0	5140.0
OFF-RO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
0118V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	11.717	INS. MASS	24574.	INSUL. MF	9.62625E-02	TANK MASS	11483.	TANK MF	7.87205E-02
VERT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	857.72	PRES MF	3.35992E-03
TOT EFF MAS	58987.	TOT EF MF	2.31046E-01	EF PP MAS	0.0	EFF PP MF	0.0	HP MASS	0.0
ROTORFF MAS	18190.	FF RO MAS	13454.	WALL TKNS	0.91816E-01	LENGTH	83.047	VOLUME	60727.
WRFACT(1)	18190.	WRFACT(2)							
AFACT(1)	7.39662E-01	AFACT(2)							
DEACT	4.99549E-01	TMAX	0.0	TDU	110.92	TOUX	0.0	BOMAX	0.0
F0TH	1.78343E-01	N-J PSSM	46528.	PROP MASS	2.55281E 05	TANK AREA	8685.4	NO OF TNK	4.0000

THE OLD VALUE OF TIME IS 2393673.0

THE NEW VALUE OF TIME IS 2400435.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01112434

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1426231.0	700998.0	273208.0
TOTAL INITIAL PROPELLANT MASS	1027340.2	329824.6	68338.1
TOTAL OXIDIZER MASS	C.O.	C.O.	C.O.
TOTAL FUEL MASS	122349.25	329824.56	68338.12
PROPELLANT TANK DRY MASS	182328.6	32982.4	7517.2
OXIDIZER TANK DRY MASS	C.O.	C.O.	0.0
FUEL TANK DRY MASS	182328.56	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O.	0.0	C.O.
OXIDIZER SUBSYSTEMS MASS	C.O.	0.0	C.O.
FUEL SUBSYSTEMS MASS	C.O.	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O.	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	C.O.	0.0	0.0
FUEL SUBSYSTEMS MASS	C.O.	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	C.O.	0.0	C.O.
MIDCOURSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLE MASS	C.O.	C.O.	C.O.
PAVILION	C.O.	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNSS	14.500	INS. MASS	33757.	INSUL. MF	1.22181E-01	TANK MASS	12617.	TANK MF	7.99279E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	931.37	PRES MF	3.37151E-03
TOT EFF MAS	80976.	TOT EF MF	2.93128E-01	EF MF MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
ROIL OFF MAS	31211.	EF RO MAS	24213.	WALL TKNS	0.94124E-01	LENGTH	89.248	VOLUME	65714.
WROACT(1)	31211.	WROACT(2)							
AFACT(1)	7.75741E-01	AFACT(2)							
DFACT	4.75160E-01	TMAX	0.0	TDU	135.55	TDUX	0.0	BOMAX	0.0
SPFH	2.04480E-01	N-J PSSM	56763.	PROP MASS	2.76247E 05	TANK AREA	5308.8	NO OF TNK	4.0000

THE OLD VALUE OF TMIED IS 2516539.0

THE NEW VALUE OF TMIED IS 2520456.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01-27-74

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1555751.	700098.	273208.
TOTAL INITIAL PROPELLANT MASS	1175362.0	329824.6	68338.1
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1175362.0	329824.56	68338.12
PROPELLANT TANK DRY MASS	227335.1	32982.4	7517.2
OXIDIZED TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	227335.06	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS COORDINATION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	17545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
NAVIGATOR	0.0	270700.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V31

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C
INS. THNESS	3.0465	INS. MASS	5911.5
VENT PRESS	14.700	CCAT MASS	C.C
TOT EFF MAS	25281.	TCT EF MF	1.12750E-01
		INSUL. MF	2.63644E-C2
		CCAT MF	0.0
		EF MP MAS	C.C
POILOFF MAS	2021.5	EF RD MAS	1355.4
WFOACT(1)	2021.5	WFOACT(2)	
AFACT(1)	6.7047E-C1	AFACT(2)	
DFACT	5.4637E-01	TMAX	0.0
EDTH	1.066705E-C1	N-J PSSH	23926.
		TEU	250.45
		PREP MASS	2.24224E 05
		WALL THNS	0.88267E-01
		TANK MASS	5865.7
		PREP MASS	749.36
		EFF MP MF	C.C
		LENGTH	73.861
		VOLUME	53339.
		TANK MF	7.69989E-02
		PRES MF	3.34201E-03
		MP PASS	0.0
		BDMAX	0.0
		NO OF TAN	4.0000
		TDLX	C.C
		TANK AREA	7761.5

**** RESULTS ****

THE OLD VALUE OF IMIEC IS 2189512.0

THE NEW VALUE OF IMIEC IS 2188338.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U127031

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STACK MASS	12141.35	70059.8	273208.
TOTAL INITIAL PROPELLANT MASS	395482.7	325824.6	68238.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	89380.75	325824.6	68238.12
PROPELLANT TANK DRY MASS	95701.9	32582.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95701.87	32582.44	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	1970.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOPE CORRECTION SUBSYSTEM MASS	49811.9	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLE MASS	0.0	0.0	0.0
PAVLOAR	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fert Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1263774.	700958.	273208.
TOTAL INITIAL PROPELLANT MASS	927424.7	329824.6	69338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	927424.69	329824.56	69338.12
PROPELLANT TANK DRY MASS	114596.7	32982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	114596.75	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
DETRON PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISOURSE CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
TOTAL DRY MASS	0.0	70700.0	192500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U1IRP3H

** INPUT ITEMS **

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.0				
***** RESULTS *****							
INS. THICKNESS	7.0001	INS. MASS	14662.	INSUL. MF	5.98869E-02	TANK MASS	10930.
VENT PRESS	14.700	COAT MASS	C.0	COAT MF	0.0	PRES MASS	821.03
TOT EFF MASS	48522.	TOT EFF MF	1.85939E-01	EF MP MAS	0.0	EFF MP MF	0.0
ROIL OFF MAS	15238.	FF RD MAS	10911.	WALL TKNS	0.90640E-01	LENGTH	79.954
WFACT(1)	15238.	WFACT(2)					
BFACT(1)	7.16047E-01	BFACT(2)					
DFACT	5.15549E-01	TMAX	0.0	TDU	76.684	TDUX	C.0
EPH	1.41371E-01	N-J DSSM	34611.	PROP MASS	2.44824E 05	TANK AREA	8374.4
						BOMAX	0.0
						NO DF	4.0000
						VOLUME	58239.
						TANK MF	7.81308E-02
						PRES MF	3.35355E-03
						MP MASS	0.0

THE OLD VALUE OF IMF0 IS 2319396.0

THE NEW VALUE OF IMF0 IS 2314534.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

111,0074

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1347332.	707998.	273208.
TOTAL INITIAL PROPELLANT MASS	987294.7	329824.6	68338.1
TOTAL OXIDIZER MASS	C.C	0.C	C.C
TOTAL FUEL MASS	98206.19	329824.56	68338.12
PROPELLANT TANK DRY MASS	138572.9	32982.4	7517.2
OXIDIZER TANK DRY MASS	C.C	0.C	C.C
FUEL TANK DRY MASS	138572.87	32982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	0.C	0.C
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	0.C	0.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.C	0.0	0.C
FUEL SUBSYSTEMS MASS	0.C	13263.82	8483.08
MISCELLANEOUS DEPENDENT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PETROL PRODUCTION SUBSYSTEM MASS	0.C	0.C	0.C
WINDMORSE CORRECTION SUBSYSTEM MASS	69811.9	0.C	0.C
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	0.C	0.C
PAVY TAN	0.C	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
0127P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	19.5462	INS. MASS	18650.	INSUL. MF	7.26391E-02	TANK MASS	11562.	TANK MF	7.88040E-02
VENT PRESS	14.7000	COAT MASS	0.0	COAT MF	0.0	PRES MASS	862.82	PRES MF	3.36056E-03
TOT EFF MAS	56907.	TOT FF MF	2.21644E-01	FF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
COLLOFF MAS	2325.	FF RO MAS	17161.	WALL TKNS	0.91979E-01	LENGTH	83.481	VOLUME	61076.
WROACT(1)	2325.	WROACT(2)							
AFACT(1)	7.35752E-01	AFACT(2)							
DFACT	5.02216E-01	TMAX	0.0	TDU	90.578	TANK AREA	0.0	BOMAX	0.0
FPTH	1.54804E-01	N-J PSSH	39746.	PRCP MASS	2.56750E 05			NO OF TNK	4.0000

THE OLD VALUE OF IMFD IS 2381963.0

THE NEW VALUE OF IMFD IS 2381870.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1477665.	700998.	273208.
TOTAL INITIAL PROPELLANT MASS	127112.1	329824.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	127112.06	329824.56	68338.12
PROPELLANT TANK DRY MASS	159000.6	22982.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	159000.56	22982.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13263.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13263.82	8483.08
MISCELLANEOUS PRODUCTION SUBSYSTEMS MASS	19707.0	9100.0	5300.0
ENGINE DRY MASS	105200.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PRODUCTION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	69811.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	1545.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAP	0.0	272700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127F31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	1.9192	INS. MASS	3714.1	INSUL. MF	1.66161E-02	TANK MASS	9830.0	TANK MF	7.69611E-02
VPNT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	746.52	PRES MF	3.34159E-03
TOT EFF MAS	2356.0	TCT EF MF	1.05427E-01	EF MF MAS	0.0	EFF MP MF	0.0	PF MASS	0.0
ROLOFF MAS	2856.2	FF RC MAS	1501.9	WALL TKNS	0.68165E-01	LENGTH	73.653	VOLUME	53172.0
WROACT(1)	2856.2	WROACT(2)							
AFACT(1)	6.65655E-01	AFACT(2)							
DFACT	5.45506E-01	TMAX	0.0	TCU	211.48	TDLX	0.0	BOMAX	0.0
FPTH	6.66187E-02	N-J PCSM	21663.0	FPCP MASS	2.23522E 05	TANK AREA	7741.0	MC CF TAN	4.0000

THE OLD VALUE OF IMIEC IS 217606J.0

THE NEW VALUE OF IMIEC IS 2176454.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0000000

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	120050.	70059.	273206.
TOTAL INITIAL PROPELLANT MASS	893 47.6	374824.6	68338.1
TOTAL ADJUSTED MASS	0.	0.	0.
TOTAL FUEL MASS	894 47.62	374824.60	68338.12
PROPELLANT TANK DRY MASS	86649.9	32582.6	7517.2
PROXIMATED TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	36649.67	32582.44	7517.19
NON-EXPANDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
ADJUSTED SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPANDABLE PROPELLANT SUBSYSTEMS MASS	0.	13283.8	8483.1
ADJUSTED SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	13283.82	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	14700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
PERIOD PROPELLANT SUBSYSTEM MASS	0.	0.	0.
MISCELLANEOUS PROPELLANT SUBSYSTEM MASS	6911.0	0.	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10545.6	1053.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
TOTAL DRY	0.	27370.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109N9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THKNESS	8.6569	INS. MASS	18437.	INSUL. MF	7.38250E-02	TANK MASS	11186.	TANK MF	7.83870E-02
VENT PRESS	14.645	COAT MASS	0.0	COAT MF	0.0	PRES MASS	836.70	PRES MF	3.35038E-03
TOT EFF MAS	38849.	TOT EF MF	1.55562E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BDILOFF MAS	0.0	EF R0 MAS	0.0	WALL TKNS	0.91188E-01	LENGTH	81.391	VOLUME	59395.
WFOACT(1)	0.0	WFOACT(2)							
AFACT(1)	6.95565E-01	AFACT(2)							
DFACT	5.29406E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	80MAX	0.0
FPTH	1.55562E-01	N-J PSSM	38849.	PROP MASS	2.49734E 05	TANK AREA	8518.8	NO OF TNK	4.0000

THE OLD VALUE OF IMIED IS 2450655.0

THE NEW VALUE OF IMIED IS 2452668.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ100904

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1384575.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	999754.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	999754.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	155524.1	37521.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	155524.12	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109N91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS 0.60536	INS. MASS 1214.8	INSUL. MF 5.12779E-03	TANK MASS 10322.	TANK MF 7.62486E-02
VENT PRESS 10.452	COAT MASS 0.0	COAT MF 0.0	PRES MASS 677.47	PRES MF 2.85963E-03
TUT EFF MAS 19956.	TOT EF MF 8.42360E-02	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
BOILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.89304E-01	LENGTH 76.497	VOLUME 55459.
WBOACT(1) 0.0	WBOACT(2)			
AFACT(1) 6.53209E-01	AFACT(2)			
DFACT 5.58062E-01	TMAX 0.0	TDU -1.0000	TDUX 0.0	BO MAX 0.0
EPTH 8.42360E-02	N-J PSSM 19956.	PRCP MASS 2.36910E 05	TANK AREA 8026.8	NO OF TNK 4.000

THE OLD VALUE OF IMIED IS 2324815.0

THE NEW VALUE OF IMIED IS 2324884.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U109N91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1256791.	795863.	272429.
TOTAL INITIAL PROPELLANT MASS	947666.8	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	947666.81	379215.69	67714.00
PROPELLANT TANK DRY MASS	79827.6	37921.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79827.62	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J169N9L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000	INITIAL ENERGY	1.0	INSUL. MF	1.23769E-03	TANK MASS	9900.1	TANK MF	7.35182E-02
INS. TKNESS	0.14992	INS. MASS	291.67	COAT MF	0.0	PRES MASS	484.88	PRES MF	2.05756E-03
VENT PRESS	4.1298	TOT EF MF	7.68135E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
TOT EFF MAS	18102.	EF BO MAS	0.0	WALL TKNS	1.88346E-01	LENGTH	74.060	VOLUME	53499.
BOILOFF MAS	0.0	WBFACT(2)		TDU	-1.0000	TDUX	0.0	ROMAX	0.0
WBFACT(1)	6.48825E-01	AFACI(2)		PROP MASS	2.35657E 05	TANK AREA	7781.9	NO OF TNK	4.0000
AFACI(1)		TMAX	0.0						
DFACT	5.61028E-C1	N-J PSSM	18102.						
EPH	7.68135E-C2								

THE OLD VALUE OF IMIED IS 2312525.1

THE NEW VALUE OF IMIED IS 2312346.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01/19/91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1244254.	795883.	272429.
TOTAL INITIAL PROPELLANT MASS	342555.1	379215.7	87714.1
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	342555.1	379215.7	87714.1
PROPELLANT TANK DRY MASS	74481.6	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	74481.6	37921.6	7448.5
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14423.3	8397.7
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19710.1	9110.1	5300.1
ENGINE DRY MASS	115000.1	35010.1	35000.1
INTERSTAGE STRUCTURE MASS	14497.1	9044.1	5140.1
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75539.8	0.	9495.1
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPLODABLES MASS	0.	0.	0.
PAYLOAD	0.	30980.1	13250.1

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
ULIRNPH

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNFSS	13.358	INS. MASS	31380.
VENT PRESS	27.221	COAT MASS	0.0
TOT EFF MAS	65536.	TOT FF MF	2.43555E-01
ROILOFF MAS	0.0	EF RO MAS	0.0
WRFACT(1)	0.0	WRFACT(2)	
AFACT(1)	7.51831E-01	AFACT(2)	
DFACT	4.91337E-01	TMAX	0.0
FPTH	2.43555E-01	N-J PSSH	65536.
		TDU	-1.7000
		PROP MASS	2.69082E 05
		WALL TKNS	0.13862
		INSUL. MF	1.16617E-01
		COAT MF	0.0
		EF MP MAS	0.0
		TANK MASS	18757.
		PRES MASS	1332.9
		EFF MP MF	0.0
		LENGTH	90.122
		VOLUME	66417.
		TANK MF	1.21985E-01
		PRES MF	4.95332E-03
		MP MASS	0.0
		BO MAX	0.0
		NO OF TNK	4.0000

THE OLD VALUE OF IMIFO IS 2640529.0

THE NEW VALUE OF IMIFO IS 2631070.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_{mp})

0119W9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1562977.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1072474.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1072474.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	261206.4	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	261206.37	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UL18N91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	1.2797	INS. MASS	2615.1	INSUL. MF	1.09787E-02	TANK MASS	10579.	TANK MF	7.77220E-02
VENT PRESS	14.586	COAT MASS	0.0	CGAT MF	0.0	PRES MASS	794.96	PRES MF	3.33735E-03
TOT EFF MAS	21924.	TOT EF MF	9.20389E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILLOFF MAS	0.0	EF BU MAS	0.0	WALL TKNS	0.89874E-01	LENGTH	77.965	VOLUME	56640.
WBOACT(1)	0.0	WBOACT(2)							
AFACT(1)	6.57683E-01	AFACT(2)							
CFACT	5.55035E-01	IMAX	0.0	IDU	-1.0000	IDUX	0.0	BOOMAX	0.
EPTH	9.20389E-02	N-J PSSM	21924.	PROP MASS	2.38202E 05	TANK AREA	8174.4	NO UF	4.9000

THE OLD VALUE OF IMIEU IS 2337494.0

THE NEW VALUE OF IMIEU IS 2338211.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U118N91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1270118.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	953099.1	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	953099.12	379215.69	67714.00
PROPELLANT TANK DRY MASS	87722.2	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	87722.19	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J1118N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	0.22047	INS. MASS	437.97	INSUL. MF	1.85449E-03	TANK MASS	10163.	TANK MF	7.54533E-02
VENT PRESS	8.1574	COAT MASS	0.0	COAT MF	0.0	PRES MASS	609.58	PRES MF	2.58115E-03
TOT EFF MAS	18667.	TOT EF MF	7.98889E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.88990E-01	LENGTH	75.694	VOLUME	54814.
WBOACT(1)	0.0	WBOACT(2)		TDU	-1.0000	TUOX	0.0	BDMAX	0.0
AFACT(1)	0.50619E-01	AFACT(2)		PROP MASS	2.36168E-05	TANK AREA	7946.2	NO OF TNK	4.0000
DFACT	5.59815E-01	TMAX	0.0						
EPTH	7.98889E-02	N-J PSSM	18667.						

THE OLD VALUE OF IMIED IS 2317537.0

 THE NEW VALUE OF IMIED IS 2317524.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U116N9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1245432.	795661.	272429.
TOTAL INITIAL PROPELLANT MASS	944888.7	379215.7	67714.1
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	344008.75	379215.69	67714.00
PROPELLANT TANK DRY MASS	75488.4	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	75488.37	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	70539.9	0.	3495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	31980.0	132500.0

GENERAL DYNAMICS
Fert Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U127NPH

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	18.562	INS. MASS	47707.	INSUL. MF	1.63934E-01	TANK MASS	24990.	TANK MF	1.50278E-01
VENT PRESS	34.729	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1717.6	PRES MF	5.90223E-03
TOT EFF MAS	93157.	TOT EF MF	3.20115E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
ROI/OFF MAS	0.0	EF RD MAS	0.0	WALL TKNS	0.16881	LENGTH	98.912	VOLUME	73486.
WROACT(1)	0.0	WROACT(2)							
AFACT(1)	8.06552E-01	AFACT(2)							
DFACT	4.54315E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BO MAX	0.0
EPH	3.20115E-01	N-J PSSM	93157.	PROP MASS	2.91010E 05	TANK AREA	10280.	NO OF TNK	4.0000

THE OLD VALUE OF IMIED IS 2855706.0

THE NEW VALUE OF IMIED IS 2808833.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U127N9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1740740.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1144933.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1144933.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	366510.0	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	366510.00	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127N9I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TRNNS	3.2672	INS. MASS	6749.0
VENT PRESS	14.694	COAT MASS	0.0
TOT EFF MAS	26342.	TOT EF MF	1.09266E-01
BOILOFF MAS	0.0	EF 80 MAS	0.0
#BOACT(1)	0.0	#BOACT(2)	
#FACT(1)	6.67470E-01	#FACT(2)	
DFACT	5.48413E-01	TMAX	0.0
EPTH	1.09266E-01	N-J PSSM	26342.
		INSUL. MF	2.79953E-02
		COAT MF	0.0
		EF MP MAS	0.0
		WALL TRNS	0.90214E-01
		TDU	-1.0000
		PROP MASS	2.41078E 05
		TANK MASS	10734.
		PKES MASS	807.91
		EFF MP MF	0.0
		LENGTH	78.844
		VOLUME	57347.
		TANK MF	7.79198E-02
		PRES MF	3.35124E-03
		MP MASS	0.0
		TANK AREA	0.0
		TDUX	0.0
		TANK AREA	8262.9
		3UMAX	0.0
		NO UF TNK	4.00000

THE OLD VALUE OF IMIED IS 2365716.0

THE NEW VALUE OF IMIED IS 2368101.0

GENERAL DYNAMICS
Fort Worth Division

U127N91
MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1300088.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	965315.4	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	965315.44	379215.69	67714.00
PROPELLANT TANK DRY MASS	105476.4	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	105476.37	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
012749L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000

INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	6.27043	INS. MASS	549.10	INSUL. MF	2.31590E-13	TANK MASS	20.6620	TANK MF	7.73562E-02
VENT PRESS	13.760	COAT MASS	0.0	COAT MF	0.0	PRES MASS	767.67	PRES MF	3.24361E-03
TOT EFF MAS	19624.	TOT EF MF	8.29156E-02	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	0.0	EF BU MAS	0.0	WALL TKNS	1.89614E-01	LENGTH	77.295	VOLUME	56101.
WBOACT(1)	0.0	WBOACT(2)	0.0	TDU	-1.00000	TDUX	0.0	RUMAX	0.0
AFACT(1)	0.52383E-01	AFACT(2)	0.0	PROP MASS	4.36673E-05	TANK AREA	817.01	NO OF TNK	4.00000
DFACT	5.58621E-01	TMAX	19624.						
EPTH	8.29156E-02	N-J PSSM							

THE OLD VALUE OF IMIED IS 2322447.0

THE NEW VALUE OF IMIED IS 2322443.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

J1277:0L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	125455.0	79163.3	272429.0
TOTAL INITIAL PROPELLANT MASS	946753.3	375233.7	677140.0
TOTAL OXIDIZER MASS	1.0	0.0	0.0
TOTAL FUEL MASS	946753.3	375233.7	677140.0
PROPELLANT TANK DRY MASS	7871.0	3721.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	7851.0	3721.0	7448.5
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.3	8397.7
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	910.0	530.0
ENGINE DRY MASS	10500.0	3500.0	3500.0
INTERSTAGE STRUCTURE MASS	10497.0	9144.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	7535.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	1151.0	1151.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	31980.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U10999H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKMESS	7.9154	INS. MASS	16927.
VFNT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	38717.	TOT EF MF	1.54339E-01
INSUL. MF	6.74769E-02	INSUL. MF	6.74769E-02
COAT MF	0.0	COAT MF	0.0
EF MP MAS	0.0	EF MP MAS	0.0
ADJL OFF MAS	1816.3	EF RN MAS	1263.1
WRNACT(1)	1816.3	WRNACT(2)	
AFACT(1)	6.95448E-01	AFACT(?)	
DFACT	5.29485E-01	TMAX	0.0
EPFH	1.49304E-01	N-J PSSM	37454.
		YDU	84.655
		PROP MASS	2.50856E 05
		WALL TKNS	0.91320E-01
		TDUX	0.0
		TANK AREA	8553.8
		TANK MASS	11248.
		PRES MASS	842.19
		EFF MP MF	0.0
		LENGTH	81.738
		VOLUME	59674.
		TANK MF	7.84698E-02
		PRES MF	3.35725E-03
		MP MASS	0.0
		BOMAX	0.0
		NO OF TMR	4.0000

THE OLD VALUE OF IMIED IS 2450290.0
 THE NEW VALUE OF IMIED IS 2450356.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01130V04

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1382264.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1003187.9	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1003187.94	379215.69	67714.00
PROPELLANT TANK DRY MASS	149779.8	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	149779.81	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U118V9H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

*0*** RESULTS *0***

DESIGN PRESSURE 19.7000C

INS. TKNESS 11.661	INS. MASS 26964.	INSUL. MF 9.83203E-02	TANK MASS 12507.	TANK MF 7.98107E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 924.21	PRES MF 3.37007E-03
TOT EFF MAS 62339.	TOT EF MF 2.27313E-01	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
BOILOFF MAS 17016.	EF RO MAS 12564.	WALL TKNS 0.93906E-01	LENGTH 88.656	VOLUME 65238.
WFACT(1) 17016.	WFACT(2) 7.38333E-01			
AFACT(1) 5.00470E-01	TMAX 0.0	TDU 116.93	TDX 0.0	60MAX 0.0
EPH 1.81501E-01	N-J PSSM 49775.	PROP MASS 2.74242E 05	TANK AREA 9249.2	NO OF TANK 4.00000

THE OLD VALUE OF IMTED IS 2592344.0

THE NEW VALUE OF IMTED IS 2596358.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U114V04

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1528266.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1099423.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1099423.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	199546.4	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	199546.37	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDCORSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 14.705	INS. MASS 36478.	INSUL. MF 1.22R63E-01	TANK MASS 13767.	TANK MF 8.11431E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 1004.2	PRES MF 3.38224E-03
TOT EFF MAS 85986.	TOT EF MF 2.88264E-01	EF MP MAS 0.0	EFF MP MF 0.0	MP MASS 0.0
BOILOFF MAS 31050.	EF BO MAS 24012.	WALL TKNS 0.96344E-01	LENGTH 95.358	VOLUME 70628.
WFACT(1) 31050.	WFACT(2) 7.77245E-01			
AFACT(1) 4.76848E-01	TMAX 0.0	TNU 140.82	TDUX 0.0	BOMAX 0.0
EPH 2.07318E-01	N-J PSSM 61574.	PROP MASS 2.96903E 05	TANK ARFA 9923.0	NO OF TNK 4.0000

THE OLD VALUE OF IMIED IS 2720755.0

THE NEW VALUE OF IMIED IS 2732776.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0127044

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1664683.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1188836.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1188836.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	246550.6	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	246550.62	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MANCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30900.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127V91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	3.0551	INS. MASS	6323.6	INSUL. MF	2.61704E-02	TANK MASS	10763.	TANK MF	7.79526E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	810.01	PRES MF	3.35225E-03
TOT EFF MAS	26349.	TOT EF MF	1.09045E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	567.81	EF 80 MAS	379.41	WALL TKNS	0.90277E-01	LENGTH	79.010	VOLUME	57480.
MBOACT(1)	567.81	MBOACT(2)							
AFACT(1)	6.08165E-01	AFACT(2)							
DFACT	5.47942E-01	TMAX	0.0	TDU	264.63	TDUX	0.0	HOMAX	0.0
EPTH	1.07475E-01	N-J PSSM	25969.	PROP MASS	2.41631E 05	TANK AREA	8279.5	NO OF TNK	4.0000

***** RESULTS *****

THE OLD VALUE OF IMIEO IS 2367748.0

THE NEW VALUE OF IMIEO IS 2367742.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U127V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1299698.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	966524.4	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	966524.44	379215.69	67714.00
PROPELLANT TANK DRY MASS	103877.2	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	103877.25	37921.55	7446.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1156.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30980.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U109P9H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. THNESS	4.9739	INS. MASS	10649.	INSUL. MF	4.23930E-02	TANK MASS	11267.	TANK MF	7.84893E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	843.34	PRES MF	3.35722E-03
TOT EFF MAS	35691.	TOT EF MF	1.42080E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	6511.8	EF RO MAS	4481.6	WALL TKNS	0.91359E-01	LENGTH	81.840	VOLUME	59756.
WBOACT(1)	6511.8	WBOACT(2)							
AFACT(1)	6.88231E-01	AFACT(2)							
DFACT	5.34367E-01	TMAX	0.0	TDU	57.498	TDUX	0.0	ROMAX	0.0
DEPTH	1.24240E-01	N-J PSSM	31209.	PROP MASS	2.51201E 05	TANK AREA	8564.0	NO OF TNK	4.0000

THE OLD VALUE OF IMFID IS 2427903.0

THE NEW VALUE OF IMFID IS 2427439.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
ANT MASS	1259347.	795443.	272429.
UNEXPOSED MASS	1055169.1	379215.7	67714.0
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	1055169.06	379215.69	67714.00
OXIDIZER TANK DRY MASS	124881.7	37921.6	7448.5
FUEL TANK DRY MASS	0.0	0.0	0.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	124881.69	37921.55	7448.54
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U118P9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	7.0071	INS. MASS	15710.	INSUL. MF	5.92924E-02	TANK MASS	12002.	TANK MF	7.92733E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	891.49	PRES MF	3.36476E-03
TOT EFF MAS	48934.	TOT EF MF	1.84692E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	15842.	EF BO MAS	11330.	WALL TKNS	0.92888E-01	LENGTH	85.907	VOLUME	63027.
WBOACT(1)	15842.	WBOACT(2)							
AFACT(1)	7.15165E-01	AFACT(2)							
DFACT	5.16145E-01	TMAX	0.0	TDU	78.438	TDX	0.0	BO MAX	0.0
EPTH	1.41930E-01	N-J PSSM	37604.	PROP MASS	2.64950E 05	TANK AREA	8972.9	NO OF TNK	4.0000

THE OLD VALUE OF IMIED IS 2513618.0

THE NEW VALUE OF IMIED IS 2508807.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

111100 GH

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1440717.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1060853.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1060853.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	150567.2	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	150567.19	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U127P9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNESS	8.5767	INS. MASS	20C29.	INSUL. MF	7.22152E-02	TANK MASS	12685.	TANK MF	7.99994E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	935.61	PRES MF	3.37179E-03
TOT EFF MAS	60952.	TOT EF MF	2.19661E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
BOILOFF MAS	24205.	EF BO MAS	17789.	WALL TKNS	0.94258E-01	LENGTH	89.614	VOLUME	66008.
WBOACT(1)	24205.	WBOACT(2)							
AFACT(1)	7.34546E-01	AFACT(2)							
DFACT	5.03031E-01	TMAX	0.0	TDU	93.028	TDUX	0.0	BOMAX	0.0
FPTH	1.55586E-01	N-J PSSM	43172.	PROP MASS	2.77482E 05	TANK AREA	9345.5	NO OF TNK	4.0000

***** RESULTS *****

THE OLD VALUE OF IMIED IS 2579143.0

THE NEW VALUE OF IMIED IS 2590758.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11177094

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1512067.	795663.	272429.
TOTAL INITIAL PROPELLANT MASS	1110060.0	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1110060.00	379215.69	67714.00
PROPELLANT TANK DRY MASS	172710.2	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	172710.19	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U1ZTP91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. TKNESS	1.9192	INS. MASS	3976.3	INSUL. MF	1.64376E-02	TANK MASS	10777.	TANK MF	7.79676E-07
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	810.94	PRES MF	3.35240E-3
TOT EFF MAS	25241.	TOT EF MF	1.04345E-01	EF MP MAS	0.0	EFF MP MF	0.0	MP MASS	0.0
***** RESULTS *****									
BOILOFF MAS	2395.6	EF BU MAS	1593.5	WALL TKNS	0.90308E-01	LENGTH	79.089	VOLUME	57544.
WBOACT(1)	2395.6	WBOACT(2)							
AFACT(1)	6.65151E-01	AFACT(2)							
DFACT	5.49982E-01	TMAX	0.0	TDU	222.31	TDUX	0.0	BDMAX	0.0
EPH	9.77576E-02	N-J PSSM	23647.	PROP MASS	2.41899E 05	TANK AREA	8287.5	NU OF TNK	4.0000

THE OLD VALUE OF IMIEO IS 2356968.0

THE NEW VALUE OF IMIEO IS 2357545.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0127P91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1291452.	792663.	272429.
TOTAL INITIAL PROPELLANT MASS	967508.1	379215.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	967508.12	379215.69	67714.00
PROPELLANT TANK DRY MASS	94587.1	37921.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	94587.06	37921.55	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14423.3	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14423.25	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76539.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11561.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS

Fort Worth Division

S E C T I O N 3

M A R S B R A K I N G S T A G E D A T A

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206N2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	15.363	INS. MASS	22450.	INSUL. MF	1.49224E-01	TANK MASS	12411.	TANK MF	1.44368E-01
VENT PRESS	34.870	COAT MASS	0.0	COAT MF	0.0	PRES MASS	818.38	PRES MF	5.43964E-03
TOT EFF MAS	46563.	TOT EF MF	3.09499E-01	EF MP MAS	1574.8	EFF MP MF	1.04674E-02	MP MASS	2780.5
BOILGFF MAS	0.0	EF BU MAS	0.0	WALL TKNS	0.14745	LENGTH	54.798	VOLUME	38008.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	6.14023E-01	AFACT(2)	8.94644E-01	AFACT(3)					
DFACT	5.66379E-01	TMAX	0.0	TDU	-1.0000	TDX	0.0	BOMAX	0.0
EPTH	2.99031E-01	N-J PSSM	44989.	PROP MASS	1.50448E 05	TANK AREA	5845.5	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2098814.0

THE NEW VALUE OF IMIED IS 2093097.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1167477.	236423.	236960.
TOTAL EXHAUST PROPELLANT MASS	863576.8	23922.2	40337.2
TOTAL EXHAUST MASS	C.C.	0.0	0.0
TOTAL FUEL MASS	363576.94	24492.57	80337.25
PROPELLANT TANK DRY MASS	86357.6	29686.2	8837.1
GALVANIZED TANK DRY MASS	C.C.	0.0	0.0
FUEL TANK DRY MASS	86357.62	29686.19	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C.	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12836.9	8916.8
GALVANIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12836.94	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5744.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	66327.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10019.3	933.6	1434.3
MISCELLANEOUS PAYLOADS MASS	C.C.	0.0	0.0
PAYLOAD	0.0	142100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206N2I

*** INPUT ITEMS ***

DESIGN PRESSURE - 19.70000 INITIAL ENERGY C.0

***** RESULTS *****

INS. THICKNESS	2.8006	INS. MASS	7680.9	INSUL. MF	2.72683E-02	TANK MASS	5605.3	TANK MF	7.29355E-02
VENT PRESS	14.688	COAT MASS	0.0	COAT MF	0.0	PRES MASS	410.28	PRES MF	3.05060E-03
TOT EFF MAS	15356.	TOT EF WF	1.14179E-01	EF MP MAS	1455.8	FFF MP MF	1.08247E-02	MP MASS	2296.9
BNLDEF MAS	0.0	FF BO MAS	0.0	WALL TKNS	0.76422E-01	LENGTH	47.318	VOLUME	31992.
WFACT(1)	0.0	WFACT(2)	0.0	WRCFACT(3)					
AFACT(1)	4.41470E-01	AFACT(2)	7.55504E-01	AFACT(3)					
DFACT	6.23817E-01	TMAX	0.0	TDU	-1.7000	TDX	0.0	BOMAX	0.0
EDTH	1.03244E-01	N-J PSSM	13900.	PRMP MASS	1.34492E 05	TANK AREA	5093.5	NO OF TNK	2.0000

THE OLD VALUE OF IMF0 IS 1955724.0

THE NEW VALUE OF IMF0 IS 1908348.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

117-4931

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	177596.0	545430.	286960.
TOTAL INITIAL PROPELLANT MASS	78737.7	249501.8	80337.2
TOTAL OXYGENIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	78737.25	269511.81	80337.25
PROPELLANT TANK DRY MASS	78736.7	27854.2	8837.1
OXYGENIZED TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78736.60	27854.16	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXYGENIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11896.7	8916.8
OXYGENIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11896.70	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	15497.0	9044.0	5140.0
PERTO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59649.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	3310.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVING	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
1J205M2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7900C

INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	0.22314	INS. MASS	281.13	INSUL. MF	2.11426E-03	TANK MASS	5525.6	TANK MF	7.27226E-02
VENT PRESS	14.611P	COAT MASS	0.0	COAT MF	0.0	PRES MASS	397.55	PRES MF	2.98984E-03
TOT EFF MAS	11709.	TOT EF MF	8.87342E-02	EF MP MAS	1450.4	EFF MP MF	1.09076E-02	MP MASS	2262.3
ROILOFF MAS	0.0	FF RD MAS	0.0	WALL TKNS	0.76141E-01	LENGTH	46.782	VOLUME	31561.
WROACT(1)	0.0	WROACT(2)	0.0	WROACT(3)					
AFACT(1)	4.22892E-01	AFACT(2)	7.40458E-01	AFACT(3)					
DFACT	6.41105E-01	TMAX	0.0	TDU	-1.000C	TDUX	0.0	ROMAX	0.0
EDTH	7.78266E-02	N-J PSSM	1.7249.	PROP MASS	1.32948E 05	TANK ARFA	5039.6	NO OF TNK	2.0000

THE OLD VALUE OF IMPED IS 1886742.0

THE NEW VALUE OF IMPED IS 1887040.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01204N 7

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	17654.72	534679.	286960.
TOTAL INITIAL PROPELLANT MASS	778575.64	265982.2	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	778575.64	265982.19	80337.25
PROPELLANT TANK DRY MASS	77857.5	20700.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77857.50	20700.48	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11819.4	8916.8
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11819.35	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RFTRD PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MINDOURSE CORRECTION SUBSYSTEM MASS	58879.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8894.1	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLRAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212N2H

** INPUT ITEMS **

DESIGN PRESSURE 19.70000 INITIAL ENERGY G.C

**** RESULTS ****

INS. TKNESS	19.820	INS. MASS	30724.	INSUL. MF	1.93496E-01	TANK MASS	15636.	TANK MF	1.72331E-01
VENT PRESS	42.433	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1005.1	PRES MF	6.32983E-03
TOT EFF MAS	60707.	TOT EF MF	3.82324E-01	EF MP MAS	1614.4	EFF MP MF	1.01672E-02	MP MASS	3008.9
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.17512	LENGTH	58.333	VOLUME	40850.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	6.90384E-01	AFACT(2)	9.56217E-01	AFACT(3)					
DFACT	5.36534E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BO MAX	0.0
EPTH	3.72157E-01	N-J PSSH	59093.	PROP MASS	1.58785E 05	TANK AREA	6206.8	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2200022.0

THE NEW VALUE OF IMIED IS 2173224.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212N2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1207198.	679071.	286960.
TOTAL INITIAL PROPELLANT MASS	896652.9	313131.4	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	896652.94	313131.37	80337.25
PROPELLANT TANK DRY MASS	89665.2	116534.0	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89665.25	116534.00	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13227.8	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13227.76	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69226.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10457.1	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212N2I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. TRNFS	3.43R3	INS. MASS	4507.2
VENT PRESS	21.817	COAT MASS	0.0
TOT EFF MAS	19818.	TOT EF MF	1.45015E-01
INSUL. MF	3.29813E-02	INSUL. MF	3.29813E-02
COAT MF	0.0	COAT MF	0.0
EF MP MAS	1492.8	EF MP MAS	1492.8
EF RD MAS	0.0	WALL TKNS	0.10054
WRDFACT(1)	0.0	WRDFACT(1)	0.0
AFAC(1)	4.67381E-01	AFAC(1)	7.76398E-01
DEACT	6.2369CE-01	TDU	-1.0000
FPTH	1.34091E-01	PRDP MASS	1.36660F 05
		TANK MASS	7591.7
		PRES MASS	532.33
		EFF MP MF	1.09233E-02
		LENGTH	48.811
		VOLUME	33193.
		TANK AREA	0.0
		TANK NO OF TNK	5243.6
		BO MAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF TMFO IS 1031623.0

THE NEW VALUE OF TMFO IS 1934258.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11212427

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1099144.	558856.	286960.
TOTAL INITIAL PROPELLANT MASS	798346.1	273865.1	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	798346.12	273865.12	80337.25
PROPELLANT TANK DRY MASS	79834.6	35723.0	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79834.56	36722.98	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12090.5	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12090.46	8916.81
MISCELLANEOUS PROVISION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	15497.0	9044.0	5140.0
RETRO PROPELLSION SUBSYSTEM MASS	0.0	0.0	0.0
WIDOWIFE CORRECTION SUBSYSTEM MASS	60611.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9155.8	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UP12N2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0						
INS. TKNFSS	C.07214	INS. MASS	1106.4	INSUL. MF	8.29617E-03	TANK MASS	5874.2	TANK MF	7.70799E-02
VENT PRESS	15.946	COAT MASS	0.0	COAT MF	0.0	PRES MASS	426.80	PRES MF	3.20018E-03
TOT EFF MAS	13273.	TOT FF MF	9.95259F-02	EF MP MAS	1460.3	EFF MP MF	1.09498E-02	MP MASS	2284.8
RDILDF MAS	0.0	EF BD MAS	0.0	WALL TKNS	0.80388E-01	LENGTH	47.130	VOLUME	31841.
WRFACT(1)	0.0	WRFACT(2)	2.0	WRFACT(3)					
AFACT(1)	4.27789E-01	AFACT(2)	7.44473F-01	AFACT(3)					
DFACT	6.39164E-01	TMAX	0.0	TDI	-1.0000	TDUX	0.0	BDMAX	0.0
FPTH	8.45761E-02	N-J PSSW	11813.	PRNP MASS	1.33367E 05	TANK ARFA	5074.6	NO OF TANK	2.0000

**** RESULTS ****

THE OLD VALUE OF TIME IS 1891627.0

THE NEW VALUE OF TIME IS 1895992.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0121202

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1069838.	529196.	286960.
TOTAL INITIAL PROPELLANT MASS	782269.3	267453.1	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	782269.31	267453.06	80337.25
PROPELLANT TANK DRY MASS	79224.9	23690.0	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79226.97	23689.96	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11875.8	8916.8
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11875.85	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	175000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59202.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	3943.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218N2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY C.0

**** RESULTS ****

INS. TKNESS 22.687	INS. MASS 36846.	INSUL. MF 2.25531E-01	TANK MASS 20155.	TANK MF 2.15888E-01
VENT PRESS 53.774	COAT MASS 0.0	COAT MF 0.0	PRES MASS 1256.4	PRES MF 7.68993E-03
TOT EFF MAS 75042.	TOT EF MF 4.59317E-01	EF MP MAS 1667.8	EFF MP MF 1.02081E-02	MP MASS 3199.0
BOILOFF MAS C.0	EF BO MAS 0.0	WALL TKNS 0.21545	LENGTH 61.273	VOLUME 43215.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 7.29266E-01	AFACT(2) 9.87570E-01	AFACT(3) 0.0		
DFACT 5.21339E-01	TMAX 0.0	TOU -1.0000	TDUX C.0	BOMAX 0.0
EPH 4.49109E-01	N-J PSSM 73374.	PROP MASS 1.63376E 05	TANK AREA 6496.4	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2256006.0

 THE NEW VALUE OF IMIED IS 2265673.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218N2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	125300.3	72571.4	28696.0
TOTAL INITIAL PROPELLANT MASS	934796.4	328349.0	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	934796.44	328349.00	80337.25
PROPELLANT TANK DRY MASS	93479.6	147464.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	93479.56	147464.50	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13723.3	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13723.29	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	72568.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10962.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U71A21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0						
INS. TKNFSS	1.8967	INS. MASS	5262.4	INSUL. MF	3.78679E-02	TANK MASS	9669.5	TANK WF	1.21766E-01
VENT PRESS	28.740	COAT MASS	0.0	COAT MF	0.0	PRES MASS	654.33	PRES WF	4.70849E-03
TOT EFF MAS	24260.	TOT FF MF	1.75354E-01	EF MP MAS	1530.2	EFF MP MF	1.10112E-02	MP MASS	2495.2
BOILOFF MAS	0.0	FF BO MAS	0.0	WALL TKMS	0.12431	LENGTH	50.386	VOLUME	34459.
WROACT(1)	0.0	WROACT(2)	0.0	WROACT(3)					
AFACT(1)	4.04098E-01	AFACT(2)	7.97941E-01	AFACT(3)					
CFACT	6.1248E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	BOMAX	0.0
FOTH	1.64343E-01	N-J PSSM	22839.	PRCP MASS	1.38967E 05	TANK AREA	5401.9	NO OF TMK	2.0000

***** RESULTS *****

THE OLD VALUE OF TIME IS 1959754.0

THE NEW VALUE OF TIME IS 1962008.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1107546.	572505.	286960.
TOTAL INITIAL PROPELLANT MASS	909506.7	278299.7	80337.2
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	809506.75	278299.69	80337.25
PROPELLANT TANK DRY MASS	80950.6	45736.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	80950.62	45736.49	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12291.0	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12291.04	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETON PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDMORSE CORRECTION SUBSYSTEM MASS	61599.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9303.6	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21ANPL

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. TKNESS	0.98197	INS. MASS	1277.4	INSUL. MF	9.45775E-03	TANK MASS	7683.6	TANK MF	9.95559E-02
VENT PRESS	22.500	COAT MASS	0.0	COAT MF	0.0	PRES MASS	536.75	PRES MF	3.97405E-03
TOT EFF MAS	16755.	TOT FF MF	1.24950E-01	FF MP MAS	1494.1	EFF MP MF	1.10624E-02	MP MASS	2367.6
ROUOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.12255	LENGTH	48.411	VOLUME	32871.
WFACT(1)	0.0	WFACT(?)	0.0	WFACT(1)					
AFACT(1)	4.48516E-01	AFACT(?)	7.61186E-01	AFACT(1)					
DFACT	6.31764E-01	TMAX	0.0	TCJ	-1.0000	TDUX	0.0	BOMAX	0.0
FDTH	1.12988E-01	N-J PSSM	15260.	PRNP MASS	1.35063E 05	TANK AREA	5203.4	NO OF TNK	2.0000

THE OLD VALUE OF TIME IS 1912319.0

THE NEW VALUE OF TIME IS 1916765.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11210471

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1087130.	549677.	286960.
TOTAL INITIAL PROPELLANT MASS	792840.2	270254.3	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	790840.19	270254.31	80337.25
PROPELLANT TANK DRY MASS	79083.9	30603.2	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79083.94	30603.19	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12042.0	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12042.00	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	59953.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9056.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
UJ06V2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	12.158	INS. MASS	17462.	INSUL. MF	1.11352E-01	TANK MASS	6690.4	TANK MF	7.38156E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	486.81	PRES MF	3.06913E-03
TOT EFF MAS	45250.	TOT EF MF	2.85291E-01	EF MP MAS	1593.0	EFF MP MF	1.00429E-02	MP MASS	2758.3
BOILOFF MAS	15431.	EF BO MAS	13600.	WALL TKNS	0.79955E-01	LENGTH	54.455	VOLUME	37732.
WBFACT(1)	0.0	WBFACT(2)	15831.	WBFACT(3)					
AFACT(1)	5.85518E-01	AFACT(2)	8.71659E-01	AFACT(3)					
DFACT	5.77519E-01	TMAX	0.0	TDU	121.14	TOUX	0.0	BOMAX	0.0
EPTH	1.88236E-01	N-J PSSM	29857.	PROP MASS	1.58615E-05	TANK ARFA	5811.0	NO OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IATED IS 2.63717.0

THE NEW VALUE OF IATED IS 2068160.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1155441.	92001.	286960.
TOTAL INITIAL PROPELLANT MASS	57954.1	31737.1	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	85334.6	31737.6	80337.25
PROPELLANT TANK DRY MASS	55330.4	59734.3	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	85330.37	59734.33	8837.09
JM-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12812.4	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12812.41	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	13720.0	9100.0	5300.0
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTER-STAGE STRUCTURE MASS	10497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	85427.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	7883.3	433.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVEL AD	0.0	132100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U236V21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	J.J
*** RESULTS *****			
INS. TKNESS	2.7212	INS. MASS	3472.7
VENT PRESS	14.750	COAT MASS	J.C
TOT EFF MAS	15342.	TOT EF MF	1.13755E-01
BOILOFF MAS	212.16	EF BO MAS	166.76
WFACT(1)	0.0	WFACT(2)	212.16
AFACT(1)	4.44195E-01	AFACT(2)	7.57732E-01
DFACT	6.32752E-01	TMAX	J.C
EPTH	1.01752E-01	N-J PSSM	13723.
		PROP MASS	265.53
		TANK MASS	1.34865E 05
		INSUL. MF	2.57497E-02
		COAT MF	0.0
		EF MP MAS	1458.0
		WALL TKNS	0.75481E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	0.0
		TANK AREA	5104.8
		TDUX	0.0
		BO MAX	0.0
		NO OF TNK	2.0000
		TANK MASS	5622.0
		PRES MASS	411.63
		EFF MP MF	1.08106E-02
		LENGTH	47.430
		VOLUME	32082.
		TANK MF	7.29507E-02
		PRES MF	3.05217E-03
		MP MASS	2304.2

THE OLD VALUE OF IMIED IS 19J7960.0
 THE NEW VALUE OF IMIED IS 1908004.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UNIT

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL WEIGHT	1,717,000	545,257	285,900
TOTAL INITIAL PROPELLANT MASS	747,225.4	2,697,311.4	5,033,372
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	747,225.37	2,697,311.37	5,033,372.5
PROPELLANT TANK DRY MASS	747,225.5	2,744,518	5,033,371
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	747,225.50	2,744,518.1	5,033,370.9
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	119,225.4	891,608
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	119,225.38	891,608.1
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	1,370,000	910,000	530,000
ENGINE DRY MASS	1,000,000	3,500,000	3,500,000
INTERSTAGE STRUCTURE MASS	1,643,700	90,440	51,400
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	5,637,000	0.0	949,500
ATTITUDE CONTROL SUBSYSTEM MASS	3,000,000	933,600	143,400
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	1,421,000	1,325,000

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.C						
INS. THICKNESS	12.507	INS. MASS	19339.	INSUL. MF	1.12962E-01	TANK MASS	7274.0	TANK MF	7.43549E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	526.94	PRES MF	3.07795E-03
TOT EFF MAS	57384.	TOT EF MF	3.35195E-01	EF MP MAS	1685.4	EFF MP MF	9.84481E-03	MP MASS	2998.9
BUJLOFF MAS	26426.	FF RD MAS	23103.	WALL TKNS	0.81669E-01	LENGTH	58.177	VOLUME	40725.
WBOACT(1)	2790.2	WBOACT(2)	23636.	WBOACT(3)					
AFACT(1)	6.25179E-01	AFACT(2)	9.03639E-01	AFACT(3)					
DFACT	5.62018E-01	TMAX	0.0	TDU	104.70	TDX	C.0	BDMAX	0.0
EPH	1.90345E-01	N-J PSSM	32595.	PROP MASS	1.71198E 05	TANK AREA	6185.1	NO OF TMK	2.0000

***** RESULTS *****

THE OLD VALUE OF IMIED IS 2112932.0

THE NEW VALUE OF IMIED IS 2121332.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_{mp})

0112704

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1174730.	255644.	286960.
TOTAL INITIAL PROPELLANT MASS	872447.9	341227.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	872447.87	341227.25	80337.25
PROPELLANT TANK DRY MASS	87294.7	64968.0	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	87294.75	64967.98	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13271.2	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13271.24	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	350000.0	350000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67148.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	1.143.3	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	J.0						
***** RESULTS *****									
INS. TKNESS	3.1576	INS. MASS	4061.9	INSUL. MF	2.91708E-02	TANK MASS	5815.8	TANK MF	7.30917E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	425.45	PRES MF	3.05545E-03
TOT EFF MAS	19318.	TOT EF MF	1.36732E-01	EF MP MAS	1491.4	EFF MP MF	1.07108E-02	MP MASS	2387.9
***** RESULTS *****									
BOILOFF MAS	4581.2	FF RD MAS	3161.4	WALL TKNS	0.77149E-01	LENGTH	48.725	VOLUME	33124.
WBOACT(1)	0.0	WBOACT(2)	4081.2	WBOACT(3)					
AFACT(1)	4.65136E-01	AFACT(2)	7.74587E-01	AFACT(3)					
DFACT	6.24568E-01	TMAX	0.0	TIX	242.89	TDOX	0.0	BOMAX	0.0
EPTH	1.05318E-01	N-J PSSW	14665.	PROP MASS	1.39244E 05	TANK AREA	5235.0	NO OF TNK	2.0000

THE OLD VALUE OF IMF0 IS 192931.0

THE NEW VALUE OF IMF0 IS 1929486.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1201

	STAGE 1	STAGE 2	STAGE 3
TOTAL DRY MASS	1,204,330	356,035	286,950
TOTAL TOTAL MASS	790,447	172,515.1	80,337.2
TOTAL WET MASS	0	0	0
TOTAL WET MASS	790,447.5	172,515.1	80,337.25
PROPELLANT TANK DRY MASS	790,447	29,332.0	8,837.1
OXIDIZER TANK DRY MASS	0	0	0
FUEL TANK DRY MASS	790,447.1	29,332.01	8,837.09
NON-DEPENDABLE PROPPELLANT SUBSYSTEMS MASS	0	0	0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	0	0
DEPENDABLE PROPPELLANT SUBSYSTEMS MASS	0	120,703	8,916.8
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	120,702.7	8,916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197,000	91,000	53,000
ENGINE DRY MASS	1,050,000	350,000	350,000
INTERSTAGE STRUCTURE MASS	16,437.0	90,440	51,400
RETRO PROPULSION SUBSYSTEM MASS	0	0	0
MISCELLANEOUS PROPELLANT SUBSYSTEM MASS	50,413.7	0	9,495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9,125.9	533.6	14,340.3
MISCELLANEOUS ROCKETRY MASS	0	0	0
PAGE 1	0	1,421	122,500

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	0.80413	INS. MASS	1021.7	INSUL. MF	7.61847E-03	TANK MASS	5588.6	TANK MF	7.29272E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	409.24	PRES MF	3.05161E-03
TOT EFF MAS	13182.	TOT FF MF	9.92931E-02	EF MP MAS	1460.5	EFF MP MF	1.08905E-02	MP MASS	2289.7
ROUOFF MAS	682.97	EF 80 MAS	510.32	WALL TKNS	0.76364E-01	LENGTH	47.206	VOLUME	31902.
WRFACT(1)	0.0	WRFACT(2)	682.97	WRFACT(3)					
AFACT(1)	4.31135E-01	AFACT(2)	7.47171E-01	AFACT(3)					
DFACT	6.37857E-01	TMAX	C.0	TMJ	311.66	TDUX	0.0	80MAX	0.0
DEPTH	8.35972E-C2	N-J PSSM	11211.	PROP MASS	1.34107E 05	TANK AREA	5082.2	NO OF TANK	2.0000

THE OLD VALUE OF IMF0 IS 1894929.0

THE NEW VALUE OF IMF0 IS 1894985

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	176910.	518688.	286960.
TOTAL INITIAL PROPELLANT MASS	781853.6	268215.6	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	781853.62	268215.56	80337.25
PROPELLANT TANK DRY MASS	78185.3	22422.1	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78185.31	22422.06	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11873.4	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11873.40	8916.81
MISCELLANEOUS POPULATION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
BEYON POPULATION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59166.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8937.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218V2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7600C INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 13.717	INS. MASS 22101.	INSUL. MF 1.22830E-01	TANK MASS 7686.1	TANK MF 7.47541E-02
VENT PRESS 14.70C	COAT MASS 0.0	COAT MF 0.0	PRES MASS 554.60	PRES MF 3.08227E-03
TOT EFF MAS 66376.	TOT EF MF 3.68899E-01	EF MP MAS 1735.2	EFF MP MF 9.64355E-03	MP MASS 3165.8
ROILOFF MAS 33787.	EF RO MAS 28535.	WALL TKNS 0.82819E-01	VOLUME 42803.	
WBOACT(1) 10926.	WBOACT(2) 2286J.	WBOACT(3)		
AFACT(1) 6.6C809E-01	AFACT(2) 9.32370E-01	AFACT(3)		
DFACT 5.48094E-01	TMAX 0.0	TDJ 118.02	TDUX 0.0	BOMAX 0.0
EPTH 2.00667E-01	N-J PSSM 36106.	PROP MASS 1.79932E 05	TANK AREA 6444.8	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2159515.0

THE NEW VALUE OF IMIED IS 2157512.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

12-1-724

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	11,235.82	8,819.76	2,869.60
TOTAL INITIAL PROPELLANT MASS	8,811.52	3,599.39	6,037.42
TOTAL OXIDIZER MASS	0.00	0.00	0.00
TOTAL FUEL MASS	8,811.52	3,599.39	6,037.42
PROPELLANT TANK DRY MASS	8,811.52	7,227.09	8,837.01
OXIDIZER TANK DRY MASS	0.00	0.00	0.00
FUEL TANK DRY MASS	8,811.52	7,227.09	8,837.01
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.00	0.00	0.00
OXIDIZER SUBSYSTEMS MASS	0.00	0.00	0.00
FUEL SUBSYSTEMS MASS	0.00	0.00	0.00
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.00	1,362.70	891.68
OXIDIZER SUBSYSTEMS MASS	0.00	0.00	0.00
FUEL SUBSYSTEMS MASS	0.00	1,362.70	891.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1,970.00	910.00	530.00
ENGINE DRY MASS	1,050.00	350.00	350.00
INTERSTAGE STRUCTURE MASS	1,497.00	904.00	514.00
RETRO PROPULSION SUBSYSTEM MASS	0.00	0.00	0.00
MIDCOURSE CORRECTION SUBSYSTEM MASS	6,787.70	0.00	9,495.00
ATTITUDE CONTROL SUBSYSTEM MASS	1,251.90	933.60	1,434.30
MISCELLANEOUS EXPENDABLES MASS	0.00	0.00	0.00
PAVLIAN	0.00	1,210.00	1,325.00

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1213V21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1,907.36	366.97	286.96
TOTAL INITIAL PROPELLANT MASS	834668.4	287056.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	834668.37	287056.25	80337.25
PROPELLANT TANK DRY MASS	83466.7	31120.1	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	83466.75	31120.06	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12233.7	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12233.66	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICRO-COURSE CORRECTION SUBSYSTEM MASS	61165.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9239.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21RV2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	0.98744	INS. MASS	1151.4	INSUL. MF	8.36028E-03	TANK MASS	5748.1	TANK MF	7.30414E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	420.64	PRES MF	3.05432E-03
TOT EFF MAS	161RR.	TOT EF MF	1.17547E-01	EF MP MAS	1489.3	EFF MP MF	1.08142E-02	MP MASS	2358.7
ROILOFF MAS	4034.0	FF BO MAS	3067.9	WALL TKNS	0.76918E-01	LENGTH	48.274	VOLUME	32761.
WROACT(1)	0.0	WROACT(2)	4034.0	WROACT(3)					
AFACT(1)	4.47652E-01	AFACT(2)	7.50489E-01	AFACT(3)					
DFACT	6.31402E-01	TMAX	0.0	TDU	283.19	TDUX	0.0	BOMAX	0.0
EPTH	8.44559E-02	N-J PSSH	11631.	PRNP MASS	1.37719E 05	TANK AREA	5189.6	NO OF TNK	2.0000

THE OLD VALUE OF IMJEN IS 1911444.0

THE NEW VALUE OF IMJEN IS 1911224.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1/21/67

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1077395.	546882.	286960.
TOTAL INITIAL PROPELLANT MASS	788553.7	275431.6	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	788553.60	275431.56	80337.25
PROPELLANT TANK DRY MASS	78855.3	23261.8	8837.1
OXIDIZER BULK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78855.31	23261.82	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12011.4	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12011.38	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19707.0	9103.0	5300.0
ENGINE DRY MASS	105300.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59753.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9026.2	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAN	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS.
UZ06P2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THNESS	7.5918	INS. MASS	10560.	INSUL. MF	7.02557E-02	TANK MASS	6312.1	TANK MF	7.34873E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	460.45	PRES MF	3.06330E-03
TOT EFF MAS	33074.	TOT EF MF	2.20035E-01	EF MP MAS	1554.1	EFF MP MF	1.03391E-02	MP MASS	2599.5
BOILOFF MAS	11392.	EF BO MAS	9453.1	WALL TKNS	0.78780E-01	LENGTH	51.999	VOLUME	35757.
WBOACT(1)	0.0	WBOACT(2)	11392.	WBOACT(3)					
AFACT(1)	5.33526E-01	AFACT(2)	8.29735E-01	AFACT(3)					
DFACT	5.97839E-01	TMAX	0.0	TDU	76.415	TDUX	0.0	ROMAX	0.0
EPTH	1.46808E-01	N-J PSSM	22067.	PROP MASS	1.50313E 05	TANK AREA	5564.1	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2003069.C

THE NEW VALUE OF IMIED IS 2003519.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U206P2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1123114.	593449.	286960.
TOTAL INITIAL PROPELLANT MASS	826634.1	300641.7	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	826634.06	300641.75	80337.25
PROPELLANT TANK DRY MASS	82663.4	44136.1	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	82663.37	44136.16	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12493.4	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12493.35	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	63090.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9530.3	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U706P2I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNMSS	1.7084	INS. MASS	2184.3	INSUL. MF	1.61574E-02	TANK MASS	5636.3	TANK MF	7.29607E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	412.65	PRES MF	3.05240E-03
TOT FFE MAS	14787.	TOT EF MF	1.09380E-01	EF MP MAS	1465.1	EFF MP MF	1.08374E-02	MP MASS	2310.4
ROILOFF MAS	1141.1	FF BN MAS	861.40	WALL TKNS	0.76531E-01	LENGTH	47.526	VOLUME	32159.
WROACT(1)	0.0	WROACT(2)	1141.1	WROACT(3)					
AFACT(1)	4.40649E-01	AFACT(2)	7.54842E-01	AFACT(3)					
DFACT	6.34138E-01	TMAX	0.0	TDU	218.95	TDUX	0.0	BCMAX	0.0
FPTH	9.21704E-02	N-J PSSM	12460.	PROP MASS	1.35189E 05	TANK AREA	5114.4	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 1904400.0

THE NEW VALUE OF IMIED IS 1904299.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11204031

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1073354.	543397.	286960.
TOTAL INITIAL PROPELLANT MASS	785686.9	270374.7	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	785686.87	270374.75	80337.25
PROPELLANT TANK DRY MASS	785686.6	24920.6	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	785686.62	24920.55	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11914.7	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11914.69	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	1497.0	9044.0	5140.0
RYDRO PROPELLSION SUBSYSTEM MASS	0.0	0.0	0.0
MINDRSE CORRECTION SUBSYSTEM MASS	59573.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9980.4	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U210P2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 7.8169	INS. MASS 11245.	INSUL. MF 7.17586E-02	TANK MASS 6603.0	TANK MF 7.37380E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 480.72	PRES MF 3.06766E-03
TOT EFF MAS 38007.	TOT EF MF 2.42537E-01	EF MP MAS 1606.3	EFF MP MF 1.02507E-02	MP MASS 2721.8
BOILOFF MAS 17067.	EF 80 MAS 13120.	WALL TKNS 0.79688E-01	LENGTH 53.890	VOLUME 37278.
WBOACT(1) 4484.6	WBOACT(2) 12582.	WBOACT(3)		
AFACT(1) 5.53119E-01	AFACT(2) 8.45534E-01	AFACT(3)		
DFACT 5.90183E-01	TMAX 0.0	TDU 73.902	TDUX 0.0	BOMAX 0.0
EPTH 1.48564E-01	N-J PSSM 23281.	PROP MASS 1.56706E 05	TANK AREA 5754.2	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2025432.0

THE NEW VALUE OF IMIED IS 2025753.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218P2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	112939.0	66886.6	28696.0
TOTAL INITIAL PROPELLANT MASS	83186.1	313340.8	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	83186.12	313340.81	80337.25
PROPELLANT TANK DRY MASS	83185.9	46551.2	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	83185.94	46551.23	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12736.3	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12736.31	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	63548.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9599.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212P21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNFSS 1.9502	INS. MASS 2523.9	INSUL. MF 1.83847E-02	TANK MASS 5728.8	TANK MF 7.30273E-02
VENT PPRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 419.27	PRES MF 3.05401E-03
TOT EFF MAS 16707.	TOT FF MF 1.21700E-01	FF MP MAS 1481.4	EFF MP MF 1.07910E-02	MP MASS 2350.4
ROILOFF MAS 2959.0	EF RD MAS 2257.4	WALL TKNS 0.76852E-01	LENGTH 48.146	VOLUME 32657.
WROACT(1) 0.0	WROACT(2) 2959.0	WROACT(3) 0.0		
AFACT(1) 4.50513E-01	AFACT(2) 7.62796E-01	AFACT(3) 0.0		
DFACT 6.30283E-01	TMAX 0.0	TDU 195.51	TDUX 0.0	BOHAX 0.0
EDTH 9.44659E-02	N-J PSS# 12969.	PROP MASS 1.37284E 05	TANK AREA 5176.7	NO OF TNK 2.0000

THE OLD VALUE OF IMF0 IS 1914340.0

THE NEW VALUE OF IMF0 IS 1914778.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

41210021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1079144.	548675.	286960.
TOTAL INITIAL PROPELLANT MASS	790020.2	274565.7	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	790020.19	274565.75	80337.25
PROPELLANT TANK DRY MASS	79001.9	25937.1	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79001.94	25937.10	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11994.8	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11994.82	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MICROURSE CORRECTION SUBSYSTEM MASS	59881.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9045.6	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAULOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 0.50978	INS. MASS 641.56	INSUL. MF 4.79401E-03	TANK MASS 5576.2	TANK MF 7.29187E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 408.36	PRES MF 3.05138E-03
TOT EFF MAS 12715.	TOT FF MF 9.50089E-02	EF MP MAS 1459.4	EFF MP MF 1.09053E-02	MP MASS 2264.3
BNLOFF MAS 599.75	EF RO MAS 446.91	WALL TKNS 0.76320E-01	LENGTH 47.123	VOLUME 31835.
WFOACT(1) 0.0	WFOACT(2) 599.75	WFOACT(3) 0.0		
AFACT(1) 4.28500E-01	AFACT(2) 7.45046E-01	AFACT(3) 0.0		
DFACT 6.38866E-01	TMAX 0.0	YD1 291.68	TDUX 0.0	ROMAX 0.0
EPYH 8.07639E-02	N-J PSSM 10808.	PROP MASS 1.33826E 05	TANK APEA 5073.9	NO OF TANK 2.0000

THE OLD VALUE OF IMFD IS 1892324.0

THE NEW VALUE OF IMFD IS 1892347.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212P2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	104798.3	537307.	286560.
TOTAL INITIAL PROPELLANT MASS	783724.6	267650.4	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	783724.6	267650.37	80337.25
PROPELLANT TANK DRY MASS	783724.6	21616.5	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78372.37	21616.50	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11862.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11862.60	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	59067.3	0.0	0495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9222.6	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218P2H

*** INPUT ITEMS ***

DESIGN PRESSURE	9.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	8.51	INSUL. MF	7.76569E-02
VENT PRESS	14.7	COAT MF	0.0
TOT EFF MAS	4235	TOT EF MF	2.61500E-01
BOILOFF MAS	2139	EF BO MAS	15651.
WBOACT(1)	9344	WBOACT(2)	12053.
AFACT(1)	5.6833E-01	AFACT(2)	8.57833E-01
DFACT	5.8423E-01	TMAX	0.0
EPTH	1.5403E-01	N-J PSSM	25051.
		TDU	79.668
		PROP MASS	1.61953E 05
		TANK MASS	6899.1
		PRES MASS	47.339
		EFF MP MF	1.03203E-02
		TANK MF	7.39542E-02
		PRES MF	3.07119E-03
		MP MASS	2622.1
		LENGTH	55.442
		VOLUME	38526.
		TDUX	0.0
		TANK AREA	5910.2
		BOMAX	0.0
		NO OF TNK	2.0000

OLD VALUE OF IMIED IS 2043251.C

NEW VALUE OF IMIED IS 2043931.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U21BP2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1133877.	623096.	286960.
TOTAL INITIAL PROPELLANT MASS	835597.3	323882.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	835597.25	323882.19	80337.25
PROPELLANT TANK DRY MASS	83559.7	50098.8	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	83559.69	50098.79	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12937.8	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12937.78	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	63875.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9648.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
1218P21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70900

INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	1.8850	INS. MASS	2473.5	INSUL. MF	1.77045E-02	TANK MASS	5836.4	TANK MF	7.31071E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	426.92	PRES MF	3.05579E-03
TOT FEE MAS	18572.	TOT FF MF	1.32935E-01	EF MP MAS	1501.3	EFF MP MF	1.07462E-02	MP MASS	2396.8
RTLOFF MAS	5276.6	FF RC MAS	3956.8	WALL TKNS	0.77219E-01	LENGTH	48.862	VOLUME	33234.
W90ACT(1)	357.12	W90ACT(2)	4919.5	W90ACT(3)					
AFACT(1)	4.60454E-01	AFACT(2)	7.70813E-01	AFACT(3)					
DFACT	6.26199E-01	TMAX	0.0	TDU	170.57	TDUX	0.0	BO MAX	0.0
FPTH	9.38674E-02	N-J PSSH	12114.	PROP MASS	1.39709E 05	TANK AREA	5248.7	NO OF TMK	2.0000

THE OLD VALUE OF IMFD IS 1924481.0

THE NEW VALUE OF IMFD IS 192446.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11210021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1083583.	553907.	286960.
TOTAL INITIAL PROPELLANT MASS	793714.9	279413.8	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	793714.94	279413.81	80337.25
PROPELLANT TANK DRY MASS	79371.4	26277.8	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79371.44	26277.82	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12687.5	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12687.51	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	62205.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9094.5	433.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAN	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U219P2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. THICKNESS	0.56299	INS. MASS	720.77	INSUL. MF	5.32280E-03	TANK MASS	5646.1	TANK MF	7.29678E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	413.36	PRES MF	3.05259E-03
TOT EFF MAS	14036.	TOT FF MF	1.03655E-01	FF MP MAS	1473.2	EFF MP MF	1.08721E-02	MP MASS	2314.6
ROILOFF MAS	2062.6	EF BO MAS	1549.0	WALL TKAS	0.76565E-01	LENGTH	47.552	VOLUME	32212.
WROACT(1)	0.0	WROACT(2)	2062.6	WROACT(3)					
AFACT(1)	4.35779E-01	AFACT(2)	7.50016E-01	AFACT(3)					
REACT	6.36042E-01	TMAX	0.0	TRU	267.28	TDX	0.0	RDMAX	0.0
EDTH	8.13431E-02	N-J PSSM	11015.	PRNP MASS	1.35413E 05	TANK AREA	5121.0	NO OF TANK	2.0000

***** RESULTS *****

THE OLD VALUE OF TMIED IS 1899439.0

 THE NEW VALUE OF TMIED IS 1899475.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

112140-21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1071564.	540054.	286060.
TOTAL OXIDIZER MASS	783706.6	270823.6	80337.2
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	783706.62	270823.56	80337.25
OXIDIZER TANK DRY MASS	783706.6	270823.6	80337.1
FUEL TANK DRY MASS	0.0	0.0	0.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	783706.62	270823.61	8837.09
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	0.0	11923.3	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11923.27	8916.81
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	10700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	50328.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8067.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N2H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C						
INS. TKNSS	6.4191	INS. MASS	8289.4	INSUL. MF	6.0534CE-C2	TANK MASS	5712.2	TANK MF	7.29994E-02
VENT PRESS	14.643	COAT MASS	0.0	COAT MF	C.O	PRES MASS	417.34	PRES MF	3.04765E-03
TOT EFF MAS	20162.	TUT EF MF	1.47233E-C1	EF MP MAS	1458.7	EFF MP MF	1.06520E-02	MP MASS	2343.3
BUILDUP MAS	C.C	EF HC MAS	C.C	WALL TKNS	C.76795E-C1	LENGTH	48.035	VOLUME	32568.
WBFACT(1)	C.O	WBFACT(2)	0.0	WBFACT(3)					
AFACT(1)	4.70441E-01	AFACT(2)	7.78866E-01	AFACT(3)					
CFACT	6.22455E-01	TMAX	0.0	TUC	-1.0000	TDUX	0.0	BCMAX	C.C
EPH	1.30541E-C1	N-J PSSM	18703.	PROP MASS	1.36939E 05	TANK AREA	5165.5	NC OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIE1 IS 1934737.0

 THE NEW VALUE OF IMIE1 IS 1936912.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S200A20

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1090113.	557343.	286960.
TOTAL INITIAL PROPELLANT MASS	799152.7	274224.3	80337.2
TOTAL LAUNCHER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	799152.75	274224.31	80337.25
PROPELLANT TANK DRY MASS	79915.2	37453.9	8837.1
LAUNCHER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79915.19	37453.90	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11986.5	8916.8
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11986.46	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
METAL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	60682.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9166.5	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	14210.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S2CONZ1

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THNESS	0.48671	INS. MASS	605.09
VENT PRESS	9.4930	COAT MASS	0.0
TOT EFF MASS	11857.	TOT EF MF	8.91412E-02
BOILLOFF MASS	0.0	EF BO MASS	0.0
WBOACT(1)	0.0	WBOACT(2)	0.0
WFACT(1)	4.23270E-01	WFACT(2)	7.40835E-01
WFACT	6.40527E-01	WFACT	0.0
EPH	7.84475E-02	N-J PSSM	10435.
		WALL TRNS	0.75769E-01
		WBOACT(3)	0.0
		WFACT(3)	0.0
		TLU	-1.0000
		PRGP MASS	1.33018E 05
		TANK MASS	5427.2
		PRES MASS	332.22
		EFF MP MF	1.06937E-02
		LENGTH	46.118
		VOLUME	31027.
		TANK MF	7.14011E-02
		PRES MF	2.69754E-03
		MP MASS	2219.4
		TDUX	0.0
		TANK AREA	4972.8
		BOUMAX	0.0
		NO LF TNK	2.0000

THE TLU VALUE OF IMTEL IS 1887186.C

THE NEW VALUE OF IMTEL IS 1887375.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5206621

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	160950.0	534050.0	286960.0
TOTAL INITIAL PROPELLANT MASS	778714.3	266066.7	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	778714.31	266066.09	80337.25
PROPELLANT TANK DRY MASS	77871.4	27072.3	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77871.37	26872.27	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11733.3	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11733.25	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	195000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	58691.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8846.0	933.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N2L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.C

***** RESULTS *****

INS. THICKNESS	6.12510	INS. MASS	150.61	INSUL. MF	1.13097E-03	TANK MASS	5246.9	TANK MF	6.92428E-02
VENT PRESS	3.8891	COAT MASS	0.0	COAT MF	0.0	PRES MASS	245.63	PRES MF	1.85239E-03
TOT EFF MAS	10561.	TOT EF MF	8.26544E-02	EF MP MAS	1376.2	EFF MP MF	1.03784E-02	MP MASS	2140.3
BOILOFF MAS	0.0	EF BL MAS	0.0	WALL TKNS	0.75130E-01	LENGTH	44.895	VOLUME	30043.
WBFACT(1)	0.0	WBFACT(2)	0.0	WBFACT(3)					
AFACT(1)	4.17916E-01	AFACT(2)	7.30511E-01	AFACT(3)					
CFACT	6.45023E-01	TMAX	0.C	TDU	-1.0000	TDUX	0.0	RGMAX	0.C
EPFH	7.22700E-02	N-J PSSM	9584.3	PROP MASS	1.32607E 05	TANK AREA	4849.5	NG CF TNK	2.0000

THE OLD VALUE CF IMIEC IS 1881947.C

 THE NEW VALUE CF IMIEC IS 1882028.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SZ06N2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1062919.	512151.	286960.
TOTAL INITIAL PROPELLANT MASS	776507.7	265224.1	80337.2
TOTAL LAUNCHER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	776507.75	265224.10	80337.25
PROPELLANT TANK DRY MASS	77650.7	19169.7	8837.1
LAUNCHER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77650.09	19169.09	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11574.8	8916.8
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11574.79	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9103.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	58697.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8466.7	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
INS. THICKNESS	10.888	INSUL. MF	1.04198E-01
VENT PRESS	24.764	COAT MF	0.0
TOT EFF MAS	32420.	TOT EF MF	2.20091E-01
		EF MP MAS	1514.9
BULLOFF MAS	0.0	WALL TKNS	0.11160
MBGACT(1)	0.0	MBGACT(3)	
AFACT(1)	5.38352E-01	AFACT(3)	
JFACT	5.95937E-01	TDU	-1.0000
EPTH	2.18094E-01	PROP MASS	1.43014E 05
		TMAX	0.0
		N-J PSSM	30505.
		TANK MASS	8797.9
		PRES MASS	607.06
		EFF MP MF	1.05926E-02
		LENGTH	51.110
		VOLUME	35041.
		TANK MF	1.07655E-01
		PRES MF	4.24673E-03
		MP MASS	2542.0
		ROMAX	0.0
		NO OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIEG IS 2036509.0

THE NEW VALUE OF IMIEG IS 2009650.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

32124201

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1122250.	570347.	286960.
TOTAL INITIAL PROPELLANT MASS	424249.8	200279.2	80377.2
TOTAL OXIDIZER MASS	0.0	0.	0.0
TOTAL FUEL MASS	829245.81	200279.14	80337.25
PROPELLANT TANK DRY MASS	62424.5	61153.7	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	82424.50	61853.66	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12341.6	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12391.63	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	10497.0	4044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	63319.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	7564.8	933.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	12100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.C

***** RESULTS *****

INS. THICKNESS	C.53694	INS. MASS	1185.4	INSUL. MF	8.88381E-03	TANK MASS	5557.0	TANK MF	7.28789E-02
VENT PRESS	14.605	COAT MASS	C.0	COAT MF	0.0	PRES MASS	405.79	PRES MF	3.04110E-03
TOT EFF MAS	12770.	TOT EF MF	9.56999E-02	EF MP MAS	1453.9	EFF MP MF	1.08962E-02	MP MASS	2275.9
BOILOFF MAS	0.0	EF BU MAS	C.0	WALL TKNS	C.76252E-01	LENGTH	46.993	VOLUME	31731.
WBFACT(1)	0.0	WBFACT(2)	D.0	WBFACT(3)					
AFACT(1)	4.28637E-01	AFACT(2)	7.45156E-01	AFACT(3)					
CFACT	9.38832E-01	THAX	0.C	TDU	-1.0000	TDUX	0.0	BOMAX	C.0
EPH	8.48037E-02	N-J PSSM	11316.	PRUP MASS	1.33436E 05	TANK AREA	5060.8	NU OF TNK	2.0000

THE OLD VALUE OF IMIEC IS 1892459.0

THE NEW VALUE OF IMIEC IS 1892820.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

Schedule

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1762767.	37596.	286966.
TOTAL INITIAL PROPELLANT MASS	764625.4	266734.4	80337.2
TOTAL LAUNCHER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	760960.67	266934.94	80337.25
PROPELLANT TANK DRY MASS	760960.0	266937.1	80337.1
LAUNCHER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	760960.00	266937.07	80337.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11840.9	8916.8
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11840.94	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	2044.0	5140.0
RETAL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	19086.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8425.7	933.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	102100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	0.17064	INS. MASS	210.84
VENT PRESS	7.9093	COAT MASS	0.0
TOT EFF MAS	11351.	TOT EF MF	8.54893E-02
INS. TKNES	0.17064	INSUL. MF	1.58794E-03
VENT PRES	7.9093	COAT MF	0.0
TOT EFF MAS	11351.	EF MP MAS	1412.5
BUILDOFF MAS	0.0	EF BU MAS	0.0
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	4.20218E-01	AFACT(2)	7.38368E-01
UFACT	6.42123E-01	TMAX	0.0
EPTH	7.48509E-02	N-J PSSM	9938.4
		TDU	-1.0000
		PROP MASS	1.32775E 05
		WALL TKNS	0.75627E+01
		WBOACT(3)	
		AFACT(3)	
		TANK MASS	5382.4
		PRES MASS	308.38
		EFF MP MF	1.06383E-02
		LENGTH	45.815
		TANK AREA	0.0
		TANK AREA	4942.3
		TDUX	0.0
		TANK OF INK	2.0000
		ROMAX	9.0
		NC OF INK	2.0000
		VOLUME	30793.
		TANK MF	7.09405E-02
		PRES MF	2.32236E-03
		MP MASS	2199.7

THE OLD VALUE OF IMIEG IS 1884193.0

THE NEW VALUE CF IMIEG IS 1884361.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212N2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1064076.	533326.	286960.
TOTAL INITIAL PROPELLANT MASS	777470.4	265577.9	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	777470.44	265577.94	80337.25
PROPELLANT TANK DRY MASS	77747.0	19878.7	6837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77747.00	19878.75	6837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11693.9	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11693.95	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19760.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	58782.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8879.5	933.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	142100.0	132500.0

THEIRPAL PROTECTION SYSTEM OPTIMIZATION RESULTS
221-52M

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0C

***** RESULTS *****

INS. THICKNESS	14.146	INS. MASS	20533.	INSUL. MF	1.37518E-01	TANK MASS	12241.	TANK MF	1.266E-01
VEHT PRESS	34.632	COAT MASS	0.0	COAT MF	0.0	PRES MASS	807.87	PRES MF	1.4108E-01
TOT EFF MAS	44335.	TOT EFF MF	2.70923E-01	EFF MP MAS	1577.3	EFF MP MF	1.05105E-01	MP MASS	0.55E-01
BUILCFF MAS	0.0	EFF BU. MAS	0.0	WALL INDS	0.14040	LENGTH	54.40E	VOLUME	37604
WBUACT(1)	0.0	WBUACT(2)	0.0	WBUACT(3)					
AFAC(11)	0.03014E-01	AFAC(2)	0.05706E-01	AFAC(3)					
UFACT	0.7000E-01	THAX	0.0	TUU	-1.0000	TDUX	0.0	RUMAX	0.0
EPH	2.0053E-01	N-U PSSM	42762.	PRUP MASS	1.49314E-05	TANK AREA	5806.2	N-U JF TANK	2.0000

THE OLD VALUE OF IMED IS 205.460C

THE NEW VALUE OF IMED IS 2079913.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SzL042h

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	110350.0	63195.0	286960.0
TOTAL INITIAL PROPELLANT MASS	858153.0	297751.7	80337.2
TOTAL GALLIUMZER MASS	0.0	0.0	0.0
TOTAL FULL MASS	858153.02	297751.67	80337.25
PROPELLANT TANK DRY MASS	858153.3	35273.9	8837.1
GALLIUMZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	85815.31	85273.94	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
GALLIUMZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12788.3	8916.8
GALLIUMZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12788.28	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETAL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	8582.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9947.5	933.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	142100.0	142500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	4.4104	INS. MASS	3060.4	INSUL. MF	2.28330E-02	TANK MASS	5596.7	TANK MF	7.29289E-02
VENT PRESS	14.686	COAT MASS	0.0	COAT MF	0.0	PRES MASS	409.64	PRES MF	3.05025E-03
TOT EFF MAS	14726.	TUT EF MF	1.09651E-01	EF MP MAS	1455.6	EFF MP MF	1.08384E-02	MP MASS	2293.2
BULGFF MAS	0.0	EF BU MAS	0.0	WALL TKNS	0.76392E-01	LENGTH	47.260	VOLUME	31945.
MBUACT(1)	0.0	MBUACT(2)	0.0	MBUACT(3)					
AFACT(1)	4.39119E-01	AFACT(2)	7.53609E-01	AFACT(3)					
DFACT	6.34737E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	HOMAX	0.0
EPFH	5.88121E-02	N-J PSSM	13270.	PROP MASS	1.34298E 05	TANK AREA	5087.7	NO OF TNK	2.0000

THE OLD VALUE OF IMIEC IS 1902869.0

 THE NEW VALUE OF IMIEC IS 1904519.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SCIENCE

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	10,740.3	54,549.4	280,960.
TOTAL INITIAL PROPELLANT MASS	7,657.7	29,858.7	80,537.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	7,657.7	29,858.7	80,537.2
PROPELLANT TANK DRY MASS	7,657.7	29,858.7	80,537.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	7,657.7	29,858.7	80,537.2
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1,970.0	9,100.0	5,300.0
ENGINE DRY MASS	10,500.0	35,000.0	35,000.0
INTERSTAGE STRUCTURE MASS	16,497.0	9,044.0	5,140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	5,951.0	0.0	9,495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8,989.0	933.0	1,434.3
MISCELLANEOUS LAPONABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	1,821.0	1,325.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. THKNESS	0.21690	INS. MASS	272.50	INSUL. MF	2.04977E-03	TANK MASS	5504.5	TANK MF	7.24598E-02
VENT PRESS	13.21E	COAT MASS	0.0	COAT MF	0.0	PRES MASS	384.88	PRES MF	2.89512E-03
TOT EFF MAS	11735.	TOT EF PF	8.62725E-02	EF MP MAS	1444.8	EFF MP MF	1.08679E-02	MP MASS	2253.1
BCILFF MAS	0.0	EF EG MAS	C.0	WALL TKNS	0.76066E-01	LENGTH	46.640	VOLUME	31446.
MBUACT(1)	0.0	MBUACT(2)	C.0	MBUACT(3)					
AFACT(1)	4.22455E-01	AFACT(2)	7.4C172E-01	AFACT(3)					
DFACT	6.41249E-01	THAX	0.0	TDU	-1.0000	TDUX	0.0	BDMAX	0.0
EPTH	7.74046E-02	N-J PSSM	1C290.	PRGP MASS	1.32941E 05	TANK AREA	5025.3	NO GF TNK	2.0000

THE OLD VALUE OF IMIEL IS 1880381.0

THE NEW VALUE OF IMIEC IS 7886658.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1065214.	534447.	246960.
TOTAL INITIAL PROPELLANT MASS	778414.1	259749.9	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	778418.13	259749.81	80337.25
PROPELLANT TANK DRY MASS	77841.8	20533.8	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77841.75	20583.79	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11800.9	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	0.0	11800.92	8916.81
ENGINE DRY MASS	19700.0	9100.0	5300.0
INTERSTAGE STRUCTURE MASS	105000.0	35000.0	35000.0
RFTRC PROPULSION SUBSYSTEM MASS	16497.0	9044.0	5140.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	0.0	0.0	0.0
ATTITUDE CONTROL SUBSYSTEM MASS	58865.2	0.0	9495.0
MISCELLANEOUS EXPENDABLES MASS	8892.0	931.0	1434.3
PAYLOAD	0.0	0.0	0.0
	0.0	182100.0	142500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206VZH

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. TKNESS	5.2500	INS. MASS	6660.4	INSUL. MF	4.93640E-C2	TANK MASS	5803.9	TANK MF	7.30827E-02
VENT PRESS	19.700	CUAT MASS	0.0	CUAT MF	0.0	PRES MASS	424.58	PRES MF	3.09508E-03
TOT EFF MAS	20085.	TOT EF MF	1.44522E-01	EF MP MAS	1483.4	EFF MP MF	1.06736E-02	MP MASS	2382.8
BOILOFF MAS	2455.0	EF BU MAS	1160.0	WALL TKNS	0.77108E-01	LENGTH	48.646	VOLUME	33060.
WBUACT(1)	2439.3	WBUACT(2)	10.250	WBUACT(3)					
AFACT(1)	4.70324E-01	AFACT(2)	7.78771E-01	AFACT(3)					
DFACT	0.22541E-01	TMAX	0.0	TDU	52.036	TDUX	0.0	ROMAX	0.0
EPTH	1.29502E-01	N-J PSSM	17442.	PROP MASS	1.38976E 05	TANK AREA	5227.0	NO OF TNK	2.0000

THE OLD VALUE OF IMTEL IS 1934675.0

THE NEW VALUE OF IMTEL IS 1934543.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

520624

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1080521.	50104.	286960.
TOTAL INITIAL PROPELLANT MASS	796162.4	277944.7	80337.2
TOTAL GALLIUM MASS	0.0	0.0	0.0
TOTAL FUEL MASS	796162.37	277944.75	80337.25
PROPELLANT TANK DRY MASS	79616.2	34447.5	8337.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79610.19	34684.55	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
GALLIUM SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12059.4	8916.8
GALLIUM SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12059.43	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	910.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NET PL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69420.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9126.9	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	14210.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S212V2H

** INPUT ITEMS **

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. THNESS	7.5230	INS. MASS	10506.	INSUL. MF	6.95525E-02	TANK MASS	6345.3	TANK MF	7.35154E-02
VENT PRESS	14.700	COAT MASS	0.0	CLAT MF	0.0	PRES MASS	462.80	PRES MF	3.06390E-03
TOT EFF MAS	25893.	TOT EF MF	1.97901E-01	EF MP MAS	1582.6	EFF MP MF	1.04775E-02	MP MASS	2613.6
**** RESULTS ****									
BUILCOFF MAS	12130.	EF BU MAS	6237.1	WALL TKNS	C.78885E-01	LENGTH	52.217	VOLUME	35932.
WBCACT(1)	12117.	WBOACT(2)	13.031	WBOACT(3)					
AFACT(1)	5.13847E-01	AFACT(2)	6.13866E-01	AFACT(3)					
UFACT	6.05591E-01	TMAX	0.0	TDU	70.496	TDUX	0.0	BOMAX	0.0
EPH	1.46132E-01	N-J PSSM	22073.	PROP MASS	1.51048E 05	TANK AKEA	5586.0	ND OF TNK	2.0000

THE OLD VALUE OF IMIEL IS 1981175.0

 THE NEW VALUE OF IMIEL IS 1982803.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

521428

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL SINGLE MASS	1100840.	902000.	286960.
TOTAL INITIAL PROPELLANT MASS	808655.6	927151.7	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	808655.6	927151.7	80337.25
PROPELLANT TANK DRY MASS	808655.6	44153.7	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	808655.6	44153.7	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12522.2	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12522.15	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	4100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16457.0	4044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	61465.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9284.7	933.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	14210.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218V2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
INS. THICKNESS	9.2416	INSUL. MF	8.43075E-02
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	39373.	TUT EF MF	2.43004E-01
		EF MP MAS	1669.1
BOILOFF MAS	20994.	EF BG MAS	11563.
WBDACT(1)	20982.	WBDACT(2)	11.656
AFACT(1)	5.5062CE-01	AFACT(2)	8.43518E-01
DFACT	5.91158E-01	TMAX	0.0
EPH	1.61336E-01	N-J PSSM	26140.
		TDU	84.192
		PRUP MASS	1.62025E 05
		WALL TKMS	0.80427E-01
		WBDACT(3)	
		AFACT(3)	
		TDUX	0.0
		TANK AREA	5912.4
		TANK MASS	6847.4
		PRES MASS	497.65
		EFF MP MF	1.03016E-02
		LENGTH	55.464
		VOLUME	38543.
		TANK MF	7.39572E-02
		PRES MF	3.07143E-03
		MP MASS	2823.5
		BOMAX	0.0
		NO OF TNK	2.0000

***** RESULTS *****

THE OLD VALUE OF IMIEC IS 2022548.C

THE NEW VALUE OF IMIEC IS 2025988.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5218V2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1113447.	625584.	286960.
TOTAL INITIAL PROPELLANT MASS	818584.4	324164.2	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	818584.4	324164.2	80337.2
PROPELLANT TANK DRY MASS	0.0	0.0	0.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	818584.4	324164.2	80337.2
NON-LAFENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12942.9	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12942.9	8916.8
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDDLE-USE CORRECTION SUBSYSTEM MASS	62385.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9423.7	933.6	1434.3
MISCELLANEOUS LAFENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 SZ18V21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.C

***** RESULTS *****

INS. THICKNESS	2.0102	INS. MASS	2568.7	INSUL. MF	1.90147E-02	TANK MASS	5632.0	TANK MF	7.29577E-02
VENT PRESS	14.700	COAT MASS	0.C	COAT MF	0.0	PRES MASS	412.34	PRES MF	3.05231E-03
TOT EFF MAS	14681.	TOT EF MF	1.08670E-01	EF MP MAS	1464.3	EFF MP MF	1.08396E-02	MP MASS	2308.5
BUILDUP MAS	859.50	EF BO MAS	379.90	WALL TKNS	0.76516E-01	LENGTH	47.497	VOLUME	32136.
WBFACT(1)	854.63	WBFACT(2)	4.8750	WBFACT(3)					
AFACT(1)	4.40173E-01	AFACT(2)	7.54458E-01	AFACT(3)					
EFACT	6.34324E-01	TMAX	0.0	TDU	170.67	TDUX	0.0	80MAX	0.0
EPTH	9.50246E-02	N-J PSSM	12837.	PROP MASS	1.35092E 05	TANK AREA	5111.5	NO OF TNK	2.0000

THE OLD VALUE OF IMIEG IS 1903925.0

 THE NEW VALUE OF IMIEG IS 1903705.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5213VZ1

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1072013.	2825900.	2869600.
TOTAL INITIAL PROPELLANT MASS	784740.7	270173.0	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	784740.69	270173.50	80337.25
PROPELLANT TANK DRY MASS	70474.6	25673.1	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78474.09	25673.14	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11910.9	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11910.86	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	55415.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8975.0	933.0	1474.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	18210.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206P2H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.7000C	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. TKWESS	3.2750	INS. MASS	4302.2	INSUL. MF	3.07510E-02	TANK MASS	5845.1	TANK MF	7.31137E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	427.50	PRES MF	3.05565E-03
TU1 EFF MAS	18570.	TUT EF MF	1.32730E-01	EF MP MAS	1503.6	EFF MP MF	1.07473E-02	MP MASS	2400.5
BOILOFF MAS	4505.1	EF BU MAS	2107.3	WALL TKNS	0.77248E-01	LENGTH	48.921	VOLUME	33281.
MBOACT(1)	4559.4	MBOACT(2)	9.6250	MBOACT(3)					
AFACT(1)	4.60551E-01	AFACT(?)	7.70891E-01	AFACT(3)					
DFACT	6.26361E-01	TMAX	0.0	TU	35.047	TDUX	0.0	BDMAX	0.0
EPH	1.06920E-01	N-J PSJM	14959.	PROP MASS	1.39904L 05	TANK AREA	5254.6	NO OF TNK	2.0000

THE OLD VALUE OF I EC IS 1924580.0

 THE NEW VALUE OF I EC IS 1924263.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SZLGPZt

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1079327.	547579.	286960.
TOTAL INITIAL PROPELLANT MASS	790171.2	27775.7	80337.2
TOTAL LAUNCHER MASS	0.0	0.0	0.0
TOTAL FULL MASS	790171.25	279760.75	80337.25
PROPELLANT TANK DRY MASS	79017.1	29915.3	8837.1
LAUNCHER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79017.05	29915.29	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12094.7	8916.8
LAUNCHER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12094.75	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
REINFL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59895.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9047.6	933.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	18210.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212P2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. TKNESS	4.6406	INS. MASS	6329.9	INSUL. MF	4.31543E-02	TANK MASS	6148.1	TANK MF	7.33517E-02
VENT PRESS	14.700	CUAT MASS	0.0	CUAT MF	0.0	PRES MASS	448.91	PRES MF	3.06046E-03
TOT EFF MAS	23987.	TOT EF MF	1.63534E-01	EF MP MAS	1558.1	EFF MP MF	1.06224E-02	MP MASS	2530.1
***** RESULTS *****									
BUILDUP MAS	10028.	EF BD MAS	4891.1	WALL TKNS	0.78253E-01	LENGTH	50.925	VOLUME	34893.
NBFACT(1)	10021.	WBFACT(2)	7.4082	WBFACT(3)					
AFACT(1)	4.87495E-01	AFACT(2)	7.52617E-01	AFACT(3)					
CFACT	6.15829E-01	TMAX	0.0	IDU	48.340	IDUX	0.0	BOMAX	0.0
EPH	1.19566E-01	N-J PSSM	17538.	PKCP MASS	1.46680E 05	TANK AREA	1.100.1	NO OF TANK	2.0000

THE OLD VALUE OF IMIEC IS 1952715.0

THE NEW VALUE OF IMIEC IS 1951306.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

571622

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	130741.5	577047.	286960.
TOTAL INITIAL PROPELLANT MASS	79621.4	293421.2	80337.2
TOTAL EXHAUSTOR MASS	0.0	0.0	0.0
TOTAL FUEL MASS	79621.4	293421.2	80337.2
PROPELLANT TANK DRY MASS	79621.4	35083.3	8837.1
EXHAUSTOR TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79622.0	35083.3	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
EXHAUSTOR SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12355.2	8916.8
EXHAUSTOR SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12355.21	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	10497.0	9044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
PIVOTAL CORRECTION SUBSYSTEM MASS	60477.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9135.0	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218P2H

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	0.0	*** INPUT ITEMS ***					
INS. TKNESS	5.7712	INS. MASS	8125.6	INSUL. MF	5.22514E-02	TANK MASS	6415.3	TANK MF	7.35749E-02
VENT PRESS	14.700	COAT MASS	C.C	COAT MF	0.0	PRES MASS	467.60	PRES MF	3.06445E-03
TOT EFF MAS	28953.	TOT EF MF	1.90009E-C1	EF MP MAS	1604.2	EFF MP MF	1.05133E-02	MP MASS	2643.1
BUILGFF MAS	14631.	EF BU MAS	7569.2	WALL TKNS	0.79105E-01	LENGTH	52.673	VOLUME	36298.
WBFACT(1)	14825.	WBFACT(2)	6.4687	WBFACT(3)					
AFACT(1)	5.10214E-01	AFACT(2)	8.10937E-C1	AFACT(3)					
LFACT	6.C6551E-C1	TMAX	0.C	IDU	58.157	IDUX	0.C	BOMAX	0.0
EPTH	1.29891E-C1	N-J PSSM	1982C.	PKUP MASS	1.52589E 05	TANK AREA	5631.8	NO OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIEC IS 1977192.0
 THE NEW VALUE OF IMIEC IS 1975258.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SZ18P27

	STAGE 1	STAGE 2	STAGE 3
INITIAL INITIAL STAGE MASS	109440.8	545893.	286960.
TOTAL INITIAL PROPELLANT MASS	872774.7	3,0455.1	80337.2
TOTAL EXHAUSTER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	862725.75	30455.06	80337.25
PROPELLANT TANK LRY MASS	86272.9	34675.7	8837.1
EXHAUSTER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	86272.94	39675.75	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
EXHAUSTER SUBSYSTEMS MASS	0.0	0.0	0.0
FULL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12584.9	8916.8
EXHAUSTER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12584.91	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NETEL PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	60995.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9213.8	933.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218P21

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. THICKNESS	1.2627	INS. MASS	1617.3	INSUL. MF	1.19369E-02	TANK MASS	5649.6	TANK MF	7.29702E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	413.60	PRES MF	3.05262E-03
TOT EFF MAS	14134.	TOT EF MF	1.04319E-01	EF MP MAS	1.472.7	EFF MP MF	1.08693E-02	MP MASS	2316.2
**** RESULTS ****									
BULG OFF MAS	1703.0	EF BG MAS	743.81	WALL TKNS	0.76577E-01	LENGTH	47.615	VOLUME	32231.
WB0ACT(1)	1700.6	WB0ACT(2)	2.3437	WB0ACT(3)					
AFACT(1)	4.36307E-01	AFACT(2)	7.51341E-01	AFACT(3)					
DFACT	6.35836E-01	THAX	0.C	TDU	141.52	TDUX	0.0	ROMAX	0.0
EPH	8.79590E-02	N-J PSSM	11918.	PROP MASS	1.35492E 05	TANK AREA	5123.4	NO OF TNK	2.0000

THE OLD VALUE OF IMIEG IS 1900063.0

THE NEW VALUE OF IMIEG IS 1900034.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SZ18P21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1979156.	942921.	286960.
TOTAL INITIAL PROPELLANT MASS	782533.9	270981.0	80337.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	782533.87	270981.02	80337.25
PROPELLANT TANK DRY MASS	78253.3	23835.4	8837.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78253.31	23835.43	8837.09
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11926.3	8916.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11926.29	8916.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9103.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.7	5140.0
REFIG PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	59225.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8546.5	923.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	14210.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U225A3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000	INITIAL ENERGY	C.C
**** RESULTS ****			
INS. THICKNESS	14.048	TANK MASS	14147.
VENT PRESS	33.657	PRES MASS	534.63
TOT EFF MAS	5.803.	EFF MP MF	1.10746E-C2
INS. MASS	23176.	TANK PF	1.41633E-01
CCAT MASS	0.0	PRES PF	5.34700E-03
TCT FF MF	2.90642E-01	MF PASS	3417.2
INSUL. MF	1.22585E-C1		
CCAT MF	C.C		
EF MP MAS	1935.8	LENGTH	62.252
EF RO MAS	0.0	VOLUME	44035.
WFACT(1)	0.0		
AFACT(1)	5.52370E-C1		
WFACT(2)	0.0		
AFACT(2)	8.73049E-01		
WFACT(3)	0.0		
AFACT(3)	0.0		
TMAX	5.66478E-C1	TDLX	C.C
N-J PSSM	48867.	TANK AREA	6558.9
TDU	-1.0000	BCMAX	0.0
FRCP MASS	1.74795E 05	NC CF TNK	2.0000

THE OLD VALUE OF IMIEC IS 2350594.C

THE NEW VALUE OF IMIEC IS 2357109.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U25AN7H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1298306.	785559.	273268.
TOTAL INITIAL PROPELLANT MASS	972521.9	348588.8	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	972521.87	348588.81	68338.12
PROPELLANT TANK DRY MASS	97252.1	57566.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97252.12	57566.37	7517.15
NON-EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	14116.7	8483.1
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	14116.72	8483.08
MISCELLANEOUS PROPULSION SURSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SURSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SURSYSTEM MASS	75874.4	0.0	5495.0
ATTITUDE CONTROL SURSYSTEM MASS	11461.4	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206A31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESC	2.0327	INS. MASS	2032.9	INSUL. MF	1.86448E-C2	TANK MASS	6625.4	TANK PF	7.37531E-02
VENT PRESS	14.670	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	482.13	PRES PF	3.06501E-03
TOT EFF MAS	16818.	TCT FF MF	1.066014E-01	EF MP MAS	1801.2	EFF MP MF	1.14505E-C2	MF MASS	2860.3
ROILOFF MAS	0.0	FF RC MAS	0.0	WALL TKNS	0.79765E-C1	LENGTH	54.061	VOLUME	37415.
WFACT(1)	0.0	WFACT(2)	0.0	WFACT(3)					
AFACT(1)	4.33645E-01	AFACT(2)	7.45655E-01	AFACT(3)					
EFACT	6.29322E-C1	TMAX	0.0	TDU	-1.0000	TDUX	C.C	RCMAX	0.0
FDTH	5.64625E-C2	N-J PCSM	15016.	PRCP MASS	1.57301E 05	TANK AREA	5771.4	NO CF TNK	2.0000

THE OLD VALUE OF IMFC IS 2151590.0

THE NEW VALUE OF IMFC IS 2153709.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1107528.	582577.	273208.
TOTAL INITIAL PROPELLANT MASS	888611.2	314561.7	68238.1
TOTAL OXIDIZER MASS	0.	0.C	0.C
TOTAL FUEL MASS	888601.19	314561.69	68238.12
PROPELLANT TANK DRY MASS	88860.1	30067.2	7517.2
OXIDIZER TANK DRY MASS	0.C	0.C	0.C
FUEL TANK DRY MASS	88860.06	30067.16	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	0.C	0.C
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	0.C	0.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	13021.2	8483.1
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	13021.16	8483.08
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.C	0.C	0.C
MISCORSE CORRECTION SUBSYSTEM MASS	6852.5	0.C	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	13350.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	0.C	0.C
PAYLOAD	0.C	27000.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206A7L

*** INPUT ITEMS ***

DESIGN PRESSURE	15.7000	INITIAL ENERGY	C.C						
INS. THICKNESS	C.22706	TANK MASS	322.45	INSUL. MF	2.0671EE-C3	TANK MASS	6485.8	TANK MF	7.28098E-02
VENT PRESS	11.717	COAT MASS	C.C	COAT MF	0.C	PRES MASS	429.27	PRES MF	2.75201E-03
TOT EFF MAS	12887.	TOT EF MF	8.90260E-12	EF MP MAS	1777.P	EFF MP MF	1.13571E-C2	MF MASS	2799.2
ROLLOFF MAS	0.C	FF RC MAS	C.C	WALL TKNS	C.7932EE-C1	LENGTH	53.157	VOLUME	36688.
WBFACT(1)	0.C	WBFACT(1)	0.0	MPCACT(1)					
AFACT(1)	4.20167E-C1	AFACT(2)	7.34833E-01	AFACT(3)					
DFACT	6.25104E-C1	TMAY	0.0	TDU	-1.0000	YOUX	C.C	BOVAX	0.0
FPTH	7.76289E-C2	N-J PSSH	12109.	PRCP MASS	1.55984E C5	TANK AREA	5680.5	NO CF TAK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMFEC IS 2135741.0

THE NEW VALUE OF IMFEC IS 2136028.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1199767.	474054.	273208.
TOTAL INITIAL PROPELLANT MASS	401377.2	312014.7	68338.1
TOTAL OXIDIZER MASS	.	.0	.0
TOTAL FUEL MASS	81306.19	312014.75	68338.12
PROPELLANT TANK DRY MASS	94130.6	24221.4	7517.2
OXIDIZER TANK DRY MASS	.	.0	.0
FUEL TANK DRY MASS	88137.56	24221.26	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.0	.0	.0
OXIDIZER SUBSYSTEMS MASS	.0	.0	.0
FUEL SUBSYSTEMS MASS	.0	.0	.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.0	12893.2	8483.1
OXIDIZER SUBSYSTEMS MASS	.0	.0	.0
FUEL SUBSYSTEMS MASS	.0	12893.16	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
DETON PROPELLANT SUBSYSTEM MASS	.0	.0	.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	67891.2	.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	17254.0	1087.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	.0	.0	.0
PAVEDAC	.0	27700.0	13250.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212N3H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000C INITIAL ENERGY C.O

**** RESULTS ****

INS. THNESS	19.471	INS. MASS	33623.	INSUL. MF	1.83661E-C1	TANK MASS	16054.	TANK MF	1.53467E-01
VENT PRESS	27.13C	CCAT MASS	C.O	CCAT MF	0.0	PRES MASS	1647.9	PRES MF	5.72380E-03
TOT PFF MAS	64726.	TCT FF MF	3.53559E-01	EF PP MAS	196C.4	EFF MP MF	1.07082E-C2	MP PASS	3624.8
POILOFF MAS	0.0	EF BC MAS	0.0	WALL TKAS	0.16141	LENGTH	65.361	VOLUME	46503.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	6.56765E-C1	AFACT(2)	5.24720E-01	AFACT(3)					
DFACT	5.40814E-C1	TMAX	0.0	TCU	-1.3000	TDUX	C.C	BCMAX	0.0
EPTH	3.42651E-C1	N-J PSSM	62766.	PRCP MASS	1.83670E C5	TANK AREA	6507.4	NO CF TAK	2.0000

THE OLD VALUE OF IMIEC IS 2459335.0

THE NEW VALUE OF IMIEC IS 2437407.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0121703H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	133839C.	876112.	2732CF.
TOTAL INITIAL PROPELLANT MASS	1005651.9	362448.5	68238.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1005651.94	362448.50	68238.12
PROPELLANT TANK DRY MASS	100565.1	124265.5	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	100565.12	124265.87	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14470.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14470.56	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5200.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	78777.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11899.9	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212A31

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY C.G

**** RESULTS ****

INS. THICKNESS	3.4017	INS. MASS	4989.3	INSUL. MF	3.12616E-02	TANK MASS	7625.8	TANK WF	8.39279E-02
VENT PRESS	17.722	CCAT MASS	G.C	CCAT MF	0.C	PRES MASS	545.61	PRES WF	3.42954E-03
TOT EFF MAS	2070E.	TOT FF MF	1.30165E-01	EF MP MAS	1820.9	EFF MP MF	1.1445E-02	PF MASS	2924.6
ROLOFF MAS	G.C	FF PD MAS	G.C	WALL TKAS	0.50212E-01	LENGTH	55.011	VOLUME	38179.
WBOACT(1)	G.C	WBOACT(2)	G.C	WBOACT(3)					
AFACT(1)	4.51482E-01	AFACT(2)	7.59970E-01	AFACT(3)					
DFACT	6.22624E-01	TMAX	G.C	TEU	-1.0000	TDUX	0.C	BCMAX	0.0
FPTH	1.18719E-01	N-J PSSM	1.8887.	PRCP MASS	1.59050E 05	TANK ARFA	5866.5	NO CF TANK	2.0000

THE OLD VALUE OF IMIEC IS 217203.0

 THE NEW VALUE OF IMIEC IS 2177203.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212N31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1739167.	654831.	273208.
TOTAL INITIAL PROPELLANT MASS	898204.5	318869.2	68238.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	898294.50	318869.19	68338.12
PROPELLANT TANK DRY MASS	89829.4	37858.2	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89829.27	37858.20	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13156.2	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13156.18	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRIB MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	69369.9	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10478.8	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212A3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000 INITIAL ENERGY C.C

**** RESULTS ****

INS. THNESS	0.27773	INS. MASS	541.90	INSUL. MF	3.47003E-C3	TANK MASS	6586.7	TANK MF	7.38102E-02
VENT PRESS	14.728	CCAT MASS	C.C	CCAT MF	0.C	PRES MASS	479.55	PRES MF	3.07078E-03
TOT EFF MAS	14246.	TCT EF MF	9.18790E-72	EF MP MAS	1800.3	EFF MP MF	1.15281E-02	MF MASS	2838.2
BTLOFF MAS	0.C	FF RC MAS	0.C	WALL TKNS	C.79708E-01	LENGTH	53.735	VOLUME	37152.
WFACT(1)	C.C	WFACT(2)	0.0	WFACT(3)					
AFACT(1)	4.22170E-C1	AFACT(2)	7.36446E-71	AFACT(3)					
PFACT	6.34900E-C1	TMX	0.0	TDU	-1.C000	TDUX	0.C	BCMAX	0.0
FPTH	8.C3500E-C2	N-J PCCM	12548.	PRCP MASS	1.56167E C5	TANK AREA	5738.6	NC OF TANK	2.0000

THE OLD VALUE OF TMFC IS 2135085.C
 THE NEW VALUE OF TMFC IS 2150825.C

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11212N21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1190153.	675467.	273266.
TOTAL INITIAL PROPELLANT MASS	882459.8	312460.5	68338.1
TOTAL OXIDIZER MASS	C.C	C.C	O.C
TOTAL FUEL MASS	882459.81	312460.54	68338.12
PROPELLANT TANK DRY MASS	88245.9	25106.5	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	88245.94	25106.53	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	O.C	O.C	C.C
OXIDIZER SUBSYSTEMS MASS	O.C	O.C	O.C
FUEL SUBSYSTEMS MASS	C.C	C.C	O.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	O.C	12572.6	8483.1
OXIDIZER SUBSYSTEMS MASS	O.C	O.C	C.O
FUEL SUBSYSTEMS MASS	C.C	12572.77	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.C	5300.0
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.C	9044.C	5140.C
RETRO PROPULSION SUBSYSTEM MASS	C.O	O.C	O.O
MISCOURSE CORRECTION SUBSYSTEM MASS	67982.3	7.C	9495.C
ATTITUDE CONTROL SUBSYSTEM MASS	10269.2	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	O.C	O.C
PAYLOAD	O.C	270700.C	132500.C

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218N3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.O						
INS. THICKNESS	22.275	INS. MASS	40982.	INSUL. MF	2.12523E-01	TANK MASS	20825.	TANK MF	1.89025E-01
VENT PRESS	46.631	COAT MASS	C.O	CCAT MF	0.0	PRES MASS	1320.4	PRES MF	6.84752E-03
TOT EFF MAS	83770.	TOT EFF MF	4.18854E-01	EF MP MAS	2016.8	EFF MP MF	1.04588E-02	MP MASS	3929.0
ROTL OFF MAS	0.0	EF BC MAS	0.0	WALL TKNS	0.19655	LENGTH	65.857	VOLUME	50119.
WPROACT(1)	C.O	WPROACT(2)	0.0	WBCACT(3)					
AFACT(1)	7.25748E-01	AFACT(2)	9.80097E-01	AFACT(3)					
DFACT	5.13215E-01	TMAX	C.O	TCU	-1.0000	TDUX	0.0	BCMAX	0.0
EDTH	4.08395E-01	N-J PSSH	78753.	PRCP MASS	1.52836E 05	TANK AREA	7355.3	NO CF TANK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIEC IS 2576099.0

 THE NEW VALUE OF IMIEC IS 2527611.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U219N3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1382783.	871623.	273206.
TOTAL INITIAL PROPELLANT MASS	1042869.4	377528.8	68236.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	1042869.44	377528.81	68236.12
PROPELLANT TANK DRY MASS	104286.9	154180.5	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	104286.87	154180.54	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14986.1	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	14986.13	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PFTRD PROPULSION SUBSYSTEM MASS	0.0	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	82038.9	C.C	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12392.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U219N31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TRNESH	3.8437	INS. MASS	5789.7	INSUL. MF	3.52685E-02	TANK MASS	5650.7	TANK MF	1.05063E-01
VENT PRESS	23.870	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	670.34	PRES MF	4.15291E-03
TOT EFF MAS	25278.	TCT EF MF	1.56606E-01	EF MP MAS	1855.8	EFF MP MF	1.15215E-02	MF MASS	3031.1
BOILOFF MAS	0.0	FF RC MAS	0.0	WALL TKNS	0.11165	LENGTH	56.585	VOLUME	39445.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.74170E-01	AFACT(2)	7.78178E-01	AFACT(3)					
DFACT	6.125E2E-01	TMAX	0.0	TDU	-1.0000	TDUX	C.C	BCMAX	0.0
EPTH	1.45004E-01	N-J PSSM	23419.	PREP MASS	1.61415E 05	TANK AREA	6025.1	NO CF TANK	2.0000

THE OLD VALUE OF IMTEC IS 220068.C

THE NEW VALUE OF IMTEC IS 220466.C

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212821

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1022773.	708686.	273208.
TOTAL INITIAL PROPELLANT MASS	909624.5	323461.5	68338.1
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	909624.50	323461.87	68338.12
PROPELLANT TANK DRY MASS	90962.4	46525.2	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90962.37	46525.17	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13368.0	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13368.00	8483.08
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	10730.0	9100.0	5300.0
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	70362.7	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10628.8	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U219N3L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 0.97214	INS. MASS 1410.8	INSUL. MF 8.98179E-02	TANK MASS 7495.7	TANK MF 8.35095E-02
VENT PRESS 17.621	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 536.61	PRES MF 3.41620E-03
TOT EFF MAS 16983.	TCT EF MF 1.07482E-01	EF MP MAS 1818.1	EFF MP MF 1.15742E-02	MF MASS 2883.0
POILOFF MAS 0.0	EF RC MAS 0.0	WALL TKMS 0.89666E-01	LENGTH 54.356	VOLUME 37685.
WFACT(1) 4.31440E-01	WFACT(2) 0.0	WFACT(3) 0.0		
AFACT(1) 4.31440E-01	AFACT(2) 7.43895E-01	AFACT(3) 0.0		
DFACT 6.30611E-01	TMAX 0.0	TDU -1.0000	TDUX 0.0	BOIMAX 0.0
EPTH 9.55074E-02	N-J PSSM 15065.	PRCP MASS 1.57077E 05	TANK AREA 5805.1	NO CF TAN 2.0000

THE OLD VALUE OF IMFC IS 2148972.0

 THE NEW VALUE OF IMFC IS 2154257.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U21-PN3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1197800.	683253.	273200.
TOTAL INITIAL PROPELLANT MASS	989827.5	315035.8	68338.1
TOTAL OXIDIZER MASS	C.C	0.0	C.C
TOTAL FUEL MASS	888827.50	315035.81	68338.12
PROPELLANT TANK DRY MASS	88882.7	30214.3	7517.2
OXIDIZER TANK DRY MASS	C.C	0.0	C.C
FUEL TANK DRY MASS	88882.69	30214.26	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	0.0	C.C
FUEL SUBSYSTEMS MASS	C.C	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13076.2	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C	0.0	0.0
FUEL SUBSYSTEMS MASS	C.C	13076.16	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	C.C	C.C
MICROCORRE CORRECTION SUBSYSTEM MASS	68540.2	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10353.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	C.C	C.C
PAYLOAD	C.C	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212C3H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.7000	INITIAL ENERGY	C.O						
INS. THNESS	13.811	INS. MASS	23301.	INSUL. MF	1.31566E-01	TANK MASS	16355.	TANK MF	1.61609E-01
VENT PRESS	39.416	COAT MASS	0.C	COAT MF	0.C	PRES MASS	1060.3	PRES MF	5.98717E-03
TOT EFF MAS	54546.	TCT EF MF	3.10267E-01	EF MP MAS	1566.7	EFF MP MF	1.11045E-C2	MF MASS	3518.1
ROILOFF MAS	0.C	EF RC MAS	C.C	WALL TKNS	0.16625	LENGTH	63.783	VOLUME	45234.
WFACT(1)	8311.1	WFACT(2)	C.O	WFACT(3)					
AFACT(1)	6.11045E-C1	AFACT(2)	8.88023E-01	AFACT(3)					
DFACT	5.59034E-01	TMAX	181.00	TCU	74.283	TDLX	82.514	BCMAX	17903.
FPTH	2.99162E-01	N-J PSSH	52983.	PRCP MASS	1.77103E 05	TANK AREA	6746.7	NO CF TKN	2.0000

*** RESULTS ****

THE OLD VALUE OF IMTED IS 2388290.0

THE NEW VALUE OF IMTED IS 2381491.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212C2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1310385.	757501.	273208.
TOTAL INITIAL PROPELLANT MASS	982581.7	353048.1	68238.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	982581.75	353048.06	68238.12
PROPELLANT TANK DRY MASS	98258.1	105618.7	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	98258.13	105618.69	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	14207.1	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	14207.10	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	76755.9	C.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11594.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218C3F

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000	INITIAL ENERGY	0.0						
INS. THNESS	13.811	INS. MASS	23301.	INSUL. MF	1.21566E-01	TANK MASS	16355.	TANK MF	1.61608E-01
VENT PRESS	39.416	COAT MASS	0.0	CCAT MF	0.0	PRES MASS	1060.3	PRES PF	5.98716E-03
TOT EFF MAS	54549.	TCT EF MF	3.10267E-01	EF MF MAS	1966.7	EFF MP MF	1.11049E-C2	MF PASS	3518.1
BOILOFF MAS	0.0	EF BC MAS	0.0	WALL TKNS	0.14E25	LENGTH	63.783	VOLUME	45234.
WROACT(1)	17903.	WROACT(2)	0.0	WROACT(3)					
AFACT(1)	6.11043E-C1	AFACT(2)	8.88026E-01	AFACT(3)					
DEFACT	5.55036E-C1	TMAX	180.99	TCU	74.283	IDUX	82.514	80MAX	17903.
DEPTH	2.95162E-01	N-J PSSM	52983.	PRCP MASS	1.77103E 05	TANK AREA	6748.7	NO CF TANK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIEN IS 2388293.0

THE NEW VALUE OF IMIEN IS 2381470.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218C34

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1310384.	757901.	273208.
TOTAL INITIAL PROPELLANT MASS	982580.9	353048.1	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	982580.94	353048.06	68338.12
PROPELLANT TANK DRY MASS	98258.0	105618.5	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98258.00	105618.50	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14307.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14307.10	8483.00
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RFTRD PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76755.9	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11594.6	1003.1	1424.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218C31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.76000 INITIAL ENERGY C.O

**** RESULTS ****

INS. THICKNESS	2.4640	TNS. MASS	7683.1	INSUL. MF	2.25895E-02	TANK MASS	5412.5	TANK PF	1.02820E-01
VFNT PRESS	23.237	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	653.33	PRES PF	4.07807E-03
TOT EFF MAS	22664.	TCT FF MF	1.41465E-01	FF MP MAS	1854.7	EFF MP MF	1.15767E-C2	PF MASS	3000.0
POILOFF MAS	C.O	FF RC MAS	C.O	WALL TKNS	0.10933	LENGTH	56.126	VOLUME	39076.
WBFACT(1)	3947.5	WBFACT(2)	C.O	WBFACT(3)					
AFACT(1)	4.62552E-C1	AFACT(2)	7.68854E-01	AFACT(3)					
CFACT	6.18212E-C1	TMAX	235.41	TCU	176.19	TDUX	143.81	BOPAX	8253.7
EPTH	1.25888E-C1	N-J PSSH	20809.	PRCP MASS	1.63207E C5	TANK AREA	5575.0	NC CF TANK	2.0000

THE OLD VALUE OF IMFD IS 2186460.0

THE NEW VALUE OF IMFD IS 218853.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ218C31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	121494.1	750709.	273208.
TOTAL INITIAL PROPELLANT MASS	903101.2	320810.6	68238.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	903101.21	320810.56	68238.12
PROPELLANT TANK DRY MASS	90310.1	41665.5	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90310.06	41665.54	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13301.5	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13301.53	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5200.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PFTD PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUPSE CORRECTION SUBSYSTEM MASS	69791.1	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10542.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

U206V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

JNS. TKNESS	12.128	INS. MASS	15854.	INSUL. MF	1.08261E-01	TANK MASS	7842.6	TANK PF	7.49087E-02
VENT PRESS	14.700	CCAT MASS	C.C	CCAT MF	0.0	PRES MASS	565.14	PRES PF	3.08453E-03
TOT EFF MAS	45685.	TCT EF MF	2.71180E-01	EF MP MAS	1542.8	EFF MP MF	1.06638E-02	PF PASS	3379.3
ROILOFF MAS	15885.	FF BC MAS	13599.	WALL TKNS	0.83244E-01	LENGTH	61.732	VOLUME	43584.
WRFACT(1)	0.0	WRFACT(2)	15885.	WRFACT(3)					
AFACT(1)	5.71205E-01	AFACT(2)	8.56053E-01	AFACT(3)					
DFACT	5.74912E-01	TMAX	C.C	TDU	121.53	TDLX	C.C	BCMAX	0.0
DEPTH	1.80354E-01	N-J PSSM	34143.	FPCP MASS	1.83217E 05	TANK AREA	6542.5	NO CF TNK	2.0000

THE OLD VALUE OF IMFC IS 2330065.0

THE NEW VALUE OF IMFC IS 2333661.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U276V3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1286688.	773770.	273208.
TOTAL INITIAL PROPELLANT MASS	962847.7	366451.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	962847.69	366451.62	68338.12
PROPELLANT TANK DRY MASS	96284.7	68257.3	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96284.69	68257.25	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14053.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14053.66	8483.08
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75026.7	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11333.4	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY C.C

**** RESULTS ****

INS. THICKNESS	13.513	INS. MASS	23795.	INSUL. MF	1.2313E-C1	TANK MASS	8325.7	TANK PF	7.53947E-C2
VENT PRESS	14.700	CCAT MASS	C.C	CCAT MF	0.C	PRES MASS	597.21	PRES MF	3.09035E-03
TOT EFF MAS	61777.	TOT FF MF	3.19675E-01	EF MF MAS	1999.2	EFF MP MF	1.C3455E-C2	MF PASS	3580.1
ROIL OFF MAS	23410.	FF RC MAS	20816.	WALL TRNS	0.84518E-C1	LENGTH	64.659	VOLUME	45971.
WFACT(1)	C.C	WFACT(2)	23410.	WFACT(3)					
AFACT(1)	6.12481E-01	AFACT(2)	8.89179E-01	AFACT(3)					
DFACT	5.56462E-C1	TMAX	0.0	TCU	122.CC	TCUX	C.C	BCMAX	0.0
EPFH	2.01615E-01	N-J PESH	38962.	PFCF MASS	1.5225E C5	TANK AREA	684C.E	NO CF TANK	2.0000

THE OLD VALUE OF IMIEC IS 239.459.C

THE NEW VALUE OF IMIEC IS 2393562.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212V24

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1316366.	802951.	273268.
TOTAL INITIAL PROPELLANT MASS	987561.6	386652.1	68338.1
TOTAL OXIDIZER MASS	C.O	C.O	C.O
TOTAL FUEL MASS	987561.56	386652.12	68338.12
PROPELLANT TANK DRY MASS	98756.1	77554.7	7517.2
OXIDIZER TANK DRY MASS	C.O	C.O	C.O
FUEL TANK DRY MASS	98756.06	77554.75	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	C.O	C.O
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	C.O	C.O
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	14457.C	8483.1
OXIDIZER SUBSYSTEMS MASS	C.O	C.O	C.O
FUEL SUBSYSTEMS MASS	C.O	14456.57	8483.C8
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.C	5200.C
ENGINE DRY MASS	105000.C	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.C	9044.C	5140.C
RETRO PROPELLION SUBSYSTEM MASS	C.O	C.O	C.O
MIDCOURSE CORRECTION SUBSYSTEM MASS	77192.3	C.O	5455.C
ATTITUDE CONTROL SUBSYSTEM MASS	11660.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.O	C.O	C.O
PAYLOAD	C.O	270700.C	132500.C

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V31

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0	**** RESULTS ****			
INS. THICKNESS	3.1061	INS. MASS	4560.7	INSUL. MF	2.83789E-02	TANK MASS	6786.6
VENT PRESS	14.700	CRAT MASS	0.0	CRAT MF	0.0	PRES MASS	453.43
TOT EFF MASS	20467.	TOT EFF MF	1.27321E-1	FF MP MAS	1822.1	EFF MP MF	1.1337E-02
ROIL OFF MASS	2245.2	FF RC MASS	1708.7	WALL TKNS	0.81245E-01	LENGTH	55.074
WFACT(1)	0.0	WFACT(2)	2245.3	WFACT(3)		VOLUME	38230.
AFACT(1)	4.52160E-01	AFACT(2)	7.60995E-01	AFACT(3)		TDLX	0.0
FFACT	6.22114E-01	TMAX	0.0	TDU	2P3.17	TANK AREA	5873.2
FPTH	1.05351E-01	N-J PRCM	16031.	PRCP MASS	1.61707E 05	RCMAX	0.0
						NC CF TAK	2.0000

THE OLD VALUE OF TIME IS 217451.0

 THE NEW VALUE OF TIME IS 2174323.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

(2) 10000

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	100774.0	45227.0	272200.0
TOTAL INITIAL PROPELLANT MASS	807106.4	321434.5	68228.1
TOTAL OXIDIZER MASS	0	0.0	0.0
TOTAL FUEL MASS	807106.4	321434.5	68228.1
PROPELLANT TANK DRY MASS	0.0	0.0	0.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	807106.4	321434.5	7517.2
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13152.0	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13152.0	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5200.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	14497.0	9044.0	5140.0
DETONATION PROTECTION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	60265.7	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10463.1	1083.1	1424.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVING	0.0	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U212V3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.0
**** RESULTS ****			
INS. THNESS	0.37799	INS. MASS	542.29
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	14348.	TCT EF MF	9.18682E-02
		EF MP MAS	1800.3
BOTLOFF MAS	18.000	EF RO MAS	13.257
WBOACT(1)	C.0	WBOACT(2)	18.000
AFACT(1)	4.22206E-01	AFACT(2)	7.36475E-01
DFACT	6.34291E-01	TMAX	0.0
EPTH	8.02563E-02	N-J PSSM	12535.
		TCU	329.56
		PREP MASS	1.56183E 05
		WALL TRNS	0.79614E-01
		WFACT(3)	
		AFACT(3)	
		TANK MASS	6575.0
		PRES MASS	479.07
		EFF MP MF	1.15265E-02
		TANK AREA	5738.6
		TDUX	0.0
		BOFAX	0.0
		NO OF TANK	2.0000
		LENGTH	53.735
		VOLUME	37153.
		TANK MF	7.37169E-02
		PRES MF	3.06739E-03
		MF MASS	2838.3

THE OLD VALUE OF IMTEC IS 2138128.0

THE NEW VALUE OF IMTEC IS 2138817.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

022107L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	119149.	675462.	273208.
TOTAL INITIAL PROPELLANT MASS	892456.1	312483.4	68338.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	892456.6	312483.44	68338.12
PROPELLANT TANK DRY MASS	89245.6	25078.8	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	89245.56	25078.78	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	12572.7	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	12572.72	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	350000.0	350000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPELLSION SUBSYSTEM MASS	C.C	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	67981.0	C.C	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10265.2	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAVING	C.C	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U218V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0

***** RESULTS *****

INS. THNESS 12.686	INS. MASS 24733.	INSUL. MF 1.15892E-01	TANK MASS 8565.3	TANK MF 7.60532E-02
VENT PRESS 14.700	COAT MASS 0.0	CCAT MF 0.0	PRES MASS 638.59	PRES MF 3.09749E-03
TOT EFF MAS 72408.	TOT EF MF 3.50996E-01	EF MP MAS 2101.1	EFF MP MF 1.01648E-02	MF MASS 3841.1
BOILDOFF MAS 35174.	EF BO MAS 29246.	WALL TKNS 0.86128E-01	LENGTH 68.557	VOLUME 49074.
WBFACT(1) 10490.	WBFACT(2) 24684.	WBFACT(3) 9.12271E-01		
AFACT(1) 6.41254E-01	AFACT(2) 9.12271E-01	AFACT(3) 3		
DFACT 5.46596E-01	TMA 0.0	TDU 124.89	TDUX 0.0	80PMX 0.0
EPTH 1.99042E-01	N-J PSSM 41061.	PRCP MASS 2.06293E 05	TANK AREA 722E.7	NC OF TAK 2.0000

THE OLD VALUE CF IMIEC IS 2434705.0

THE NEW VALUE CF IMIEC IS 2433762.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U21RV2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1325889.	834669.	273208.
TOTAL INITIAL PROPELLANT MASS	995491.4	412633.4	68336.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	995491.44	412633.27	68336.12
PROPELLANT TANK DRY MASS	99549.1	82131.4	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	99549.06	82131.44	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19706.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	77887.2	C.C	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11765.4	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218V31

*** INPUT ITEMS ***

DESIGN PRESSURE 14.7000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNFSS 3.4000	INS. MASS 502.5	INSUL. MF 3.05244E-C2	TANK MASS 6576.0	TANK PF 7.40697E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 506.04	PRES MF 3.07293E-03
TOT EFF MAS 24556.	TOT EF MF 1.49111E-01	EF MP MAS 1856.5	EFF MP MF 1.12755E-C2	MP MASS 3008.3
NOILOFF MAS 6361.0	EF RC MAS 4903.2	WALL TRNS 0.80750E-C1	LENGTH 56.248	VOLUME 39174.
WBCACT(1) 0.0	WBCACT(2) 6361.0	WBCACT(3) 0.0	TANK AREA 5991.2	BCMAX 0.0
AFACT(1) 4.64564E-01	AFACT(2) 7.70791E-01	AFACT(3) 0.0	TDUX 0.0	NO OF TNK 2.0000
CFACT 6.17251E-C1	TMAX 0.0	TDU 258.82	TANK AREA 5991.2	
EPH 1.00067E-C1	N-J PSSH 17796.	PRCP MASS 1.64677E 05		

THE OLD VALUE OF IMFC IS 2199428.0

THE NEW VALUE OF IMFC IS 2196984.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218V31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1218968.	704805.	273208.
TOTAL INITIAL PROPELLANT MASS	906455.2	330757.2	68238.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	906455.25	330757.15	68238.12
PROPELLANT TANK DRY MASS	90645.4	35748.2	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90645.44	35748.21	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13326.5	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13326.52	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	79085.0	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10586.9	1083.1	1424.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21RV3L

*** INPUT ITEMS ***

DESIGN PRESSURE	15.7000	INITIAL ENERGY	C.C						
**** RESULTS ****									
INS. TKNSS	0.8535E	INS. MASS	1297.4	INSUL. MF	8.18492E-C2	TANK MASS	6685.5	TANK PF	7.38115E-02
VENT PRESS	14.700	CCAT MASS	C.C	CCAT MF	0.C	PRES MASS	486.48	PRES PF	3.06893E-03
TOT EFF MAS	16831.	TCT EF MF	1.04915E-1	EF MP MAS	1816.1	EFF MP MF	1.14571E-C2	MP MASS	2885.0
BOILOFF MAS	1783.C	FF RC PAS	1330.4	WALL TKAS	0.79541E-C1	LENGTH	54.42E	VOLUME	37708.
WBOACT(1)	G.C	WBOACT(2)	1783.0	WBOACT(3)					
AFACT(1)	4.34200E-C1	AFACT(2)	7.46100E-01	AFACT(3)					
EFACT	6.25510E-C1	TMAX	0.0	TCU	342.44	TDOX	C.C	BOMAX	0.0
FPTH	8.50652E-C2	N-J PSSM	13484.	PRCP MASS	1.58517E 05	TANK AREA	5808.C	NO CF TNK	2.0000

THE OLD VALUE OF TIMEC IS 2152239.C

THE NEW VALUE OF TIMEC IS 2151728.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218V71

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1106545.	681077.	273206.
TOTAL INITIAL PROPELLANT MASS	887783.2	317018.5	68338.1
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	887783.25	317018.07	68338.12
PROPELLANT TANK DRY MASS	88778.2	26567.3	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88778.25	26567.25	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13063.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13063.73	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	68448.8	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10339.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212T3H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.76000 INITIAL ENERGY C.0

*** RESULTS ***

INS. THNESS	5.5234	INS. PASS	166C2.	INSUL. MF	8.81534E-C2	TANK MASS	6683.7	TANK PF	7.51497E-02
VENT PRESS	14.700	CCAT PASS	0.0	CCAT PF	C.0	PRES MASS	581.17	PRES MF	3.08736E-03
TOT EFF MAS	52451.	TCT EF MF	2.78847E-01	EF MP MAS	1585.C	EFF MP MF	1.05666E-02	PF MASS	3479.9
BCILOFF MAS	22221.	FF RC MAS	15173.	WALL TKNS	C.83886E-C1	LENGTH	63.216	VOLUME	44780.
WBFACT(1)	13144.	WBFACT(1)	22221.	WBFACT(3)					
AFACT(1)	5.75666E-C1	AFACT(2)	8.62796E-01	AFACT(3)					
CFACT	5.71564E-C1	TMAX	884.86	TCU	62.585	TDUX	C.C	BOMAX	0.0
EPTH	1.66430E-C1	N-J PSSP	31329.	PRCP MASS	1.88243E C5	TANK AREA	6692.0	AC CF TNK	2.0000

THE OLD VALUE OF IMIEC IS 2342076.0

THE NEW VALUE OF IMIEC IS 2342760.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212124

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1291197.	718260.	273208.
TOTAL INITIAL PROPELLANT MASS	966601.9	376514.5	68338.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	966601.87	376514.54	68338.12
PROPELLANT TANK DRY MASS	96660.1	62663.5	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	96660.12	62663.45	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	0.C	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.C	C.C
FUEL SUBSYSTEMS MASS	0.0	0.C	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	14254.3	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	14254.25	8483.08
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.C	5100.C	5300.C
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	5044.C	5140.C
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.C	0.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	75355.6	C.C	5455.C
ATTITUDE CONTROL SUBSYSTEM MASS	11383.0	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	C.C	C.C
PAYLOAD	0.0	270700.C	132500.C

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21813H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0
INS. TKNESS	5.5234	INSUL. MF	8.81534E-02
VENT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	52491.	EF MP MAS	1585.0
RO ILOFF MAS	22221.	WALL TKNS	0.82800E-01
WBFACT(1)	26800.	WBFACT(3)	
AFACT(1)	5.75606E-01	AFACT(3)	
CFACT	5.71564E-01	TCU	62.585
EPTH	1.66430E-01	FPCP MASS	1.88243E 05
		TMAX	884.86
		N-J PSSM	31329.
		TANK MASS	63.218
		LENGTH	63.218
		TANK AREA	6652.0
		TANK MASS	8083.7
		PRES MASS	581.17
		EFF MP MF	1.05660E-02
		TANK PF	7.51497E-02
		PRES PF	3.08736E-03
		PF MASS	3479.9
		VOLUME	44780.
		BDPAX	0.0
		NO CF TAK	2.0000

***** RESULTS *****

THE OLD VALUE OF IMIEC IS 2342076.0

THE NEW VALUE OF IMIEC IS 2342760.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

021813H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1291197.	778360.	273208.
TOTAL INITIAL PROPELLANT MASS	966601.9	376514.5	68336.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	966601.87	376514.54	68338.12
PROPELLANT TANK DRY MASS	96660.1	62663.5	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96660.12	62663.45	7517.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14254.3	6483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14254.29	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	75355.6	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11383.0	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAOLOAC	0.0	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206P3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	7.5469	INS. MASS	11872.
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	37233.	TOT EF MF	2.12995E-01
BOILGFF MAS	12055.	EF 80 MAS	9894.2
WBUACT(1)	0.0	WBUACT(2)	12055.
AFACT(1)	5.27166E-01	AFACT(2)	8.20711E-01
DFACT	5.92463E-01	TMAX	0.0
EPTH	1.45512E-01	N-J PSSM	25437.
		TDU	83.182
		PKDP MASS	1.74808E 05
		WALL TKNS	0.82148E-01
		WBUACT(3)	
		AFACT(3)	
		INSUL. MF	6.79150E-02
		COAT MF	0.0
		EF MP MAS	1902.4
		TANK MASS	7443.6
		PRES MASS	538.24
		EFF MP MF	1.08829E-02
		TANK MF	7.45177E-02
		PRES MF	3.07902E-03
		MP MASS	3211.0
		LENGTH	59.245
		VOLUME	41584.
		TDUX	0.0
		TANK AREA	6292.5
		80MAX	0.0
		NO OF TMK	2.0000

THE OLD VALUE OF IMIEG IS 2269329.0

THE NEW VALUE OF IMIEG IS 2265849.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U206P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1253088.	739555.	273208.
TOTAL INITIAL PROPELLANT MASS	934668.4	349979.1	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	934668.44	349979.12	68338.12
PROPELLANT TANK DRY MASS	93486.8	50926.0	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	93486.75	50926.03	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13722.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13722.70	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	72574.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10963.0	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206P3I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	1.7084	INS. MASS	2470.8
VENT PRESS	14.700	COAT MASS	0.0
TUT EFF MAS	16756.	TDT EF MF	1.06220E-01
BUILDFF MAS	477.91	EF BO MAS	356.91
WBOACT(1)	0.0	WBOACT(2)	477.91
AFACT(1)	4.34978E-01	AFACT(2)	7.46725E-01
DFACT	6.29200E-01	TMAX	0.0
EPTH	9.25114E-02	N-J PSSM	14593.
		WALL TKNS	0.79833E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	249.55
		PROP MASS	1.57746E 05
		TANK MASS	6650.6
		PRES MASS	484.03
		EFF MP MF	1.14458E-02
		LENGTH	54.198
		VOLUME	37525.
		TANK MF	7.37801E-02
		PRES MF	3.06841E-03
		MP MASS	2869.6
		TDUX	0.0
		TANK AREA	5785.1
		BOMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIEU IS 2153161.0

THE NEW VALUE OF IMIEU IS 2153030.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U206P41

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1197191.	682634.	273208.
TOTAL INITIAL PROPELLANT MASS	888321.2	315487.8	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	888321.19	315487.81	68338.12
PROPELLANT TANK DRY MASS	88832.1	29186.2	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88832.06	29186.20	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13033.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13033.07	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68495.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10346.8	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212P3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0				
**** RESULTS ****							
INS. TKNESS	7.8492	INS. MASS	12766.	INSUL. MF	7.01513E-02	TANK MASS	7783.8
VENT PRESS	14.700	CUAT MASS	0.0	COAT MF	0.0	PRES MASS	561.18
TOT EFF MAS	42821.	TOT EF MF	2.35303E-01	EF MP MAS	1966.4	EFF MP MF	1.08053E-02
BOILLOFF MAS	18237.	EF BC MAS	13906.	WALL TKNS	0.83085E-01	LENGTH	61.367
WBUACT(1)	4450.6	WBUACT(2)	13786.	WBUACT(3)		VOLUME	43291.
AFACT(1)	5.42947E-01	AFACT(2)	8.33376E-01	AFACT(3)			
DFACT	5.86173E-01	TMAX	0.0	TDU	78.252	TDUX	0.0
EPFH	1.48085E-01	N-J PSSM	26949.	PROP MASS	1.81984E 05	TANK AREA	6505.9
						BOMAX	0.0
						NO DF TNK	2.0000

THE OLD VALUE OF IMIEU IS 2290677.0

THE NEW VALUE OF IMIEC IS 2291375.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1261326.	756846.	273208.
TOTAL INITIAL PROPELLANT MASS	941727.8	364010.1	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	941727.81	364010.12	68338.12
PROPELLANT TANK DRY MASS	94172.7	53904.6	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	94172.69	53904.57	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14004.0	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14004.02	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	73176.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11053.8	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212P31

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 1.9502	INS. MASS 2852.2	INSUL. MF 1.78343E-02	TANK MASS 6750.8	TANK MF 7.38698E-02
VENT PKESS 14.700	CUAT MASS 0.0	CUAT MF 0.0	PRES MASS 490.97	PRES MF 3.06991E-03
TOT EFF MAS 18754.	TOT EF MF 1.17265E-01	EF MP MAS 1823.2	EFF MP MF 1.14001E-02	MP MASS 2913.3
WOLLOFF MAS 2353.8	EF 80 MAS 1773.8	WALL TKNS 0.80137E-01	LENGTH 54.844	VOLUME 38044.
WBOACT(1) 0.0	WBOACT(2) 2353.8	WBOACT(3) 0.0		
AFACT(1) 4.43444E-01	AFACT(2) 7.53520E-01	AFACT(3) 0.0		
DFACT 6.25827E-01	THAX 0.0	TDU 226.35	TDUX 0.0	BOHAX 0.0
EPTH 9.47738E-02	N-J PSSM 15157.	PKOP MASS 1.59929E 05	TANK AREA 5850.1	NO OF TNK 2.0000

THE OLD VALUE OF IMIEC IS 2103261.0

THE NEW VALUE OF IMIEU IS 2164118.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212P31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1202684.	688229.	273208.
TOTAL INITIAL PROPELLANT MASS	892895.4	319865.9	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	892895.37	319865.94	68338.12
PROPELLANT TANK DRY MASS	89289.5	30314.9	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89289.50	30314.92	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13120.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13120.67	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CONNECTION SUBSYSTEM MASS	68896.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10407.4	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	8.5640	INS. MASS	14292.	INSUL. MF	7.61488E-02	TANK MASS	8057.0	TANK MF	7.51229E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	579.40	PRES MF	3.08704E-02
TOT EFF MAS	47519.	TOT EF MF	2.53178E-01	EF MP MAS	2012.5	EFF MP MF	1.07225E-02	MP MASS	3468.8
BUILDUP MAS	22854.	EF BU MAS	16535.	WALL TKNS	0.83816E-01	LENGTH	63.055	VOLUME	44648.
WBOACT(1)	9696.8	WBOACT(2)	13157.	WBOACT(3)		TDUX	0.0	BOMAX	0.0
AFACT(1)	5.58002E-01	AFACT(2)	8.45458E-01	AFACT(3)		TANK AREA	6675.5	NO OF TNK	2.0000
DFACT	5.60174E-01	TMAX	0.0	TDU	84.631				
EPTH	1.54359E-01	N-J PSSM	28971.	PROP MASS	1.87689E 05				

THE OLD VALUE OF IMIEG IS 2311472.0

THE NEW VALUE OF IMIEG IS 2312168.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U210P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1266429.	772535.	273208.
TOTAL INITIAL PROPELLANT MASS	945977.1	375425.4	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	945977.06	375425.37	68338.12
PROPELLANT TANK DRY MASS	94597.6	57950.1	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	94597.63	57950.14	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14232.5	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14232.45	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	73548.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11110.0	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218P31

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 2.1775	INS. MASS 3218.3	INSUL. MF 1.98646E-02	TANK MASS 6846.7	TANK MF 7.39565E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 497.58	PRES MF 3.07125E-03
TOT EFF MAS 20685.	TOT EF MF 1.27674E-01	EF MP MAS 1838.5	EFF MP MF 1.13483E-02	MP MASS 2954.9
BOILOFF MAS 4137.8	EF BO MAS 3148.4	WALL TKNS 0.80425E-01	VOLUME 55.459	38540.
WBOACT(1) 0.0	WBOACT(2) 4137.8	WBOACT(3)		
AFACT(1) 4.52549E-01	AFACT(2) 7.60827E-01	AFACT(3)		
DFACT 6.22198E-01	TMAX 0.0	TDU 208.44	TDUX 0.0	BOMAX 0.0
EPTH 9.68923E-02	N-J PSSM 15698.	PROP MASS 1.62011E 05	TANK AREA 5911.9	NO OF TNK 2.0000

THE OLD VALUE OF IMIEO IS 2174244.0

THE NEW VALUE OF IMIEO IS 2174486.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

Uz1ap31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1207921.	693561.	273208.
TOTAL INITIAL PROPELLANT MASS	897255.7	324033.2	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	897255.75	324033.25	68338.12
PROPELLANT TANK DRY MASS	89725.5	31396.3	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89725.50	31396.32	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13204.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13204.05	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	69278.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10465.1	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218P3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.55941	INS. MASS	808.43
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	15592.	TOT EF MF	9.89344E-02
BOILOFF MAS	1162.5	EF BO MAS	862.49
WBOACT(1)	0.0	WBOACT(2)	1.162.5
AFACT(1)	4.28813E-01	AFACT(2)	7.41777E-01
DFACT	6.31658E-01	TMAX	0.0
EPTH	8.19721E-02	N-J PSSM	12918.
		WALL TKNS	0.79812E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	316.41
		PROP MASS	1.57596E 05
		TDUX	6.0
		TANK AREA	5780.7
		LENGTH	54.154
		VOLUME	37489.
		TANK MASS	6643.7
		PRES MF	483.56
		EFF MP MF	1.14895E-02
		TANK MF	7.37741E-02
		PRES MF	3.06833E-03
		MP MASS	2866.6
		BOMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2145873.0

 THE NEW VALUE OF IMIED IS 2145787.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218P3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1193604.	678980.	273208.
TOTAL INITIAL PROPELLANT MASS	885332.9	315189.4	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	885332.87	315189.37	68338.12
PROPELLANT TANK DRY MASS	885333.2	25836.7	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	885333.25	25836.72	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13027.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13027.10	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68234.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10307.3	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U206PT3H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 6.1875	INS. MASS 9749.3	INSUL. MF 5.56631E-02	TANK MASS 7459.6	TANK MF 7.45932E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 539.34	PRES MF 3.07933E-03
TOT EFF MAS 36152.	TCT EF MF 2.06406E-01	EF MP MAS 1915.2	EFF MP MF 1.09346E-02	MF PASS 3217.8
BOILOFF MAS 13362.	EF BO MAS 10894.	WALL TKNS 0.82193E-01	LENGTH 59.345	VOLUME 41665.
WBOACT(1) 2169.3	WBOACT(2) 13362.	WBOACT(3) 8.15240E-01		
AFACT(1) 5.20345E-01	AFACT(2) 8.15240E-01	AFACT(3) 3		
DFACT 5.95179E-01	TMAX 1441.4	TCU 42.728	TDX 0.0	BO MAX 0.0
EPTH 1.33275E-01	N-J PSSM 23343.	PRCP MASS 1.75148E 05	TANK AREA 6302.6	NO OF TAK 2.0000

THE OLD VALUE OF IMIED IS 2260250.0

THE NEW VALUE OF IMFC IS 2258599.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

112-40124

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1249472.	735872.	273200.
TOTAL INITIAL PROPELLANT MASS	931856.8	350458.8	68338.1
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	931856.81	350458.81	68338.12
PROPELLANT TANK DRY MASS	93185.6	46712.5	7517.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	93185.62	46712.58	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13733.4	8483.1
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13733.36	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.C	5100.C	5300.C
ENGINE DRY MASS	105000.C	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9044.C	5140.C
RETRO PROPULSION SUBSYSTEM MASS	C.C	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	72310.9	C.C	9455.C
ATTITUDE CONTROL SUBSYSTEM MASS	11023.1	1083.1	1434.3
MISCELLANEOUS EXPENDABLE MASS	C.C	C.C	C.C
PAVING	C.C	273700.C	132500.C

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212PT3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 6.1875	INS. MASS 9749.3	INSUL. MF 5.58631E-02	TANK MASS 7459.6	TANK MF 7.45332E-02
VENT PRFSS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 539.34	PRES MF 3.07933E-03
TOT EFF MAS 36192.	TCT EF MF 2.06406E-01	FF MP MAS 1915.2	EFF MP MF 1.09346E-02	MP MASS 3217.8
BOILOFF MAS 19262.	EF BC MAS 10894.	WALL TKNS 0.82192E-01	LENGTH 55.345	VOLUME 41665.
WBFACT(1) 9676.7	WBFACT(2) 13362.	WBFACT(3) 8.15240E-01		
AFACT(1) 5.20349E-01	AFACT(2) 8.15240E-01	AFACT(3) 3		
DFACT 5.55179E-01	TMAX 1441.4	TDU 42.728	TDUX 0.70	BOPAX 0.0
EPH 1.93275E-01	N-J PSSH 23343.	PROP MASS 1.75148E 05	TANK AREA 6302.6	NO OF TKN 2.0000

THE OLD VALUE OF IMIEC IS 2260250.0

THE NEW VALUE OF IMIEC IS 225854.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

01212013H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1247472.	725872.	273208.
TOTAL INITIAL PROPELLANT MASS	931856.8	350458.8	68338.1
TOTAL OXIDIZER MASS	0.	0.0	0.0
TOTAL FUEL MASS	931856.81	350458.81	68338.12
PROPELLANT TANK DRY MASS	93185.6	46712.9	7517.2
OXIDIZER TANK DRY MASS	0.	0.0	0.0
FUEL TANK DRY MASS	93185.62	46712.88	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.	0.0	0.0
FUEL SUBSYSTEMS MASS	0.	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	13733.4	8483.1
OXIDIZER SUBSYSTEMS MASS	0.	0.0	0.0
FUEL SUBSYSTEMS MASS	0.	13733.36	8483.08
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	10700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RFTRD PROPELLANT SUBSYSTEM MASS	0.	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	72310.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11923.1	1083.1	1434.3
MISCELLANEOUS EXPENDABLE MASS	0.0	0.0	0.0
PAYLOAD	0.	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U21RPT3H

** INPUT ITEMS **

DESIGN PRESSURE 19.7COCC INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 6.1875	INS. MASS 9749.3	INSUL. MF 5.56631E-02	TANK MASS 7459.6	TANK MF 7.45332E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 539.34	PRES MF 3.07933E-03
TOT EFF MAS 36152.	TCT FF MF 2.06406E-01	EF PP MAS 1915.2	EFF MP MF 1.09346E-02	MP PASS 3217.8
BOILOFF MAS 13362.	EF RD MAS 1CR94.	WALL TKNS 0.82193E-01	LENGTH 59.345	VOLUME 41645.
WROACT(1) 17190.	WROACT(2) 13362.	WROACT(3) 13362.		
AFACT(1) 5.26349E-01	AFACT(2) 8.15240E-01	AFACT(3) 8.15240E-01		
DFACT 5.55179E-01	TMAX 1441.4	TCU 42.728	TDUX 0.0	BDMAX 0.0
EPYH 1.33275E-01	N-J PSSM 23343.	PRCP MASS 1.75148E 05	TANK AREA 6302.6	NO OF TNK 2.00000

THE OLD VALUE CF IMIED IS 2260250.0

THE NEW VALUE CF IMIED IS 2258549.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11-10-67

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1249472.	715872.	272208.
TOTAL INITIAL PROPELLANT MASS	631856.8	350458.8	68338.1
TOTAL OXIDIZER MASS	C.C.	C.C.	C.C.
TOTAL FUEL MASS	931456.81	350458.81	68238.12
PROPELLANT TANK DRY MASS	93185.6	46712.5	7517.2
OXIDIZER TANK DRY MASS	C.C.	C.C.	C.C.
FUEL TANK DRY MASS	93195.62	46712.89	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C.	C.C.	C.C.
OXIDIZER SUBSYSTEMS MASS	C.C.	C.C.	C.C.
FUEL SUBSYSTEMS MASS	C.C.	C.C.	C.C.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C.	C.C.	C.C.
OXIDIZER SUBSYSTEMS MASS	C.C.	C.C.	C.C.
FUEL SUBSYSTEMS MASS	C.C.	C.C.	C.C.
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19790.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C.	C.C.	C.C.
MIDCOURSE CORRECTION SUBSYSTEM MASS	72310.9	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10923.1	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C.	C.C.	C.C.
PAVLAP	C.C.	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 3.0

**** RESULTS ****

INS. TKNESS	5.9456	INS. MASS	8710.5	INSUL. MF	5.43371E-02	TANK MASS	6766.4	TANK MF	7.38667E-02
VENT PRESS	14.639	COAT MASS	3.0	COAT MF	0.0	PRES MASS	491.11	PRES MF	3.06362E-03
TOT EFF MAS	22847.	TOT EF MF	1.42523E-01	EF MP MAS	1804.4	EFF MP MF	1.12560E-02	MP MASS	2920.0
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.80184E-01	LENGTH	54.944	VOLUME	38125.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.63248E-01	AFACT(2)	7.69414E-01	AFACT(3)					
DFACT	6.17934E-01	TMAX	0.0	TDJ	-1.0000	TDUX	0.0	BDMAX	0.0
EPTH	1.31267E-01	N-J PSSM	21043.	PROP MASS	1.60304E 05	TANK AREA	5860.1	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2187318.0

THE NEW VALUE OF IMIED IS 2189450.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SZ06N3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1215483.	701262.	273208.
TOTAL INITIAL PROPELLANT MASS	903553.5	321049.3	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	903553.50	321049.31	68338.12
PROPELLANT TANK DRY MASS	90355.3	42143.3	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90355.31	42143.26	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13142.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13142.09	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69830.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10548.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
5206N31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNESS	0.49005	INS. MASS	689.31	INSUL. MF	4.41651E-03	TANK MASS	6407.2	TANK MF	7.18402E-02
VENT PRESS	8.3900	COAT MASS	0.0	COAT MF	0.0	PRES MASS	373.22	PRES MF	2.39124E-03
TOT EFF MAS	14029.	TOT EF MF	8.98846E-02	EF MP MAS	1753.8	EFF MP MF	1.12366E-02	MP MASS	2762.8
BOILLOFF MAS	0.0	EF 80 MAS	0.0	WALL TKNS	0.79080E-01	LENGTH	52.620	VOLUME	36256.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.20980E-01	AFACT(2)	7.35491E-01	AFACT(3)					
DFACT	6.34780E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	ROMAX	0.0
EPTH	7.86479E-02	N-J PSSM	12275.	PROP MASS	1.56076F 05	TANK AREA	5626.5	NO OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIED IS 2136696.0

 THE NEW VALUE OF IMIED IS 2/36872.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S206N31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1189185.	674481.	273208.
TOTAL INITIAL PROPELLANT MASS	881654.0	312181.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	881654.00	312181.56	68338.12
PROPELLANT TANK DRY MASS	88165.3	24557.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88165.31	24552.43	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12820.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12820.12	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67911.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10258.6	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.15247	INS. MASS	208.75
VENT PRESS	3.4287	COAT MASS	0.0
TOT EFF MAS	12998.	TOT EF MF	8.35393E-02
		INSUL. MF	1.34163E-03
		COAT MF	0.0
		EF MP MAS	1695.2
BOILOFF MAS	0.0	EF BO MAS	0.0
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	4.15760E-01	AFACT(2)	7.31301E-01
DFACT	6.36860E-01	TMAX	0.0
EPH	7.26445E-02	N-J PSSH	11303.
		TDU	-1.0000
		PROP MASS	1.55597E 05
		WALL TKNS	0.78353E-01
		WBOACT(3)	
		AFACT(3)	
		TANK MASS	6178.9
		PRES MASS	281.41
		EFF MP MF	1.08948E-02
		LENGTH	51.127
		TANK MF	6.94944E-02
		PRES MF	1.80858E-03
		MP MASS	2661.8
		VOLUME	35055.
		TDUX	0.0
		TANK AREA	5476.4
		BO MAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2130632.0

THE NEW VALUE OF IMIED IS 2130664.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S206N3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1186112.	671353.	273208.
TOTAL OXIDIZER MASS	879095.1	311201.1	68338.1
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	879095.06	311201.06	68338.12
OXIDIZER TANK DRY MASS	87909.4	22607.0	7517.2
FUEL TANK DRY MASS	0.0	0.0	0.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	87909.44	22607.04	7517.19
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12617.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12617.75	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67687.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10224.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N3H

*** INPUT ITEMS ***

INITIAL ENERGY C.O

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. TKNESS	10.827	INS. MASS	16688.	INSUL. MF	1.00034E-01	TANK MF	9493.3	TANK MF	9.95829E-02
VENT PRESS	22.232	COAT MASS	0.0	COAT MF	0.0	PRES MF	661.42	PRES MF	3.95466E-03
TOT EFF MAS	35819.	TOT EF MF	2.14704E-01	EF MP MAS	1855.7	EFF MP MF	1.11234E-02	MP MASS	3125.7
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.10692	LENGTH	57.984	VOLUME	40570.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	5.24108E-01	AFACT(2)	8.18256E-01	AFACT(3)					
DFACT	5.93681E-01	TMAX	0.0	TDU	-1.0000	TOUX	0.0	ROMAX	0.0
EPTH	2.03581E-01	N-J PSSM	33963.	PROP MASS	1.66829E 05	TANK AREA	6165.8	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2265246.0

THE NEW VALUE OF IMIED IS 2267893.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212N3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1254132.	740587.	273208.
TOTAL INITIAL PROPELLANT MASS	935712.1	334091.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	935712.12	334091.62	68338.12
PROPELLANT TANK DRY MASS	93571.1	68014.7	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	93571.13	68014.69	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13553.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13553.62	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	72648.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10974.2	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.80444	INS. MASS	1155.7
VENT PRESS	14.602	COAT MASS	0.0
TOT EFF MAS	14969.	TOT EF MF	9.56413E-02
BOILOFF MAS	0.0	EF BO MAS	0.0
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	4.25713E-01	AFACT(2)	7.39289E-01
DFACT	6.32893E-01	TMAX	0.0
EPTH	8.41420E-02	N-J PSSM	13170.
		INSUL. MF	7.38420E-03
		COAT MF	0.0
		EF MP MAS	1799.8
		WALL TKNS	0.79653E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	-1.0000
		PROP MASS	1.56515E 05
		TANK MASS	6591.6
		PRES MASS	478.52
		EFF MP MF	1.14993E-02
		LENGTH	53.817
		VOLUME	37218.
		TANK MF	7.37006E-02
		PRES MF	3.05733E-03
		MP MASS	2843.8
		TDUX	0.0
		TANK AREA	5746.8
		BDMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2142230.0

THE NEW VALUE OF IMIED IS 2142532.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212N31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1191990.	677338.	273208.
TOTAL INITIAL PROPELLANT MASS	883989.9	313084.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	883989.94	313084.56	68338.12
PROPELLANT TANK DRY MASS	88398.9	26343.6	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88398.94	26343.57	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12982.5	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12982.54	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68116.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10299.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212W3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 0.17290	INS. MASS 241.40	INSUL. MF 1.54961E-03	TANK MASS 6339.3	TANK MF 7.12147E-02
VENT PRESS 6.8376	COAT MASS 0.0	CDAY MF 0.0	PRES MASS 345.18	PRES MF 2.21589E-03
TOT EFF MAS 13419.	TOT EF MF 8.61380E-02	EF MP MAS 1738.2	EFF MP MF 1.11579E-02	MP MASS 2732.9
BOILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.78866E-01	LENGTH 52.177	VOLUME 35900.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 4.17856E-01	AFACT(2) 7.32984E-01	AFACT(3) 3.0		
DFACT 4.36024E-01	TRAX 0.0	TDU -1.0000	TDX 0.0	BOMAX 0.0
EPTH 7.49801E-02	N-J PSSM 11680.	PROP MASS 1.55779E 05	TANK AREA 5582.0	NO OF TANK 2.0000

THE OLD VALUE OF IMIED IS 2133063.0

THE NEW VALUE OF IMIED IS 2133286.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212N3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1187368.	672631.	273208.
TOTAL INITIAL PROPELLANT MASS	880140.5	311581.7	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	880140.50	311581.69	68338.12
PROPELLANT TANK DRY MASS	88014.0	23362.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88014.00	23362.42	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12760.1	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12760.13	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	14497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67779.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10238.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	13.767	INS. MASS	22486.
VENT PRESS	32.363	COAT MASS	0.0
TOT EFF MAS	48864.	TOT EF MF	2.81554E-01
BOILOFF MAS	0.0	EF BO MAS	0.0
WBDACT(1)	0.0	WBDACT(2)	0.0
AFACT(1)	5.82136E-01	AFACT(2)	8.64826E-01
DFACT	5.70556E-01	TMAX	0.0
EPTH	2.70465E-01	N-J PSSM	46940.
		INSUL. MF	1.29561E-01
		COAT MF	0.0
		EF MP MAS	1924.5
		WALL TKNS	0.14310
		WBDACT(3)	
		AFACT(3)	
		TDU	-1.0000
		PROP MASS	1.73552E 05
		TANK MASS	13462.
		PRES MASS	895.07
		EFF MP MF	1.10888E-02
		LENGTH	61.639
		VOLUME	43509.
		TANK MF	1.35747E-01
		PRES MF	5.15735E-03
		MP MASS	3373.0
		BDMAX	0.0
		NO OF TNK	2.0000
		TDUX	0.0
		TANK AREA	6533.2

THE OLD VALUE OF IMIED IS 2345721.0

THE NEW VALUE OF IMIED IS 2345991.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S218N3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1292796.	779990.	273208.
TOTAL INITIAL PROPELLANT MASS	967934.4	347134.3	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	967934.37	347134.31	68338.12
PROPELLANT TANK DRY MASS	96793.4	93887.6	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96793.37	93887.56	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14040.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14040.60	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19799.0	9100.0	5300.0
ENGINE DRY MASS	105990.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75472.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11400.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
SZ18N31

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 1.7812	INS. MASS 2568.1	INSUL. MF 1.63382E-02	TANK MASS 6622.9	TANK MF 7.37352E-02
VENT PRESS 14.628	COAT MASS 0.0	COAT MF 0.0	PRES MASS 481.06	PRES MF 3.06046E-03
TOT EFF MAS 16440.	TOT EF MF 1.04590E-01	EF MP MAS 1800.8	EFF MP MF 1.14564E-02	MP MASS 2857.5
BOILOFF MAS 0.0	EF 80 MAS 0.0	WALL TKNS 0.79749E-01	LENGTH 54.019	VOLUME 37382.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 4.32484E-01	AFACT(2) 7.44723E-01	AFACT(3) 0.0		
DFACT 6.30194E-01	TMAX 0.0	TDU -1.0000	TDUX 0.0	ROMAX 0.0
EPH 9.31337E-02	N-J PSSM 14639.	PROP MASS 1.57186E 05	TANK AREA 5767.2	ND OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2150207.0

THE NEW VALUE OF IMIED IS 2157347.0



MASS SUMMARY (lb_m)

S218N31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1196381.	681811.	273208.
TOTAL INITIAL PROPELLANT MASS	887647.2	314573.6	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	887647.25	314573.56	68338.12
PROPELLANT TANK DRY MASS	88764.7	29297.4	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88764.69	29297.41	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13012.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13012.66	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68436.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10337.9	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAOLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S210N3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 0.22009	INS. MASS 311.77	INSUL. MF 1.99913E-03	TANK MASS 6468.1	TANK MF 7.25793E-02
VENT PRESS 10.937	COAT MASS 0.0	COAT MF 0.0	PRES MASS 416.27	PRES MF 2.66914E-03
TOI EFF MAS 13019.	TOT EF MF 8.86101E-02	EF MP MAS 1772.1	EFF MP MF 1.13627E-02	MP MASS 2789.6
BOILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.79271E-01	LENGTH 53.016	VOLUME 36574.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 4.19826E-01	AFACT(2) 7.34565E-01	AFACT(3) 0.0		
DFACT 6.35239E-01	TRAX 0.0	TOU -1.0000	TDUX 0.0	BOHAX 0.0
EPTH 7.72474E-02	N-J PSSM 12047.	PROP MASS 1.55955E 05	TANK AREA 5666.3	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 213533.0

 THE NEW VALUE OF IMIED IS 2135422.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S218N3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1180565.	673851.	273208.
TOTAL INITIAL PROPELLANT MASS	881137.7	311952.2	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	881137.69	311952.19	68338.12
PROPELLANT TANK DRY MASS	88113.7	24097.5	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88113.69	24097.51	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12874.0	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12873.96	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	67866.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10251.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	5.2998	INS. MASS	7829.7	INSUL. MF	4.83532E-02	TANK MASS	6842.9	TANK MF	7.39531E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	497.28	PRES MF	3.07099E-03
TOT EFF MAS	22955.	TOT EF MF	1.41762E-01	EF MP MAS	1822.9	EFF MP MF	1.12575E-02	MP MASS	2953.3
BOILOFF MAS	1773.7	EF 80 MAS	830.21	WALL TKMS	0.80413E-01	LENGTH	55.435	VOLUME	38520.
WBOACT(1)	1755.7	WBOACT(2)	18.000	WBOACT(3)					
AFACT(1)	4.64967E-01	AFACT(2)	7.70793E-01	AFACT(3)					
DFACT	6.17251E-01	TMAX	0.0	TDU	54.824	TDX	0.0	BOMAX	0.0
EPTM	1.25377E-01	N-J PSSM	20302.	PRDP MASS	1.61928E 05	TANK AREA	5909.5	ND OF TANK	2.0000

THE OLD VALUE OF IMIED IS 2189439.0

THE NEW VALUE OF IMIED IS 218976.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S206V3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	121335.0	702611.	273208.
TOTAL INITIAL PROPELLANT MASS	901785.0	323876.2	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	901785.00	323876.19	68338.12
PROPELLANT TANK DRY MASS	90178.4	40606.7	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90178.44	40606.70	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13200.9	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13200.89	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105030.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69675.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10525.1	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212V3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
*** RESULTS ***			
INS. TKNESS	7.5469	INS. MASS	11884.
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	33534.	TOT EF MF	1.91608E-01
BOILOFF MAS	12121.	EF BO MAS	6136.2
WBOACT(1)	12106.	WBOACT(2)	14.250
AFACT(1)	5.05900E-01	AFACT(2)	8.03644E-01
DFACT	6.00937E-01	TMAX	0.0
EPTH	1.45507E-01	N-J PSSM	25466.
		TDU	74.800
		PROP MASS	1.75015E 05
		WALL TKNS	0.82176E-01
		WBOACT(3)	
		AFACT(3)	
		TANK MASS	7453.3
		PRES MASS	538.95
		EFF MP MF	1.10397E-02
		LENGTH	59.306
		VOLUME	41633.
		TANK MF	7.45271E-02
		PRES MF	3.07943E-03
		MP MASS	3215.2
		BOHAX	0.0
		ND OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2241273.C

THE NEW VALUE OF IMIED IS 2242341.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212V3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1229443.	739694.	273208.
TOTAL INITIAL PROPELLANT MASS	915178.1	350099.2	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	915178.06	350099.25	68338.12
PROPELLANT TANK DRY MASS	91517.8	50942.1	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	91517.75	50942.05	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13725.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13725.59	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105300.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70849.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10702.3	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 9.2963	INS. MASS 15458.	INSUL. MF 8.27188E-02	TANK MASS 8017.5	TANK MF 7.50833E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 576.81	PRES MF 3.08674E-03
TOT EFF MAS 43738.	TOT EF MF 2.34057E-01	EF MP MAS 2028.0	EFF MP MF 1.08525E-02	MP MASS 3452.4
BOILOFF MAS 21564.	EF 80 MAS 11645.	WALL TKNS 0.83712E-01	LENGTH 62.812	VOLUME 44453.
WBOACT(1) 21552.	WBOACT(2) 12.687	WBOACT(3) 0.0		
AFACT(1) 5.39826E-01	AFACT(2) 8.30870E-01	AFACT(3) 0.0		
DFACT 5.87417E-01	TMAX 0.0	TDU 89.452	TDUX 0.0	BOMAX 0.0
EPTH 1.60889E-01	N-J PSSM 30065.	PRDP MASS 1.86868E 05	TANK AREA 6651.1	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2286418.0

THE NEW VALUE OF IMIED IS 2290244.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S218V3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	124381C.	773234.	273208.
TOTAL INITIAL PROPELLANT MASS	927142.0	373941.2	68336.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	927142.00	373941.25	68336.12
PROPELLANT TANK DRY MASS	92714.1	60162.9	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	92714.12	60162.93	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14202.5	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14202.51	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	71897.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10860.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206P3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. TKNESS	3.2750	INS. MASS	4878.1
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	21520.	TOT EF MF	1.31572E-01
BOILOFF MAS	4768.2	EF 80 MAS	2179.0
WBOACT(1)	4757.5	WBOACT(2)	10.750
AFACT(1)	4.56272E-01	AFACT(2)	7.63815E-01
DFACT	6.20715E-01	TMAX	0.0
EPTH	1.06918E-01	N-J PSSM	17488.
		INSUL. MF	2.98245E-02
		COAT MF	0.0
		EF MP MAS	1853.4
		WALL TKNS	0.80638E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	36.681
		PROP MASS	1.63561E 05
		TDUX	0.0
		TANK AREA	5958.0
		LENGTH	55.918
		TANK MASS	6918.4
		PRES MASS	502.46
		EFF MP MF	1.13317E-02
		TANK MF	7.40221E-02
		PRES MF	3.07198E-03
		MP MASS	2985.9
		VOLUME	38908.
		80MAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIEO IS 2178774.0

THE NEW VALUE OF IMIEO IS 2178668.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S206P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	120518.0	790285.	273208.
TOTAL INITIAL PROPELLANT MASS	894973.9	327117.9	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	894973.87	327117.90	68338.12
PROPELLANT TANK DRY MASS	89497.3	34974.8	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89497.31	34974.84	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13265.8	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13265.79	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69778.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10434.9	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.C

***** RESULTS *****

INS. TKNESS 4.6406	INS. MASS 7171.6	INSUL. MF 4.19197E-02	TANK MASS 7268.4	TANK MF 7.43496E-02
VENT PRESS 14.700	COAT MASS 0.C	COAT MF 0.C	PRES MASS 526.36	PRES MF 3.07670E-03
TOT EFF MAS 27520.	TOT EF MF 1.60861E-01	EF MP MAS 1915.0	EFF MP MF 1.11938E-02	MP MASS 3136.4
BOILOFF MAS 10764.	EF 80 MAS 5187.4	WALL TKNS 0.81653E-01	LENGTH 58.141	VOLUME 40697.
WBDACT(1) 10756.	WBDACT(2) 8.2187	WBDACT(3)		
AFACT(1) 4.81699E-01	AFACT(2) 7.84221E-01	AFACT(3)		
DFACT EPTH 6.10583E-01	TMAX 0.C	TDU 50.720	IDUX 0.C	80MAX 0.7
	N-J PSSM 20418.	PROP MASS 1.71079E 05	TANK ARFA 6181.6	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2210288.C

THE NEW VALUE OF IMIED IS 2209124.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

S212P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1214326.	721599.	273208.
TOTAL INITIAL PROPELLANT MASS	902589.1	342256.5	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	902589.12	342256.50	68338.12
PROPELLANT TANK DRY MASS	90258.9	40846.9	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90258.87	40846.91	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13568.6	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13568.59	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69746.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10535.7	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27070.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S210P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	5.7352	INS. MASS	9152.6	INSUL. MF	5.14569E-02	TANK MASS	7588.2	TANK MF	7.46582E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	548.03	PRES MF	3.09112E-03
TOT EFF MAS	33042.	TOT EF MF	1.85768E-01	EF MP MAS	1972.0	EFF MP MF	1.10869E-02	MP MASS	3272.3
BOILOFF MAS	16124.	EF BO MAS	8090.3	WALL TKMS	0.82550E-01	LENGTH	60.150	VOLUME	42312.
WBOACT(1)	16117.	WBOACT(2)	7.1562	WBOACT(3)					
AFACT(1)	5.01615E-01	AFACT(2)	8.00206E-01	AFACT(3)					
DFACT	6.02646E-01	TMAX	0.0	TDU	60.415	TDX	0.0	80MAX	0.0
EPTH	1.29196E-01	M-J PSSH	22980.	PROP MASS	1.77869E 05	TANK AREA	6383.5	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2235713.0

THE NEW VALUE OF IMIED IS 2235726.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S218P3H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1222294.	740427.	273278.
TOTAL INITIAL PROPELLANT MASS	909224.7	355706.4	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	909224.75	355706.37	68338.12
PROPELLANT TANK DRY MASS	90922.4	45955.9	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90922.44	45955.86	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13838.0	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13837.96	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70327.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10623.5	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S210P31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. TKNESS	1.2627	INS. MASS	1829.7	INSUL. MF	1.15721E-02	TANK MASS	6667.3	TANK MF	7.37950E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	485.19	PRES MF	3.06864E-03
TOT EFF MAS	16290.	TOT EF MF	1.03031E-01	EF MP MAS	1813.3	EFF MP MF	1.14685E-02	MP MASS	2876.9
**** RESULTS ****									
BOILOFF MAS	1141.8	EF BO MAS	494.35	WALL TKNS	0.79884E-01	LENGTH	54.306	VOLUME	37612.
WBOACT(1)	1139.3	WBOACT(2)	2.5000	WBOACT(3)					
AFACT(1)	4.32220E-01	AFACT(2)	7.44511E-01	AFACT(3)					
DFACT	6.30300E-01	TMAX	0.0	TDU	155.69	TDUX	0.0	ROMAX	0.0
EPTH	8.84355E-02	N-J PSSH	13983.	PROP MASS	1.58111E 05	TANK AREA	5796.0	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2149894.0
 THE NEW VALUE OF IMIED IS 219957.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S218P31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1194488.	682160.	273208.
TOTAL INITIAL PROPELLANT MASS	886069.7	316220.3	68338.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	886069.69	316220.31	68338.12
PROPELLANT TANK DRY MASS	88606.9	27965.1	7517.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88606.88	27965.11	7517.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13047.7	8483.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13047.73	8483.08
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68298.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10317.0	1083.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U206N9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.0
*** RESULTS *****			
INS. TKNESS	13.944	INS. MASS	25666.
VENT PRESS	31.263	COAT MASS	0.0
TOT EFF MAS	55558.	TOT EF MF	2.76828E-01
BOILOFF MAS	0.0	EF BO MAS	0.0
WBDOACT(1)	0.0	WBDOACT(2)	0.0
AFACT(1)	5.68612E-01	AFACT(2)	8.41330E-01
DFACT	5.50429E-01	TMAX	0.0
EPTH	2.65758E-01	N-J PSSM	53336.
		INSUL. MF	1.27888E-01
		COAT MF	0.0
		EF MP MAS	2221.8
		WALL TKNS	C.14368
		WBDOACT(3)	
		AFACT(3)	
		TDJ	-1.0000
		PROP MASS	2.00694E 05
		TANK MASS	15233.
		PRES MASS	1012.1
		EFF MP MF	1.10704E-02
		LENGTH	69.890
		VOLUME	50146.
		TANK MF	1.32827E-01
		PRES MF	5.04300E-03
		MP MASS	4036.4
		TDUX	0.0
		TANK AREA	7362.7
		BOIMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2558482.0

 THE NEW VALUE OF IMIED IS 2556798.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

112.6148

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	130724.5	887127.	272429.
TOTAL INITIAL PROPELLANT MASS	1054011.0	41075.5	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1054011.0	401075.50	67714.00
PROPELLANT TANK DRY MASS	105401.0	106588.8	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	105401.00	106588.81	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15360.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15360.56	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16487.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTIVE SUBSYSTEM MASS	80004.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12552.0	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206N91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7G000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. TKNESS	1.6440	INS. MASS	2655.9
VENT PRESS	14.648	COAT MASS	0.0
TOT EFF MAS	18799.	TOT EF MF	1.04129E-01
		INSUL. MF	1.47107E-02
		COAT MF	0.0
		EF MP MAS	2089.7
BOILOFF MAS	0.0	EF BO MAS	0.0
MBOACT(1)	0.0	MBOACT(2)	0.0
AFACT(1)	4.22641E-01	AFACT(2)	7.25916E-01
DFACT	6.12102E-01	TMAX	0.0
EPH	9.25540E-02	N-J PSSM	16710.
		TDU	-1.0000
		PROP MASS	1.80540E-05
		WALL TKNS	0.82893E-01
		MBOACT(3)	
		AFACT(3)	
		TANK MASS	7713.3
		PRES MASS	555.59
		EFF MP MF	1.15146E-02
		TANK MF	7.47660E-02
		PRES MF	3.07738E-03
		MP MASS	3413.9
		LENGTH	60.929
		VOLUME	42939.
		TANK AREA	6461.9
		TDUX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2329016.0

 THE NEW VALUE OF IMIED IS 2330774.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U200N51

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1285228.	773060.	272429.
TOTAL INITIAL PROPELLANT MASS	961631.6	361382.8	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	961631.62	361382.81	67714.00
PROPELLANT TANK DRY MASS	96163.1	33447.4	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96163.12	33447.43	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14127.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14127.61	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74920.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11317.3	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS

U206N9L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	0.22792	INSUL. MF	2.01234E-03
VENT PRESS	9.9573	COAT MF	0.0
TOT EFF MAS	15994.	EF MP HAS	2048.7
BOILOFF MAS	0.0	WALL TKNS	0.82303E-01
WBFACT(1)	0.0	WBFACT(3)	
AFACT(1)	4.11290E-01	AFACT(3)	
DFACT	6.16897E-01	TDU	-1.0000
EPTH	7.78368E-02	PROP MASS	1.79163E '05
		TMAX	0.0
		N-J PSSM	13945.
		TANK MASS	7499.0
		PRES MASS	461.74
		EFF MP MF	1.14350E-02
		LENGTH	59.592
		VOLUME	41863.
		TANK MF	7.32473E-02
		PRES MF	2.57723E-03
		MP MASS	3321.0
		'TDUX	0.0
		TANK AREA	6327.4
		BOMAX	0.0
		NO OF TMK	2.0000

THE OLD VALUE OF IMIEG IS 2313098.0

THE NEW VALUE OF IMIEG IS 2313357.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

L20689L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1276628.	764303.	272429.
TOTAL INITIAL PROPELLANT MASS	954470.2	356369.2	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	954470.25	358369.19	67714.00
PROPELLANT TANK DRY MASS	95446.9	27894.3	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95446.94	27894.29	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13936.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13936.83	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74292.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11222.5	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J212N9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	18.527	INS. MASS	35684.	INSUL. MF	1.70492E-01	TANK MASS	17511.	TANK MF	1.45412E-01
VENT PRESS	34.878	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1146.1	PRES MF	5.47572E-03
TOT EFF MAS	69728.	TOT EF MF	3.33153E-01	EF MP MAS	2254.8	EFF MP MF	1.07730E-02	MP MASS	4272.3
ROILOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.15784	LENGTH	73.286	VOLUME	52877.
WBDACT(1)	0.0	WBDACT(2)	0.0	WBDACT(3)					
AFACT(1)	6.22261E-01	AFACT(2)	8.83749E-01	AFACT(3)					
DFACT	5.27762E-01	TMAX	0.0	TDU	-1.0000	TDUX	0.0	80MAX	0.0
EPFH	3.22380E-01	N-J PSSM	57473.	PROP MASS	2.09297E 05	TANK AREA	7704.1	NO OF TNK	2.0000

THE OLD VALUE OF IMTED IS 2656296.C

THE NEW VALUE OF IMTED IS 2641804.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

02120644

	STAGE 1 1439352.	STAGE 2 920016.	STAGE 3 272429.
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	109984.0	416013.1	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1089984.0	416013.06	67714.00
PROPELLANT TANK DRY MASS	109984.3	134114.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	109984.31	134114.19	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15785.9	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15785.90	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	86167.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	13716.3	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212N91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	3.3455	INS. MASS	5438.4	INSUL. MF	2.99002E-02	TANK MASS	7778.4	TANK MF	7.48386E-02
VENT PRESS	14.677	COAT MASS	0.0	COAT MF	0.0	PRES MASS	560.44	PRES MF	3.08127E-03
TOT EFF MAS	21702.	TOT EF MF	1.19318E-01	EF MP MAS	2091.3	EFF MP MF	1.14977E-02	MP MASS	3442.0
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.83070E-01	LENGTH	61.334	VOLUME	43264.
MBOACT(1)	0.0	MBOACT(2)	0.0	MBOACT(3)					
AFACT(1)	4.33363E-01	AFACT(2)	7.34893E-01	AFACT(3)					
DFACT	6.07572E-01	TMAX	0.0	TDU	-1.0000	TIDUX	0.0	BDMAX	0.0
EPTH	1.07820E-01	M-J PSSM	19611.	PROP MASS	1.81887E 05	TANK AREA	6502.5	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2344286.0

 THE NEW VALUE OF IMIED IS 2348761.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212N51

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1294169.	782166.	272429.
TOTAL INITIAL PROPELLANT MASS	969077.6	364562.9	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	969077.62	364562.87	67714.00
PROPELLANT TANK DRY MASS	96907.7	39307.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96907.69	39307.16	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14193.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14192.98	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75572.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11415.8	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
V212N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.76000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	0.26452	INS. MASS	424.11	INSUL. MF	2.36456E-03	TANK MASS	7635.5	TANK MF	7.44991E-02
VENT PRESS	13.977	COAT MASS	0.0	COAT MF	0.0	PRES MASS	539.18	PRES MF	3.00616E-03
TOT EFF MAS	16408.	TOT EF MF	9.14822E-02	EF MP MAS	2082.8	EFF MP MF	1.16124E-02	MP MASS	3380.3
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.82680E-01	LENGTH	60.445	VOLUME	42549.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.13036E-01	AFACT(2)	7.18322E-01	AFACT(3)					
DFACT	6.16160E-01	TMAX	0.0	TDU	-1.0000	'TDUX	0.0	BOMAX	0.0
EPH	7.98697E-02	N-J PSSM	14325.	PROP MASS	1.79359E '05	TANK AREA	6413.1	NO OF TNK	2.0000

THE OLD VALUE OF IMIEG IS 2315531.0

THE NEW VALUE OF IMIEG IS 2315722.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0212N5L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1277698.	765597.	272429.
TOTAL INITIAL PROPELLANT MASS	955528.1	358782.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	955528.12	358782.56	67714.00
PROPELLANT TANK DRY MASS	95552.7	28655.8	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95552.75	28655.85	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14055.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14055.77	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74385.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11236.5	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS

U21R99H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	21.999	INS. MASS	44855.	INSUL. MF	2.03837E-01	TANK MASS	21516.	TANK MF	1.71109E-01
VENT PRESS	41.536	COAT MASS	0.0	COAT MF	0.0	PRES MASS	1377.3	PRES MF	6.25902E-03
TOT EFF MAS	86185.	TOT EF MF	3.91660E-01	EF MP MAS	2300.8	EFF MP MF	1.04555E-02	MP MASS	4584.4
BOIL OFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.18320	LENGTH	77.779	VOLUME	56490.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)		TDUX	0.0	BOMAX	0.0
AFACT(1)	6.83559E-01	AFACT(2)	9.32216E-01	AFACT(3)		TANK AREA	8155.8	NO OF TNK	2.30000
DFACT	5.01864E-01	TMAX	0.0	TDU	-1.0000				
EPH	3.81205E-01	N-J PSSM	83885.	PROP MASS	2.20052E 05.				

THE OLD VALUE OF IMIED IS 2778869.0

THE NEW VALUE OF IMIED IS 2737187.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U21R1010H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	148662.0	978139.	272429.
TOTAL INITIAL PROPELLANT MASS	1129337.0	432757.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1129337.0	432757.75	67714.00
PROPELLANT TANK DRY MASS	112933.6	164969.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	112933.62	164969.19	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	16309.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	16309.84	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	89616.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	13537.2	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218N91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THNESS	3.7925	INS. MASS	6317.7
VENT PRESS	20.136	COAT MASS	0.0
TOT EFF MAS	26304.	TOT EF MF	1.42897E-01
		INSUL. MF	3.42730E-02
		COAT MF	0.0
		EF MP MAS	2129.9
BOILOFF MAS	0.0	EF 80 MAS	0.0
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	4.52588E-01	AFACT(2)	7.49594E-01
CFACT	5.09449E-01	TMAX	0.0
EPH	1.31142E-01	M-J PSSM	24174.
		TDU	-1.0000
		PROP MASS	1.84333E-05
		WALL TKNS	0.10225
		WBOACT(3)	
		AFACT(3)	
		TANK MASS	9810.7
		PRES MASS	687.50
		EFF MP MF	1.15548E-02
		TANK MF	9.31397E-02
		PRES MF	3.72966E-03
		MP MASS	3553.2
		LENGTH	62.934
		VOLUME	44551.
		TANK AREA	0.0
		BO MAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2372244.0

 THE NEW VALUE OF IMIED IS 2377194.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

6218N91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1308257.	796511.	272429.
TOTAL INITIAL PROPELLANT MASS	980808.7	369530.4	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	980808.69	369530.37	67714.00
PROPELLANT TANK DRY MASS	98080.8	48461.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98080.81	48461.05	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14417.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14416.98	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76600.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11571.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U218N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	0.71217	INS. MASS	1146.0	INSUL. MF	6.37929E-03	TANK MASS	7681.6	TANK MF	7.48313E-02
VENT PRESS	14.728	COAT MASS	0.0	COAT MF	0.0	PRES MASS	554.31	PRES MF	3.08563E-03
TUT EFF MAS	17233.	TOT EF MF	9.59271E-02	EF NP MAS	2089.4	EFF MP MF	1.16310E-02	MP MASS	3396.5
BOILOFF MAS	0.0	EF 80 MAS	0.0	WALL TKNS	0.82876E-01	LENGTH	60.678	VOLUME	42737.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.15392E-01	AFACT(2)	7.20184E-01	AFACT(3)					
DFACT	6.15165E-01	TMAX	0.0	TDU	-1.0000	TDUX	-0.0	BDMAX	0.0
EPH	8.42961E-02	N-J PSSM	15143.	PROP MASS	1.79642E 05	TANK AREA	6436.6	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2318621.0

 THE NEW VALUE OF IMIED IS 2321086.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U216884L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1280458.	766203.	272429.
TOTAL INITIAL PROPELLANT MASS	957659.5	359685.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	957659.50	359685.69	67714.00
PROPELLANT TANK DRY MASS	95765.9	30320.1	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95765.87	30320.10	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14094.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14094.63	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74572.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11264.7	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U206V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	12.008	INS. MASS	21940.	INSUL. MF	1.04987E-01	TANK MASS	9098.6	TANK MF	7.61921E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	647.66	PRES MF	3.09915E-03
TOT EFF MAS	54173.	TOT EF MF	2.59228E-01	EF MP MAS	2231.2	EFF MP MF	1.06766E-02	MP MASS	39999.0
BOILOFF MAS	16236.	FF BO MAS	13432.	WALL TKNS	0.86453E-01	LENGTH	69.352	VOLUME	49712.
WROACT(1)	0.0	WBJACT(2)	16236.	WBJACT(3)					
AFACT(1)	5.50850E-01	AFACT(2)	8.27287E-01	AFACT(3)					
DFACT	5.57933E-01	TMAX	0.0	TDJ	139.53	TDUX	0.0	BO MAX	0.0
EPH	1.84278E-01	N-J PSSM	38510.	PROP MASS	2.08978E 05	TANK AREA	7508.5	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2527849.C

THE NEW VALUE OF IMIED IS 2531660.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11/27/64

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1304700.	874443.	272429.
TOTAL INITIAL PROPELLANT MASS	1744530.7	410016.4	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1744530.75	41016.17	67714.00
PROPELLANT TANK DRY MASS	1744530.0	77031.3	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	174453.04	77031.31	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15203.1	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15203.14	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	14497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	82185.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12414.7	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U212V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 13.799	INS. MASS 26338.	INSUL. MF 1.19751E-01	TANK MASS 9648.3	TANK MF 7.67691E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 682.88	PRES MF 3.19485E-03
TOT EFF MAS 66884.	TOT EF MF 3.04103E-01	EF MP MAS 2284.8	EFF MP MF 1.03885E-02	MP MASS 4224.2
BOILOFF MAS 24085.	EF RD MAS 20696.	WALL TKNS 0.87763E-01	LENGTH 72.593	VOLUME 52320.
WBOACT(1) 0.0	WBOACT(2) 24085.	WBOACT(3) 0.0		
AFACT(1) 5.91187E-01	AFACT(2) 8.59179E-01	AFACT(3) 0.0		
DFACT 5.40890E-01	TMAX 0.0	TDU 131.40	TDUX 0.0	80MAX 0.0
EPTH 1.99625E-01	N-J PSSM 43905.	PROP MASS 2.19939E 05	TANK AREA 7634.4	NO OF TMK 2.0000

THE OLD VALUE OF IMIED IS 2598642.0

THE NEW VALUE OF IMIED IS 2597620.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1212204H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	141717.0	272421.0	272429.0
TOTAL INITIAL PROPELLANT MASS	107157.0	439785.9	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	107157.0	439785.94	67714.0
PROPELLANT TANK DRY MASS	107157.6	47703.1	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	107150.62	97702.06	7449.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15740.7	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15740.65	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	107150.0	9100.0	5300.0
ENGINE DRY MASS	106100.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	10497.0	9044.0	5140.0
RETRY PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS PROPULSION SUBSYSTEM MASS	84540.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10771.7	1159.7	1424.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVING	0.0	30900.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U212V91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THKNESS	3.0786	INS. MASS	5019.5
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	21677.	TOT EF MF	1.18767E-01
BOILOFF MAS	452.38	EF 80 MAS	333.17
WBOACT(1)	0.0	WBOACT(2)	452.38
AFACT(1)	4.35995E-01	AFACT(2)	7.36475E-01
DFACT	6.06460E-01	TMAX	0.0
EPTH	1.05461E-01	N-J PSSM	19249.
		WALL TKNS	0.83154E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	320.82
		PROP MASS	1.82520E 05
		TANK MASS	7809.3
		PRES MASS	562.90
		EFF MP MF	1.14811E-02
		LENGTH	61.526
		VOLUME	43418.
		TANK MF	7.48757E-02
		PRES MF	3.08403E-03
		MP MASS	3455.4
		TDUX	0.0
		TANK AREA	6521.8
		BOMAX	0.0
		NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2348070.0

 THE NEW VALUE OF IMIED IS 2349131.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1293857.	781847.	272429.
TOTAL INITIAL PROPELLANT MASS	968817.6	365042.3	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	968817.56	365042.31	67714.00
PROPELLANT TANK DRY MASS	96881.7	38497.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96881.69	38497.57	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14204.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14204.76	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75549.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11412.4	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21RV9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 13.559	INS. MASS 27325.	INSUL. MF 1.16630E-01	TANK MASS 10382.	TANK MF 7.75465E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 729.16	PRES MF 3.11223E-03
TOT EFF MAS 78497.	TOT EF MF 3.35043E-01	EF MP MAS 2396.7	EFF MP MF 1.02296E-02	MP MASS 4519.1
BOILOFF MAS 37059.	EF BO MAS 29878.	WALL TKNS 0.89437E-01	LENGTH 76.838	VOLUME 55733.
WBOACT(1) 10252.	WBOACT(2) 26807.	WBOACT(3) 8.78907E-01		
AFACT(1) 6.16137E-01	AFACT(2) 8.78907E-01	AFACT(3) 3		
DFACT 5.30349E-01	TMAX 0.0	TDJ 130.42	TDUX 0.0	BDMAX 0.0
EPH 1.97289E-01	N-J PSSM 46223.	PROP MASS 2.34289E 05	TANK AREA 8861.2	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2644709.0

 THE NEW VALUE OF IMIED IS 2644652.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

121PVC4

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1430500.	941614.	272429.
TOTAL INITIAL PROPELLANT MASS	1092550.	468706.5	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1092550.00	468706.50	67714.00
PROPELLANT TANK DRY MASS	109250.5	92470.5	7449.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	109269.50	92470.50	7449.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	16334.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	16334.60	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	10700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16407.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	8528.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12910.8	1159.7	1436.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	303900.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U218V91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. THKNESS	3.4212	INS. MASS	5695.0	INSUL. MF	3.04360E-02	TANK MASS	8029.3	TANK MF	7.50951E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	577.58	PRES MF	3.08678E-03
TOT EFF MAS	25773.	TOT EF MF	1.37742E-01	EF MP MAS	2130.2	EFF MP MF	1.13848E-02	MP MASS	13549.7
BOILOFF MAS	4435.3	EF BO MAS	3319.3	WALL TKNS	0.83743E-01	LENGTH	62.884	VOLUME	44511.
WBODACT111	0.0	WBODACT(2)	4435.3	WBODACT(3)					
AFACT111	4.51022E-01	AFACT(2)	7.48356E-01	AFACT(3)					
DFACT	6.00112E-01	TMAX	0.0	TDU	299.15	TDOX	-0.0	BDMAX	0.0
EPTH	1.08618E-01	N-J PSSM	20324.	PROP MASS	1.87114E 05	TANK AREA	6658.4	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2369937.0

 THE NEW VALUE OF IMIED IS 237145.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1305260.	793459.	272429.
TOTAL INITIAL PROPELLANT MASS	978313.3	374305.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	978313.31	374305.75	67714.00
PROPELLANT TANK DRY MASS	97831.2	40656.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97831.25	40656.23	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14395.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14394.98	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NETRU PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76381.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11538.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 J218V9L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.70927	INS. MASS	1141.4
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	17237.	TOT EF MF	9.59361E-02
BOILOFF MAS	32.156	EF 80 MAS	23.160
WBOACT(1)	0.0	WBOACT(2)	32.156
AFACT(1)	4.15400E-01	AFACT(2)	7.20191E-01
DFACT	6.15161E-01	THAX	0.0
EPTH	8.41770E-02	N-J PSSM	15124.
		INSUL. MF	6.35273E-03
		COAT MF	0.0
		EF MP MAS	2089.6
		WALL TKNS	0.82786E-01
		WBOACT(3)	
		AFACT(3)	
		TDU	389.16
		PROP MASS	1.79675E 05
		TANK MASS	7673.9
		PRES MASS	553.82
		EFF MP MF	1.16301E-02
		LENGTH	60.684
		VOLUME	42742.
		TANK MF	7.47421E-02
		PRES MF	3.08234E-03
		MP MASS	3396.9
		TDUX	0.0
		TANK AREA	6437.2
		BO MAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIEO IS 2318832.0

THE NEW VALUE OF IMIEG IS 2321076.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1280462.	768208.	272429.
TOTAL INITIAL PROPELLANT MASS	957663.6	359729.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	957663.56	359729.62	67714.00
PROPELLANT TANK DRY MASS	95766.3	30281.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95766.31	30280.96	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14095.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14094.98	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74572.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11264.7	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30980.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U236P9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERG	0.0						
INS. TKNESS	7.5258	INS. MASS	13269.	INSUL. MF	6.62224E-02	TANK MASS	8673.3	TANK MF	7.57508E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	619.95	PRES MF	3.09403E-03
TOT EFF MAS	41639.	TOT EF MF	2.07810E-01	EF MP MAS	2196.0	EFF MP MF	1.09595E-02	MP MASS	3822.1
BOILOFF MAS	13031.	EF BO MAS	10376.	WALL TKNS	C.85403E-01	LENGTH	66.806	VOLUME	47665.
WBOACT(1)	0.0	WBOACT(2)	13031.	WBOACT(3)					
AFACT(1)	5.11550E-01	AFACT(2)	7.96212E-01	AFACT(3)					
DFACT	5.74537E-01	TMAX	0.0	TDU	87.028	TDUX	0.0	BOMAX	0.0
EPH	1.45067E-01	N-J PSSM	2067.	PROP MASS	2.00371E 05	TANK AREA	7852.6	NO OF TNK	2.0000

**** RESULTS ****

THE OLD VALUE OF IMIED IS 2462916.0

THE NEW VALUE OF IMIED IS 2460629.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1177699H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1349596.	838606.	272429.
TOTAL INITIAL PROPELLANT MASS	1015233.4	401334.0	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1015233.37	401334.00	67714.00
PROPELLANT TANK DRY MASS	101523.2	58220.3	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	101523.25	58220.33	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14949.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14949.58	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105300.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	79617.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12026.9	1156.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U21AP9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. TKNESS	7.7695	INS. MASS	14157.
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	47612.	TOT EF MF	2.28579E-01
		INSUL. MF	6.79635E-02
		COAT MF	0.0
		EF MP MAS	2263.0
BDILDF MAS	19740.	FF 80 MAS	14684.
WBDFACT(1)	4549.1	WRJACT(2)	15192.
AFACT(1)	5.27317E-01	AFACT(2)	8.08690E-01
DFACT	5.67876E-01	TMAX	0.0
EPH	1.47219E-01	N-J PSSM	30665.
		TDU	81.291
		PROP MASS	2.08296E 05
		WALL TKNS	0.86370E-01
		WBDFACT(3)	
		AFACT(3)	
		TANK MASS	9064.6
		PRES MASS	645.43
		EFF MP MF	1.08642E-02
		TANK MF	7.61567E-02
		PRES MF	3.09863E-03
		MP MASS	3985.0
		LENGTH	69.150
		VOLUME	49550.
		TDUX	0.0
		TANK AREA	7288.2
		BDMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2488511.0

THE NEW VALUE OF IMIED IS 2488772.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U21800H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1350033.	857312.	272429.
TOTAL INITIAL PROPELLANT MASS	1723792.1	416613.1	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1723092.06	416613.06	67714.00
PROPELLANT TANK DRY MASS	172309.1	61333.3	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	172309.12	61333.26	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15264.4	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15264.37	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	80305.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12130.8	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
W212P91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS 1.9378	INS. MASS 3164.1	INSUL. MF 1.73052E-02	TANK MASS 7824.7	TANK MF 7.48909E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 563.92	PRES MF 3.08421E-03
TOT EFF MAS 20805.	TOT EF MF 1.13786E-01	EF NP MAS 2105.4	EFF MP MF 1.15150E-02	MP MASS 3462.0
BOILGFF MAS 1743.0	EF 80 MAS 1278.3	WALL TKNS 0.83196E-01	LENGTH 61.621	VOLUME 43495.
WBOACT(1) 0.0	WBOACT(2) 1743.0	WBOACT(3) 0.0		
AFACT(1) 4.31978E-01	AFACT(2) 7.33298E-01	AFACT(3) 0.0		
DFACT 6.08157E-01	TMAX 0.0	TDU 255.91	'TDUX 0.0	80MAX 0.0
EPH 9.52802E-02	N-J PSSM 17421.	PROP MASS 1.82842E 05	TANK AREA 6531.4	NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2342301.0

THE NEW VALUE OF IMIED IS 2342175.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U212P>1

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1290906.	778842.	272429.
TOTAL INITIAL PROPELLANT MASS	966360.2	365679.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	966360.19	365679.62	67714.00
PROPELLANT TANK DRY MASS	96635.9	34842.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96635.94	34842.02	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14217.9	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14217.86	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75334.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11379.8	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U218P9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	8.4675	INS. MASS	15829.	INSUL. MF	7.37398E-02	TANK MASS	9382.1	TANK MF	7.64889E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	665.88	PRES MF	3.13209E-03
TOT EFF MAS	52688.	TOT EF MF	2.45457E-01	EF MP MAS	2313.3	EFF MP MF	1.07767E-02	MP MASS	4115.6
BOILOFF MAS	24815.	EF BO MAS	17462.	WALL TKNS	0.87135E-01	LENGTH	71.030	VOLUME	51063.
WBOACT(1)	10324.	WBOACT(2)	14491.	WBOACT(3)					
AFACT(1)	5.41056E-01	AFACT(2)	8.19542E-01	AFACT(3)					
DFACT	5.62071E-01	TMAX	0.0	TDJ	87.833	TOUX	0.0	80MAX	0.0
EPTH	1.53931E-01	N-J PSSM	32913.	PROP MASS	2.14654E 05	TANK AREA	7477.3	NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2511308.C

THE NEW VALUE OF IMIED IS 2512152.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1121800H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1364893.	874833.	272429.
TOTAL INITIAL PROPELLANT MASS	1727971.6	429368.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1027971.62	429368.62	67714.00
PROPELLANT TANK DRY MASS	172797.1	65835.4	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	102797.12	65835.37	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15526.4	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15526.40	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9107.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	87733.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12195.4	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30980.0	132500.0

*** INPUT ITEMS ***

*** RESULTS ****

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

INS. TKNESS 2.1477 INS. MASS 3542.5 INSUL. MF 1.91412E-02 TANK MASS 7931.3 TANK MF 7.49970E-02
 VENT PRESS 14.700 COAT MASS 0.0 COAT MF 0.0 EFF MP MF 1.14688E-02 PRES MASS 571.05 PRES MF 3.08557E-03
 TOT EFF MAS 22802. TOT EF MF 1.23207E-01 EF MP MAS 2122.6 TANK MASS 7931.3 TANK MF 7.49970E-02
 BOILOFF MAS 3634.5 EF BO MAS 2686.3 WALL TKNS 0.83482E-01 LENGTH 62.280 VOLUME 44025.
 WBOACT(1A) 0.0 WBOACT(2) 3634.5 WBOACT(3) WBOACT(3) WBOACT(3) WBOACT(3)
 AFACT(1) 4.39221E-01 AFACT(2) 7.39026E-01 AFACT(3) AFACT(3) AFACT(3) AFACT(3)
 DFACT 6.05097E-01 TMAX 0.0 TDU 235.28 TIDUX 0.0 BOMAX 0.0
 ERTH 9.72236E-02 N-J PSSH 17993. PROP MASS 1.85072E .05 TANK AREA 6597.7 NO OF TNK 2.0000

THE OLD VALUE OF IMIED IS 2352725.0

 THE NEW VALUE OF IMIED IS 2353471.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218P91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1296502.	784542.	272429.
TOTAL INITIAL PROPELLANT MASS	971020.9	370143.2	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	971020.87	370143.25	67714.00
PROPELLANT TANK DRY MASS	97102.0	35986.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97102.00	35986.65	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14309.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14309.57	8397.73
MISCELLANECUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75742.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11441.5	1158.7	1434.3
MISCELLANECUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U218P9L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
*** RESULTS ****			
INS. TKNESS	0.55595	INS. MASS	895.67
VENI PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	17189.	TOT EF MF	9.55424E-02
BOILOFF MAS	273.91	EF 80 MAS	197.28
WBOACT(1)	0.0	WBOACT(2)	273.91
AFACT(1)	4.15367E-01	AFACT(2)	7.20165E-01
GFACT	6.15176E-01	TMAX	0.0
EPTH	8.28140E-02	N-J PSSM	14899.
		TDU	372.77
		PROP MASS	1.79913E 05
		WALL TKNS	0.82817E-01
		WBOACT(3)	
		AFACT(3)	
		INSUL. MF	4.97839E-03
		COAT MF	0.0
		EF MP MAS	2092.7
		TANK MASS	7685.2
		PRES MASS	554.59
		EFF MP MF	1.16317E-02
		LENGTH	60.754
		VOLUME	42798.
		TANK MF	7.47532E-02
		PRES MF	3.08253E-03
		MP MASS	3401.6
		TDUX	0.0
		TANK AREA	6444.3
		BOMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIED IS 2318785.0

THE NEW VALUE OF IMIEC IS 2320641.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U218P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1280237.	767978.	272429.
TOTAL INITIAL PROPELLANT MASS	957475.6	359965.3	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	957475.56	359965.31	67714.00
PROPELLANT TANK DRY MASS	95747.5	29810.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95747.50	29810.18	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14100.2	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14100.22	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74555.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11262.2	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 5.6306	INS. MASS 9248.0	INSUL. MF 5.02094E-02	TANK MASS 7886.5	TANK MF 7.48583E-02
VENT PRESS 14.623	COAT MASS 0.0	COAT MF 0.0	PRES MASS 566.71	PRES MF 3.87889E-03
TOT EFF MAS 25709.	TOT EF MF 1.39580E-01	EF MP MAS 2093.1	EFF MP MF 1.13636E-02	MP MASS 3488.5
BDILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.83362E-01	LENGTH 62.003	VOLUME 43802.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 4.51329E-01	AFACT(2) 7.48598E-01	AFACT(3) 3		
DFACT 5.99981E-01	THAX 0.0	TDU -1.0000	TOUX 0.0	BONAX 0.0
EPTH 1.28216E-01	N-J PSSM 23616.	PROP MASS 1.84188E 05	TANK AREA 6569.8	NO OF TMS 2.0000

THE OLD VALUE OF IMIED IS 2370389.0

THE NEW VALUE OF IMIED IS 2373370.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5206N9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1306363.	794582.	272429.
TOTAL INITIAL PROPELLANT MASS	979231.5	368899.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	979231.50	368899.62	67714.00
PROPELLANT TANK DRY MASS	97923.1	47299.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97923.06	47298.98	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14281.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14280.96	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76462.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11550.2	1156.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 0.48690	INS. MASS 765.29	INSUL. MF 4.26805E-03	TANK MASS 7435.1	TANK MF 7.25647E-02
VENT PRESS 7.7807	COAT MASS 0.0	COAT MF 0.0	PRES MASS 418.89	PRES MF 2.33617E-03
TOT EFF MAS 16226.	TOT EF MF 9.04904E-02	EF MP MAS 2030.0	EFF MP MF 1.13215E-02	MP MASS 3293.2
POILOFF MAS 0.0	EF BO MAS 0.0	WALL TKNS 0.82125E-01	LENGTH 59.191	VOLUME 41541.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3)		
AFACT(1) 4.12389E-01	AFACT(2) 7.17810E-01	AFACT(3)		
DFACT 6.16433E-01	TMAX 0.0	TDU -1.0000	TDUX 0.0	BOMAX 0.0
FPTH 7.91689E-02	N-J PSSM 14196.	PROP MASS 1.79307E 05	TANK AREA 6287.1	NO OF TMR 2.00000

THE OLD VALUE OF IMIED IS 2314627.0

THE NEW VALUE OF IMIED IS 2314771.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5276491

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1277328.	765016.	272429.
TOTAL INITIAL PROPELLANT MASS	955053.5	358639.9	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	955053.50	358639.94	67714.00
PROPELLANT TANK DRY MASS	95505.3	28393.1	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95505.31	28393.11	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13880.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13880.83	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74343.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11230.2	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 0.13075	INS. MASS 200.10	INSUL. MF 1.11968E-03	TANK MASS 7174.2	TANK MF 7.02512E-02
VENT PRESS 3.3345	COAT MASS 0.0	COAT MF 0.0	PRES MASS 323.18	PRES MF 1.80838E-03
TOT EFF MAS 15045.	TOT EF MF 8.41827E-02	EF MP MAS 1966.5	EFF MP MF 1.10036E-02	MP MASS 3178.9
ROILOFF MAS 0.0	EF RO MAS 0.0	WALL TKMS 0.81384E-01	LENGTH 57.546	VOLUME 40217.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3)		
AFACT(1) 4.07242E-01	AFACT(2) 7.13740E-01	AFACT(3)		
DFACT 6.18609E-01	THAX 0.0	TDU -1.0000	TQX 0.0	BOMAX 0.0
EPTH 7.31791E-02	N-J PSSM 13078.	PROP MASS 1.78713E 05	TANK AREA 6121.7	MO OF TMK 2.0000

THE OLD VALUE OF IMED IS 2307477.0

THE NEW VALUE OF IMED IS 2307476.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S206N9

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1273714.	761336.	272429.
TOTAL INITIAL PROPELLANT MASS	952043.9	357425.8	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	952043.94	357425.81	67714.00
PROPELLANT TANK DRY MASS	95204.3	26156.1	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95204.31	26156.11	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13651.8	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13651.77	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74079.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11190.3	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	10.697	INS. MASS	10416.	INSUL. MF	9.61453E-02	TANK MASS	10347.	TANK MF	9.49358E-02
VENT PRESS	20.451	COAT MASS	0.0	COAT MF	0.0	PRES MASS	722.25	PRES MF	3.77067E-03
TOT EFF MAS	39385.	TOT EF MF	2.03617E-01	EF MP MAS	2138.7	EFF MP MF	1.11655E-02	MP MASS	3787.4
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.10434	LENGTH	65.154	VOLUME	46337.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	5.06029E-01	AFACT(2)	7.91849E-01	AFACT(3)					
DFACT	5.76870E-01	TMAX	0.0	TDU	-1.0000	TQUX	0.0	80MAX	0.0
EPFH	1.94452E-01	N-J PSSM	37246.	PROP MASS	1.91545E 05	TANK AREA	6886.6	NO OF TANK	2.0000

THE OLD VALUE OF IMIED IS 2454094.0

THE NEW VALUE OF IMIED IS 2457770.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

9212N9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1348179.	937164.	272429.
TOTAL INITIAL PROPELLANT MASS	1014053.6	383724.3	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1014053.56	383724.31	67714.00
PROPELLANT TANK DRY MASS	101405.3	74615.8	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	101405.31	74615.81	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14721.1	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14721.10	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	79513.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12011.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212M9I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	0.71842	INS. MASS	1156.5	INSUL. MF	6.43220E-03	TANK MASS	7677.3	TANK MF	7.47283E-02
VENT PRESS	14.615	COAT MASS	0.0	COAT MF	0.0	PRES MASS	552.62	PRES MF	3.8397E-03
TOT EFF MAS	17233.	TOT EF MF	9.58433E-02	EF MP MAS	2088.7	EFF MP MF	1.16165E-02	MP MASS	3988.4
ROILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.82795E-01	LENGTH	60.705	VOLUME	42759.
WROACT(1)	0.0	WROACT(2)	0.0	WROACT(3)					
AFACT(1)	4.16692E-01	AFACT(2)	7.21213E-01	AFACT(3)					
DFACT	6.14616E-01	TMAX	0.0	TDU	-1.0000	TQIX	0.0	BO MAX	0.0
EPH	8.42268E-02	N-J PSSM	15144.	PROP MASS	1.79804E 05	TANK AREA	6439.3	NO OF TMR	2.0000

THE OLD VALUE OF IMIED IS 2320642.0

THE NEW VALUE OF IMIED IS 2321001.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212401

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	12804.16	768160.	272429.
TOTAL INITIAL PROPELLANT MASS	957624.1	359671.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	957624.12	359671.62	67714.00
PROPELLANT TANK DRY MASS	95762.4	30294.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95762.37	30294.00	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14091.9	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14091.92	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74569.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11264.2	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	0.17595	INS. MASS	273.84	INSUL. MF	1.53044E-03	TANK MASS	7337.8	TANK WF	7.17657E-02
VENT PRESS	6.0231	COAT MASS	0.0	COAT MF	0.0	PRES MASS	381.93	PRES WF	2.13449E-02
TOT EFF MAS	15505.	TOT EF MF	8.66538E-02	EF MP MAS	2008.2	EFF MP MF	1.12232E-02	MP MASS	3250.7
ROILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.61851E-01	LENGTH	58.579	VOLUME	41049.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)					
AFACT(1)	4.09223E-01	AFACT(2)	7.15307E-01	AFACT(3)					
DFACT	6.17771E-01	TMAX	0.0	TDU	-1.0000	TQUX	0.0	BOGMAX	0.0
EPTH	7.54306E-02	N-J PSSM	13497.	PROP MASS	1.78932E 05.	TANK AREA	6225.6	NO OF TMK	2.0000

THE OLD VALUE OF IMIFO IS 2310225.0

THE NEW VALUE OF IMIED IS 2310328.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

S212N9

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1275127.	762775.	272429.
TOTAL INITIAL PROPELLANT MASS	953220.5	357881.1	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	953220.50	357881.12	67714.00
PROPELLANT TANK DRY MASS	95322.0	26995.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95322.00	26995.18	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13795.7	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13795.71	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74183.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11205.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THKNESS 13.607	INS. MASS 24804.	INSUL. MF 1.24A25E-01	TANK MASS 14494.	TANK WF 1.27231E-01
VENT PRESS 29.723	COAT MASS 0.0	COAT MF 0.0	PRES MASS 969.06	PRES WF 4.65108E-03
TOT EFF MAS 53347.	TOT EF MF 2.67601E-01	EF MP MAS 2209.6	EFF MP MF 1.10842E-02	MP MASS 3987.4
BOILOFF MAS 0.0	EF RD MAS 0.0	WALL TKNS 0.13803	LENGTH 69.185	VOLUME 49578.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0		
AFACT(1) 5.59789E-01	AFACT(2) 8.34354E-01	AFACT(3) 0.0		
DFACT 5.54157E-01	TMAX 0.0	TDU -1.0000	TDX 0.0	BOIMAX 0.0
EPH 2.56517E-01	N-J PSSH 51137.	PROP MASS 1.99351E 05.	TANK AREA 7291.8	NO OF TMS 2.0000

THE OLD VALUE OF IMIED IS 2543162.0

THE NEW VALUE OF IMIED IS 2543452.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S219N9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1390632.	880394.	272429.
TOTAL INITIAL PROPELLANT MASS	1049405.0	398738.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1049405.00	398738.62	67714.00
PROPELLANT TANK DRY MASS	104940.4	102283.0	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	104940.44	102283.00	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15269.5	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15269.53	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	82611.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12479.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. YKNSS	1.4611	INS. MASS	2359.0	INSUL. MF	1.30734E-02	TANK MASS	7707.8	TANK MF	7.47523E-02
VENT PRESS	14.619	COAT MASS	0.0	COAT MF	0.0	PRES MASS	554.73	PRES MF	3.07428E-03
TOT EFF MAS	18492.	TOT EF MF	1.02479E-01	EF MP MAS	2089.3	EFF MP MF	1.15790E-02	MP MASS	3411.6
BOILOFF MAS	0.0	EF RO MAS	0.0	WALL TKNS	0.82878E-01	LENGTH	60.895	VOLUME	42911.
WROACT(1)	0.0	WROACT(2)	0.0	WROACT(3)					
AFACT(1)	4.21857E-01	AFACT(2)	7.25296E-01	AFACT(3)					
DFACT	6.12434E-01	TMAX	0.0	TDU	-1.0000	TQX	0.0	SDMAX	0.0
EPTH	9.08999E-02	N-J PSSM	16402.	PROP MASS	1.80444E 05	TANK AREA	6458.4	NO OF TMK	2.0000

THE OLD VALUE OF IMIED IS 2327908.0

THE NEW VALUE OF IMIED IS 2328778.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S21AN91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1286269.	772083.	272429.
TOTAL INITIAL PROPELLANT MASS	960832.9	361041.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	960832.87	361041.69	67714.00
PROPELLANT TANK DRY MASS	96083.2	32818.6	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96083.25	32818.64	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14120.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14120.02	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74850.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11306.7	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	0.22169	INS. MASS	349.85	INSUL. MF	1.95309E-03	TANK MASS	7475.6	TANK MF	7.30324E-02
VENT PRESS	9.2529	COAT MASS	0.0	COAT MF	0.0	PRES MASS	447.85	PRES MF	2.50018E-03
TOT EFF MAS	15923.	TOT EF MF	8.88900E-02	EF MP MAS	2042.9	EFF MP MF	1.14044E-02	MP MASS	3310.8
BOILOFF MAS	0.0	EF 80 MAS	0.0	WALL TKNS	0.82238E-01	LENGTH	59.445	VOLUME	41745.
WROACT(1)	0.0	WROACT(2)	0.0	WROACT(3)		TDUX	0.0	BOONAK	0.0
AFACT(1)	4.10987E-01	AFACT(2)	7.16702E-01	AFACT(3)		TANK AREA	6312.6	NO-OF TNK	2.00000
DFACT	6.17026E-01	TMAX	0.0	TDU	-1.0000				
EPH	7.74956E-02	N-J PSSM	13880.	PROP MASS	1.79129E 05				

THE OLD VALUE OF IMTED IS 2312673.0

THE NEW VALUE OF IMFD IS 2312916.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S219N9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1276409.	764080.	272429.
TOTAL INITIAL PROPELLANT MASS	954288.0	358298.0	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	954288.00	358298.00	67714.00
PROPELLANT TANK DRY MASS	95428.7	27762.9	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	95428.75	27762.92	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13916.4	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13916.39	8397.73
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74276.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11220.0	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S206V9H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. TKNESS	5.2337	INS. MASS	8646.3	INSUL. MF	4.66301E-02	TANK MASS	7946.2	TANK MF	7.50139E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	572.14	PRES MF	3.08958E-03
TOT EFF MAS	25797.	TOT EF MF	1.39125E-01	EF MP MAS	2106.2	EFF MP MF	1.13589E-02	MP MASS	3515.0
BOILOFF MAS	1229.4	EF BO MAS	563.06	WALL TKNS	0.83527E-01	LENGTH	62.384	VOLUME	44109.
WBOACT(1)	1209.6	WBOACT(2)	19.875	WBOACT(3)					
AFACT(1)	4.53171E-01	AFACT(2)	7.50055E-01	AFACT(3)					
DFACT	5.99202E-01	TMAX	0.0	TDU	56.772	TQUX	0.0	BGMAX	0.0
EPTH	1.24729E-01	N-J PSSM	23128.	PROP MASS	1.85423E 05	TANK AREA	6608.1	NO OF TANK	2.0000

THE OLD VALUE OF IMIED IS 2373104.0

THE NEW VALUE OF IMIED IS 2372833.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5206V9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1304897.	795509.	272429.
TOTAL INITIAL PROPELLANT MASS	978010.9	370829.6	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	978010.87	370829.56	67714.00
PROPELLANT TANK DRY MASS	97801.0	46253.3	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97801.00	46253.34	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14323.7	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14323.70	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76355.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11534.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S212V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0

***** RESULTS *****

INS. THNESS	7.4787	INS. MASS	13163.	INSUL. MF	6.58293E-02	TANK MASS	8653.3	TANK MF	7.57302E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	618.70	PRES MF	3.09407E-03
TOT EFF MAS	37280.	TOT EF MF	1.86434E-01	EF MP MAS	2273.1	EFF MP MF	1.11173E-02	MP MASS	3813.8
ANILOFF MAS	12460.	FF RO MAS	6131.6	WALL TKNS	0.85353E-01	LENGTH	66.685	VOLUME	4.7568.
WROACT(1)	12444.	WROACT(2)	15.656	WROACT(3)					
AFACT(1)	4.91749E-01	AFACT(?)	7.80557E-01	AFACT(3)					
DFACT	5.82904E-01	TMAX	0.0	TDU	77.719	TDUX	0.0	ROMAX	0.0
FPTH	1.44654E-01	N-J PSSH	28926.	PROP MASS	1.99964E 05	TANK AREA	7040.5	NO OF TMR	2.0000

THE OLD VALUE OF IMIED IS 2431601.0

THE NEW VALUE OF IMIED IS 2432677.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S212V9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1323390.	836810.	272429.
TOTAL INITIAL PROPELLANT MASS	993411.7	399934.4	67714.0
TOTAL OXIDIZER MASS	C.0	0.0	0.0
TOTAL FUEL MASS	993411.69	399934.37	67714.00
PROPELLANT TANK DRY MASS	99341.1	57851.9	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	99341.12	57851.88	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14921.7	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14921.68	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	77704.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11737.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S21R99H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	9.1656	INS. MASS	17061.	INSUL. MF	8.00816E-02	TANK MASS	9301.4	TANK WF	7.64043E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	660.74	PRES WF	3.10141E-03
TOT EFF MAS	48195.	TOT EF MF	2.26221E-01	EF MP MAS	2325.3	EFF MP MF	1.09146E-02	MP MASS	4882.5
ROILOFF MAS	22676.	EF BO MAS	11871.	WALL TKMS	0.86942E-01	LENGTH	70.554	VOLUME	50480.
WROACT(1)	22662.	WROACT(2)	13.875	WROACT(3)					
AFACT(1)	5.23309E-01	AFACT(2)	8.05507E-01	AFACT(3)					
DFACT	5.69571E-01	TMAX	0.0	TDU	93.059	TDUX	0.0	BORAX	0.0
EPTH	1.59587E-01	N-J PSSH	33999.	PROP MASS	2.13044E 05	TANK AREA	7429.4	NB OF TANK	2.0000

THE OLD VALUE OF IMIED IS 2481942.0

THE NEW VALUE OF IMIED IS 2485860.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S219V9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1339634.	873800.	272429.
TOTAL INITIAL PROPELLANT MASS	1006937.4	426217.4	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1006937.44	426217.44	67714.00
PROPELLANT TANK DRY MASS	100693.7	68018.8	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	100693.69	68018.81	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15461.6	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15461.55	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	78890.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11917.0	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S206P9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 3.2500	INS. MASS 5423.2	INSUL. MF 2.88986E-02	TANK MASS 8055.8	TANK MF 7.51217E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 579.28	PRES MF 3.8848E-03
TOT EFF MAS 24505.	TOT EF MF 1.30580E-01	EF MP MAS 2144.7	EFF MP MF 1.14287E-02	MP MASS 3541.8
BOILOFF MAS 5061.0	EF BO MAS 2260.3	WALL TKMS 0.83813E-01	LENGTH 63.047	VOLUME 44642.
WBOACT(1) 5049.1	WBOACT(2) 11.969	WBOACT(3) 0.0		
AFACT(1) 4.45887E-01	AFACT(2) 7.44296E-01	AFACT(3) 0.0		
DFACT 6.02281E-01	TMAX 0.0	TDU 37.779	TDX 0.0	BO MAX 0.0
EPTH 1.07107E-01	N-J PSSH 20100.	PROP MASS 1.87663E 05	TANK AREA 6674.7	NO OF TMS 2.0000

THE OLD VALUE OF IMEO IS 2362414.0

THE NEW VALUE OF IMEO IS 2362392.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S706P9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1295920.	794046.	272429.
TOTAL INITIAL PROPELLANT MASS	970535.4	375327.2	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	970535.37	375327.25	67714.00
PROPELLANT TANK DRY MASS	97053.5	40200.1	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97053.50	40200.14	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14416.1	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14416.09	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RTTP ₁ PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75700.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11435.1	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S212P9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	4.6298	INS. MASS	8019.9	INSUL. MF	4.08739E-02	TANK MASS	8469.8	TANK MF	7.55417E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	606.62	PRES MF	3.09168E-03
TOT EFF MAS	31199.	TOT EF MF	1.59009E-01	EF MP MAS	2212.7	EFF MP MF	1.12773E-02	MP MASS	3736.7
BOILOFF MAS	11782.	EF RO MAS	5538.0	WALL TKMS	0.84888E-01	LENGTH	65.575	VOLUME	46675.
WBOACT(1)	11772.	WBOACT(2)	9.1875	WBOACT(3)					
AFACT(1)	4.69823E-01	AFACT(2)	7.63221E-01	AFACT(3)					
DFACT	5.92167E-01	TMAX	0.0	TDU	52.061	TDUX	0.0	RDIMAX	0.0
EPTH	1.19507E-01	N-J PSSH	23449.	PROP MASS	1.96211E 05	TANK AREA	6928.9	NO OF TMR	2.0000

THE OLD VALUE OF IMIED IS 2397959.0

 THE NEW VALUE OF IMIED IS 2397577.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5212PQH

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1306654.	818436.	272429.
TOTAL INITIAL PROPELLANT MASS	979474.1	392639.3	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	979474.06	392639.31	67714.00
PROPELLANT TANK DRY MASS	97947.3	46923.2	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97947.31	46923.17	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14771.5	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14771.48	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76483.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11553.4	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S218P9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	5.7016	INSUL. MF	5.00460E-02
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	37095.	TOT EF MF	1.82159E-01
BOILOFF MAS	17474.	EF RO MAS	8541.1
WFACT(1)	17466.	WFACT(2)	7.9062
AFACT(1)	4.88659E-01	AFACT(2)	7.78114E-01
DFACT	5.84209E-01	TMAX	0.0
EPTH	1.29059E-01	N-J PSSM	26281.
		WALL TKNS	0.85804E-01
		WBOACT(3)	WBOACT(3)
		AFACT(3)	AFACT(3)
		TDU	62.630
		PROP MASS	2.03639E 05
		TDUX	0.0
		TANK AREA	7149.8
		TANK MASS	8834.1
		PRES MASS	630.47
		EFF MP MF	1.11578E-02
		LENGTH	67.772
		VOLUME	48442.
		TANK MF	7.59170E-02
		PRES MF	3.89604E-03
		MP MASS	3889.3
		BOMAX	0.0
		NO OF TNK	2.0000

THE OLD VALUE OF IMIEQ IS 2426794.0

THE NEW VALUE OF IMIEQ IS 2427060.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S219P94

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1315657.	838976.	272429.
TOTAL INITIAL PROPELLANT MASS	986971.6	407243.3	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	986971.62	407243.31	67714.00
PROPELLANT TANK DRY MASS	98697.1	52558.4	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98697.12	52558.37	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	15071.9	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	15071.93	8397.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PFTO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	77140.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11652.7	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

TANK MASS	7735.2	TANK WF	7.40025E-02
PRES MASS	597.93	PRES WF	3.00307E-03
EFF MP WF	1.15029E-02	MP MASS	3423.4
LENGTH	61.066	VOLUME	43049.
TDUX TANK AREA	0.0	BOMAX NO OF TMK	0.0
	6475.4		2.0000

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5219001

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1293474.	772447.	272429.
TOTAL INITIAL PROPELLANT MASS	960171.0	361937.7	67714.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	960171.00	361937.75	67714.00
PROPELLANT TANK DRY MASS	96017.1	32265.7	7448.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96017.06	32265.65	7448.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14141.0	8397.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14140.96	8397.73
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RFTRD PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74792.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11297.9	1158.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

S E C T I O N 4

M A R S D E P A R T U R E S T A G E D A T A

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U303V2H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.700CC INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 20.509	INS. MASS 24917.	INSUL. MF 1.96781E-01	TANK MASS 5261.4	TANK MF 7.27137E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 299.10	PRES MF 2.36211E-03
TOT EFF MAS 0.11500E 06	TCT EFF MF 9.40270E-01	EF MP MAS 1463.1	EFF MP MF 1.15546E-02	MP MASS 2710.8
BOIL OFF MAS 56309.	EF RC MAS 83175.	WALL TKAS C.75184E-01	LENGTH 44.993	VOLUME 30122.
WBOACT(1) 0.0	WBOACT(2) 5363.5	WBOACT(3) 50545.	WBOACT(4)	
AFACT(1) 1.12620E 00	AFACT(2) 1.29261E 00	AFACT(3) 1.49647E 00	AFACT(4)	
OFACT 5.39724E-01	TPAN 0.0	TDU 165.14	TDUX 0.0	BCMAX 0.0
EPTH 2.71856E-01	N-J PSSH 34424.	PROP MASS 1.26625E 05	TANK AREA 4855.7	NO OF TNK 1.0000

THE OLD VALUE OF IMTEC IS 2159733.0

THE NEW VALUE OF IMTEC IS 2762016.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

13-50754

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1201642.	600400.	355574.
TOTAL INITIAL PROPELLANT MASS	897729.0	315415.2	126664.9
TOTAL OXIDIZER MASS	0.0	C.C	C.C
TOTAL FUEL MASS	897729.00	315415.25	126664.94
PROPELLANT TANK DRY MASS	89202.8	31541.5	24434.7
OXIDIZER TANK DRY MASS	0.0	0.0	C.C
FUEL TANK DRY MASS	89202.75	31541.51	34434.68
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12724.1	10005.7
OXIDIZER SUBSYSTEMS MASS	0.0	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	12724.05	10005.68
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C	0.0	C.C
MISCELLANEOUS EXPENDABLE SUBSYSTEM MASS	68820.7	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10395.9	1075.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	C.C	C.C
PAVING	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303V21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	4.5432	INSUL. MF	4.67920E-02
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	51263.	TOT EF MF	5.36844E-01
		EF RP MAS	1243.6
BOILOFF MAS:	32556.	EF RP MAS	1243.6
WFOACT(1)	0.0	WALL TKNS	0.65648E-01
AFACT(1)	7.51805E-01	WFOACT(2)	1165.0
		AFACT(2)	9.47530E-01
DFACT	6.34815E-01	WFOACT(3)	31430.
EPTH	1.21446E-01	AFACT(3)	1.18731E 00
		TCU	212.46
		PRCP MASS	95490.
		TQX	0.0
		TANK AREA	3533.5
		BCPAX	0.0
		NO CF TANK	1.0000
		TANK MASS	3545.5
		PRES MASS	224.14
		EFF MP MF	1.30239E-02
		TANK MF	7.23067E-02
		PRES MF	2.34728E-03
		PF PASS	1959.1
		VOLUME	22715.

THE OLD VALUE CF IMIEC IS 1992777.0

 THE NEW VALUE CF IMIEC IS 1992706.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U-2V21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STACK MASS	111775.7	569721.	205221.
TOTAL INITIAL PROPELLANT MASS	822172.6	292040.2	55509.2
TOTAL EXHAUSTER MASS	0.	0.0	0.0
TOTAL FUEL MASS	822172.6	292040.19	55509.19
PROPELLANT TANK DRY MASS	82217.2	29204.0	11599.2
EXHAUSTER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	82217.19	29204.01	11599.19
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
EXHAUSTER SUBSYSTEMS MASS	0.	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12258.7	5253.5
EXHAUSTER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12258.68	5253.48
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	1970.0	9100.0	5300.0
ENGINE DRY MASS	10500.0	25000.0	25000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RFTR PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	62400.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9471.2	574.2	1434.3
MISCELLANEOUS EXPENDABLE MASS	0.0	0.0	0.0
PAVIMAC	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U303V2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	1.1867	INS. MASS	1120.5	INSUL. MF	1.24214E-02	TANK MASS	3729.6	TANK MF	7.23522E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	211.48	PRES MF	2.34935E-03
TOT EFF MAS	41003.	TOT EF MF	4.54534E-01	EF MP MAS	1198.5	EFF MP MF	1.32861E-02	MP MASS	1831.5
BOILOFF MAS	28526.	EF BO MAS	31945.	WALL TKNS	0.68575E-01	LENGTH	34.221	VOLUME	21459.
WBOACT(1)	0.0	WBOACT(2)	450.47	WBOACT(3)	28076.	WBOACT(4)			
AFACT(1)	6.74794E-01	AFACT(2)	8.76550E-01	AFACT(3)	1.12372E 00	AFACT(4)			
DFACT	6.54374E-01	TMAX	0.0	TDU	228.48	TOUX	0.0	BO MAX	0.0
EPTH	8.21179E-02	N-J PSSM	7858.7	PROP MASS	90208.	TANK AREA	3776.9	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 1964451.0

THE NEW VALUE OF IMIED IS 1964392.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U303V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1103728.	564595.	296072.
TOTAL INITIAL PROPELLANT MASS	810490.6	287466.4	90217.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	810490.62	287466.44	90217.19
PROPELLANT TANK DRY MASS	81049.0	28746.6	7059.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81049.00	28746.63	7859.53
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12180.9	9125.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12180.93	9125.72
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	61675.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9316.6	957.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS
U306V2H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNFSS 20.522	INS. MASS 26018.	INSUL. MF 1.59402E-C1	TANK MASS 5425.5	TANK PF 7.28197E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 308.42	PRES PF 2.36370E-03
TOT EFF MAS 0.12810E C6	TOT EF MF 9.66406E-01	EF PP MAS 1496.1	EFF MP MF 1.1466EE-C2	PP MASS 2804.0
BOILOFF MAS 59691.	EF BC MAS 88774.	WALL TKNS 0.7575EE-C1	VCLUNE 46.134	31040.
WBFACT(1) 0.0	WBFACT(2) 8672.7	WBFACT(3) 51018.	LENGTH	
AFACT(1) 1.15044E C6	AFACT(2) 1.31495E 00	AFACT(3) 1.51645E 00	WBFACT(4)	
			AFACT(4)	
CFACT 5.2256EE-C1	TRAY 0.0	TCU 151.12	TDUX 0.0	80MAX 0.0
EPTH 2.74585E-C1	N-J PSSM 35829.	PREP MASS 1.20483E C5	TANK AREA 4574.4	NO OF TNK 1.0000

THE OLD VALUE OF TMFC IS 2172594.0

THE NEW VALUE OF TMFC IS 2175759.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11204V-24

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1208154.	601654.	265352.
TOTAL INITIAL PROPELLANT MASS	997450.9	220524.2	130539.2
TOTAL OXIDIZER MASS	0.0	G.C	G.C
TOTAL FUEL MASS	897450.87	220524.25	130539.25
PROPELLANT TANK DRY MASS	89745.0	32053.4	35844.1
OXIDIZER TANK DRY MASS	G.C	G.C	G.C
FUEL TANK DRY MASS	89745.00	32053.41	35844.13
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	G.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	G.C	G.C	G.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12743.1	10099.2
OXIDIZER SUBSYSTEMS MASS	G.C	G.C	G.C
FUEL SUBSYSTEMS MASS	0.0	12743.08	10099.19
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69295.9	G.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10467.7	1079.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	G.C	G.C
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306V2I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	4.5306	INS. MASS	4532.8	INSUL. MF	4.63584E-02	TANK MASS	4035.7	TANK MF	7.23004E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	229.64	PRES MF	2.34853E-03
TOT EFF MAS	54027.	TCT FF MF	5.52542E-01	EF MP MAS	1271.2	EFF MP MF	1.30000E-02	MP MASS	2014.3
BOILOFF MAS	34760.	EF RD MAS	40924.	WALL TKMS	0.70099E-01	LENGTH	36.460	VOLUME	23260.
WBOACT(1)	0.0	WBOACT(2)	3246.3	WBOACT(3)	31514.	WBOACT(4)			
AFACT(1)	7.66525E-01	AFACT(2)	9.61098E-01	AFACT(3)	1.19947E 00	AFACT(4)			
CFACT	6.21077E-01	TMAX	0.0	TCU	156.80	TDUX	C.C	BO MAX	0.0
EPYH	1.21007E-01	N-J PSSM	11832.	PRCP MASS	97778.	TANK AREA	4002.0	NO OF TNK	1.0000

THE OLD VALUE OF IMFID IS 1998390.0

THE NEW VALUE OF IMIEC IS 1998292.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UR-4V21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1120524.	570000.	307770.
TOTAL INITIAL PROPELLANT MASS	924477.3	292288.8	57763.2
TOTAL OXIDIZER MASS	C.O.	C.O.	C.O.
TOTAL FUEL MASS	824477.31	292288.81	57763.19
PROPELLANT TANK DRY MASS	82447.7	29228.9	11830.0
OXIDIZER TANK DRY MASS	C.O.	C.O.	C.O.
FUEL TANK DRY MASS	82447.69	29228.87	11830.05
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O.	C.O.	C.O.
OXIDIZER SUBSYSTEMS MASS	C.O.	C.O.	C.O.
FUEL SUBSYSTEMS MASS	C.O.	C.O.	C.O.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O.	12262.5	9308.0
OXIDIZER SUBSYSTEMS MASS	C.O.	C.O.	C.O.
FUEL SUBSYSTEMS MASS	C.O.	12262.51	9308.01
MISCELLANEOUS PRODUCTION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PETRO PRODUCTION SUBSYSTEM MASS	C.O.	C.O.	C.O.
MISCOPE CORRECTION SUBSYSTEM MASS	62901.3	C.O.	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9501.7	575.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.O.	C.O.	C.O.
PAYLOAD	C.O.	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U306V2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	1.1671	INS. MASS	1119.2	ENSUL. MF	1.21397E-02	TANK MASS	3610.3	TANK MF	7.23297E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	216.23	PRES MF	2.34555E-03
TOT EFF MAS	48137.	TOT EF MF	4.67915E-01	EF MP MAS	1224.5	EFF MP MF	1.32823E-02	MP MASS	1879.4
BOILOFF MAS	30434.	EF BO MAS	33909.	WALL TKNS	0.68983E-01	LENGTH	34.807	VOLUME	21930.
WBOACT(1)	0.0	WBOACT(2)	2324.5	WBOACT(3)	28110.	WBOACT(4)			
AFACT(1)	6.85964E-01	AFACT(2)	8.86845E-01	AFACT(3)	1.13294E 00	AFACT(4)			
DFACT	6.61538E-01	TMAX	0.0	TDU	211.09	TDUX	0.0	80MAX	0.0
EPTH	8.68149E-02	N-J PSSH	8003.4	PROP MASS	92189.	TANK AREA	3635.8	MO OF TNK	1.0000

THE OLD VALUE OF IMIEO IS 1968455.0

 THE NEW VALUE OF IMIEO IS 1969048.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

U306V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1106035.	564775.	298241.
TOTAL INITIAL PROPELLANT MASS	812411.4	287626.4	92194.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	812411.44	287626.37	92194.50
PROPELLANT TANK DRY MASS	81241.1	28762.6	8003.9
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81241.06	28762.62	8003.85
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12183.6	9173.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12183.64	9173.48
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	61844.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9342.0	957.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V2H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	21.204	INS. MASS	27016.	INSUL. MF	2.00732E-C1	TANK MASS	5605.8	TANK MF	7.29421E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	218.36	PRES MF	2.36541E-03
TOT EFF MAS	0.13353E C6	TCT EFF MF	9.92148E-01	EF MP MAS	1532.8	EFF MP MF	1.13885E-C2	PF MASS	2903.1
ROILOFF MAS	62373.	EF RC MAS	94848.	WALL TKNS	0.76438E-C1	LENGTH	47.349	VOLUME	32016.
WBOACT(1)	0.0	WBOACT(2)	12107.	WBOACT(3)	51266.	WBOACT(4)			
AFACT(1)	1.17248E C6	AFACT(2)	1.33526E 00	AFACT(3)	1.53468E 00	AFACT(4)			
DFACT	5.27571E-C1	TPAX	0.0	TDU	128.49	TDUX	C.C	BOPIX	0.0
EPTM	2.76035E-C1	N-J PSSM	37152.	PRCP MASS	1.24585E C5	TANK AREA	5056.5	NO OF TAK	1.0000

THE OLD VALUE OF IMED IS 2184544.0

 THE NEW VALUE OF IMED IS 2184897.0

MASS SUMMARY (lb_m)

U200004

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1215007.	602585.	370594.
TOTAL INITIAL PROPELLANT MASS	903157.0	321725.4	134733.4
TOTAL OXIDIZER MASS	0.0	0.0	C.C
TOTAL FUEL MASS	903157.00	321725.37	134733.44
PROPELLANT TANK DRY MASS	90315.6	32172.5	37151.7
OXIDIZER TANK DRY MASS	0.0	0.0	C.C
FUEL TANK DRY MASS	90315.62	32172.52	37191.75
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12763.3	10200.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	12763.33	10200.24
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	69795.9	C.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10543.2	1084.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	C.C
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.700CC	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	4.6933	INSUL. MF	4.77534E-C2
VENT PRESS	14.70C	CCAT MF	0.0
TOT EFF MAS	56765.	EF MP MAS	1294.8
ROILOFF MAS	36678.	WALL TKNS	0.70455E-01
WROACT(1)	0.0	WBRACT(3)	31426.
AFACT(1)	7.81105E-01	AFACT(3)	1.21151E 0C
DFACT	6.27373E-C1	TCU	183.13
EPTH	1.22404E-C1	PRCP MASS	99828.
		TMAX	0.0
		N-J PSSM	12219.
		TANK MASS	4124.4
		PRES MASS	234.55
		EFF MP MF	1.29701E-C2
		TANK MF	7.23009E-02
		PRES MF	2.34959E-03
		PF MASS	2063.8
		LENGTH	37.067
		WBOACT(4)	
		AFACT(4)	
		TDUX	C.C
		TANK AREA	4C62.9
		BO MAX	0.0
		NO CF TNK	1.0000

THE OLD VALUE OF IMIEC IS 2004017.C

THE NEW VALUE OF IMIEC IS 2003881.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJCCSVZT

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1123294.	570207.	310283.
TOTAL INITIAL PROPELLANT MASS	826783.4	292563.1	55835.7
TOTAL OXIDIZER MASS	0.0	0.0	C.C
TOTAL FUEL MASS	826783.37	292563.06	55835.65
PROPELLANT TANK DRY MASS	82678.3	25256.3	12220.3
OXIDIZER TANK DRY MASS	0.0	0.0	C.C
FUEL TANK DRY MASS	82678.25	29256.25	12220.26
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12267.6	5358.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	12267.57	5357.57
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	63103.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9532.2	576.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	C.C
PAYLOAD	0.0	18200.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	1.2017	INS. MASS	1169.1	INSUL. MF	1.24284E-02	TANK MASS	3887.3	TANK MF	7.23145E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	220.75	PRES MF	2.34660E-03
TOT EFF MAS	46286.	TOT EF MF	4.81401E-01	EF MP MAS	1248.0	EFF MP MF	1.32670E-02	MP MASS	1924.8
BOILOFF MAS	32242.	EF 80 MAS	35845.	WALL TKNS	0.69365E-01	LENGTH	35.364	VOLUME	22378.
WBOACT(1)	0.0	WBOACT(2)	4151.5	WBOACT(3)	28091.	WBOACT(4)			
AFACT(1)	8.98335E-01	AFACT(2)	8.98248E-01	AFACT(3)	1.14316E 00	AFACT(4)			
BFACT	6.48396E-01	TMAX	0.0	TDU	196.07	TDUX	0.0	BOMAX	0.0
EPTH	8.70894E-02	M-J PSSH	8192.6	PROP MASS	94071.	TANK AREA	3891.7	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 1972929.0

THE NEW VALUE OF IMIED IS 1973640.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U309V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1108310.	564959.	300373.
TOTAL INITIAL PROPELLANT MASS	814306.4	287791.4	94090.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	814306.37	287791.44	94090.81
PROPELLANT TANK DRY MASS	81430.6	28779.1	8194.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81430.56	28779.13	8194.31
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12186.5	9219.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12186.45	9219.21
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	62010.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9367.1	958.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303P21

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7COCC INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 13.174	INS. MASS 12691.	INSUL. MF 1.36785E-01	TANK MASS 3834.2	TANK MF 7.23244E-02
VENT PRESS 14.7CC	CCAT MASS C.O	CCAT MF 0.C	PRES MASS 217.65	PRES MF 2.34597E-03
TOT EFF MAS 52521.	TCT EF MF 5.70423E-01	EF MP MAS 1185.C	EFF MP MF 1.28160E-02	PP PASS 1893.5
ROILOFF MAS 27456.	EF PC MAS 32114.	WALL TKNS 0.69102E-01	LENGTH 34.5EC	VOLUME 22069.
WBOACT(1) 0.0	WBOACT(2) 4647.5	WBOACT(3) 22808.	WBOACT(4)	
AFACT(1) 7.78893E-01	AFACT(2) 9.72498E-01	AFACT(3) 1.20566E CC	AFACT(4)	
DFACT 6.27934E-C1	TMAX 0.C	TCU 98.912	TCUX 0.0	BOMAX 0.0
EPATH 2.11455E-C1	N-J PSSM 19618.	PRCP MASS 92774.	TANK AREA 3853.2	NO CF TAK 1.0000

THE OLD VALUE OF IMIEC IS 2003161.0

THE NEW VALUE OF IMIEC IS 2005259.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

11703074

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1123976.	570797.	210488.
TOTAL INITIAL PROPELLANT MASS	827352.1	253000.6	528066.0
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FUEL MASS	927352.06	253000.62	528066.00
PROPELLANT TANK DRY MASS	82735.1	25300.1	19624.7
OXIDIZED TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	82735.13	25300.05	19624.70
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12275.0	5188.1
OXIDIZED SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12275.01	5188.15
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	63153.2	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9539.8	577.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	162100.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303P2I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	2.5152	INS. MASS	2455.8	TASUL. MF	3.21620E-02	TANK MASS	3173.5	TANK MF	7.27330E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	178.34	PRES MF	2.33570E-03
TOT EFF MAS	23742.	TCT EFF MF	3.10936E-01	EF MF MAS	1030.7	EFF MP MF	1.34552E-02	MP MASS	1497.1
BOILOFF MAS	14746.	EF BC MAS	14523.	WALL TRMS	0.65453E-01	LENGTH	30.124	VOLUME	18164.
WROACT(1)	0.0	WROACT(2)	1589.4	WROACT(3)	13158.	WROACT(4)			
AFACT(1)	5.40415E-01	AFACT(2)	7.52694E-01	AFACT(3)	1.01275E 00	AFACT(4)			
DFACT	6.88504E-01	TPAX	0.0	TCU	154.47	TDUX	0.C	BO MAX	0.0
FPTM	1.C7231E-01	N-J PSSM	8187.7	PREP MASS	76356.	TANK AREA	3365.C	NO OF TNK	1.0000

THE OLD VALUE OF TIMEC IS 1918893.0

 THE NEW VALUE OF TIMEC IS 1918850.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U3C3P21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1081163.	555466.	282203.
TOTAL INITIAL PROPELLANT MASS	791700.6	279338.2	76355.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	791700.56	279338.25	76355.19
PROPELLANT TANK DRY MASS	79170.0	27933.8	8187.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79170.00	27933.81	8187.61
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12042.7	8791.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12042.75	8791.07
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60029.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9067.8	527.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	0.75090	INS. MASS	614.96	INSUL. MF	8.38281E-03	TANK MASS	3055.1	TANK MF	7.28803E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	171.19	PRES MF	2.33361E-03
TOT EFF MAS	18933.	TOT EF MF	2.58093E-01	EF MP MAS	998.75	EFF MP MF	1.36145E-02	MP MASS	1424.7
BOILOFF MAS	12420.	EF BO MAS	11802.	WALL TKMS	0.64765E-01	LENGTH	29.238	VOLUME	17451.
MBOACT(1)	0.0	MBOACT(2)	1029.0	MBOACT(3)	11391.	MBOACT(4)			
AFACT(1)	4.91165E-01	AFACT(2)	7.07301E-01	AFACT(3)	9.72086E-01	AFACT(4)			
DFACT	7.01014E-01	TMAX	0.0	TDU	175.71	TDUX	0.0	BOMAX	0.0
EPTH	8.35966E-02	N-J PSSM	6132.6	PROP MASS	73359.	TANK AREA	3275.9	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 1903292.0

THE NEW VALUE OF IMIED IS 1903194.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U303P2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1073407.	552714.	277076.
TOTAL INITIAL PROPELLANT MASS	785240.9	276864.9	73356.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	785240.94	276864.94	73356.19
PROPELLANT TANK DRY MASS	78524.1	27686.5	6132.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78524.06	27686.48	6132.33
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12000.7	8718.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12000.70	8718.66
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	59463.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8982.3	918.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
(U306P2)

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	13.415	INS. MASS	13090.
VFNT PRESS	14.700	CCAT MASS	0.0
TOT EFF MAS	55226.	TCT FF MF	5.84720E-01
INS. TKNESS	13.415	INSUL. MF	1.38552E-01
VFNT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	55226.	EF MP MAS	1208.0
ROILOFF MAS	28555.	EF RC MAS	33878.
WROACT(1)	0.0	WROACT(2)	6207.5
AFACT(1)	7.92026E-01	AFACT(2)	9.84611E-01
CFACT	6.24557E-01	TMAX	0.0
EPFH	2.13250E-01	N-J PSSW	20142.
		WALL TKNS	0.65441E-01
		WROACT(3)	22747.
		AFACT(3)	1.22053E 00
		TDU	85.630
		PRCP MASS	94453.
		TANK MASS	3502.9
		PRES MASS	221.67
		EFF MP MF	1.27853E-02
		LENGTH	35.477
		WROACT(4)	
		AFACT(4)	
		TDUX	0.0
		TANK AREA	3503.1
		VOLUME	22469.
		BOPAX	0.0
		NO CF TAK	1.0000

THE OLD VALUE OF IMEC IS 200920.0

THE NEW VALUE OF IMEC IS 2010550.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

4/30/62

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1124597.	571216.	312735.
TOTAL INITIAL PROPELLANT MASS	822634.0	252374.2	54450.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	822634.0	252374.2	54450.8
PROPELLANT TANK DRY MASS	822634.0	252374.2	20150.2
PROPELLANT TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	822634.0	252374.2	20150.2
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12281.4	5228.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12281.4	5228.8
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	1970.0	5100.0	5300.0
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	63244.5	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9568.7	575.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
DAVINAD	0.0	182100.0	132500.0

HEAT PROTECTION SYSTEM OPTIMIZATION RESULTS
U306P2I

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNFSS	2.5707	INS. MASS	2520.2	INSUL. MF	3.25575E-02	TANK MASS	3211.4	TANK MF	7.26917E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	180.63	PRES MF	2.33643E-03
TOT EFF MAS	24635.	TCT EF MF	3.18648E-01	EF PP MAS	1044.4	EFF MP MF	1.35083E-02	MF MASS	1520.2
BOILOFF MAS	15643.	EF RC MAS	15270.	WALL TKNS	0.65720E-01	LENGTH	30.407	VOLUME	18391.
WBFACT(1)	0.0	WBFACT(2)	2507.6	WBFACT(3)	13135.	WBFACT(4)			
AFACT(1)	5.46338E-01	AFACT(2)	7.58153E-01	AFACT(3)	1.01764E 00	AFACT(4)			
EFACT	6.87000E-01	TPAX	0.0	TDU	137.44	TDUX	G.C	BOPAX	0.0
EPTH	1.07629E-01	N-J PSSH	8320.8	PRCP MASS	77312.	TANK AREA	3393.4	NO OF TKN	1.0000

THE OLD VALUE OF IMTEC IS 1920795.0

THE NEW VALUE OF IMTEC IS 1721253.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

112-4027

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	85557.0	85557.0	85557.0
TOTAL INITIAL PROPELLANT MASS	792431.4	279437.5	77301.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	792431.4	279437.5	77301.4
PROPELLANT TANK DRY MASS	79265.1	27543.7	8215.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79269.04	27543.74	8219.60
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12044.4	8814.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12044.43	8813.56
MISCELLANEOUS PROPELLION SUBSYSTEM MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOPE CORRECTION SUBSYSTEM MASS	63116.0	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9181.0	927.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVILAP	0.0	18200.0	13200.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS 0.76422	INS. MASS 630.52	INSUL. MF 8.50009E-03	TANK MASS 3087.4	TANK MF 7.28373E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 173.15	PRES MF 2.33419E-03
TOT EFF MAS 19642.	TOT EF MF 2.64801E-01	EF MP MAS 1010.3	EFF MP MF 1.36202E-02	MP MASS 1444.5
BOILOFF MAS 13205.	EF BO MAS 12426.	MALL TKNS 0.64966E-01	LENGTH 29.480	VOLUME 17646.
MBOACT(1) 0.0	MBOACT(2) 1620.8	MBOACT(3) 11384.	MBOACT(4)	
AFACT(1) 4.97412E-01	AFACT(2) 7.13058E-01	AFACT(3) 9.77244E-01	AFACT(4)	
DFACT 6.89426E-01	TMAX 0.0	TDU 157.92	TDOX 0.0	BOMAX 0.0
EPTH 6.36715E-02	N-J PSSM 6206.6	PROP MASS 74178.	TANK AREA 3300.2	NO OF TNK 1.0000

THE OLD VALUE OF IMIED IS 1905238.0

THE NEW VALUE OF IMIED IS 1905744.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U306P2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1074372.	552787.	277987.
TOTAL INITIAL PROPELLANT MASS	786045.5	276929.7	74173.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	786045.50	276929.69	74173.75
PROPELLANT TANK DRY MASS	78604.5	27693.0	6206.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78604.50	27692.96	6206.22
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12001.8	8738.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12001.80	8738.41
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	59533.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8993.0	918.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	102100.0	132500.0

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS
 U309P2H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	13.467	IAS. MASS	13316.	INSUL. MF	1.38420E-01	TANK MASS	3574.6	TANK PF	7.23039E-02
VENTY PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	225.84	PRES PF	2.34704E-03
TOT EFF MAS	57525.	TCT EF MF	5.98005E-01	EF PP MAS	1225.8	EFF MP MF	1.27424E-C2	PP MASS	1976.2
NOILOFF MAS	30561.	EF 8C MAS	35805.	WALL TKNS	0.65785E-01	LENGTH	35.953	VOLUME	22884.
WBOACT(1)	562.13	WRCACT(2)	7209.9	WBCACT(3)	22789.	WBOACT(4)			
AFACT(1)	8.05001E-01	AFACT(2)	1.00025E 00	AFACT(3)	1.23454E 00	AFACT(4)			
DFACT	6.20289E-01	TMAX	0.0	TDU	75.850	TDUX	C.C	BOMAX	0.0
EPTH	2.13071E-C2	N-J PSSM	20497.	PRCP MASS	96159.	TANK AREA	3555.0	NO OF TANK	1.0000

THE OLD VALUE OF IMPEC IS 2014970.0

THE NEW VALUE OF IMPEC IS 2014896.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UPCCP2H

	STAGE 1 1128472.	STAGE 2 571559.	STAGE 3 314667.
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	831095.9	253680.0	96224.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	831095.87	253680.00	96224.87
PROPELLANT TANK DRY MASS	83109.5	25368.0	20502.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	83109.50	25367.55	20502.75
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12286.6	5270.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12286.56	5270.72
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	63481.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9589.3	580.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309P21

** INPUT ITEMS **

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. TKNESS	3.0316	INS. MASS	2592.8
VENT PRESS	14.700	CCAT MASS	0.0
TOT EFF MAS	25549.	TCT EF MF	3.26539E-01
		INSUL. MF	3.21387E-C2
		CCAT MF	0.0
		EF MP MAS	1056.7
ROILOFF MAS	16514.	EF RD MAS	16032.
WBFACT(1)	0.0	WBFACT(2)	3406.1
AFACT(1)	5.54201E-C1	AFACT(2)	7.65401E-01
DFACT	6.85004E-C1	TMAX	0.0
EPYH	1.08130E-C1	N-J PSSM	8460.3
		TU	122.93
		PROP MASS	78242.
		WALL TKNS	0.65939E-01
		WBFACT(3)	13108.
		AFACT(3)	1.02414E CC
		TANK MASS	3248.3
		PRES MASS	182.85
		EFF MP MF	1.35055E-C2
		TANK MF	7.26540E-02
		PRES MF	2.33703E-03
		MF MASS	1542.6
		LENGTH	30.682
		WBFACT(4)	
		AFACT(4)	
		TDUX	0.0
		TANK AREA	3421.1
		BCMAX	0.0
		NC CF TANK	1.0000
		VOLUME	18612.

THE OLD VALUE OF IMIEC IS 1923348.0

THE NEW VALUE OF IMIEC IS 1923633.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ20927

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1083533.	555712.	284351.
TOTAL INITIAL PROPELLANT MASS	793673.8	275535.5	78226.8
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	793673.75	275535.50	78226.81
PROPELLANT TANK DRY MASS	79367.3	27553.5	8458.6
OXIDIZER TANK DRY MASS	0.0	0.0	C.C
FUEL TANK DRY MASS	79367.31	27553.54	8458.63
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	0.0	C.C
FUEL SUBSYSTEMS MASS	C.C	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	12046.2	8836.3
OXIDIZER SUBSYSTEMS MASS	C.C	0.0	C.C
FUEL SUBSYSTEMS MASS	C.C	12046.17	8836.32
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60202.0	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9094.0	528.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	C.C
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THNESS	0.77626	INS. MASS	645.19	INSUL. MF	8.60263E-03	TANK MASS	3119.8	TANK MF	7.27963E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	175.10	PRES MF	2.33477E-03
TOT EFF MAS	20361.	TOT EF MF	2.71478E-01	EF MP MAS	1021.9	EFF MP MF	1.36250E-02	MP MASS	1464.3
BOILOFF MAS	13992.	EF BO MAS	13059.	WALL TKNS	0.65166E-01	LENGTH	29.723	VOLUME	17841.
WBOACT(1)	0.0	WBOACT(2)	2612.3	WBOACT(3)	11380.	WBOACT(4)			
AFACT(1)	5.03652E-01	AFACT(2)	7.18810E-01	AFACT(3)	9.82397E-01	AFACT(4)			
DFACT	6.97841E-01	TMAX	0.0	TDU	142.72	TDOX	0.0	BOMAX	0.0
EPFH	8.37336E-02	N-J PSSH	6279.9	PROP MASS	74999.	TANK AREA	-3324.6	NO OF TANK	1.0000

THE OLD VALUE OF IMIED IS 1907191.0

THE NEW VALUE OF IMIED IS 1907103.0

GENERAL DYNAMICS
Fort Worth Division

U309P2L
MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1075343.	552861.	278901.
TOTAL INITIAL PROPELLANT MASS	786853.8	276996.1	74994.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	786853.81	276996.06	74994.37
PROPELLANT TANK DRY MASS	78685.3	27699.6	6279.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78685.31	27699.59	6279.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12002.9	8758.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12002.93	8758.22
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	59604.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9003.7	918.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V2H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.7000	INITIAL ENERGY	0.0
INS. THICKNESS	18.325	INSUL. MF	1.83287E-01
VENT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	6175.	EF MP MAS	1307.5
INS. MASS	19570.	WALL TKNS	0.71792E-01
COAT MASS	0.0	WECACT(3)	38791.
TCT FF MF	7.59338E-01	AFACT(3)	1.24624E 00
BCILOFF MAS	28751.	EF BC MAS	52223.
WROACT(1)	0.0	WROACT(2)	0.0
AFACT(1)	5.44267E-C1	AFACT(2)	1.12492E 00
DFACT	5.85933E-C1	TMAX	0.0
FPTH	2.57583E-C1	N-J PSSH	27545.
		TCU	119.21
		PRCP MASS	1.06771E C5
		TANK MASS	4413.7
		PRES MASS	251.31
		EFF MP MF	1.22457E-C2
		LENGTH	35.120
		WBOACT(4)	
		AFACT(4)	
		TDUX	0.0
		TANK AREA	42655.4
		BCFAX	0.0
		NO CF TAN	1.0000
		TANK PF	7.23415E-02
		PRES MF	2.35376E-03
		PF MASS	2231.4
		VOLUME	25399.

**** RESULTS ****

THE OLD VALUE OF IMFC IS 2071834.0

THE NEW VALUE OF IMFC IS 2087483.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1161743.	587080.	332664.
TOTAL INITIAL PROPELLANT MASS	858901.4	307529.2	106734.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	858901.37	307529.25	106734.31
PROPELLANT TANK DRY MASS	85880.1	30752.5	27535.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	85880.06	30752.51	27535.55
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12522.0	9524.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12522.00	9524.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9160.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	65909.1	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9256.1	1021.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V2I

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000C INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	4.0851	TAS. MASS	3668.0	INSUL. MF	4.2679E-C2	TANK MASS	3477.6	TANK MF	7.24702E-02
VENT PRESS	14.760	COAT MASS	0.0	COAT MF	0.0	PRES MASS	196.54	PRES MF	2.34041E-03
TOT EFF MAS	34951.	TOT EF MF	4.16210E-01	EF MP MAS	1112.5	EFF MP MF	1.32481E-C2	PP MASS	1681.1
ROILOFF MAS	21723.	EF BC MAS	23889.	WALL TKNS	0.67241E-01	LENGTH	32.378	VOLUME	19976.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	21723.	WBOACT(4)			
AFACT(1)	6.45582E-01	AFACT(2)	8.49627E-01	AFACT(3)	1.09560E 00	AFACT(4)			
DFACT	6.61754E-01	TMAX	0.0	TCU	161.48	TDUX	0.0	BOPAX	0.0
EPYH	1.18450E-01	N-J PSSH	9950.2	PRCP MASS	82975.	TANK AREA	3591.5	NO OF TNK	1.0000

THE OLD VALUE OF IMIEC IS 1954146.0

THE NEW VALUE OF IMIEC IS 1951218.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

520 2021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1097200.	562255.	251765.
TOTAL INITIAL PROPELLANT MASS	805954.9	285378.0	83571.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	805054.87	285378.00	83571.37
PROPELLANT TANK DRY MASS	80505.4	28537.8	8354.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	80535.44	28537.75	8345.75
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	7.0	12145.4	8575.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12145.42	8574.97
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	61199.3	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9744.6	549.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
*** RESULTS ***			
INS. THNESS	1.0568	INSUL. MF	1.14643E-02
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	27581.	EF MP MAS	1081.9
		TANK MASS	3323.9
		PRES MASS	187.39
		EFF MP MF	1.35008E-02
		TANK MF	7.25843E-02
		PRES MF	2.33828E-03
		MP MASS	1588.4
BOILOFF MAS	18882.	EF BO MAS	19576.
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	5.69402E-01	AFACT(2)	7.79411E-01
DFACT	6.81143E-01	TMAX	0.0
EPTH	8.63867E-02	N-J PSSM	6922.9
		WALL TKNS	0.66378E-01
		WBOACT(3)	18882.
		AFACT(3)	1.03669E 00
		TDU	171.31
		PROP MASS	80138.
		TDUX	0.0
		TANK AREA	3477.4
		BO MAX	0.0
		NO OF TNK	1.0000
		VOLUME	19063.
		LENGTH	31.243
		WBOACT(4)	
		AFACT(4)	

THE OLD VALUE OF IMIED IS 1928325.0

THE NEW VALUE OF IMIED IS 1929734.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S303V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1086259.	558046.	284932.
TOTAL INITIAL PROPELLANT MASS	795943.5	281622.7	80155.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	795943.50	281622.69	80155.37
PROPELLANT TANK DRY MASS	79594.3	28162.3	6924.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79594.31	28162.26	6924.36
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS			
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS			
OXIDIZER SUBSYSTEMS MASS	0.0	12081.6	8882.7
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60400.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9124.0	935.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S20AV24

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C						
INS. TKWESS	16.700	INS. MASS	20650.	INSUL. MF	1.87C16E-01	TANK MASS	4567.1	TANK MF	7.23841E-02
VENT PRESS	87523.	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	240.09	PRES MF	2.35557E-03
TOT EFF MAS		TOT EFF MF	7.06374E-01	EF MF MAS	1340.5	EFF MP MF	1.21408E-02	MF MASS	2319.5
ROLOFF MAS	42041.	EF PC MAS	57690.	WALL TKAS	0.72448E-01	LENGTH	40.195	VOLUME	26266.
WFACT(1)	C.C	WFACT(2)	C.C	WFACT(3)	42241.	WBDACT(4)			
AFACT(1)	5.75449E-01	AFACT(2)	1.15389E 00	AFACT(3)	1.27218E CC	AFACT(4)			
EFACY	5.77954E-01	TMAX	C.C	TCU	112.42	IDLX	C.0	BOMAX	0.0
BDTH	2.61754E-01	N-J PCCW	28922.	PREP MASS	1.10416E C5	TANK AREA	4377.6	NC CF TANK	1.0000

***** RESULTS *****

THE OLD VALUE OF INTFC IS 208507.0

THE NEW VALUE OF INTFC IS 2098225.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

87-4024

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1170037.	590270.	337520.
TOTAL INITIAL PROPELLANT MASS	855708.6	310376.1	110508.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	855708.62	310376.06	110508.87
PROPELLANT TANK DRY MASS	85570.8	31037.6	28926.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	85570.81	31037.55	28926.28
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12570.4	5615.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12570.39	5615.41
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETEN PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	66514.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10047.5	1022.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS 4.70015	INS. MASS 3938.7	INSUL. MF 4.45516E-02	TANK MASS 3562.6	TANK MF 7.24216E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 201.58	PRES MF 2.34160E-03
TOT EFF MASS 37576.	TCT EFF MF 4.41144E-01	EF PP MASS 1134.6	EFF MP MF 1.31800E-02	MF MASS 1732.0
ROUOFF MASS 23685.	EF RC MASS 26567.	WALL TKNS 0.67701E-01	LENGTH 33.002	VOLUME 20478.
WRNACT(1) 0.0	WRBACT(2) 0.0	WRBACT(3) 23689.	WRNACT(4)	
AFACT(1) 6.72004E-01	AFACT(2) 9.73979E-01	AFACT(3) 1.12142E 00	AFACT(4)	
CFACT 6.55082E-01	TMAX 0.0	TDU 155.66	TDLX	RCMAX 0.0
EDTH 1.15255E-01	N-J PSSH 10275.	PRCP MASS 86786.	TANK AREA 3654.3	NO CF TNK 1.0000

THE OLD VALUE OF IMFC IS 1963458.C

THE NEW VALUE OF IMFC IS 1958046.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

852421

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	110107.0	56374.6	294223.
TOTAL INITIAL PROPELLANT MASS	808284.0	286709.1	86056.9
TOTAL OXIDIZER MASS	C.C	0.C	C.C
TOTAL FUEL MASS	808284.87	286709.12	86056.94
PROPELLANT TANK DRY MASS	80828.4	28670.9	10271.3
OXIDIZER TANK DRY MASS	C.C	0.C	C.C
FUEL TANK DRY MASS	80828.44	28670.90	10271.30
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	0.C	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	C.C	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	12168.1	9025.4
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	12168.05	9025.43
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.C	5300.C
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9044.C	5140.C
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	61482.4	0.C	9495.C
ATTITUDE CONTROL SUBSYSTEM MASS	9287.4	954.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	182100.C	132500.C

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THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNESS	1.0732	INS. MASS	948.21	INSUL. MF	1.15577E-02	TANK MASS	3399.9	TANK MF	7.25234E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	191.93	PRES MF	2.33944E-03
TOT EFF MAS	30039.	TOT EF MF	3.66142E-01	EF MP MAS	1103.7	EFF MP MF	1.34529E-02	MP MASS	1634.3
BOILOFF MAS	20691.	EF BO MAS	21845.	WALL TKNS	0.66810E-01	LENGTH	31.806	VOLUME	19516.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	20691.	WBOACT(4)			
AFACT(1)	5.92363E-01	AFACT(2)	8.00575E-01	AFACT(3)	1.05565E 00	AFACT(4)			
DFACT	6.75310E-01	TMAX	0.0	TDU	165.99	TDOX	0.0	ROMAX	0.0
EPFH	8.64205E-02	N-J PSSM	7090.0	PROP MASS	82041.	TANK AREA	3534.0	NO OF TNK	1.0000

**** RESULTS ****

THE OLD VALUE OF IMIED IS 1935953.0

THE NEW VALUE OF IMIED IS 1935787.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

S306V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	10899555.	559314.	286920.
TOTAL INITIAL PROPELLANT MASS	798688.1	282753.9	82033.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	798688.06	282753.94	82033.50
PROPELLANT TANK DRY MASS	79868.8	28275.4	7089.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	79868.75	28275.38	7089.37
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12100.8	8928.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12100.81	8928.20
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60641.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9160.3	939.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309V2H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.765CC INITIAL ENRGY 0.0

**** RESULTS ****

INS. THNESS 15.461	TAS. MASS 21824.	INSUL. MF 1.51322E-C1	TANK MASS 4723.8	TANK MF 7.24405E-02
VENT PRESS 14.7CC	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 265.03	PRES MF 2.35752E-03
TOT FER MAS 54P15.	TCT FF MF P.30P66E-01	EF MF MAS 1375.1	EFF MP MF 1.2C457E-C2	MF MASS 2408.8
ROILDF MAS 45201.	FF PC MAS 62070.	WALL TKNS 0.72096E-C1	LENGTH 41.253	VOLUME 27146.
WFOACT(1) 0.0	WFOACT(1) 0.0	WFOACT(2) 45201.	WBOACT(4)	
AFACT(1) 1.00365E C0	AFACT(2) 1.17965E 00	AFACT(3) 1.35527E 0C	AFACT(4)	
CFACT 5.7C95CF-C1	TWAY 0.0	TCU 106.89	TCUX C.C	BCPAX 0.0
EPTH 2.6F130E-C1	N-J PSSM 30370.	PRCP MASS 1.01411E C5	TANK AREA 4487.8	NO OF TKN 1.0000

THE OLD VALUE OF IMIEC IS 2090959.0

THE NEW VALUE OF IMIEC IS 2114666.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

03-00-00

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	117418.3	59340.2	34308.2
TOTAL INITIAL PROPELLANT MASS	972492.4	313171.5	114134.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	872492.37	313171.87	114134.69
PROPELLANT TANK DRY MASS	87249.2	31317.2	30374.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	87249.19	31317.18	30374.68
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12617.5	9703.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12617.52	9703.19
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	25000.0
INTERSTAGE STRUCTURE MASS	15497.0	9044.0	5140.0
BEYOND PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MICROCURSE CORRECTION SUBSYSTEM MASS	67108.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10137.3	1052.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVILAN	0.0	18210.0	13250.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S393V21

*** INPUT ITEMS ***

REFLECTOR PRESSURE	15.70000	INITIAL ENERGY	C.C
**** RESULTS ****			
TNS. THICKNESS	4.4684	TNSUL. MF	4.64684E-02
VENT PRESS	14.700	CCAT MF	0.C
TOT EFF MAS	41724.	EFF MP MAS	1154.3
ROILOFF MAS	25545.	WALL TKNS	0.6612EE-01
WFACT(1)	C.C	WFACT(3)	25545.
AFACT(1)	6.58111E-01	AFACT(3)	1.14297E 00
DFACT	4.46842E-01	TNU	152.46
FPTH	1.71105E-01	PRCP MASS	8637P.
		TANK MASS	2643.1
		PRFS MASS	206.34
		EFF MP MF	1.31056E-02
		LENGTH	33.551
		WFACT(4)	
		AFACT(4)	
		TDLX	C.C
		TANK AREA	3713.5
		RCMAX	0.0
		NC CF TAK	1.0000
		TANK MF	7.23840E-02
		PRES MF	2.34265E-03
		MF MASS	1780.1
		VCLLME	20952.

THE OLD VALUE OF IMEF IS 1072847.C

 THE NEW VALUE OF IMEF IS 1966881.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SPACV21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1104967.	565240.	256683.
TOTAL INITIAL PROPELLANT MASS	911517.8	288041.5	88066.7
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	911517.91	288041.50	88066.69
PROPELLANT TANK DRY MASS	91151.7	28804.1	10673.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	91151.75	28804.14	10673.23
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	12150.7	5073.9
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	12150.70	5073.88
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	C.C	C.C	C.C
MICROUSE CORRECTION SUBSYSTEM MASS	61765.7	C.C	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	9300.2	559.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAVING	C.C	18200.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309V2L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THICKNESS	1.1215	INS. MASS	1006.2
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	32526.	TOT EF MF	3.87767E-01
INS. THICKNESS	1.1215	INSUL. MF	1.19952E-02
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	32526.	EF MP MAS	1124.0
BOILOFF MAS	22450.	EF BO MAS	24121.
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	6.14980E-01	AFACT(2)	8.21420E-01
DFACT	6.69565E-01	TMAX	0.0
EPH	8.68082E-02	N-J PSSM	7281.6
TANK MASS	3473.8	WALL TKMS	0.67220E-01
PRES MASS	196.32	WBOACT(3)	22450.
EFF MP MF	1.34005E-02	AFACT(3)	1.07433E 00
TANK MF	7.24726E-02	TDU	161.06
PRES MF	2.34050E-03	PROP MASS	83881.
MP MASS	1678.8	TANK AREA	0.0
VOLUME	19954.	TANK AREA	3588.7
BOMAX	0.0	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 1943594.0

THE NEW VALUE OF IMIED IS 1942408.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1092835.	560576.	288999.
TOTAL INITIAL PROPELLANT MASS	801420.1	283879.9	83876.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	801420.06	283879.94	83876.06
PROPELLANT TANK DRY MASS	80141.9	28388.0	7281.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	80141.94	28387.98	7281.13
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12120.0	8972.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12119.96	8972.67
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	60880.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9196.5	944.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S30912H

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DESIGN PRESSURE      19.70000      INITIAL ENERGY      0.0
*** INPUT ITEMS ***
***** RESULTS *****
INS. TKNESS          17.474          INS. MASS            19469.          INSUL. MF            1.72164E-01          TANK MASS            4679.5          TANK MF              7.24234E-02
VENT PRESS           14.700          COAT MASS            0.0                COAT MF              0.0                EFF MP MF            1.20132E-02          PRES MF              2.35630E-03
TOT EFF MAS          91945.          TOT EF MF            8.13157E-01        EF MP MAS            1358.4             MP MASS              2383.6
BUILGFF MAS          44806.          EF 8D MAS            62662.             WALL TKNS            0.72915E-01          VOLUME               26898.
WBDOACT(1)           3084.6          WBDOACT(2)           0.0                WBDOACT(3)           44806.             WBUACT(4)
AFACT(1)              1.00748E 00      AFACT(2)              1.18319E 00        AFACT(3)              1.39844E 00          AFUNCT(4)
DFACT                 5.69877E-01      TMAX                 940.82             TDU                  66.138              TDUX                 0.0
EPTH                 2.46964E-01      N-J PSSM             27925.             PROP MASS            1.13072E 05          TANK AREA            4456.7
                                                                BOMAX                0.0                NU OF TNK            1.0000

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THE OLD VALUE OF IMIEU IS 2100760.0

THE NEW VALUE OF IMIEU IS 2102556.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309T2H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1172182.	591095.	339280.
TOTAL INITIAL PROPELLANT MASS	867495.4	311112.6	112864.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	867495.44	311112.56	112864.06
PROPELLANT TANK DRY MASS	86749.5	31111.2	27873.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	86749.50	31111.24	27873.36
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12582.9	9673.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12582.91	9673.21
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	66670.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10071.2	1044.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
530302H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.76000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNFSS	11.724	TAS. MASS	10401.
VENT PRFSS	14.700	COAT MF	0.0
TOT FFF MAS	15564.	TOT FF MF	4.78282E-01
ROILOFF MAS	19245.	FF BO MAS	22141.
WROACT(1)	0.0	WROACT(2)	0.0
AFACT(1)	7.08306E-01	AFACT(2)	0.04673E-01
DFACT	6.46624E-01	TMAX	0.0
FPTH	2.00371E-01	N-J PSSV	16742.
		TDI	82.687
		PRCP MASS	82557.
		WALL TKNS	0.67148E-01
		WPCACT(3)	19269.
		AFACT(3)	1.14891E 00
		TANK MASS	3460.7
		PRES MASS	195.52
		FFF MP MF	1.29310E-02
		TANK WF	7.24810E-02
		PRES WF	2.33999E-03
		MP PASS	1670.9
		VOLUME	19877.
		ROMAX	0.0
		NO OF TANK	1.0000

THE OLD VALUE OF IMPED IS 1075470.0

THE NEW VALUE OF IMPED IS 1971757.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

527022H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1107377.	566169.	298213.
TOTAL INITIAL PROPELLANT MASS	813529.2	288870.6	83622.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	813529.25	288870.56	83622.50
PROPELLANT TANK DRY MASS	81357.9	28887.0	16755.6
OXIDIZED TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81352.87	28887.04	16755.56
NON-EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	12204.8	8566.3
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	12204.80	8566.26
MISCELLANEOUS PROPELLANT SURSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SURSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SURSYSTEM MASS	61941.9	0.0	9495.0
ATTITUDE CONTROL SURSYSTEM MASS	9156.8	962.6	1434.7
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVILION	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303P21

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	C.C				
***** RESULTS *****							
INS. THNESS	2.6156	INS. MASS	2103.6	IASUL. MF	2.94705E-02	TANK MASS	2577.3
VENT PRESS	16.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	166.49
TOT EFF MAS	18153.	TCT EFF MF	2.54317E-01	EF MP MAS	969.53	EFF MP MF	1.35684E-02
ROILOFF MAS	19062.	EF RO MAS	9704.4	WALL TKNS	0.64270E-01	LENGTH	28.653
WFACT(1)	0.0	WFACT(2)	0.0	WFACT(3)	10762.	WFACT(4)	
AFACT(1)	4.81839E-01	AFACT(2)	6.98704E-01	AFACT(3)	5.64784E-01	AFACT(4)	
DFACT	7.03392E-01	YMAX	0.0	TDU	125.17	TDUX	C.C
EPYH	1.04706E-01	N-J PSSM	748C.4	PRCP MASS	71381.	TANK AREA	3217.C
						BO MAX	0.0
						NO OF TAK	1.0000
						VOLUME	16980.
						TANK MF	7.29936E-02
						PRES MF	2.33237E-03
						MF PASS	1377.0

THE OLD VALUE OF TIMEC IS 1902407.0

THE NEW VALUE OF TIMEC IS 1902310.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5223021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1772969.	552934.	276410.
TOTAL INITIAL PROPELLANT MASS	784876.1	277061.3	71388.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	784876.06	277061.31	71388.25
PROPELLANT TANK DRY MASS	784876.6	27706.1	7481.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78487.56	27706.12	7481.22
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12004.0	8671.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12004.04	8671.10
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19790.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDE CORRECTION SUBSYSTEM MASS	58431.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8977.5	518.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVILION	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S203P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNSS	0.67031	INS. MASS	527.38	INSUL. MF	7.64007E-02	TANK MASS	2885.2	TANK MF	7.31465E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	160.88	PRES MF	2.33067E-03
TOT EFF MAS	14.264.	TOT EF MF	2.08095E-01	FF MP MAS	943.81	EFF MP MF	1.36728E-02	MP MASS	1320.1
ROULOFF MAS	2288.3	EF RD MAS	7683.1	WALL TKNS	0.62667E-01	LENGTH	27.957	VOLUME	16421.
WFACT(1)	0.0	WBOACT(2)	0.0	WBCACT(3)	8288.3	WBOACT(4)			
AFACT(1)	4.36383E-01	AFACT(2)	6.56808E-01	AFACT(3)	9.28849E-01	AFACT(4)			
DFACT	7.14927E-01	TMAX	0.0	TDU	142.21	TDOX	0.0	BOMAX	0.0
EPYH	8.31172E-02	N-J PSSM	5737.4	PRCP MASS	69028.	TANK AREA	3147.1	NO OF TANK	1.0000

THE OLD VALUE OF TIMEO IS 1886592.0

 THE NEW VALUE OF TIMEO IS 1889135.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SCALE

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1966441.	590423.	272273.
TOTAL INITIAL PROPELLANT MASS	779439.9	274820.9	69050.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	779439.94	274820.87	69050.19
PROPELLANT TANK DRY MASS	77943.9	27482.1	5739.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	77943.94	27482.07	5739.26
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11966.0	8614.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11965.95	8614.57
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	58954.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8975.6	910.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306R2H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

*** RESULTS ***

INS. TKNFSS	12.174	INS. MASS	11026.	INSUL. MF	1.29679E-01	TANK MASS	3519.9	TANK MF	7.24448E-02
VENT PRFSS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	199.03	PRES MF	2.34077E-03
TOT EFF MAS	42468.	TOT EF MF	4.99454E-01	FF MP MAS	1093.9	EFF MP MF	1.28655E-02	MP MASS	1706.5
ROILOFF MAS	20553.	EF RC MAS	23088.	WALL TKNS	0.67472E-01	LENGTH	32.689	VOLUME	20227.
WFACT(1)	0.0	WFACT(2)	0.0	WFACT(3)	20553.	WFACT(4)			
AFACT(1)	7.27258E-01	AFACT(2)	9.24976E-01	AFACT(3)	1.16704E 00	AFACT(4)			
CFACT	6.47045E-01	TMAX	0.0	TDU	75.956	TDX	C.C	BOMAX	0.0
EDTH	2.04465E-01	N-J PSSW	17385.	PPCP MASS	85328.	TANK AREA	3622.8	NO CF TAK	1.0000

THE OLD VALUE OF IMTEC IS 1983562.0
 THE NEW VALUE OF IMTEC IS *****
 THE OLD VALUE OF IMFD IS 7978779.0
 THE NEW VALUE OF IMFD IS *****

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

527407H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1110956.	567507.	300410.
TOTAL INITIAL PROPELLANT MASS	816426.5	290064.6	85138.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	816426.50	290064.62	85138.69
PROPELLANT TANK DRY MASS	81442.6	79006.4	17407.8
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81642.56	29006.45	17407.85
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12225.1	9002.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12225.10	9002.69
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	62195.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9395.1	967.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS

S106021

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000	INITIAL ENERGY	C.C.	***** RESULTS *****	TANK MASS	3013.3	TANK MF	7.29395E-02
INS. TRNSEC	2.7001	INSUL. MF	3.C2805E-02	TANK MASS	168.67	PRES MF	2.33302E-03	
VENT PRESS	14.700	CFAT MF	C.C.	PRES MASS	1.25538E-02	MP MASS	1399.1	
TOT EFF MAS	19255.	TOT EFF MF	2.66337E-01	EFF MP MF	1.25538E-02			
		EFF RC MAS	10637.	LNPTH	28.924	VOLUME	17198.	
WROACT(1)	C.C.	WROACT(2)	C.C.	WROACT(4)				
WROACT(1)	4.532673E-01	AFACT(2)	7.09566E-01	AFACT(4)				
DEACT	7.C0288E-01	TMAX	C.C.	TDX	C.C.	BOMAX	0.0	
EDTN	1.095453E-01	N-J DISM	7638.4	TANK AREA	3244.3	NO OF TAK	1.0000	
		TRU	117.61					
		PRTP MASS	72797.					

THE OLD VALUE OF TIME IS 1904056.0

THE NEW VALUE OF TIME IS 1905806.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_{mp})

5264021

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1074700.	553600.	277507.
TOTAL INITIAL PROPELLANT MASS	786318.4	277655.8	72305.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	786318.4	277655.8	72305.7
PROPELLANT TANK DRY MASS	78631.7	27765.6	7635.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78631.7	27765.6	7635.3
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12014.1	8693.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12014.1	8693.2
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	59557.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	8996.6	921.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVE PAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
5306P2L

*** INPUT ITEMS ***

DESIGN PRESSURE 10.70000 INITIAL ENERGY C.O

**** RESULTS ****

INS. TRNFS	0.6986	INS. MASS	557.41	TANGL. MF	7.92421E-02	TANK MASS	2916.8	TANK WF	7.30916E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	C.O	PRES MASS	162.81	PRES MF	2.33127E-03
TOT EFF MAS	15251.	TCT EFF MF	2.18376E-01	EF MP MAS	954.26	EFF MP MF	1.36657E-02	WF MASS	1339.7
ROI(OFF) MAS	5062.4	EFF AD MAS	8475.4	WALL TRMS	0.63876E-01	LENGTH	28.156	VOLUME	16613.
WFOACT(1)	0.0	WFOACT(2)	0.0	WFOACT(3)	9062.4	WFOACT(4)			
AFOACT(1)	4.46275E-01	AFOACT(2)	6.65019E-01	AFOACT(3)	9.35099E-01	AFOACT(4)			
DEACT	7.12389E-01	TMAX	0.0	TCU	136.25	TCUX	C.O	RCMAX	0.0
EDTH	8.32470E-02	N-J PCCW	5820.7	PRCP MASS	69837.	TANK AREA	3171.1	NO OF TANK	1.0000

THE OLD VALUE OF IMPEC IS 189599.0

 THE NEW VALUE OF IMPEC IS 1892046.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

59687

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1067483.	550578.	273187.
TOTAL INITIAL PROPELLANT MASS	780640.0	275315.9	69861.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	780640.94	275315.94	69861.12
PROPELLANT TANK DRY MASS	78064.1	27531.6	5822.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78064.06	27531.58	5822.71
NON-EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	0.0	0.0
OXIDIZED SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	11974.4	8634.1
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	11974.37	8634.14
MISCELLANEOUS PROPELLANT SURSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SURSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SURSYSTEM MASS	59960.0	0.0	9495.0
ATTITUDE CONTROL SURSYSTEM MASS	8971.5	912.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S30002H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	11.784	INS. MASS	10882.	INSUL. WF	1.24400E-01	TANK MASS	3616.6	TANK PF	7.23955E-C2
VENT PRESS	16.700	CPAT MASS	0.0	CPAT MF	0.0	PRES MASS	204.81	PRES PF	2.34271E-03
TOT EFF MAS	44719.	TOT EFF ME	5.11508E-01	EFF MP MAS	1130.2	EFF MP MF	1.29275E-C2	MP MASS	1764.3
RODLEFF MAS	22808.	EFF RC MAS	26171.	WALL TKAS	0.67988E-01	LENGTH	33.358	VOLUME	20797.
WRODCT(1)	1102.1	WRODCT(2)	3.0000	WRODCT(3)	21703.	WRODCT(4)			
AFACT(1)	7.26666E-01	AFACT(2)	0.26572E-01	AFACT(3)	1.16853E 00	AFACT(4)			
CPACT	6.40591E-01	TMAX	0.0	TDU	70.678	TDX	0.0	BCMAX	0.0
CDTH	1.00218E-01	N-J DSSM	17416.	PRCP MASS	87424.	TANK AREA	3694.1	NC CF TANK	1.0000

THE OLD VALUE OF IMEETS 1994277.0

THE NEW VALUE OF IMEETS 1983708.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

520007H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1112753.	568235.	302723.
TOTAL INITIAL PROPELLANT MASS	818005.7	290714.5	87386.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	818005.69	290714.50	87386.81
PROPELLANT TANK DRY MASS	81800.5	29071.4	17409.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81800.50	29071.44	17409.01
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12236.1	9057.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12236.14	9057.57
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDANCE CORRECTION SUBSYSTEM MASS	62334.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9416.1	969.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132900.0

*** INPUT ITEMS ***
 THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S309P21

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. THICKNESS	2.7883	INS. MASS	2200.0
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MASS	20374.	TOT FF MF	2.78247E-01
ROILOFF MAS	11783.	EF BD MAS	11500.
WRFACT(1)	0.0	WRFACT(2)	0.0
AFACT(1)	5.05441E-01	AFACT(2)	7.20459E-01
DFACT	6.57387E-01	TMAX	0.0
FPTH	1.06371E-01	N-J PSSM	7700.0
		WALL THKS	0.64731E-01
		WRFACT(3)	11783.
		AFACT(3)	9.83874E-01
		TOT PROP MASS	109.91
		TANK MASS	3045.8
		PRES MASS	170.88
		EFF MP MF	1.35380E-02
		LENGTH	25.158
		WBFACT(4)	
		AFACT(4)	
		TANK AREA	3271.8
		TANK VOLUME	17419.
		BOMAX	0.0
		NO OF TMS	1.0000

THE OLD VALUE OF IMIEN IS 1907754.0

 THE NEW VALUE OF IMIEN IS 1909294.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

Stage 21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1076428.	554265.	278602.
TOTAL INITIAL PROPELLANT MASS	787757.4	278248.9	73228.5
TOTAL OXIDIZER MASS	C.C	0.0	C.C
TOTAL FUEL MASS	787757.44	278248.94	73228.50
PROPELLANT TANK DRY MASS	78775.7	27824.9	7789.4
OXIDIZER TANK DRY MASS	C.C	0.0	C.C
FUEL TANK DRY MASS	78775.69	27824.88	7789.36
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12024.2	8715.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12024.23	8715.54
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
PETRO PROPELLANT SUBSYSTEM MASS	C.C	0.0	0.0
MISCELLANEOUS PROPELLANT SUBSYSTEM MASS	59683.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9015.7	923.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	0.0
PAYLOAD	C.C	187100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S30992L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 0.72656	INS. MASS 580.37	INSUL. MF 8.21522E-03	TANK MASS 2548.5	TANK MF 7.30391E-02
VENT PRESS 14.700	COAT MASS 0.0	CCAT MF 0.0	PRES MASS 164.74	PRES MF 2.33186E-03
TOT EFF MAS 16149.	TOT EF MF 2.28589E-01	FF MP MAS 964.83	EFF MP MF 1.36573E-02	MP MASS 1339.2
BOILOFF MAS 9835.9	EF BO MAS 9279.1	WALL TKAS 0.64084E-01	VOLUME 28.435	16805.
WFACT(1) 0.0	WFACT(2) 0.0	WFACT(3) 9835.9	LENGT 28.435	
AFACT(1) 4.56385E-01	AFACT(2) 6.75245E-01	AFACT(3) 9.43366E-01	WBOACT(4)	
			AFACT(4)	
DFACT 7.09846E-01	TMAX 0.0	TDU 126.29	TDUX 0.0	BOMAX 0.0
FPTH 8.35860E-02	N-J PSSM 5905.0	PRCP MASS 70646.	TANK AREA 3195.2	NO OF TNK 1.0000

THE OLD VALUE OF TIME IS 1897613.0

THE NEW VALUE OF TIME IS 1894958.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

575922

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1069326.	551533.	274102.
TOTAL INITIAL PROPELLANT MASS	781842.8	275811.2	70671.6
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	781842.81	275811.25	70671.62
PROPELLANT TANK DRY MASS	78184.3	27581.1	5907.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	78184.25	27581.11	5907.16
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	11982.8	8653.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	11982.79	8653.70
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RIGHT PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDE CORRECTION SUBSYSTEM MASS	59165.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9937.4	914.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	182100.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S306PT2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	11.289	INS. MASS	10219.
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	41691.	TOT EF MF	4.90698E-01
BOILOFF MAS	20738.	EF BO MAS	24021.
MBOACT(1)	846.71	MBOACT(2)	0.0
AFACT(1)	7.16523E-01	AFACT(2)	9.15012E-01
DFACT	6.43775E-01	TMAX	1506.9
EPTH	1.95060E-01	N-J PSSM	16573.
		INSUL. MF	1.20273E-01
		COAT MF	0.0
		EF MP MAS	1097.6
		WALL TKNS	0.67457E-01
		MBOACT(3)	20738.
		AFACT(3)	1.15018E 00
		TDU	45.440
		PROP MASS	84964.
		TANK MASS	3517.3
		PRES MASS	198.89
		EFF MP MF	1.29182E-02
		LENGTH	32.670
		MBOACT(4)	
		AFACT(4)	
		TDUX	0.0
		TANK AREA	3620.9
		TANK MF	
		MP MASS	
		VOLUME	20211.
		BDMAX	0.0
		NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 1979587.0

THE NEW VALUE OF IMIED IS 1975968.0

GENERAL DYNAMICS

Fort Worth Division

MASS SUMMARY (lb_m)

S306P12H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1109463.	566971.	299536.
TOTAL INITIAL PROPELLANT MASS	815266.6	289586.7	85071.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	815266.56	289586.69	85071.50
PROPELLANT TANK DRY MASS	81526.6	28958.7	16594.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	81526.62	28958.66	16594.03
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12217.0	9001.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12216.97	9001.07
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	62094.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	9379.8	965.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	187100.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S300PT2H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNFSS	11.285	INS. MASS	1.219.
VENT PRESS	14.700	CPAT MASS	0.0
TOT EFF MAS	41691.	TOT FF MF	4.90698E-01
BOILOFF MAS	20738.	FF BO MAS	24021.
WFACT(1)	2500.7	WFACT(2)	0.0
AFACT(1)	7.16522E-01	AFACT(2)	9.15017E-01
DFACT	6.43775E-01	TMAX	1506.9
EDTH	1.95060E-01	N-J PSSW	16573.
		WALL TKNS	0.67457E-01
		WFACT(3)	20728.
		AFACT(3)	1.15818E 00
		TU	45.440
		PRCP MASS	84984.
		TANK MASS	3517.3
		PRES MASS	198.89
		EFF MP MF	1.29182E-02
		LNPTH	32.670
		WFACT(4)	
		AFACT(4)	
		TDUX	0.0
		TANK AREA	3620.9
		BOIMAX	0.0
		NO OF TANK	1.0000
		TANK MF	7.24462E-02
		PRES MF	2.34083E-03
		MP PASS	1704.9

THE OLD VALUE OF IMIED IS 1979587.0

THE NEW VALUE OF IMIED IS 1975468.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

53300124

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1109463.	566571.	299536.
TOTAL INITIAL PROPELLANT MASS	815266.6	289586.7	85071.5
TOTAL INITIALIZED MASS	C.C	C.C	0.0
TOTAL FUEL MASS	815266.56	289586.65	85071.50
PROPELLANT TANK DRY MASS	81526.6	28958.7	16594.C
INITIALIZED TANK DRY MASS	C.C	0.C	0.C
FUEL TANK DRY MASS	81526.62	28958.66	16594.C3
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
INITIALIZED SUBSYSTEMS MASS	C.C	0.C	0.0
FUEL SUBSYSTEMS MASS	C.C	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12217.C	9001.1
INITIALIZED SUBSYSTEMS MASS	0.0	0.0	0.C
FUEL SUBSYSTEMS MASS	C.C	12216.97	9001.07
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.C	5300.0
ENGINE DRY MASS	105900.0	35000.C	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.C
DETRON PROPELLANT SUBSYSTEM MASS	C.C	0.C	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	62394.2	0.0	9495.C
ATTITUDE CONTROL SUBSYSTEM MASS	9270.8	965.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	0.C	C.C
PAVLAD	0.0	182100.C	137500.C

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
13-13734

*** INPUT ITEMS ***

INITIAL ENERGY 1.0

DESIGN COEFFICIENT 10.72

**** RESULTS ****

INFLUENCE MASS	4271.6	TANK MASS	4271.6	TANK WF	7.23145E-02
REFLECT(1)	7317.3	REFLECT(1)	7317.3	PRES MF	2.35115E-03
REFLECT(2)	1.25451E	REFLECT(2)	1.25451E	MF MASS	1966.7
REFLECT(3)	1.51165E	REFLECT(3)	1.51165E		
REFLECT(4)	1.51165E	REFLECT(4)	1.51165E		
REFLECT(5)	1.51165E	REFLECT(5)	1.51165E		
REFLECT(6)	1.51165E	REFLECT(6)	1.51165E		
REFLECT(7)	1.51165E	REFLECT(7)	1.51165E		
REFLECT(8)	1.51165E	REFLECT(8)	1.51165E		
REFLECT(9)	1.51165E	REFLECT(9)	1.51165E		
REFLECT(10)	1.51165E	REFLECT(10)	1.51165E		
REFLECT(11)	1.51165E	REFLECT(11)	1.51165E		
REFLECT(12)	1.51165E	REFLECT(12)	1.51165E		
REFLECT(13)	1.51165E	REFLECT(13)	1.51165E		
REFLECT(14)	1.51165E	REFLECT(14)	1.51165E		
REFLECT(15)	1.51165E	REFLECT(15)	1.51165E		
REFLECT(16)	1.51165E	REFLECT(16)	1.51165E		
REFLECT(17)	1.51165E	REFLECT(17)	1.51165E		
REFLECT(18)	1.51165E	REFLECT(18)	1.51165E		
REFLECT(19)	1.51165E	REFLECT(19)	1.51165E		
REFLECT(20)	1.51165E	REFLECT(20)	1.51165E		
REFLECT(21)	1.51165E	REFLECT(21)	1.51165E		
REFLECT(22)	1.51165E	REFLECT(22)	1.51165E		
REFLECT(23)	1.51165E	REFLECT(23)	1.51165E		
REFLECT(24)	1.51165E	REFLECT(24)	1.51165E		
REFLECT(25)	1.51165E	REFLECT(25)	1.51165E		
REFLECT(26)	1.51165E	REFLECT(26)	1.51165E		
REFLECT(27)	1.51165E	REFLECT(27)	1.51165E		
REFLECT(28)	1.51165E	REFLECT(28)	1.51165E		
REFLECT(29)	1.51165E	REFLECT(29)	1.51165E		
REFLECT(30)	1.51165E	REFLECT(30)	1.51165E		
REFLECT(31)	1.51165E	REFLECT(31)	1.51165E		
REFLECT(32)	1.51165E	REFLECT(32)	1.51165E		
REFLECT(33)	1.51165E	REFLECT(33)	1.51165E		
REFLECT(34)	1.51165E	REFLECT(34)	1.51165E		
REFLECT(35)	1.51165E	REFLECT(35)	1.51165E		
REFLECT(36)	1.51165E	REFLECT(36)	1.51165E		
REFLECT(37)	1.51165E	REFLECT(37)	1.51165E		
REFLECT(38)	1.51165E	REFLECT(38)	1.51165E		
REFLECT(39)	1.51165E	REFLECT(39)	1.51165E		
REFLECT(40)	1.51165E	REFLECT(40)	1.51165E		
REFLECT(41)	1.51165E	REFLECT(41)	1.51165E		
REFLECT(42)	1.51165E	REFLECT(42)	1.51165E		
REFLECT(43)	1.51165E	REFLECT(43)	1.51165E		
REFLECT(44)	1.51165E	REFLECT(44)	1.51165E		
REFLECT(45)	1.51165E	REFLECT(45)	1.51165E		
REFLECT(46)	1.51165E	REFLECT(46)	1.51165E		
REFLECT(47)	1.51165E	REFLECT(47)	1.51165E		
REFLECT(48)	1.51165E	REFLECT(48)	1.51165E		
REFLECT(49)	1.51165E	REFLECT(49)	1.51165E		
REFLECT(50)	1.51165E	REFLECT(50)	1.51165E		
REFLECT(51)	1.51165E	REFLECT(51)	1.51165E		
REFLECT(52)	1.51165E	REFLECT(52)	1.51165E		
REFLECT(53)	1.51165E	REFLECT(53)	1.51165E		
REFLECT(54)	1.51165E	REFLECT(54)	1.51165E		
REFLECT(55)	1.51165E	REFLECT(55)	1.51165E		
REFLECT(56)	1.51165E	REFLECT(56)	1.51165E		
REFLECT(57)	1.51165E	REFLECT(57)	1.51165E		
REFLECT(58)	1.51165E	REFLECT(58)	1.51165E		
REFLECT(59)	1.51165E	REFLECT(59)	1.51165E		
REFLECT(60)	1.51165E	REFLECT(60)	1.51165E		
REFLECT(61)	1.51165E	REFLECT(61)	1.51165E		
REFLECT(62)	1.51165E	REFLECT(62)	1.51165E		
REFLECT(63)	1.51165E	REFLECT(63)	1.51165E		
REFLECT(64)	1.51165E	REFLECT(64)	1.51165E		
REFLECT(65)	1.51165E	REFLECT(65)	1.51165E		
REFLECT(66)	1.51165E	REFLECT(66)	1.51165E		
REFLECT(67)	1.51165E	REFLECT(67)	1.51165E		
REFLECT(68)	1.51165E	REFLECT(68)	1.51165E		
REFLECT(69)	1.51165E	REFLECT(69)	1.51165E		
REFLECT(70)	1.51165E	REFLECT(70)	1.51165E		
REFLECT(71)	1.51165E	REFLECT(71)	1.51165E		
REFLECT(72)	1.51165E	REFLECT(72)	1.51165E		
REFLECT(73)	1.51165E	REFLECT(73)	1.51165E		
REFLECT(74)	1.51165E	REFLECT(74)	1.51165E		
REFLECT(75)	1.51165E	REFLECT(75)	1.51165E		
REFLECT(76)	1.51165E	REFLECT(76)	1.51165E		
REFLECT(77)	1.51165E	REFLECT(77)	1.51165E		
REFLECT(78)	1.51165E	REFLECT(78)	1.51165E		
REFLECT(79)	1.51165E	REFLECT(79)	1.51165E		
REFLECT(80)	1.51165E	REFLECT(80)	1.51165E		
REFLECT(81)	1.51165E	REFLECT(81)	1.51165E		
REFLECT(82)	1.51165E	REFLECT(82)	1.51165E		
REFLECT(83)	1.51165E	REFLECT(83)	1.51165E		
REFLECT(84)	1.51165E	REFLECT(84)	1.51165E		
REFLECT(85)	1.51165E	REFLECT(85)	1.51165E		
REFLECT(86)	1.51165E	REFLECT(86)	1.51165E		
REFLECT(87)	1.51165E	REFLECT(87)	1.51165E		
REFLECT(88)	1.51165E	REFLECT(88)	1.51165E		
REFLECT(89)	1.51165E	REFLECT(89)	1.51165E		
REFLECT(90)	1.51165E	REFLECT(90)	1.51165E		
REFLECT(91)	1.51165E	REFLECT(91)	1.51165E		
REFLECT(92)	1.51165E	REFLECT(92)	1.51165E		
REFLECT(93)	1.51165E	REFLECT(93)	1.51165E		
REFLECT(94)	1.51165E	REFLECT(94)	1.51165E		
REFLECT(95)	1.51165E	REFLECT(95)	1.51165E		
REFLECT(96)	1.51165E	REFLECT(96)	1.51165E		
REFLECT(97)	1.51165E	REFLECT(97)	1.51165E		
REFLECT(98)	1.51165E	REFLECT(98)	1.51165E		
REFLECT(99)	1.51165E	REFLECT(99)	1.51165E		
REFLECT(100)	1.51165E	REFLECT(100)	1.51165E		

THE OLD VALUE OF IMJFC IS 2264.45

 THE NEW VALUE OF IMJFC IS 2362800.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ703924

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1371125.	722090.	328585.
TOTAL INITIAL PROPELLANT MASS	974880.9	358434.3	103322.7
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	974880.97	358434.25	103322.69
PROPELLANT TANK DRY MASS	97486.0	35843.4	27137.0
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	97486.94	35843.41	27137.03
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	12781.7	9255.8
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	12781.66	9255.80
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19780.0	9100.0	5300.0
EMPTY DRY MASS	105000.	25000.0	25000.0
INTERFACE STRUCTURE MASS	16497.0	6044.0	5140.0
RETRO PROPELLANT SUBSYSTEM MASS	C.C	C.C	C.C
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	76380.1	C.C	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11492.5	1186.3	1424.3
MISCELLANEOUS EXPENDABLE MASS	C.C	C.C	C.C
PAVING	C.C	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303V3I

** INPUT ITEMS **

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. IKNESS	4.0633	INS. MASS	3544.3	INSUL. MF	4.40123E-02	TANK MASS	3339.5	TANK MF	7.25710E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	188.31	PRES MF	2.33846E-03
TOT EFF MAS	40753.	TOT EF MF	5.06073E-01	EF MP MAS	988.49	EFF MP MF	1.22750E-02	MP MASS	1462.1
***** RESULTS *****									
BOILOFF MAS	25833.	EF BU MAS	30188.	WALL TKNS	0.66467E-01	LENGTH	31.358	VOLUME	19156.
WBOACT(1)	0.0	WBOACT(2)	2889.7	WBOACT(3)	22944.	WBOACT(4)			
AFACT(1)	7.31558E-01	AFACT(2)	9.37912E-01	AFACT(3)	1.19752E 00	AFACT(4)			
DFACT	6.76094E-01	YMAX	0.0	TDU	174.49	TDUX	0.0	BOMAX	0.0
EPTH	1.18922E-01	N-J PSSM	9576.6	PROP MASS	80529.	TANK AREA	3489.0	NO DF TNK	1.0000

THE OLD VALUE OF IMIED IS 2236893.0

THE NEW VALUE OF IMIED IS 2236826.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ03V31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1238709.	710383.	287737.
TOTAL INITIAL PROPELLANT MASS	922894.0	338191.2	80534.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	922894.00	338191.19	80534.19
PROPELLANT TANK DRY MASS	92289.3	33819.1	9577.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	92289.31	33819.11	9577.25
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13415.3	8756.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13415.26	8756.16
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETAG PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	71525.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10804.5	1113.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U303V3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THKNESS	1.0496	INS. MASS	883.72	INSUL. MF	1.15597E-02	TANK MASS	3177.1	TANK MF	7.27289E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	178.57	PRES MF	2.33582E-03
TOT EFF MAS	32650.	TOT EF MF	4.27084E-01	EF MP MAS	951.18	EFF MP MF	1.24422E-02	MP MASS	1371.9
BOILOFF MAS	22603.	EF 80 MAS	25076.	WALL TKNS	0.65515E-01	LENGTH	30.151	VOLUME	18186.
WBOACT(1)	0.0	WBOACT(2)	2076.9	WBOACT(3)	20526.	WBOACT(4)			
AFACT(1)	6.55930E-01	AFACT(2)	8.67546E-01	AFACT(3)	1.13377E 00	AFACT(4)			
DFACT	6.93335E-01	TMAX	0.0	TDU	187.27	TDUX	0.0	BOMAX	0.0
EPTH	8.66244E-02	N-J PSSH	6622.2	PROP MASS	76448.	TANK AREA	3367.7	NO OF TNK	1.0000

THE OLD VALUE OF IMIEO IS 2214542.0

THE NEW VALUE OF IMIEO IS 2214903.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJL 3V3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1227847.	706448.	280611.
TOTAL INITIAL PROPELLANT MASS	913849.2	334683.1	76453.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	913849.25	334683.12	76453.25
PROPELLANT TANK DRY MASS	91384.9	33468.3	6622.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	91384.87	33468.30	6622.71
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13351.8	8666.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13351.76	8665.99
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70732.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10684.7	1100.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306V3H

*** INPUT ITEMS ***

CFSIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNFSS	19.147	IAS. MASS	20452.	INSUL. MF	1.91891E-01	TANK MASS	4405.8	TANK PF	7.23397E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	250.74	PRES MF	2.35258E-03
TOT EFF MAS	87718.	TOT EF MF	9.26219E-01	EF PP MAS	1190.0	EFF MP MF	1.11650E-02	PF MASS	2037.7
ROILOFF MAS	46446.	EF RP MAS	69115.	WALL TKNS	0.71758E-01	LENGTH	35.064	VOLUME	25354.
WROACT(1)	0.0	WROACT(2)	10354.	WPCACT(3)	36052.	WROACT(4)			
AFACT(1)	1.13552E 00	AFACT(2)	1.31377E 00	AFACT(3)	1.53801E 00	AFACT(4)			
DFACT	5.83066E-01	TMAX	0.0	TCU	125.33	TDUX	C.0	BCMAX	0.0
EPTH	2.66587E-01	N-J PSSM	24413.	PRCP MASS	1.06582E 05	TANK AREA	\$263.7	NO OF TNK	1.0000

THE OLD VALUE OF IMFC IS 2378639.0

 THE NEW VALUE OF IMFC IS 2373779.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1306565.	734050.	232167.
TOTAL INITIAL PROPELLANT MASS	979399.6	259250.5	106559.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	979399.62	259250.50	106559.94
PROPELLANT TANK DRY MASS	97939.9	35525.0	2847.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97939.87	35529.04	2847.04
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13757.2	9331.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13757.16	9331.23
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISSEOURSE CORRECTION SUBSYSTEM MASS	76477.0	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11557.4	1189.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAULOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306V31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
INS. TKNESS	4.2042	INS. MASS	3733.3	INSUL. MF	4.51724E-02	TANK MASS	3424.2	TANK MF	7.25059E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	193.39	PRES MF	2.33994E-03
TOT EFF MAS	43335.	TOT EF MF	5.24343E-01	EF MP MAS	1015.0	EFF MP MF	1.22813E-02	MP MASS	1508.8
BOILOFF MAS	27832.	EF 80 MAS	32401.	WALL TKNS	0.66946E-01	LENGTH	31.985	VOLUME	19660.
WBDACT(1)	0.0	WBDACT(2)	4951.2	WBDACT(3)	22881.	WBDACT(4)			
AFACT(1)	7.46436E-01	AFACT(2)	9.51759E-01	AFACT(3)	1.21006E 00	AFACT(4)			
DFACT	6.727C2E-01	TMAX	0.C	TDU	159.10	TDUX	0.0	80MAX	0.0
EPTH	1.20018E-01	N-J PSSM	9919.1	PROP MASS	82646.	TANK AREA	3552.0	NO OF TNK	0.000

***** RESULTS *****

THE OLD VALUE OF IMIED IS 2241426.0

THE NEW VALUE OF IMIED IS 2242351.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U366V31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1241447.	710662.	290246.
TOTAL INITIAL PROPELLANT MASS	925173.8	338439.8	82653.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	925173.81	338439.81	82653.81
PROPELLANT TANK DRY MASS	92517.3	33844.0	9920.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	92517.31	33843.97	9919.95
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13419.8	8803.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13419.76	8802.98
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
KLTRU PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	71725.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10834.7	1114.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27070.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306V3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 1.0563	INS. MASS 904.49	INSUL. MF 1.15407E-02	TANK MASS 3253.6	TANK MF 7.26488E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 183.17	PRES MF 2.33714E-03
TOT EFF MAS 34763.	TOT EF MF 4.43554E-01	EF MP MAS 975.75	EFF MP MF 1.24500E-02	MP MASS 1414.4
BUILDUP MAS 24455.	EF BO MAS 27006.	WALL TKNS 0.65969E-01	LENGTH 30.721	VOLUME 18644.
WBOACT(1) 0.0	WBOACT(2) 3921.2	WBOACT(3) 20534.	WBOACT(4)	
AFACT(1) 6.71218E-01	AFACT(2) 8.81771E-01	AFACT(3) 1.14666E 00	AFACT(4)	
DFACT 6.89850E-01	TMAX 0.0	TDU 171.62	TDUX 0.0	BO MAX 0.0
EPTH 8.65266E-02	N-J PSSM 6781.4	PROP MASS 78374.	TANK AREA 3425.0	NO OF TNK 1.0000

THE OLD VALUE OF IMIEO IS 2218970.0

THE NEW VALUE OF IMIEO IS 2219435.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

L300V3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1230092.	706618.	282728.
TOTAL INITIAL PROPELLANT MASS	915718.8	334834.6	78369.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	915718.81	334834.62	78369.06
PROPELLANT TANK DRY MASS	91571.8	33483.4	6781.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	91571.81	33483.45	6781.00
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13354.5	8708.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13354.50	8708.36
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70896.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10709.5	1101.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V3H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

**** RESULTS ****

DESIGN PRESSURE 19.70000

JMS. TKNESS	14.517	INS. MASS	71414.	TNSUL. MF	1.93295E-01	TANK MASS	4582.6	TANK MF	7.23891E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	260.91	PRES MF	2.35514E-03
TOT EFF MAS	0.10588E 06	TCT EF MF	9.55700E-01	FF PP MAS	1239.8	EFF MP MF	1.11953E-02	PF MASS	2130.5
ROILOFF MAS	50272.	EF RC MAS	74946.	WALL TKNS	0.72513E-01	LENGTH	40.307	VOLUME	26354.
WBDCT(1)	0.0	WRCCT(2)	13053.	WPCACT(3)	36318.	WBDCT(4)			
AFACT(1)	1.15277E 00	AFACT(2)	1.32981E 00	AFACT(3)	1.55255E 00	AFACT(4)			
FFACT	5.80065E-01	TPAX	0.0	TDU	111.33	TDUX	0.0	BOPAX	0.0
FPT	2.68039E-01	N-J PSSW	29694.	PRCP MASS	1.10784E 05	TANK AREA	4388.7	NO OF TNK	1.0000

THE OLD VALUE OF IMED IS 2385690.0

THE NEW VALUE OF IMED IS 2387473.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

113503H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	131335.0	73319.	33887.
TOTAL INITIAL PROPELLANT MASS	985749.6	360421.5	110811.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	985749.62	360421.50	110811.44
PROPELLANT TANK DRY MASS	98504.9	36042.1	29701.8
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98504.87	36042.14	29701.81
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13817.6	9425.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13817.62	9425.02
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
DETER. PROPELLANT SUBSYSTEM MASS	0.0	0.0	0.0
MISCELLANEOUS CORRECTION SUBSYSTEM MASS	76972.1	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11627.2	1193.5	1434.3
MISCELLANEOUS EXPENDABLE MASS	0.0	0.0	0.0
0.0	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V3I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0						
***** RESULTS *****									
INS. IKNESS	4.1952	INS. MASS	3795.7	INSUL. MF	4.47070E-02	TANK MASS	3514.9	TANK MF	7.24477E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	198.79	PRES MF	2.34138E-03
TOT EFF MAS	46102.	TOT EF MF	5.43000E-01	EF MP MAS	1042.4	EFF MP MF	1.22777E-02	MP MASS	1558.7
***** RESULTS *****									
BOILOFF MAS	29986.	EF BC MAS	34914.	WALL IKNS	0.67444E-01	LENGTH	32.652	VOLUME	20197.
WBOACT(1)	0.0	WBOACT(2)	7042.9	WBOACT(3)	22943.	WBOACT(4)			
AFACT(1)	7.63676E-01	AFACT(2)	9.67795E-01	AFACT(3)	1.22459E 00	AFACT(4)			
DFACT	6.68771E-01	TMAX	0.0	TDU	145.97	TDUX	0.0	BDMAX	0.0
EPTH	1.19496E-01	N-J PSSM	10145.	PROP MASS	84902.	TANK AREA	3619.1	NO OF TNK	1.0000

THE OLD VALUE OF IMIEG IS 2246735.0

THE NEW VALUE OF IMIEG IS 2247839.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

0309931

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1244165.	710922.	292754.
TOTAL INITIAL PROPELLANT MASS	927438.2	338672.1	84888.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	927438.19	338672.06	84888.50
PROPELLANT TANK DRY MASS	92743.7	33867.2	10143.8
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	92743.75	33867.19	10143.83
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13424.0	8852.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13423.96	8852.43
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	71923.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10864.6	1115.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	1.1222	INS. MASS	976.24
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	36889.	TOT EF MF	4.59865E-01
		INSUL. MF	1.21698E-02
		COAT MF	0.0
		EF MP MAS	998.85
BOILOFF MAS	26231.	EF BU MAS	28904.
WBOACT(1)	0.0	WBOACT(2)	5732.6
AFACT(1)	6.86334E-01	AFACT(2)	8.95835E-01
DFACT	6.86403E-01	TMAX	0.0
EPTH	8.70895E-02	N-J PSSM	6986.2
		TDU	158.69
		PROP MASS	80218.
		WALL TKNS	0.66396E-01
		WBOACT(3)	20499.
		AFACT(3)	1.15940E 00
		TANK MASS	3327.1
		PRES MASS	187.58
		EFF MP MF	1.24517E-02
		TANK MF	7.25815E-02
		PRES MF	2.33834E-03
		MP MASS	1455.2
		VOLUME	19082.
		TDUX	0.0
		TANK AREA	3479.8
		BOMAX	0.0
		NO OF TANK	1.0000

THE OLD VALUE OF IMIEU IS 2223394.0

THE NEW VALUE OF IMIEU IS 2223979.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ09V3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1232345.	706802.	284836.
TOTAL INITIAL PROPELLANT MASS	917593.9	334999.1	80230.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	917593.87	334999.06	80230.31
PROPELLANT TANK DRY MASS	91759.3	33499.9	6987.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	91759.31	33499.89	6987.22
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13357.5	8749.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13357.48	8749.41
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	71061.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10734.3	1101.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U303P3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7C000	INITIAL ENERGY	0.0						
**** RESULTS ****									
INS. TKNESS	11.84P	INS. MASS	101C7.	INSUL. MF	1.29670F-01	TANK MASS	3236.5	TANK MF	7.26650E-02
VENT PRESS	14.7C0	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	182.14	PRES MF	2.33683E-03
TOT EFF MAS	41853.	TCT EF MF	5.37482E-01	EF MP MAS	940.52	EFF MP MF	1.2C715E-02	PP MASS	1404.9
BOILOFF MAS	21562.	EF BO MAS	24999.	WALL TKNS	0.65869E-01	LENGTH	30.594	VOLUME	18541.
WBOACT(1)	0.0	WBOACT(2)	5171.7	WBOACT(3)	16390.	WBOACT(4)			
AFACT(1)	7.55489E-01	AFACT(2)	9.63899E-01	AFACT(3)	1.22106E 00	AFACT(4)			
CFACT	6.65725E-01	YMAX	0.0	TCU	82.058	TDUX	0.0	BOCMAX	0.0
EPTH	2.04672E-01	N-J PSSM	15953.	PRCP MASS	77943.	TANK AREA	3412.2	NO CF TNK	1.0000

THE OLD VALUE OF IMTEC IS 2245443.0

 THE NEW VALUE OF IMTEC IS 2246055.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ-33334

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1743282.	711264.	291482.
TOTAL INITIAL PROPELLANT MASS	926701.0	339003.7	77557.7
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	926701.87	339003.75	77557.75
PROPELLANT TANK DRY MASS	926701.1	339003.4	15555.8
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	926701.12	339003.26	15555.79
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13430.C	8655.2
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13429.56	8655.20
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19790.C	9100.C	5300.C
ENGINE DRY MASS	105000.C	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.C	9044.C	5140.C
RETRO PROPELLION SUBSYSTEM MASS	C.C	C.C	C.C
MISCOURSE CORRECTION SUBSYSTEM MASS	71859.2	C.C	5455.C
ATTITUDE CONTROL SUBSYSTEM MASS	10854.9	1116.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	270700.C	132500.C

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U303P3I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	2.6334	INS. MASS	2003.3	INSUL. MF	3.05736E-02	TANK MASS	2748.8	TANK MF	7.34156E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	152.52	PRES MF	2.32775E-03
TOT EFF MAS	19247.	TUT EF MF	2.93739E-01	EF MP MAS	816.34	EFF MP MF	1.24588E-02	MP MASS	1130.5
BOILOFF MAS	11725.	EF BG MAS	11464.	WALL TKNS	0.62734E-01	LENGTH	26.920	VOLUME	15587.
WBOACT(1)	0.0	WBOACT(2)	2102.0	WBOACT(3)	9622.7	WBOACT(4)			
AFACT(1)	5.29826E-01	AFACT(2)	7.50217E-01	AFACT(3)	1.02749E 00	AFACT(4)			
DFACT	7.22086E-01	TMAX	0.0	TDU	128.08	TDOX	0.0	BONAX	0.0
EPTH	1.06317E-01	N-J PSSM	6966.2	PROP MASS	65523.	TANK AREA	3042.9	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 21179647.0

 THE NEW VALUE OF IMIED IS 2180052.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U301P31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1210579.	699686.	269789.
TOTAL INITIAL PROPELLANT MASS	899469.4	328655.1	65528.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	899469.37	328655.12	65528.18
PROPELLANT TANK DRY MASS	89946.9	32865.5	6966.8
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89946.87	32865.50	6966.75
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13242.7	8424.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13242.66	8424.62
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
NETO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69472.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10494.4	1078.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

HEAT PROTECTION SYSTEM OPTIMIZATION RESULTS
U303P3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	0.67662	INS. MASS	502.81	INSUL. MF	7.96134E-03	TANK MASS	2657.2	TANK MF	7.36290E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	146.89	PRES MF	2.32575E-03
TOT EFF MAS	15394.	TOT EF MF	2.43736E-01	EF MP MAS	789J81	EFF MP MF	1.25056E-02	MP MASS	1078.3
BUILGFF MAS	9835.2	EF 80 MAS	9303.9	WALL TKNS	0.62080E-01	LENGTH	26.220	VOLUME	15024.
MBOACT(1)	0.0	MBOACT(2)	1504.8	MBOACT(3)	8330.4	MBOACT(4)			
AFACT(1)	4.84182E-01	AFACT(2)	7.07749E-01	AFACT(3)	9.89014E-01	AFACT(4)			
DFACT	7.32492E-01	TMAX	0.0	TDU	146.75	TANK AREA	0.0	BOMAX	0.0
EPTH	8.39159E-02	N-J PSSM	5299.9	PROP MASS	63157.	TANK AREA	2972.5	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2167689.0

THE NEW VALUE OF IMIED IS 2167627.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U303P3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1204423.	697509.	265698.
TOTAL INITIAL PROPELLANT MASS	894343.6	326713.9	63156.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	894343.56	326713.87	63156.72
PROPELLANT TANK DRY MASS	89434.3	32671.4	5299.9
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89434.31	32671.37	5299.86
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13207.5	8372.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13207.52	8372.25
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69023.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10426.5	1071.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
FAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U3304P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 5.7000 INITIAL ENERGY 0.0

*** RESULTS ***

INS. THICKNESS	12.054	INS. MASS	10464.	INSUL. MF	0.0	TANK MASS	3301.6	TANK MF	7.26038E-02
VENT PRESS	14.700	CFAT MASS	0.0	CFAT MF	0.0	PRES MASS	186.05	PRES MF	2.33796E-03
TOT EFF MAS	44053.	TCT EF MF	5.54075E-01	EF MP MAS	959.95	EMF MF	1.0	MP MASS	1441.1
BOILOFF MAS	23023.	EF RC MAS	26705.	WALL TKNS	0.66245E-01	LENGTH	31.077	VOLUME	16730.
WFOACT(1)	0.0	WFOACT(2)	6701.3	WFOACT(3)	16321.	WFOACT(4)			
AFOACT(1)	7.75223E-01	AFOACT(2)	9.78538E-01	AFOACT(3)	1.23432E 00	AFOACT(4)			
CFACT	6.66125E-01	TMAX	C.C	TCU	65.886	TDUX	C.O	BO MAX	0.0
EPH	2.06433E-01	N-J PCSM	16428.	PRCP MASS	79575.	TANK AREA	3460.8	NC CF TAK	1.0000

THE OLD VALUE OF IMTEC IS 2250327.0

 THE NEW VALUE OF IMTEC IS 2250921.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ274034

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1245603.	711641.	293580.
TOTAL INITIAL PROPELLANT MASS	928709.6	339321.6	79553.6
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	928709.62	339321.56	79553.81
PROPELLANT TANK DRY MASS	92870.9	33932.1	16422.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	92870.88	33932.14	16422.57
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13435.7	8734.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13435.72	8734.61
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	10700.0	9100.0	5200.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUP CORRECTION SUBSYSTEM MASS	72035.1	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	13881.5	1117.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306P31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THNESS	2.7000	INS. MASS	2072.3
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	20140.	TOT EF MF	3.03128E-01
		INSUL. MF	3.11906E-02
		COAT MF	0.0
		EF MP MAS	828.53
BOILOFF MAS	12595.	EF 60 MAS	12212.
WBOACT(1)	0.0	WBOACT(2)	2999.9
AFACT(1A)	5.39202E-01	AFACT(2)	7.58941E-01
DFACT	7.19948E-01	TMAX	0.0
EPH	1.06859E-01	N-J PSSM	7099.8
		WALL TKNS	0.62982E-01
		WBOACT(3)	9595.2
		AFACT(3)	1.03539E 00
		TDU	113.36
		PROP MASS	66441.
		TANK MASS	2784.5
		PRES MASS	154.71
		EFF MP MF	1.24701E-02
		TANK MF	7.33401E-02
		PRES MF	2.32846E-03
		MP MASS	1150.8
		VOLUME	15805.
		TDUX	0.0
		TANK AREA	3070.1
		BOMAX	0.0
		NO OF TANK	1.0000

THE OLD VALUE OF IMIEC IS 2182145.0

THE NEW VALUE OF IMIEC IS 2182392.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ00731

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1211739.	699795.	270861.
TOTAL INITIAL PROPELLANT MASS	900435.0	328751.9	66446.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	900435.00	328751.94	66446.50
PROPELLANT TANK DRY MASS	90043.4	32875.2	7100.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90043.44	32875.18	7100.41
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13244.4	8444.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13244.41	8444.91
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69557.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10507.2	1079.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306P3L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	0.59629	INS. MASS	521.63	INSUL. MF	8.15442E-03	TANK MASS	2688.6	TANK MF	7.35527E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	148.82	PRES MF	2.32643E-03
TOT EFF MAS	10099.	TOT EF MF	2.51066E-01	EF MP MAS	801.08	EFF MP MF	1.25231E-02	MP MASS	1096.2
BUILDUP MAS	10616.	EF RC MAS	9922.2	WALL TKNS	0.62306E-01	LENGTH	26.460	VOLUME	15217.
WBOACT(1)	0.0	WBOACT(2)	2294.4	WBOACT(3)	8321.3	WBOACT(4)			
AFACT(1)	4.51048E-01	AFACT(2)	7.14696E-01	AFACT(3)	9.95307E-01	AFACT(4)			
DFACT	7.30789E-01	TMAX	0.0	TDU	130.53	TDUX	0.0	BOMAX	0.0
EPTH	8.40334E-02	N-J PSSM	5375.5	PROP MASS	63969.	TANK AREA	2996.6	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2169623.0

THE NEW VALUE OF IMIEG IS 2169562.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U306P3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1205383.	697580.	266602.
TOTAL INITIAL PROPELLANT MASS	895141.9	326777.8	63967.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	895141.87	326777.81	63967.75
PROPELLANT TANK DRY MASS	89514.1	32677.8	5375.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89514.12	32677.77	5375.43
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13208.7	8390.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13208.68	8390.17
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69093.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10437.1	1072.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U310923H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.O						
***** RESULTS *****									
INS. TKNFSS	12.018	INS. MASS	10558.	INSUL. MF	1.29746E-01	TANK MASS	3373.4	TANK MF	7.25436E-02
VENT PRESS	14.700	CCAT MASS	0.C	CCAT MF	0.C	PRES MASS	150.34	PRES MF	2.33898E-03
TOT EFF MAS	46127.	TCT FF MF	5.66835E-01	EF MP MAS	981.53	EFF MP MF	1.20614E-02	PF MASS	1480.8
ROILOFF MAS	24746.	FF RO MAS	28494.	WALL TKNS	0.66666E-01	LENGTH	31.605	VOLUME	19358.
WRNACT(1)	1188.3	WRNACT(2)	7125.7	WRNACT(3)	16432.	WBOACT(4)			
AFACT(1)	7.89716E-01	AFACT(2)	9.92023E-01	AFACT(3)	1.24654E-00	AFACT(4)			
DFACT	6.62024E-01	TMAX	0.C	TDJ	68.374	TDUX	C.C	ROPAX	0.0
EPFH	2.04628E-01	N-J PSSM	16652.	PRCP MASS	81377.	TANK AREA	3514.3	NO OF TANK	1.0000

THE OLD VALUE OF IMTEC IS 2254874.0

THE NEW VALUE OF IMTEC IS 2254448.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ2-2034

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1246852.	711541.	255655.
TOTAL INITIAL PROPELLANT MASS	929674.8	375580.C	81265.6
TOTAL OXIDIZER MASS	C.C	O.C	C.C
TOTAL FUEL MASS	929674.81	375580.CC	81265.56
PROPELLANT TANK DRY MASS	92967.4	33558.C	16645.7
OXIDIZER TANK DRY MASS	C.C	C.C	C.O
FUEL TANK DRY MASS	92967.44	33557.58	16645.70
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.O
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	O.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13440.4	8774.4
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13440.39	8774.55
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19790.0	9100.C	5300.C
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9044.C	5140.C
RETION MANIPULATION SUBSYSTEM MASS	C.C	O.C	C.O
MISGUIDANCE CORRECTION SUBSYSTEM MASS	72119.7	C.C	5455.C
ATTITUDE CONTROL SUBSYSTEM MASS	17894.2	1118.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	O.C	C.O
TOTAL TAC	C.C	270700.C	122500.C

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309P3I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	2.7524	INS. MASS	2131.8	INSUL. MF	3.16378E-02	TANK MASS	2821.0	TANK MF	7.32664E-02
VENT PKESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	156.95	PRES MF	2.32920E-03
TOT EFF MAS	21053.	TOT LF MF	3.12439E-01	EF MP MAS	841.01	EFF MP MF	1.24813E-02	MP MASS	1171.6
BOILLOFF MAS	13479.	EF BU MAS	12986.	WALL TKNS	0.63234E-01	LENGTH	27.470	VOLUME	16029.
WBOACT(1)	0.0	WBOACT(2)	3902.2	WBOACT(3)	9576.5	WBOACT(4)			
AFACT(1)	5.48475E-01	AFACT(2)	7.67569E-01	AFACT(3)	1.04320E 00	AFACT(4)			
DFALT	7.17833E-01	TMAX	0.0	TDU	101.09	TDUX	0.0	BOMAX	0.0
EPTH	1.07233E-01	N-J PSSM	7225.6	PROP MASS	67382.	TANK AREA	3098.1	NO OF TNK	1.0000

THE OLD VALUE OF IMIEG IS 2184632.0

THE NEW VALUE OF IMIEC IS 2184722.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U309P31

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1212893.	699900.	271932.
TOTAL INITIAL PROPELLANT MASS	901396.8	328845.9	67372.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	901396.81	328845.94	67372.44
PROPELLANT TANK DRY MASS	90139.6	32884.6	7224.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90139.62	32884.58	7224.57
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13246.1	8465.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13246.11	8465.43
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69641.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10519.9	1079.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U309P3L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	0.71566	INS. MASS	540.51
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	16797.	TOT EF MF	2.59249E-01
		INSUL. MF	8.34253E-03
		COAT MF	0.0
		EF MP MAS	813.31
BOILOFF MAS	11415.	EF BO MAS	10531.
WBOACT(1)	0.0	WBOACT(2)	3099.8
AFACT(1)	4.95710E-01	AFACT(2)	7.18475E-01
DFACT	7.29863E-01	IMAX	0.0
EPTH	8.41465E-02	N-J PSSM	5452.0
		TDU	116.22
		PROP MASS	64790.
		WALL TKNS	0.62533E-01
		WBOACT(3)	8314.8
		AFACT(3)	9.98730E-01
		TDUX	0.0
		TANK AREA	3021.1
		TANK MASS	2720.4
		PRES MASS	150.78
		EFF MP MF	1.25531E-02
		LENGTH	26.703
		WBOACT(4)	
		AFACT(4)	
		VOLUME	15412.
		TANK MF	7.34788E-02
		PRES MF	2.32722E-03
		MP MASS	1114.3
		BDMAX	0.0
		NO OF TMS	1.0000

THE OLD VALUE OF IMIEO IS 2170678.0

 THE NEW VALUE OF IMIEO IS 2171553.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U309P3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1206308.	697657.	267531.
TOTAL INITIAL PROPELLANT MASS	895903.1	326845.8	64800.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	895963.12	326845.81	64800.13
PROPELLANT TANK DRY MASS	89596.3	32684.6	5452.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89596.25	32684.57	5452.83
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13209.9	8408.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13209.91	8408.51
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETIC PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69165.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10448.0	1072.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7C0C0	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. THNESS	15.1C6	INS. MASS	12704.
VENT PRESS	16.7C0	COAT MASS	0.0
TOT EFF MAS	43352.	TOT FF MF	5.68006E-01
		INSUL. MF	1.66445E-01
		COAT MF	0.0
		EF MP MAS	911.21
ROILOFF MAS	19414.	EF RC MAS	24007.
WROACT(1)	0.0	WROACT(2)	0.0
AFACT(1)	7.77861E-01	AFACT(2)	9.80992E-01
DFACT	6.65517E-01	WALL TKNS	0.65485E-01
ERTH	2.41519E-01	N-J PSSH	18433.
		TDU	138.25
		PRCP MASS	76323.
		TANK MASS	3172.2
		PRES MASS	178.28
		EFF MP MF	1.15389E-02
		LENGTH	30.114
		WROACT(4)	
		AFACT(4)	
		TDLX	C.C
		TANK AREA	3364.C
		BOVMX	0.0
		MC CF TANK	1.0000
		VOLUME	18156.
		TANK MF	7.27346E-02
		PRES MF	2.33590E-03
		MF MASS	1369.1

THE OLD VALUE OF IMEC IS 2251157.0

THE NEW VALUE OF IMEC IS 2255842.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

STATION

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	17481.32	715177.	292537.
TOTAL INITIAL PROPELLANT MASS	933740.2	342464.5	76520.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	933740.10	342464.87	76520.38
PROPELLANT TANK DRY MASS	93373.9	34246.5	16481.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	93373.94	34246.47	16481.12
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13452.6	8666.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13452.61	8666.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	72213.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10908.3	1128.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS
 S303V31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.760CC INITIAL ENERGY 0.C

***** RESULTS *****

INS. TKNESS 1.1816	INS. MASS 2397.2	INSUL. MF 3.71385E-C2	TANK MASS 2711.C	TANK MF 7.35003E-02
VENT PRESS 14.7CC	CCAT MASS 0.0	COAT MF 0.0	PRES MASS 150.20	PRES MF 2.32694E-03
TOT FFF MAS 15125.	TCT FF MF 2.96294E-01	EF MP MAS 801.13	EFF MP MF 1.24114E-02	MF PASS 1109.0
POILOFF MAS 10749.	EF RC MAS 11032.	WALL TKNS 0.62467E-01	LENGTH 26.632	VOLUME 15355.
WFOACT(1) 0.C	WFOACT(2) 0.0	WFOACT(3) 10749.	WFOACT(4)	
AFACT(1) 5.2E452F-C1	AFACT(2) 7.48938E-01	AFACT(3) 1.C2622E CC	AFACT(4)	
DFACT 7.2258E-C1	TPAX 0.0	TCU 154.52	TDX C.C	BCPAX 0.0
FPT 1.12566F-C1	N-J PSSM 7291.7	FPCP MASS 64548.	TANK AREA 3013.9	NO CF TNK 1.0000

THE OLD VALUE OF IMIEC IS 2179281.0

THE NEW VALUE OF IMIEC IS 2180836.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1213968.	700645.	265225.
TOTAL INITIAL PROPELLANT MASS	899793.1	325510.2	64646.3
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	899793.06	325510.25	64646.21
PROPELLANT TANK DRY MASS	89979.3	32551.0	7303.1
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	89979.25	32551.01	7303.06
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	0.0	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13258.1	8404.7
OXIDIZER SUBSYSTEMS MASS	0.0	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13258.13	8404.71
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	C.C	C.C	C.C
MICROUSE CORRECTION SUBSYSTEM MASS	69501.2	C.C	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10498.7	1082.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V3L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.76000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	C.81218	INS. MASS	602.26	INSUL. MF	9.68065E-03	TANK MASS	2620.8	TANK MF	7.37219E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	144.64	PRES MF	2.32493E-03
TOT EFF MAS	14881.	TCT EF MF	2.39187E-01	EF MF MAS	775.27	EFF MP MF	1.24615E-C2	PF MASS	1057.4
BOILOFF MAS	892.3	EF BC MAS	8771.9	WALL TKNS	0.61812E-01	LENGTH	25.941	VOLUME	14799.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	8892.2	WBOACT(4)			
AFACT(1)	4.81162E-C1	AFACT(2)	7.04939E-01	AFACT(3)	5.86468E-01	AFACT(4)			
CFACT	7.33179E-C1	TMAX	0.0	TCU	217.94	TDLX	0.0	BCMAX	0.0
DEPTH	8.57273E-C2	N-J PSSM	5333.4	PRCP MASS	62213.	TANK AREA	2544.4	NO CF TANK	1.0000

THE OLD VALUE OF IMFC IS 2166912.0

THE NEW VALUE OF IMFC IS 2166482.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SPC7V2L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1203856.	657864.	264764.
TOTAL INITIAL PROPELLANT MASS	893870.6	227031.1	62210.3
TOTAL OXIDIZER MASS	0.0	C.C	C.C
TOTAL FUEL MASS	893870.56	227031.12	62210.34
PROPELLANT TANK DRY MASS	89387.0	22703.1	5333.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89387.00	22703.10	5333.12
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12213.2	8351.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	C.C
FUEL SUBSYSTEMS MASS	0.0	12213.26	8351.36
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68982.2	C.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10420.3	1073.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	C.C
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS

S306V3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C

INITIAL ENERGY C.O

***** RESULTS *****

INS. THNESS	14.979	INS. MASS	13121.	INSUL. MF	1.61941E-C1	TANK MASS	3359.2	TANK PF	7.25548E-02
VENT PRESS	14.760	CCAT MASS	C.O	CCAT MF	0.0	PRES MASS	189.55	PRES PF	2.33944E-03
TOT EFF MAS	50414.	TCT FF MF	6.22212E-01	EF MP MAS	965.37	EFF MP MF	1.15146E-C2	PF MASS	1473.0
BOILOFF MAS	22745.	FF RD MAS	3C259.	WALL TKNS	0.6658CE-C1	LENGTH	31.5C5	VOLUME	19274.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	22745.	WBOACT(4)			
AFACT(1)	8.22435E-01	AFACT(2)	1.02246E 00	AFACT(3)	1.27412E CC	AFACT(4)			
DFACT	6.55375E-C1	TMAX	0.0	TCU	92.135	TDUX	C.C	BOMAX	0.0
EPTH	2.36835E-C1	N-J PSSM	19189.	PRCP MASS	81324.	TANK AREA	35C3.E	NC CF TANK	1.0C00

THE OLD VALUE OF TIME IS 2265310.0

THE NEW VALUE OF TIME IS 2273125.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1B_{TP})

SP04V34

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1256693.	718525.	257509.
TOTAL INITIAL PROPELLANT MASS	937570.9	345445.0	81071.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	937870.87	345445.54	81071.44
PROPELLANT TANK DRY MASS	937870.0	345450.0	152000.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	937870.00	345445.58	152000.58
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13546.6	8767.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13546.64	8767.86
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	72837.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11002.7	1139.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V31

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	3.2500	INSUL. MF	3.86432E-C2
VENT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	21864.	EF MP MAS	826.95
ROILOFF MAS	12723.	EF RC MAS	13412.
WBOACT(1)	0.0	WBOACT(2)	0.0
AFACT(1)	5.61421E-C1	AFACT(2)	7.79613E-01
DFACT	7.14822E-C1	TMAY	0.0
EPFH	1.14050E-C1	N-J PSSM	7624.7
		WALL TKNS	0.63055E-01
		WBOACT(3)	12723.
		AFACT(3)	1.05412E CC
		TEU	159.48
		PREP MASS	66713.
		TANK MASS	2755.0
		PRES MASS	155.36
		EFF MP MF	1.23563E-C2
		LENGTH	27.272
		WBOACT(4)	
		AFACT(4)	
		TDUX	C.C
		TANK AREA	3078.2
		BOUMX	0.0
		NC CF TAK	1.0000
		TANK MF	7.33184E-02
		PRES MF	2.32870E-03
		MF PASS	1156.8
		VOLUME	15870.

THE OLD VALUE OF IMIFC IS 2188126.0

THE NEW VALUE OF IMIFC IS 2188690.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

9274831

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1214859.	702167.	271666.
TOTAL INITIAL PROPELLANT MASS	903333.4	330866.7	66720.7
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	903033.44	330866.75	66720.65
PROPELLANT TANK DRY MASS	93303.2	33086.7	7625.5
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	93303.25	33086.66	7625.52
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13282.7	8451.9
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	0.0	13282.68	8450.95
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	C.C	C.C
MISCOPE CORRECTION SUBSYSTEM MASS	63785.2	C.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10541.6	1086.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	0.0	C.C
PAYLOAD	C.C	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V3L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS 0.86700	INS. MASS 650.93	INSUL. MF 1.01422E-02	TANK MASS 2696.8	TANK MF 7.35333E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 145.34	PRES MF 2.32687E-03
TOT EFF MAS 17127.	TCT EFF MF 2.66848E-01	EF MP MAS 803.07	EFF MP MF 1.25127E-02	MF MASS 1100.9
BOILOFF MAS 10802.	EF RC MAS 10804.	WALL TKNS 0.62365E-01	LENGTH 26.523	VCLLNE 15267.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 10802.	WBOACT(4) WBOACT(4)	
AFACT(1) 4.57360E-01	AFACT(2) 7.20010E-01	AFACT(3) 1.00012E 00	AFACT(4) AFACT(4)	
CFACT 7.25487E-01	TMAX 0.0	TCU 178.08	TDLX	BCMAX 0.0
EPTH 8.60022E-02	N-J PSSM 5519.7	PRCP MASS 64181.	TANK AREA	NO CF TAK 1.0000

THE OLD VALUE OF IMIEC IS 2171108.0

THE NEW VALUE OF IMIEC IS 2173631.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_{mp})

SECTION

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1207398.	659250.	266586.
TOTAL INITIAL PROPELLANT MASS	896820.6	228265.9	64200.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	896820.56	228265.94	64200.50
PROPELLANT TANK DRY MASS	89682.0	22826.6	5521.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89682.00	22826.58	5521.38
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13235.6	8355.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13235.61	8355.21
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	69240.7	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10459.3	1077.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27000.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309V13H

*** INPUT ITEMS ***

DESIGN PRESSURE 14.7000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNSS	14.310	INS. MASS	13056.	INSUL. MF	1.51945E-C1	TANK MASS	3556.1	TANK MF	7.24249E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	201.32	PRES MF	2.34290E-03
TOT EFF MAS	5665P.	TOT FF MF	6.59377E-C1	FF MP MAS	1021.3	EFF MP MF	1.18853E-C2	MF MASS	1581.3
ROILOFF MAS	28244.	EF RC MAS	36156.	WALL TKAS	0.67667E-C1	LENGTH	32.555	VOLUME	20441.
WROACT(1)	2150.3	WROACT(2)	6.8867	WROACT(3)	26186.	WROACT(4)			
AFACT(1)	8.64285E-C1	AFACT(2)	1.06140E D0	AFACT(3)	1.37535E CC	AFACT(4)			
DFACT	6.46819E-C1	TMAX	0.0	TDU	72.305	TDUX	C.C	RCMAX	0.0
EDTH	2.26717E-C1	N-J PSSM	19481.	PRCP MASS	85927.	TANK AREA	3649.6	NO CF TAK	1.0000

THE OLD VALUE OF IMIED IS 2279037.0

THE NEW VALUE OF IMIED IS 2284311.0

MASS SUMMARY (lb_m)

530574

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	126117.2	722274.	302866.
TOTAL INITIAL PROPELLANT MASS	941600.9	347009.1	85697.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	941600.87	347009.06	85697.37
PROPELLANT TANK DRY MASS	94160.0	34700.9	15428.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	94160.07	34700.89	15428.66
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13574.5	8871.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13574.86	8871.05
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETOR PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
WINDUPSE CORRECTION SUBSYSTEM MASS	73164.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11752.1	1145.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS
S309V3I

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0						
*** RESULTS ***									
INS. THNESS	3.5338	INS. MASS	2773.2	IASUL. MF	4.02218E-02	TANK MASS	2674.8	TANK MF	7.31652E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	160.22	PRES MF	2.33017E-03
TOT EFF MAS	24662.	TCT EFF MF	3.58679E-01	EF MP MAS	850.40	EFF MP MF	1.23676E-02	MF MASS	1202.1
*** RESULTS ***									
BOILOFF MAS	14652.	FF RC MAS	15868.	WALL TKAS	0.62557E-01	LENGTH	27.877	VOLUME	16357.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	14652.	WBOACT(4)			
AFACT(1)	5.94005E-01	AFACT(2)	6.09930E-01	AFACT(3)	1.08158E-00	AFACT(4)			
CFACT	7.07454E-01	TMAX	0.0	TCU	125.03	TDUX	C.C	BCMAX	0.0
EPTH	1.15827E-01	N-J PSSP	7964.3	PRCP MASS	68760.	TANK AREA	3135.1	NO CF TANK	1.0000

THE OLD VALUE OF IMIEC IS 2197052.0

THE NEW VALUE OF IMIEC IS 2196573.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SECRET

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1218736.	703662.	274658.
TOTAL INITIAL PROPELLANT MASS	906261.4	332217.8	68767.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	906261.44	332217.81	68767.31
PROPELLANT TANK DRY MASS	90626.1	32221.8	7565.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90626.06	33221.77	7565.12
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13307.1	8456.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13307.14	8456.17
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRUM MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	70068.0	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10584.3	1091.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAD	0.0	27000.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTICA SYSTEM OPTIMIZATION RESULTS
S309V3L

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	G.0
*** RESULTS ****			
INS. THICKNESS	C.91245	INSUL. MF	1.05643E-02
VENT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	15415.	EF MP MAS	825.50
INS. MASS	697.62	WALL TKNS	0.62E73E-C1
CCAT MASS	0.0	WBCACT(3)	125E7.
TCT EF MF	2.94006E-01	AFACT(3)	1.02431E 00
PROLOFF MAS	12587.	EF RC MAS	12893.
WFOACT(1)	0.0	WRCACT(2)	0.0
AFACT(1)	5.26000E-C1	AFACT(2)	7.46713F-01
EFACT	7.22543E-C1	TMAX	0.0
EPTH	8.62656E-C2	N-J PSSM	5696.6
		TCU	142.74
		PRCP MASS	66036.
		TANK MASS	2766.7
		PRES MASS	153.75
		EFF MP MF	1.25000E-C2
		LENGTH	27.072
		WBOACT(4)	
		AFACT(4)	
		TOLX	G.C
		TANK AREA	3056.1
		BCMAX	0.0
		NO OF TANK	1.0000
		VOLUME	15709.
		TANK MF	7.33730E-02
		PRES MF	2.32827E-03
		PF PASS	1141.9

THE OLD VALUE OF IMIEC IS 2178647.0

THE NEW VALUE OF IMIEC IS 2180307.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_m)

S²C5V3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1210706.	700543.	265061.
TOTAL INITIAL PROPELLANT MASS	899574.6	325418.5	66056.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	899574.62	325418.87	66056.54
PROPELLANT TANK DRY MASS	89957.4	32541.5	5658.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89957.37	32541.87	5658.43
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13256.5	8436.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13256.48	8436.22
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	69482.1	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10495.8	1061.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
53067

*** INPUT PARAM ***

DESIGN PRESSURE	19.7200C	INITIAL ENERGY	D.C						
INS. THICKNESS	13.026	INS. MASS	11362.	INSUL. MF	1.41092E-01	TANK MASS	3335.5	TANK MF	7.25710E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	C.C	PRES MASS	188.33	PRES MF	2.33865E-03
TOT EFF MAS	48459.	TCT FF MF	6.01751E-01	FF MP MAS	955.66	EFF MP MF	1.19166E-02	MF MASS	1462.1
ROILOFF MAS	23694.	FF RC MAS	30105.	WALL TKNS	C.66467E-01	LENGTH	31.355	VOLUME	19157.
WROACT(1)	1871.1	WROACT(2)	0.0	WROACT(3)	23664.	WROACT(4)			
AFACT(1)	8.16059E-01	AFACT(2)	1.01843E 00	AFACT(3)	1.27046E 00	AFACT(4)			
DFACT	6.56369E-01	TMAX	655.92	TCU	46.215	TOLX	C.C	BCMAX	0.0
FPTH	2.16001E-01	N-J PSSM	17394.	PROP MASS	80530.	TANK AREA	3489.1	NO CF TANK	1.0000

**** RESULTS ****

THE OLD VALUE OF IMFC IS 2263911.0

THE NEW VALUE OF IMFC IS 226575.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SPC6734

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1752864.	717027.	255006.
TOTAL INITIAL PROPELLANT MASS	934681.2	244114.7	82494.9
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	934681.2	244114.7	82494.9
PROPELLANT TANK DRY MASS	934681.1	244114.5	17387.0
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	934681.2	244114.6	17386.9
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	13522.5	8755.4
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	13522.47	8755.45
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19760.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	25000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	72558.4	0.	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10960.5	1134.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	27070.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309T3+

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C						
INS. TKNSS	12.035	INS. MASS	11368.	INSUL. MF	1.41157E-C1	TANK MASS	333E.E	TANK MF	7.25715E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PPES MASS	188.25	PRES MF	2.33860E-03
TOT EFF MAS	48466.	TCT EF MF	6.01957E-C1	EF MF MAS	955.26	EFF MP MF	1.15143E-C2	PF MASS	1461.7
ROILOFF MAS	22689.	FF RC MAS	30107.	WALL TKNS	0.66464E-C1	LENGTH	31.354	VOLUME	19153.
WBOACT(1)	5775.E	WBOACT(2)	0.0	WBOACT(3)	22689.	WBOACT(4)			
AFACT(1)	P.18550E-C1	AFACT(2)	1.01899E 00	AFACT(3)	1.2707E 00	AFACT(4)			
CFATT	6.56253E-C1	TMAX	655.81	TCU	46.277	TDLX	C.C	BCMAX	0.0
EPH	2.16107E-C1	N-J PDSM	17400.	PRCP MASS	80513.	TANK AREA	3488.E	NC CF TANK	1.0000

THE OLD VALUE OF TIMEC IS 2264068.0

 THE NEW VALUE OF TIMEC IS 2265437.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5295724

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1252295.	717035.	255520.
TOTAL INITIAL PROPELLANT MASS	934638.7	344120.0	80456.7
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	934638.7	344120.0	80456.7
PROPELLANT TANK DRY MASS	93459.9	34412.2	17356.3
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	93459.91	34412.19	17356.34
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	13522.6	8755.4
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	13522.61	8755.45
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	7256.0	0.	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	13460.7	1134.7	1436.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULT
S303P3H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.7000C	INITIAL ENERGY	G.O						
***** RESULTS *****									
INS. THICKNESS	8.9616	INS. MASS	4857.7	INSUL. MF	1.03667E-01	TANK MASS	2772.5	TANK MF	7.33651E-02
VENT PRESS	14.700	CCAT MASS	C.O	CCAT MF	0.0	PRES MASS	153.94	PRES MF	2.32782E-03
TOT EFF MAS	24715.	TCT FF MF	3.73722E-01	EF MP MAS	802.C2	EFF MP MF	1.21274E-02	MF MASS	1144.0
***** RESULTS *****									
ROILOFF MAS	10503.	FF RO MAS	12050.	WALL TKNS	0.62899E-01	LENGTH	27.1CC	VOLUME	15732.
WBRACT(1)	0.0	WBRACT(2)	0.0	WBRACT(3)	10903.	WBRACT(4)			
AFACT(1)	6.22013E-01	AFACT(2)	8.35989E-01	AFACT(3)	1.13519E CC	AFACT(4)			
DFACT	7.01069E-01	TMAX	0.0	TEU	83.526	TDUX	C.C	BDMAX	0.0
FPTH	1.79395E-01	N-J PSSM	11863.	PRCP MASS	66132.	TANK AREA	3061.C	NO CF TANK	1.0000

THE OLD VALUE OF TIMEC IS 2204875.C

THE NEW VALUE OF TIMEC IS 2199918.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

HEADINGS

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	122142.7	704342.	275156.
TOTAL INITIAL PROPELLANT MASS	907666.3	332806.1	66009.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	907666.31	332806.06	66009.50
PROPELLANT TANK DRY MASS	90766.6	33280.6	11841.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90766.54	33280.55	11841.45
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13317.8	8435.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13317.75	8435.86
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5700.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70191.1	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10602.9	1052.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303F3I

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. THICKNESS	1.9219	INSUL. MF	2.22611E-C2
VENT PRESS	14.700	CCAT MF	0.0
TOT EFF MAS	11455.	EF MP MAS	727.66
POILOFF MAS	5215.4	WALL TKNS	0.60757E-C1
WBFACT(1)	C.G	WBFACT(2)	5215.4
AFACT(1)	4.2152E-C1	AFACT(3)	5.44550E-01
CFACT	7.4255E-C1	TEU	154.10
EPT	5.57075E-C2	PRCP MASS	58597.
		TANK MASS	2482.0
		PRES MASS	136.06
		EFF MP MF	1.2416E-C2
		TANK MF	7.41245E-02
		PRES MF	2.32198E-03
		MF MASS	977.51
		LENGTH	24.871
		WBFACT(4)	
		AFACT(4)	
		TANK AREA	C.C
		BO MAX	0.0
		MO CF TANK	1.0000
		VOLUME	13939.

THE OLD VALUE OF IMIEC IS 2154420.C

THE NEW VALUE OF IMIEC IS 2156356.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

Sheet

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1198839.	655903.	261617.
TOTAL INITIAL PROPELLANT MASS	889692.8	325282.2	58629.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	889692.81	325282.25	58629.94
PROPELLANT TANK DRY MASS	88969.2	32528.2	5845.8
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89969.19	32528.21	5845.84
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13181.6	8272.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13181.61	8272.06
MISCELLANEOUS PROPELLSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROURSE CORRECTION SUBSYSTEM MASS	68616.1	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10365.0	1066.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27000.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303P3L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7C0CC INITIAL ENERGY C.C

***** RESULTS *****

INS. TKNESS	0.52256	INS. MASS	365.24	INSUL. MF	6.4C385E-C3	TANK MASS	242.3	TANK MF	7.43238E-02
VENT PRESS	15.7CC	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	132.34	PRES MF	2.32035E-03
TOT EFF MAS	5C75.4	TCT FF MF	1.59192E-01	EF MP MAS	7C7.82	EFF MP MF	1.241C4E-02	MP MASS	942.99
POILOFF MAS	3542.4	EF RC MAS	3635.0	WALL TKNS	0.60283E-C1	LENGTH	24.4C9	VOLUME	13568.
WFACT(1)	0.C	WFACT(2)	0.0	WFACT(3)	3942.4	WBDACT(4)			
AFACT(1)	4.64667E-C1	AFACT(2)	6.33794E-01	AFACT(3)	9.22017E-01	AFACT(4)			
IFACT	7.50613E-C1	TMAX	0.C	TCU	15C.25	TCUX	C.C	BCFAX	0.0
EPTH	8.3C4FCE-C2	N-J PSSM	4736.6	PRCP MASS	57C34.	TANK AREA	275C.4	NO CF TANK	1.0000

THE OLD VALUE OF IMIEC IS 2147662.0

THE NEW VALUE OF IMIEC IS 2147539.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5303P-1

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1194470.	654155.	258876.
TOTAL INITIAL PROPELLANT MASS	886055.1	323759.4	57023.7
TOTAL OXIDIZER MASS	C.O	C.O	C.O
TOTAL FUEL MASS	886055.12	323759.44	57033.73
PROPELLANT TANK DRY MASS	88605.4	32375.5	4736.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88605.44	32375.53	4736.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	0.0	C.O
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13154.0	8237.0
OXIDIZER SUBSYSTEMS MASS	0.0	C.O	C.O
FUEL SUBSYSTEMS MASS	0.0	13154.04	8236.58
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	68297.3	C.O	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10316.8	1061.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S306P3H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.700CC INITIAL ENERGY 0.0

***** RESULTS *****

INS. THICKNESS	6.7947	INS. MASS	6868.5	INSUL. MF	1.00637E-C1	TANK MASS	2854.9	TANK PF	7.32018E-02
VENT PRESS	14.7CC	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	159.01	PRES PF	2.32984E-03
TOT EFF MAS	27C69.	TOT EFF MF	3.96607E-01	EF MP MAS	833.16	EFF MP MF	1.22074E-C2	MF PASS	1190.8
ROTI OFF MAS	13045.	EF RO MAS	14212.	WALL TKNS	0.63463E-C1	LENGTH	27.727	VOLUME	16236.
WROACT(1)	565.00	WROACT(2)	3.2969	WROACT(3)	12477.	WROACT(4)			
AFACT(1)	6.28133E-C1	AFACT(2)	8.41684E-01	AFACT(3)	1.11035E 00	AFACT(4)			
CFACT	6.99672E-C1	TMAX	0.0	TCU	50.855	TDLX	G.C	RCMAX	0.0
EPTH	1.76169E-C1	N-J PSSH	12024.	PRCP MASS	68250.	TANK AREA	3123.5	NC CF TNK	1.0000

THE OLD VALUE OF IMIEC IS 2206605.C

 THE NEW VALUE OF IMIEC IS 2206613.0

MASS SUMMARY (lb_m)

5304034

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1223467.	755229.	277628.
TOTAL INITIAL PROPELLANT MASS	910195.7	332863.7	68250.2
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	910195.60	332863.75	68250.19
PROPELLANT TANK DRY MASS	91019.5	33286.4	12023.5
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	91019.50	33286.36	12023.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13236.6	6484.8
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13236.62	8484.78
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C	C.C	C.C
MISCORPSE CORRECTION SUBSYSTEM MASS	70412.8	C.C	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10636.4	1057.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	70700.0	13250.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306P31

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	G.0
***** RESULTS *****			
INS. THICKNESS	2.1226	INS. MASS	1527.3
VENT PRESS	14.700	CCAT MASS	0.0
TOT EFF MAS	12556.	TCT EF MF	2.11078E-01
		INSUL. MF	2.561757E-02
		CCAT MF	0.0
		EF MF PAS	738.67
POILOFF MAS	6003.0	FF BC MAS	5748.4
WROACT(1)	0.0	WROACT(2)	0.0
AFACT(1)	4.46720E-01	AFACT(2)	6.72894E-01
CFACT	7.41022E-01	TMAX	0.0
FPTH	1.02017E-01	N-J PSSH	6068.3
		WALL TKNS	C.61021E-01
		WROACT(3)	6032.8
		AFACT(3)	9.57430E-01
		TCU	116.62
		PRCP MASS	59483.
		TANK MASS	2515.9
		PRES MASS	138.17
		EFF MP MF	1.24216E-02
		TANK MASS	25.133
		LENGTH	14150.
		WROACT(4)	
		AFACT(4)	
		TANK AREA	C.C
		TANK AREA	2863.2
		TANK MF	80MAX
		PRES MF	NO CF TANK
		MF MASS	0.0
			1.0000

THE OLD VALUE OF IMFC IS 2158133.0

THE NEW VALUE OF IMFC IS 2159892.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5306031

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1203591.	656588.	262716.
TOTAL INITIAL PROPELLANT MASS	891151.8	325853.1	55487.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	891151.81	325853.06	55487.15
PROPELLANT TANK DRY MASS	89115.1	32589.2	6068.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	89115.12	32589.25	6068.70
NON-EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SURSYSTEMS MASS	0.0	13152.7	8251.2
OXIDIZER SURSYSTEMS MASS	0.0	0.0	0.0
FUEL SURSYSTEMS MASS	0.0	13152.66	8251.16
MISCELLANEOUS PROPELLION SURSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5146.0
RETRO PROPELLION SURSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SURSYSTEM MASS	68744.0	0.0	5455.0
ATTITUDE CONTROL SURSYSTEM MASS	10384.2	1069.0	1434.2
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAVLOAN	0.0	27000.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306P3L

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7CCCG INITIAL ENERGY C.0

**** RESULTS ****

INS. TKNESS 0.52516	INS. MASS 39C.64	INSUL. MF 6.75285E-C3	TANK MASS 2453.4	TANK PF 7.42180E-02
VENT PRFSS 14.7CC	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 134.27	PRES PF 2.32110E-03
TOT EFF MAS 5235.C	TCT EF MF 1.71812E-01	EF MP MAS 718.71	EFF MP MF 1.24241E-C2	PF PASS 960.96
BOILOFF MAS 4723.C	FF RC MAS 4402.0	WALL TKMS 0.60531E-C1	VOLUME 13761.	
WBOACT(1) C.0	WBCACT(2) 0.0	WPCACT(2) 4723.C		
AFACT(1) 4.16578E-C1	AFACT(2) 6.44849E-01	AFACT(2) 5.32C33E-C1		
CFACT 7.475C5E-C1	TMAX 0.0	TDU 149.61		
EPTH 8.32515E-C2	N-J PDSM 4818.3	PREP MASS 57848.		
		TANK AREA C.C	BCFAX 0.0	
		TANK AREA 2614.6	NC CF TAK 1.0000	

THE OLD VALUE OF IMFC IS 2150594.0

THE NEW VALUE OF IMFC IS 2150475.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

stage 3

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1195025.	654783.	255785.
TOTAL INITIAL PROPELLANT MASS	887266.6	324266.6	57846.6
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	887266.56	324266.56	57846.64
PROPELLANT TANK DRY MASS	88726.6	32426.6	4816.2
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88726.56	32426.64	4816.15
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	12163.2	8254.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	12163.22	8254.54
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	5100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPELLION SUBSYSTEM MASS	0.0	0.0	0.0
MICROUSE CORRECTION SUBSYSTEM MASS	68403.5	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10332.9	1063.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	27000.0	132500.0

THE THERMAL PROTECTIVE SYSTEM OPTIMIZATION RESULTS
S330P3H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. THICKNESS	8.5912	INS. MASS	7141.1	INSUL. MF	1.01569E-01	TANK MASS	2524.5	TANK PF	7.30787E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	163.26	PRES PF	2.33125E-03
TOT EFF MAS	28612.	TOT EFF MF	4.08561E-01	EF MP MAS	857.66	EFF MP MF	1.22467E-02	PF PASS	1230.1
ROIL OFF MAS	14683.	EF RC MAS	15332.	WALL TKAS	0.63926E-01	LENGTH	28.254	VOLUME	16659.
WROACT(1)	2900.1	WROACT(1)	3.2695	WROACT(3)	12380.	WROACT(4)			
AFACT(1)	6.38567E-01	AFACT(2)	9.51764E-01	AFACT(3)	1.11548E-00	AFACT(4)			
CFACT	6.97202E-01	TMAX	0.0	TDU	52.463	TDLX	C.C	BCPAX	0.U
FPTH	1.77374E-01	N-J PSSH	12422.	PREP MASS	70332.	TANK AREA	3176.5	NO CF TAK	1.0000

THE OLD VALUE OF TMFC IS 2209632.0

THE NEW VALUE OF TMFC IS 2209837.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5209934

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1224197.	705817.	275825.
TOTAL INITIAL PROPELLANT MASS	913899.8	334120.9	70013.3
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	913899.81	334120.87	70013.31
PROPELLANT TANK DRY MASS	91380.9	33412.1	12418.9
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	91080.94	33412.07	12418.91
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	C.C	C.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	13341.6	8523.8
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	13341.59	8523.82
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	150000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.C	C.C	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	70466.6	C.C	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10644.5	1059.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAVLOAD	C.C	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309F31

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7C000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	2.0229	TNS. PASS	1465.0	INSUL. MF	2.41652E-02	TANK MASS	2555.4	TANK MF	7.38903E-02
VENT PRESS	14.7CC	CCAT PASS	0.0	CCAT MF	0.0	PRES MASS	140.86	PRES MF	2.32387E-03
TOT EFF MAS	13581.	TCT EF MF	2.24046F-C1	EF MP MAS	754.06	EFF MP MF	1.24355E-C2	MF PASS	1022.1
PROLOFF MAS	7077.C	EF RC MAS	6741.9	WALL TKNS	0.61333E-C1	LENGTH	25.46E	VOLUME	14419.
WBOACT(1)	235.16	WBOACT(2)	1.7891	WBOACT(3)	6840.1	WBOACT(4)			
AFACT(1)	4.61157E-C1	AFACT(2)	6.86326E-J1	AFACT(3)	9.65600E-01	AFACT(4)			
CFEACT	7.3774CF-C1	TPAX	C.C	TCU	82.57C	TOLX	C.C	BCMAX	0.0
EPTE	1.003F3E-C1	N-J PSSM	60R4.8	PRCP MASS	6C616.	TANK AREA	2896.9	NO CF TANK	1.0000

THE OLD VALUE OF IMFC IS 2161787.0

THE NEW VALUE OF IMFC IS 2162974.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S3CCP21

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1202001.	657135.	263836.
TOTAL INITIAL PROPELLANT MASS	892326.7	326364.1	60571.6
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	892326.69	326364.12	60571.64
PROPELLANT TANK DRY MASS	892322.6	326358.4	6080.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	892322.63	326358.40	6080.37
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13201.6	8315.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13201.55	8315.37
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68846.9	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10399.9	1070.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309F3L

*** INPUT ITEMS ***

INITIAL ENERGY G.G

DESIGN PRESSURE 15.70000

*** RESULTS ***

INS. TKNFSS	C.58614	INS. MASS	415.97	INSUL. MF	7.09142E-C3	TANK MASS	2484.3	TANK PF	7.41171E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	136.20	PRES PF	2.32184E-03
TOT EFF MAS	10812.	TCT FF MF	1.84323F-01	EF PP MAS	729.47	EFF MP MF	1.24355E-C2	MP MASS	978.86
POILOFF MAS	5502.1	EF BC MAS	5182.8	WALL TKNS	G.05775E-C1	LENGTH	24.885	VOLUME	13956.
WFOACT(1)	0.0	WFOACT(2)	0.0	WFOACT(3)	±52.1	WFOACT(4)			
AFOACT(1)	4.28355E-C1	AFOACT(2)	6.55807E-01	AFOACT(3)	±.41555E-C1	AFOACT(4)			
CFACT	7.45215E-C1	TMAY	0.0	TCU	0.59.15	TOUTX	C.C	BCMAX	0.0
FPTF	8.35302E-C2	N-J PFSM	4899.7	PREP MASS	±1658.	TANK AREA	2836.7	NC CF TANK	1.0000

THE OLD VALUE OF IMIEC IS 2153522.0

THE NEW VALUE OF IMIEC IS 2153406.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S3CCP3L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1197377.	655331.	266700.
TOTAL INITIAL PROPELLANT MASS	888476.0	324772.7	56658.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FLWL MASS	888476.00	324772.75	56658.31
PROPELLANT TANK DRY MASS	88847.6	32477.3	4655.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	88847.56	32477.26	4655.74
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13172.4	6272.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13172.38	8272.86
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	68509.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10348.9	1064.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306PT3H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C	*****	RESULTS	*****			
INS. THICKNESS	6.2425	INS. MASS	6351.7	INSUL. MF	9.50089E-C2	TANK MASS	2800.5	TANK MF	7.33073E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	155.67	PRES MF	2.32850E-03
TOT EFF MAS	2515E.	TCT EF MF	3.76919E-01	EF MP MAS	813.75	EFF MP MF	1.21660E-C2	MF PASS	1159.9
POILOFF MAS	11748.	FF RC MAS	12977.	WALL TRMS	C.63053E-C1	LENGTH	27.313	VOLUME	15903.
WFACT(1)	1751.4	WFACT(2)	0.0	WFACT(3)	11748.	WBOACT(4)			
AFACT(1)	6.21222E-C1	AFACT(2)	8.35254E-01	AFACT(3)	1.10452E 00	AFACT(4)			
DFACT	7.01248E-C1	TMAX	1084.3	TCU	32.447	TDLX	C.C	BDMAX	0.0
FPTH	1.70645E-C1	N-J PSSM	11408.	PRCP MASS	66853.	TANK AREA	3082.4	NO CF TAK	1.0000

THE OLD VALUE OF IMEC IS 2204652.0

THE NEW VALUE OF IMEC IS 2200876.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SECTION 24

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1220897.	704528.	275454.
TOTAL INITIAL PROPELLANT MASS	908061.6	332571.4	66743.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	908061.56	332571.44	66743.12
PROPELLANT TANK DRY MASS	90806.1	33257.1	11285.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90806.06	33257.13	11285.35
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13320.8	8452.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13320.78	8452.01
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105300.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOUPSE CORRECTION SUBSYSTEM MASS	70225.8	0.0	5455.0
ATTITUDE CONTROL SUBSYSTEM MASS	10608.1	1054.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309FT3H

*** INPUT ITEMS ***

DESIGN PRESSURE	15.70000	INITIAL ENERGY	C.C						
***** RESULTS *****									
INS. TKNSS	8.2707	INS. MASS	6370.5	INSUL. MF	9.53509E-C2	TANK MASS	2796.8	TANK MF	7.33106E-02
VENT PRESS	14.700	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	155.57	PRES MF	2.32850E-03
TOT EFF MAS	25161.	TCT FF MF	3.76591E-01	EF MP MAS	813.27	EFF MP MF	1.21727E-C2	MF MASS	1159.0
POILOFF MAS	11716.	EF RC MAS	12923.	WALL TKNS	0.63082E-C1	LENGTH	27.301	VOLUME	15893.
WROACT(1)	3647.1	WROACT(2)	0.0	WROACT(3)	11718.	WROACT(4)			
AFACT(1)	6.15216E-C1	AFACT(2)	8.33387E-01	AFACT(3)	1.10283E 00	AFACT(4)			
EFACT	7.01706E-C1	TMAX	1086.4	TDU	32.465	TOLX	C.C	BCMAX	0.0
EPTH	1.70596E-C1	N-J PSSM	11424.	PRCP MASS	66811.	TANK AREA	3081.2	NO CF TNR	1.0000

THE OLD VALUE OF IMFC IS 2204087.0

THE NEW VALUE OF IMFC IS 2200866.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

57C9P12H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1220893.	704526.	275451.
TOTAL INITIAL PROPELLANT MASS	908057.8	322569.5	66721.6
TOTAL OXIDIZED MASS	0.0	0.0	0.0
TOTAL FLFL MASS	908057.81	322569.87	66721.56
PROPELLANT TANK DRY MASS	90805.7	32257.0	11408.7
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	90805.69	32256.57	11408.71
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FLFL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	13320.7	8451.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	13320.75	8451.43
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70225.4	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	10608.1	1054.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	270700.0	132500.0

THERMAL PROTECTION OPTIMIZATION RESULTS

*** OPTIMIZATION ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.O
***** RESULTS *****			
INS. THICKNESS	17.756	INS. MASS	17999.
VENT PRESS	14.700	CCAT MASS	C.O
TOT EFF MAS	83201.	TCT EF MF	8.35788E-02
BOILOFF MAS	40065.	EF BO MAS	56676.
WROACT(1)	0.0	WROACT(2)	7961.9
AFACT(1)	1.04146E CC	AFACT(2)	1.21986E OF
DFACT	6.C2827E-C1	TMAX	O.C
EPTH	2.55454E-01	N-J PSSM	25430.
		RESUL. MF	1.80804E-C1
		INIT. MF	O.O
		EFF MP MAS	1C95.O
		ALL TNKS	O.70441E-C1
		AFACT(3)	32107.
		AFACT(3)	1.46262E OC
		TOTU	128.68
		TROP MASS	99547.
		TANK MASS	4112.8
		PRES MASS	233.86
		EFF MP MF	1.C5554E-C2
		LENGTH	36.984
		WROACT(4)	
		AFACT(4)	
		TDUX	O.C
		TANK AREA	4C54.6
		TANK MF	7.23004E-02
		PRES MF	2.34921E-03
		MP MASS	1816.4
		VOLUME	23681.
		BOIMAX	O.O
		NO CF TNK	1.0000

THE OLD VALUE OF IMIFC IS 2540785.0

 THE NEW VALUE OF IMIFC IS 2527808.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJGVSCH

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1387835.	827067.	322508.
TOTAL INITIAL PROPELLANT MASS	1047076.2	407201.4	99508.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1047076.25	407201.37	99508.54
PROPELLANT TANK DRY MASS	104707.6	40720.1	25415.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	104707.56	40720.12	25415.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14545.4	9109.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14949.38	9109.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16487.0	9044.0	5140.0
EFTRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MICROURSE CORRECTION SUBSYSTEM MASS	82407.5	0.0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	12448.3	1252.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U333V31

*** INPUT ITEMS ***

INITIAL ENERGY C.C

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. TKNESS	3.8875	INS. MASS	3323.6	INSUL. MF	4.25009E-02	TANK MASS	3246.7	TANK MF	7.25556E-02
VENT PRESS	14.730	COAT MASS	0.C	COAT MF	L.C	PRES MASS	182.76	PRES MF	2.33704E-03
TOT EFF MAS	36488.	TOT EF MF	4.66586E-01	EF MP MAS	931.01	EFF MP MF	1.19052E-02	MP MASS	1361.3
BOILOFF MAS	23419.	EF BO MAS	26368.	WALL TKNS	6.65920E-01	LENGTH	30.670	VOLUME	18573.
WBJACT(1)	0.C	WBJACT(2)	3238.C	WBJACT(3)	20181.	WBJACT(4)			
AFACT(1)	6.86167E-01	AFACT(2)	8.88573E-01	AFACT(3)	1.16398E 00	AFACT(4)			
DFACT	6.83922E-01	TMAX	0.C	TDU	166.91	TDX	C.C	ROMAX	C.C
EPTH	1.17493E-01	N-J PSSM	9188.1	PROP MASS	78231.	TANK AREA	3419.8	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2417515.C

THE NEW VALUE OF IMIED IS 2418013.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U303V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1326432.	814677.	284275.
TOTAL INITIAL PROPELLANT MASS	99755.01	38721.6	78103.2
TOTAL OXIDIZER MASS	.	.	.
TOTAL FUEL MASS	99755.012	38721.6	78193.19
PROPELLANT TANK DRY MASS	93744.9	38721.6	9187.2
OXIDIZER TANK DRY MASS	.	.	.
FUEL TANK DRY MASS	99764.94	38721.6	9187.18
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.	.	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	.	.	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14573.5	8655.1
OXIDIZER SUBSYSTEMS MASS	0.0	.	0.0
FUEL SUBSYSTEMS MASS	0.0	14573.47	8655.13
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	910.0	530.0
ENGINE DRY MASS	10500.0	3500.0	3500.0
INTERSTAGE STRUCTURE MASS	16497.0	9144.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	.	.	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70176.2	.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11794.0	1185.3	1424.2
MISCELLANEOUS EXPENDABLES MASS	.	0.0	0.0
PAYLOAD	0.0	30981.00	12250.00

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U333V9L

*** INPUT ITEMS ***

INITIAL ENERGY C.C

DESIGN PRESSURE 19.70G0C

***** RESULTS *****

INS. TKNESS	1.0120	INS. MASS	835.94	INSUL. MF	1.12487E-02	TANK MASS	3092.8	TANK MF	7.28304E-02
VEVT PRESS	14.700	COAT MASS	0.0	CUAT MF	0.0	PRES MASS	173.47	PRES MF	2.33433E-03
TOT EFF MAS	29146.	TOT EF MF	3.92202E-01	EF MP MAS	894.70	EFF MP MF	1.20393E-02	MP MASS	1278.4
BOILOFF MAS	20342.	EF BO MAS	21830.	WALL TKNS	0.65000E-01	LENGTH	29.520	VOLUME	17678.
WBOACT(1)	0.0	WBOACT(2)	2328.0	WBOACT(3)	18014.	WBOACT(4)			
AFACT(1)	6.16360E-01	AFACT(2)	8.23482E-01	AFACT(3)	1.10930E-00	AFACT(4)			
DFACT	6.99855E-01	TMAX	0.0	TDJ	180.99	TDX	0.0	BO MAX	0.0
EPTH	8.64133E-02	N-J PSSM	5421.7	PROP MASS	74314.	TANK AREA	3304.3	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2396654.0

 THE NEW VALUE OF IMIED IS 2396925.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U3C3V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1318032.	800711.	78183.
TOTAL INITIAL PROPELLANT MASS	988455.4	382714.4	74319.0
TOTAL OXIDIZER MASS	500	0.	0.
TOTAL FUEL MASS	988455.4	382714.4	74319.5
PROPELLANT TANK DRY MASS	33254.0	30271.4	6422.2
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	59924.87	38271.44	6422.2
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14507.8	8572.5
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14507.83	8572.49
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	107001.	91000.	53000.
ENGINE DRY MASS	175000.	350000.	350000.
INTERSTAGE STRUCTURE MASS	16497.0	90440.	51400.
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	77313.9	0.	94950.
ATTITUDE CONTROL SUBSYSTEM MASS	11679.8	1173.7	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	309800.	1325000.

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U306V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS 18.326	TNS. MASS 19047.	INSUL. MF 1.84915E-01	TANK MASS 4256.2	TANK MF 7.23124E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 242.15	PRES MF 2.35090E-03
TOT EFF MAS 85446.	TCT FF MF 8.68382E-01	EF MP MAS 1126.1	EFF MP MF 1.09328E-02	MP PASS 1890.0
PCILOFF MAS 43164.	EF RC MAS 61582.	WALL TKNS 0.71096E-01	LENGTH 38.006	VOLUME 24503.
WRDACT(1) 0.0	WRDACT(2) 11125.	WRDACT(3) 32038.	WBDACT(4)	
AFACT(1) 1.07219E CC	AFACT(2) 1.24852E 00	AFACT(3) 1.48845E CC	AFACT(4)	
DFACT 5.55811E-C1	TMAX 0.C	TCU 117.27	TDUX 0.C	BDFAX 0.0
EPATH 2.55578E-C1	N-J PSSM 26737.	PRCP MASS 1.03003E 05	TANK AREA 4157.3	NO CF TNK 1.0000

THE OLD VALUE OF IMIEC IS 2553027.0

THE NEW VALUE OF IMIEC IS 2549900

GENERAL DYNAMICS
Fort Worth Division

U706V5H
MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1393847.	828255.	327841.
TOTAL INITIAL PROPELLANT MASS	1052082.0	408260.1	103040.C
TOTAL OXIDIZER MASS	0.C	0.C	0.C
TOTAL FUEL MASS	1052082.00	408260.C6	103040.CC
PROPELLANT TANK DRY MASS	105208.1	40826.C	26746.5
OXIDIZER TANK DRY MASS	0.C	0.C	0.C
FUEL TANK DRY MASS	105208.12	40825.55	26746.54
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	0.C	0.C
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	0.C	0.C
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	14969.3	9184.7
OXIDIZER SUBSYSTEMS MASS	0.C	0.C	0.C
FUEL SUBSYSTEMS MASS	0.C	14969.25	9184.73
MISCELLANEOUS PROPELLANT SUBSYSTEMS MASS	19700.0	9100.C	5300.C
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9044.C	5140.C
RETRO PROPULSION SUBSYSTEM MASS	0.C	0.C	0.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	87846.1	0.C	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12514.5	1255.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	0.C	0.C
PAYLOAD	0.C	309000.C	132500.C

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U3C6V91

*** INPUT ITEMS ***

INITIAL ENERGY C.C.

***** RESULTS *****

DESIGN PRESSURE 19.70000

INS. TKNESS	3.9893	INS. MASS	3473.6	INSJL. MF	4.32450E-02	TANK MASS	3331.2	TANK MF	7.25780E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	187.83	PRES MF	2.33845E-03
TOT EFF MAS	38978.	TOT EF MF	4.85265E-01	EF MP MAS	956.47	EFF MP MF	1.10178E-02	MP MASS	1406.5
BJLOFF MAS	25440.	EF 80 MAS	28530.	WALL TKNS	0.66420E-01	LENGTH	31.29P	VOLUME	19107.
WBOACT(1)	0.0	WBOACT(2)	5281.5	WBOACT(3)	21158.	WBOACT(4)			
AFACT(1)	7.03207E-01	AFACT(2)	9.04462E-01	AFACT(3)	1.17830E 00	AFACT(4)			
DFACT	6.80033E-01	TMAX	0.0	TDU	152.58	TDUX	0.0	80MAX	0.0
EPH	1.18161E-01	N-J PSSM	9491.1	PRDP MASS	80323.	TANK AREA	3482.9	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2422755.0

THE NEW VALUE OF IMIED IS 24235240

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U306V9I

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	13211.0	27460.0	24728.0
TOTAL INITIAL PROPELLANT MASS	95000.0	30747.0	3327.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	99727.12	38747.31	81327.25
PROPELLANT TANK DRY MASS	00920.4	30747.0	9491.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	09972.07	38747.12	9491.57
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14573.4	8700.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14579.44	8700.58
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197.0	0.0	5900.0
ENGINE DRY MASS	10500.0	3500.0	3500.0
INTERSTAGE STRUCTURE MASS	16407.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	70275.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11004.1	1186.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	3000.0	13250.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lbm)

	STAGE 1	STAGE 2	STAGE 3
U306V9L			
TOTAL INITIAL STAGE MASS	1322277.	911899.	281294.
TOTAL INITIAL PROPELLANT MASS	99429.4	383832.1	70216.1
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	999829.44	383882.12	76216.06
PROPELLANT TANK DRY MASS	99062.9	38389.2	6596.1
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	99982.87	38388.20	6596.11
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14511.0	8612.9
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14510.98	8612.91
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19732.0	9110.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	77478.6	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11732.7	1174.2	1434.2
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30980.0	132500.0

HEAT PROTECTION SYSTEM OPTIMIZATION RESULTS
U309V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000C INITIAL ENERGY 0.0

**** RESULTS ****

INS. THICKNESS	18.622	INS. MASS	19851.	INSUL. MF	1.86231E-01	TANK MASS	4406.3	TANK MF	7.23398E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	250.78	PRES MF	2.35260E-02
TOT EFF MAS	55834.	TOT EFF MF	8.99044E-01	EF MP MAS	1157.4	EFF MP MF	1.08575E-02	MP MASS	1966.6
ROILOFF MAS	4636C.	FF RC MAS	66863.	WALL TKAS	0.71760E-01	LENGTH	35.068	VOLUME	25357.
WROACT(1)	0.0	WROACT(2)	14322.	WROACT(3)	32038.	WROACT(4)			
AFACT(1)	1.10424E 00	AFACT(2)	1.27841E 00	AFACT(3)	1.51539E 00	AFACT(4)			
DFACT	5.88456E-C1	TMAX	0.0	TCU	108.05	TDOX	C.C	ROMAX	0.0
EPTH	2.60924E-C1	N-J PSSM	27813.	PRCP MASS	1.06595E 05	TANK AREA	4264.1	NO OF TNK	1.0000

THE OLD VALUE OF TIME IS 2566100.0

 THE NEW VALUE OF TIME IS 2560926.0

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	13992.80	82920.6	232433.
TOTAL INITIAL PROPELLANT MASS	1056614.0	409107.6	106512.5
TOTAL OXIDIZER MASS	C.C	C.C	0.0
TOTAL FUEL MASS	1056614.00	409107.62	106512.87
PROPELLANT TANK DRY MASS	105661.3	40910.7	27751.7
OXIDIZER TANK DRY MASS	0.0	C.C	0.0
FUEL TANK DRY MASS	105661.31	40910.75	27791.75
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14985.2	5259.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14985.22	5259.12
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	25000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	83243.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12574.5	1258.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U309V9I

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.C
***** RESULTS *****			
INS. TKNESS	4.1100	INS. MASS	3642.9
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	41527.	TOT EF MF	5.03817E-01
BOILOFF MAS	27433.	EF BO MAS	30733.
WBOACT(1)	0.0	WBOACT(2)	7310.0
AFACT(1)	7.20398E-01	AFACT(2)	9.20492E-01
DFACT	6.76109E-01	TMAX	0.0
EPTH	1.19049E-01	N-J PSSM	9812.5
		WALL TKNS	0.66896E-01
		WBOACT(3)	20123.
		AFACT(3)	1.19275E 00
		TDJ	140.65
		PROP MASS	82424.
		TANK MASS	3415.3
		PRES MASS	192.85
		EFF MP MF	1.19748E-02
		LENGTH	31.919
		WBOACT(4)	
		AFACT(4)	
		IDUX	0.0
		TANK AREA	3545.4
		TANK MF	7.25121E-02
		PRES MF	2.33980E-03
		MP MASS	1431.3
		VOLUME	19607.
		80MAX	0.0
		NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2428175.C

 THE NEW VALUE OF IMIED IS 2429047.0

MASS SUMMARY (lb_m)

U309V9I

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1333245.	805220.	289869.
TOTAL INITIAL PROPELLANT MASS	100200.6	387740.9	82439.7
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	100220.62	387740.87	82439.69
PROPELLANT TANK DRY MASS	100220.6	387740.1	82439.4
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	100220.03	387740.17	82439.37
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14583.5	8745.6
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14583.53	8745.57
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.	9100.	5300.
ENGINE DRY MASS	105000.	35000.	35000.
INTERSTAGE STRUCTURE MASS	16497.0	9044.	5140.
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	78475.0	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11854.2	1187.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	309800.	132500.

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J3099L

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. TKNESS	1.0577	INS. MASS	903.60	INSUL. MF	1.15676E-12	TANK MASS	3243.3	TANK MF	7.25591E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRFS MASS	182.55	PRES MF	2.73696E-13
TOT EFF MAS	33172.	TOT EF MF	4.24661E-01	EF MP MAS	0.42.F5	EFF MP MF	1.21509E-12	MP MASS	1359.4

VOLUME 185R2.

BOILOFF MAS	24(03).	EF RD MAS	25443.	WALL TKNS	.65919E-11	LENGTH	71.844
WBDACT(1)	0.0	WBDACT(2)	5995.0	WALL-T(2)	1.6005.	WBDACT(4)	
AFACT(1)	6.46522E-01	AFACT(2)	8.51676E-01	AFACT(3)	1.13066E-00	AFACT(4)	

BOIMAX 0.0
NO OF TNK 1.0000

DFACT	6.92971E-01	TMAX	0.0	TDJ	152.85	TNUX	0.0
EPTH	8.65633E-02	N-J PSSM	5751.9	PROP MASS	78115.	TANK AREA	3417.3

THE OLD VALUE OF IMIED IS 2405548.0

THE NEW VALUE OF IMIFO IS 2406041.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U309V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1422349.	801080.	282408.
TOTAL INITIAL PROPELLANT MASS	982717.7	384147.8	79122.9
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	982717.69	384147.81	78122.94
PROPELLANT TANK DRY MASS	99271.0	38414.8	6762.6
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	99271.00	38414.77	6762.59
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14514.1	8653.6
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14514.10	8653.57
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	18700.0	9100.0	5300.0
ENGINE DRY MASS	115000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16437.0	8044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	77643.4	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11728.6	1174.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	39980.00	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U30309H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNFSS 11.263	INS. MASS 9481.5	INSUL. MF 1.24042E-01	TANK MASS 3176.7	TANK MF 7.27293E-02
VENT PRESS 14.700	CCAT MASS 0.0	CCAT MF 0.0	PRES MASS 178.55	PRES MF 2.33583E-03
TOT EFF MAS 28573.	TCT EFF MF 5.04641E-01	EF MP MAS 894.46	EFF MP MF 1.17015E-02	MF MASS 1323.7
PROLOFE MAS 20042.	FF RD MAS 22460.	WALL TKAS 0.65512E-01	LENGTH 30.146	VOLUME 19183.
WROACT(1) 7.21584E-01	WROACT(1) 5414.5	WFLACT(3) 14627.	WROACT(4)	
AFACT(1) 6.75747E-01	AFACT(2) 9.21974E-01	AFACT(3) 1.19409E 00	AFACT(4)	
CEACT 1.95107E-01	TMAX 0.0	TDU 78.202	TDUX 0.0	BO MAX 0.0
EDTH 1.95107E-01	N-J PDSM 15219.	PRCF MASS 76437.	TANK AREA 3367.4	NO CF TAK 1.0000

THE OLD VALUE OF TIMEC IS 2428602.0

 THE NEW VALUE OF TIMEC IS 2429749.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

1127096H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	133399R.	806C15.	289137.
TOTAL INITIAL PROPELLANT MASS	1002244.7	388441.1	76432.2
TOTAL OXIDIZER MASS	C.C	C.C	C.C
TOTAL FUEL MASS	1002244.69	388441.C6	76432.25
PROPELLANT TANK DRY MASS	100224.4	38844.1	15218.2
OXIDIZER TANK DRY MASS	C.C	C.C	C.C
FUEL TANK DRY MASS	100224.37	38844.C5	15218.23
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	C.C	C.C
OXIDIZER SUBSYSTEMS MASS	0.0	C.C	0.0
FUEL SUBSYSTEMS MASS	0.0	C.C	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.C	14556.7	8617.6
OXIDIZER SUBSYSTEMS MASS	C.C	C.C	C.C
FUEL SUBSYSTEMS MASS	C.C	14556.65	8617.57
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.C	5300.C
ENGINE DRY MASS	105000.0	35000.C	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9C44.C	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	C.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	78478.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11854.8	1189.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	C.C	C.C	C.C
PAYLOAD	C.C	30900.C	132500.C

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J3C399I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 2.5092	INS. MASS 1892.1	INSUL. MF 2.92763E-02	TANK MF 7.34930E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MF 2.32705E-03
TOT EFF MAS 17731.	TOT EF MF 2.74345E-01	EF MP MAS 777.65	MP MASS 1071.9
BOILOFF MAS 10681.	EF BO MAS 10161.	WALL TKNS 0.62489E-01	VOLUME 15374.
WBOACT(1) 0.0	WBJACT(2) 2182.3	WBOACT(3) 8498.9	
AFACT(1) 5.04122E-01	AFACT(2) 7.18825E-01	AFACT(3) 1.01096E-00	
DFACT 7.25473E-01	TMAX 0.0	TDJ 124.80	BO MAX 0.0
EPH 1.05096E-01	N-J PSSM 5792.4	PROP MASS 64630.	NO OF TNK 1.0000
		TANK MASS 2714.2	
		P2FS MASS 150.40	
		EFF MP MF 1.20324E-02	
		LENGTH 26.656	
		WBOACT(4)	
		AFACT(4)	
		TDUX 0.0	
		TANK AREA 3016.3	

THE OLD VALUE OF IMIED IS 2365030.0

THE NEW VALUE OF IMIED IS 2365535.0

MASS SUMMARY (lb_m)

U303P91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	131248.0	79439.7	259665.
TOTAL INITIAL PROPELLANT MASS	97599.2	378083.6	64635.4
TOTAL OXIDIZER MASS	0	0	0
TOTAL FUEL MASS	97599.2	378083.6	64635.4
PROPELLANT TANK DRY MASS	97599.7	378083.3	6793.0
OXIDIZER TANK DRY MASS	0	0	0
FUEL TANK DRY MASS	97599.75	378083.34	6793.04
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	0	0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	0	8366.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	14402.0	0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	14401.97	8366.04
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	8044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0	0	0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76179.0	0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	1157.4	1154.9	1434.2
MISCELLANEOUS EXPENDABLES MASS	0	0	0
PAYLOAD	0	39800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
J303P9L

** INPUT ERROR **

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.C						
***** RESULTS *****									
INS. TKNESS	0.64601	INS. MASS	476.29	INSUL. MF	7.63647E-03	TANK MASS	2626.9	TANK MF	7.37061E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	C.C	PRES MASS	145.12	PRES MF	2.32510E-03
TOT EFF MAS	14161.	TOT EF MF	2.27045E-01	EF MP MAS	752.73	EFF MP MF	1.20667E-02	MP MASS	1023.8
BOILOFF MAS	8871.4	EF BO MAS	8189.8	WALL TKNS	0.61857E-01	LENGTH	25.988	VOLUME	14837.
WBFACT(1)	0.0	WBFACT(2)	1550.8	WBFACT(3)	7320.6	WBFACT(4)			
AFACT(1)	4.61246E-01	AFACT(2)	6.78845E-01	AFACT(3)	9.74923E-01	AFACT(4)			
DFACT	7.35260E-01	TMAX	0.0	TDJ	144.17	TDUX	C.C	BOMAX	0.0
EPTH	8.36675E-02	N-J PSSM	5218.4	PROP MASS	62371.	TANK AREA	2949.1	NO OF TNK	1.0000

THE OLD VALUE OF IMIEO IS 2353531.0

THE NEW VALUE OF IMIEO IS 2353468.0

MASS SUMMARY (lb_m)

U303P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	129651.1	79915.5	264774.
TOTAL INITIAL PROPELLANT MASS	97119.9	374125.4	62368.7
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	97119.62	376125.44	62368.69
PROPELLANT TANK DRY MASS	6711.0	37612.5	5218.2
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	9711.87	37612.53	5218.23
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14365.2	8317.7
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14365.16	8317.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19720.6	910.0	5300.0
ENGINE DRY MASS	115000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16437.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75742.6	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11441.5	1148.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30980.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U106P94

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7C0CC INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNFSS	11.572	INS. MASS	9877.0	INSUL. MF	1.26612E-C1	TANK MASS	3239.1	TANK MF	7.26632E-02
VENT PRESS	14.7CC	CCAT MASS	0.0	CCAT MF	0.0	PRES MASS	182.3C	PRES MF	2.33687E-03
TOT EFF MAS	4C692.	TCT FF MF	5.21636E-01	EF PP MAS	912.C7	EFF MP MF	1.16517E-C2		1357.2
ROILOFF MAS	21467.	EF RC MAS	24053.	WALL TKNS	0.6322E-C1	LENGTH	30.613	VCLLME	18557.
WROACT(1)	0.0	WROACT(2)	6938.8	WROACT(3)	14528.	WROACT(7)			
AFACT(1)	7.38255E-C1	AFACT(2)	9.37180E-01	AFACT(3)	1.20779E 0C	AFACT(4)			
DFACT	6.72C24E-C1	TMAX	0.0	TCU	66.648	TDUX	C.C	BCMAX	0.0
EPTH	2.C1617E-C1	N-J PSSM	15728.	PRCP MASS	78010.	TANK AREA	3414.2	NO OF TANK	1.0000

THE OLD VALUE OF IMIED IS 2433737.0

THE NEW VALUE OF IMIED IS 2434191.0

GENERAL DYNAMICS
Fort Worth Division

UJ2742CH
MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1336497.	806425.	291271.
TOTAL INITIAL PROPELLANT MASS	1004374.8	388806.6	78020.5
TOTAL OXIDIZER MASS	C.O	C.O	C.O
TOTAL FUEL MASS	1004324.81	388806.56	78020.50
PROPELLANT TANK DRY MASS	100432.4	38880.6	15725.8
OXIDIZER TANK DRY MASS	C.O	0.0	0.0
FUEL TANK DRY MASS	100432.44	38880.64	15725.85
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	C.O	0.0	C.O
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	C.O	0.0	C.O
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14603.6	8651.4
OXIDIZER SUBSYSTEMS MASS	C.O	0.0	C.O
FUEL SUBSYSTEMS MASS	0.0	14603.56	8651.37
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	5044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	C.O	0.0	C.O
WTCOURSE CORRECTION SUBSYSTEM MASS	78661.2	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11882.4	1150.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 J336P91

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.C
***** RESULTS *****			
INS. TKNESS	2.5589	INS. MASS	1947.5
VENT PRESS	14.700	COAT MASS	C.C
TOT EFF MAS	18596.	TOT EF MF	2.83603E-01
BOILOFF MAS	11575.	EF BO MAS	10893.
WBFACT(1)	0.0	WBFACT(2)	302.4
AFACT(1)	5.13486E-01	AFACT(2)	7.27556E-01
DFACT	7.23336E-01	TMAX	C.C
EPTH	1.05440E-01	N-J PSSM	5913.8
		INSUL. MF	2.97005E-02
		COAT MF	C.C
		EF MP MAS	789.89
		WALL TKNS	1.62747E-01
		WBFACT(3)	8482.8
		AFACT(3)	1.01883E-00
		TDU	110.14
		PROP MASS	65572.
		TANK MASS	2750.7
		PRES MASS	152.64
		EFF MP MF	1.20462E-02
		LENGTH	20.934
		WBFACT(4)	
		AFACT(4)	
		TDOX	C.C
		TANK AREA	3044.3
		BOMAX	C.C
		NO OF TNK	1.0000
		VOLUME	15598.

THE OLD VALUE OF IMIED IS 2357592.C

THE NEW VALUE OF IMIED IS 2367901.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

UJ30CP91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	131,385.0	70,437.0	2,097,440.0
TOTAL INITIAL PROPELLANT MASS	276,374.2	57,115.0	5,557,407.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	274,744.10	37,815,115.0	6,557,407.0
PROPELLANT TANK DRY MASS	170,704.0	37,917,405.0	5,914,407.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	57,647.70	37,815,500.0	5,914,417.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	1,440,309.0	8,385,000.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	1,440,308.0	8,385,000.0
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197.0	210.0	5,310.0
ENGINE DRY MASS	1,057,700.0	3,550,000.0	3,500,000.0
INTERSTAGE STRUCTURE MASS	16,497.00	90,440.0	51,410.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	752,645.0	0.0	94,950.0
ATTITUDE CONTROL SUBSYSTEM MASS	11,520.3	11,555.2	143,400.0
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30,980,000.0	1,325,000.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 U306P9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7C000

INITIAL ENERGY C.C

***** RESULTS *****

INS. THNESS	0.65799	INS. MASS	489.12	INSUL. MF	7.74072E-03	TANK MASS	2658.4	TANK MF	7.36260E-02
VENT PRESS	14.700	COAT MASS	0.C	CGAT MF	C.C	PRES MASS	146.96	PRES MF	2.32578E-03
TOT EFF MAS	14838.	TOT EF MF	2.34919E-01	EF MP MAS	763.80	EFF MP MF	1.20878E-C2	MP MASS	1041.2
BOILOFF MAS	9660.8	EF BO MAS	8785.6	WALL TKNS	C.62088E-U1	LENGTH	26.229	VOLUME	15031.
MBOACT(1)	0.0	MBOACT(2)	2344.3	MBOACT(3)	7316.5	MBOACT(4)			
AFACT(1)	4.68574E-01	AFACT(2)	6.85678E-01	AFACT(3)	9.81083E-01	AFACT(4)			
DFACT	7.33588E-C1	TMAX	0.U	TDJ	128.C5	TDUX	C.C	BOMAX	0.C
EPH	8.36924E-C2	N-J PSSM	5288.4	PROP MASS	63188.	TANK AREA	2973.4	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2355476.C

THE NEW VALUE OF IMIED IS 2355470

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U30CP9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	14,747.0	7000.0	0.0
TOTAL INITIAL PROPELLANT MASS	37,000.0	37,000.0	31,270.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	37,100.0	37,100.0	31,187.0
PROPELLANT TANK DRY MASS	37,100.0	37,100.0	31,187.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	37,100.0	37,100.0	31,187.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14,366.4	3,335.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14,366.4	3,335.2
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	910.0	530.0
ENGINE DRY MASS	10,500.0	3,500.0	3,500.0
INTERSTAGE STRUCTURE MASS	16,497.0	9,044.0	5,140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75,313.2	0.0	9,495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11,452.2	11,430.0	14,340.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30,990.0	13,250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309894

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS	11.452	INS. MASS	9967.7	INSUL. MF	1.24804E-01	TANK MASS	3312.9	TANK MF	7.25938E-02
VENT PRFSS	14.700	CLAT MASS	0.0	CCAT MF	0.0	PRES MASS	186.72	PRES MF	2.33800E-03
TOT EFF MAS	42618.	TCT EF MF	9.55644E-01	REF. MAS	924.20	EFF MP MF	1.16987E-02	MP PASS	1396.7
PHILOFF MAS	23221.	EF RC MAS	25733.	WALL TKNS	0.66215E-01	WGTHTH	31.161	VOLUME	18998.
WRCACT(1)	1363.3	WRCACT(2)	7246.7	WRCACT(3)	14631.	WRCACT(4)			
AFACT(1)	7.91844E-01	AFACT(2)	9.40814E-01	AFACT(3)	1.21918E-01	AFACT(4)			
CFACT	6.8931E-01	TMAX	C.C	TDU	65.965	TDUX	0.0	BCMAX	
FPTH	1.65736E-01	N-J PSSH	15951.	PREP MASS	75863.	TANK ARFA	3469.2	NO CF TNK	1.0000

THE OLD VALUE OF IM1FD IS 2438049.0

THE NEW VALUE OF IM1EC IS 2437600.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_{md})

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1005177.7	389070.5	79851.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1005177.69	389070.87	79851.00
PROPELLANT TANK DRY MASS	100517.7	38907.1	15909.1
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	100517.69	38907.07	15949.12
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14608.5	8690.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14608.53	8690.49
MISCELLANEOUS PROPELLION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	78735.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11893.7	1151.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U393P9I

*** INPUT ITEMS ***

INITIAL ENERGY C.G.

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. TKNESS	2.6250	INS. MASS	2017.7	INSUL. MF	3.C2998E-02	TANK MASS	2790.3	TANK MF	7.33280E-02
VENT PRESS	14.700	COAT MASS	0.C	COAT MF	0.0	PRES MASS	125.C4	PRES MF	2.32818E-03
TOT EFF MAS	19670.	TOT EF MF	2.95384E-01	EF MP MAS	798.32	EFF MP MF	1.19881E-02	MP MASS	1113.8
BOILOFF MAS	12421.	EF 80 MAS	11816.	WALL TKNS	0.63023E-01	LENGTH	27.236	VOLUME	15841.
WBDACT(1)	0.0	WBDACT(2)	3946.9	WBDACT(3)	8474.C	WBDACT(4)			
AFACT(1)	5.42238E-01	AFACT(2)	7.54367E-01	AFACT(3)	1.C4300E 0C	AFACT(4)			
DFACT	7.16773E-01	TMAX	0.0	TDJ	100.68	TDUX	C.C	BOMAX	0.0
EPTH	1.05956E-01	N-J PSSM	7055.8	PROP MASS	66592.	TANK AREA	3074.6	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2375516.C

THE NEW VALUE OF IMIED IS 2370/07.0

MASS SUMMARY (lb_m)

U309P91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	137474.5	794615.	270749.
TOTAL INITIAL PROPELLANT MASS	277354.4	378291.2	66435.5
TOTAL OXIDIZER MASS	.	0.0	0.0
TOTAL FUEL MASS	977384.44	378291.31	66435.50
PROPELLANT TANK DRY MASS	97788.4	37928.1	7139.2
OXIDIZER TANK DRY MASS	0.	0.	0.0
FUEL TANK DRY MASS	97788.37	37928.12	7139.23
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	1445.7	845.1
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	1445.69	845.14
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	910.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16407.	6244.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76344.2	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11532.4	1155.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30980.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
U309P9L

*** INPUT ITEMS ***

INITIAL ENERGY C.G.

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. THNESS	C.67535	INS. MASS	506.17	INS.JL. MF	7.90716E-03	TANK MASS	2697.4	TANK MF	7.35485E-02
VENT PRESS	14.700	COAT MASS	0.0	CJAT MF	0.0	PRES MASS	148.64	PRES MF	2.32659E-03
TOT EFF MAS	15510.	TOT EF MF	2.4229CE-01	EF MP MAS	775.75	EFF MP MF	1.21183E-02	MP MASS	1058.8
BOILOFF MAS	10463.	EF RO MAS	9371.1	WALL TKNS	C.62319E-01	LENGTH	26.474	VOLUME	15228.
WBOACT(1)	0.0	WBOACT(2)	3152.2	WBOACT(3)	7311.0	WBOACT(4)			
AFACT(1)	4.72626E-01	AFACT(2)	6.89457E-01	AFACT(3)	9.84489E-01	AFACT(4)			
DFACT	7.32662E-01	TMAX	0.0	TDJ	113.87	TDUX	0.0	ROMAX	0.0
EPH	8.37821E-02	N-J PSSM	5363.3	PROP MASS	64015.	TANK AREA	2998.0	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2356554.0

THE NEW VALUE OF IMIED IS 2357470

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

U309P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	120045P.	792353.	266619.
TOTAL INITIAL PROPELLANT MASS	972648.7	376265.0	54122.8
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	972648.75	376265.56	6422.79
PROPELLANT TANK DRY MASS	972648.8	376265.5	5364.0
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	97264.81	37626.54	5363.96
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14367.8	8352.9
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14367.79	8352.94
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1370.0	910.0	530.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16437.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75385.5	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11463.1	1148.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30980.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303NH

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7COCC INITIAL ENERGY 0.0

*** RESULTS ***

INS. TKNESS 14.971	INS. MASS 11710.	INS. MF 1.95272E-01	TANK MASS 9305.6	TANK MF 2.7150E-01
VENT PRESS 63.577	CCAT MASS 0.0	CCAT MF 779.8	PRES MASS 453.66	PRES MF 7.56497E-03
TOT EFF MAS 29229.	TOT EF MF 4.87400E-01	EF MP MAS 779.8	MP MASS 1.30044E-02	MP MASS 1152.6
BOILOFF MAS 0.0	EF BC MAS 0.0	WALL TKNS 0.20654	LENGTH 27.1	VOLUME 16275.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 0.0	WBOACT(4)	
AFACT(1) 7.18322E-01	AFACT(2) 9.18556E-01	AFACT(3) 1.19100E 0C	AFACT(4)	
CFACT 6.76587E-01	TPAX 0.0	TCU -1.000C	TDUX 0.0	BO MAX 0.0
EPTH 4.74395E-01	N-J PSM 28449.	PRCP MASS 59969.	TANK AREA 3128.9	NO OF TANK 1.0000

THE OLD VALUE OF IMFC IS 2427454.0

THE NEW VALUE OF IMFC IS 2423973.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SPACER

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1331434.	807144.	285257.
TOTAL INITIAL PROPELLANT MASS	1000109.2	389447.C	59743.5
TOTAL OXIDIZER MASS	C.C	0.C	0.C
TOTAL FUEL MASS	1000109.25	389447.CC	59743.52
PROPELLANT TANK DRY MASS	100010.9	38544.7	28342.C
OXIDIZER TANK DRY MASS	C.C	0.C	0.C
FUEL TANK DRY MASS	100010.87	38944.68	28342.C4
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.C	0.C	0.0
OXIDIZER SUBSYSTEMS MASS	C.C	0.C	C.C
FUEL SUBSYSTEMS MASS	C.C	0.C	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14615.6	8442.3
OXIDIZER SUBSYSTEMS MASS	0.0	0.C	C.C
FUEL SUBSYSTEMS MASS	0.0	14615.6C	8442.31
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	910.C	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.C
INTERSTAGE STRUCTURE MASS	16497.0	9044.C	5140.C
RETRO PROPULSION SUBSYSTEM MASS	C.C	0.C	0.C
MIDCOURSE CORRECTION SUBSYSTEM MASS	78291.7	0.C	9495.C
ATTITUDE CONTROL SUBSYSTEM MASS	11826.6	1152.6	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.C	0.C	C.C
PAYLOAD	C.C	30980.C	132500.C

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
533891

*** INPUT ITEMS ***

DESIGN PRESSURE 19.76000

INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	3.3112	INS. MASS	2351.2	INSUL. MF	4.2658E-02	TANK MASS	4044.9	TANK MF	1.55990E-01
VENT PRESS	36.110	COAT MASS	0.0	COAT MF	0.0	PRES MASS	247.82	PRES MF	4.4397E-03
TOT EFF MAS	11949.	TOT EF MF	2.16792E-01	EF MP MAS	696.53	EFF MP MF	1.2637E-12	MP MASS	945.79
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	1.12091	LENGTH	24.066	VOLUME	13957.
WBDACT(1)	0.0	WBDACT(2)	0.0	WBDACT(3)	0.0	WBDACT(4)			
AFACT(1)	4.56313E-01	AFACT(2)	6.73966E-01	AFACT(3)	0.7525E-01	AFACT(4)			
DFACT	7.3654E-01	TMAX	0.0	TUJ	-1.0000	TQX	0.0	QUMAX	0.0
EPTH	2.0415E-01	N-J PSSM	11253.	PROP MASS	5511P.	TANK AREA	2841.4	NO OF TANK	1.0000

THE OLD VALUE OF IMIED IS 2352150.0

THE NEW VALUE OF IMIED IS 2350924.0

MASS SUMMARY (lb_m)

S303N91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	125534 .	797312 .	267283 .
TOTAL INITIAL PROPELLANT MASS	96777 .	372212 .	55778 .7
TOTAL OXIDIZER MASS	0 .	0 .	0 .
TOTAL FUEL MASS	96777 .	372212 .	55778 .7
PROPELLANT TANK DRY MASS	95776 .9	37672 .1	11236 .4
OXIDIZER TANK DRY MASS	0 .	0 .	0 .
FUEL TANK DRY MASS	95536 .94	37627 .12	11236 .42
NOV-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0 .	0 .	0 .
OXIDIZER SUBSYSTEMS MASS	0 .	0 .	0 .
FUEL SUBSYSTEMS MASS	5 .	0 .	0 .
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0 .	14367 .0	8238 .4
OXIDIZER SUBSYSTEMS MASS	0 .	0 .	0 .
FUEL SUBSYSTEMS MASS	0 .	14366 .96	8238 .42
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970 .0	910 .0	5300 .0
ENGINE DRY MASS	15500 .0	35000 .0	35000 .0
INTERSTAGE STRUCTURE MASS	16497 .0	9044 .0	5140 .0
RETRO PROPULSION SUBSYSTEM MASS	0 .	0 .	0 .
MIDCOURSE CORRECTION SUBSYSTEM MASS	7564 .7	0 .	9495 .1
ATTITUDE CONTROL SUBSYSTEM MASS	11427 .6	1148 .7	1434 .3
MISCELLANEOUS EXPENDABLES MASS	0 .	0 .	0 .
PAYLOAD	0 .	30980 .0	13250 .0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 530399L

*** INPUT ITEMS ***

INITIAL ENERGY 1.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. TKNSS	INS. MASS	INSUL. MF	TANK MASS	TANK MF
0.71393	498.17	9.18006E-3	4322.1	1.39393E-01
VENT PRESS	COAT MASS	COAT MF	PRES MASS	PRES MF
31.638	0.0	0.0	219.57	4.02318E-03
TOT EFF MAS	TOT EF MF	CF MP MAS	EFF MP MF	MP MASS
8961.6	1.65156E-01	0.0119	1.25540E-02	0.1051
BOILOFF MAS	EF RO MAS	WALL TKNSS	LENGTH	VOLUME
0.0	0.0	0.10753	24.416	13573.
WBOACT(1)	WBOACT(2)	WBOACT(3)	WBOACT(4)	
4.04777E-01	6.26191E-01	0.0	AFACT(4)	
AFACT(1)	AFACT(2)	AFACT(3)	AFACT(4)	
		9.27459E-1		
DFACT	TMAX	TDJ	TDUX	BOMAX
7.48149E-01	0.0	-1.000	0.0	0.0
EPH	N-J PSSM	PROP MASS	TANK AREA	NO OF TNK
1.52602E-01	8280.4	54261.	2791.2	1.0000

THE OLD VALUE OF IMIED IS 2338848.0

 THE NEW VALUE OF IMIED IS 2338280.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S303M9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1298377.	785734.	259572.
TOTAL INITIAL PROPELLANT MASS	964753.1	373931.9	542240.1
TOTAL OXIDIZER MASS	.	0.	0.
TOTAL FUEL MASS	964753.1	373931.9	542240.1
PROPELLANT TANK DRY MASS	964753.2	373931.7	82740.7
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	964753.2	373931.8	82740.72
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14323.9	8213.9
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14323.92	8213.88
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	91100.0	5300.0
ENGINE DRY MASS	105000.0	350000.0	350000.0
INTERSTAGE STRUCTURE MASS	16427.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75103.5	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11360.6	1141.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30981.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S305A9H

*** INPUT ITEMS ***

DESIGN PRESSURE 15.700CC INITIAL ENERGY C.O

**** RESULTS ****

INS. THNESS 17.146	TAS. MASS 13972.	INSUL. MF 2.26111E-C1	TANK MASS 11558.	TANK MF 3.27311E-01
VENT PRESS 76.463	CCAT MASS C.O	CCAT MF 0.C	PRES MASS 560.54	PRES MF 9.07112E-03
TOT EFF MAS 35577.	TOT EF MF 5.75734E-01	FF MF MAS 818.25	EFF MP MF 1.32414E-02	MP MASS 1246.4
POILOFF MAS C.O	EF BC MAS C.O	WALL TKNS 0.24623	LENGTH 29.077	VOLUME 17321.
WFACT(1) C.O	WFACT(2) C.O	WFACT(3) 0.0	WRDFACT(4)	
AFACT(1) 4.06419E-C1	AFACT(2) 1.00070E 00	AFACT(3) 1.26505E 00	AFACT(4)	
TFACT 4.56474E-C1	TMAX C.O	TCU -1.C000	TDUX C.C	BOMAX 0.0
FPTH 5.62453E-C1	N-J PSSH 34759.	PRCP MASS 61794.	TANK AREA 3255.7	NO OF TANK 1.0000

THE OLD VALUE OF IMIEC IS 2455829.C

THE NEW VALUE OF IMIEC IS 2450620.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

SPACECRAFT

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1344637.	812558.	293427.
TOTAL INITIAL PROPELLANT MASS	1011103.6	394271.7	61456.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1011103.56	394271.69	61456.16
PROPELLANT TANK DRY MASS	101110.3	35427.2	34568.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	101110.31	39427.15	34568.63
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14706.2	8533.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14706.20	8533.60
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	79255.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11972.1	1208.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
 S3C6N91

*** INPUT ITEMS ***

INITIAL ENERGY C.C.

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. TKNESS	3.7070	INS. MASS	2713.42	INS JL. MF	4.83378E-02	TANK MASS	6677.6	TANK MF	2.68188E-01
VENT PRESS	48.785	COAT MASS	0.C	COAT MF	0.C	PRES MASS	328.15	PRES MF	5.84608E-03
TOT EFF MAS	15456.	TOT EF MF	2.75262E-01	EF MP MAS	729.13	EFF MP MF	1.29898E-12	MP MASS	1008.4
BOILOFF MAS	0.C	EF HO MAS	0.C	WALL TKNS	0.15839	LENGTH	25.775	VOLUME	14665.
WBDACT(1)	0.C	WBDACT(2)	0.C	WBDACT(3)	0.C	WBDACT(4)			
AFACT(1)	5.14774E-01	AFACT(2)	7.28758E-01	AFACT(3)	1.01992E-06	AFACT(4)			
DFACT	7.23042E-01	TMAX	0.C	TUJ	-1.000	TUUX		HUMAX	
EPTH	2.62372E-01	N-J PSSM	14727.	PROP MASS	55131.	TANK AREA	2927.7	NO JF TNK	1.000

THE OLD VALUE OF LMIED IS 2367915.

 THE NEW VALUE OF LMIED IS 2365739.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
330091			
TOTAL INITIAL STAGE MASS	13 050.1	705713.	207847.
TOTAL INITIAL PROPELLANT MASS	0.7	3719	55989.5
TOTAL OXIDIZER MASS	.	.	0.
TOTAL FUEL MASS	0.70 00.4	370003.62	55998.53
PROPELLANT TANK DRY MASS	375 0.2	3740 .2	14689.8
OXIDIZER TANK DRY MASS	.	0.	0.
FUEL TANK DRY MASS	975 0.12	3780 .25	14689.83
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.	0.	0.
OXIDIZER SUBSYSTEMS MASS	.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14417.4	8299.0
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14417.35	8299.86
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	107 .0	310 .0	5300.0
ENGINE DRY MASS	1 50 0.0	3500 .	35000.0
INTERSTAGE STRUCTURE MASS	10427.0	3144.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	70144.4	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	115 0.5	1.57.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	.	0.	0.
PAYLOAD	0.	3090 .0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S356NOL

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7000C

INITIAL ENERGY C.C.

**** RESULTS ****

INS. TKNESS	0.95121	INS. MASS	680.86	INSJL. MF	1.23688E-02	TANK MASS	5601.6	TANK MF	1.80745E-01
VENT PRESS	42.059	COAT MASS	0.C	COAT MF	0.C	PRES MASS	281.92	PRES MF	5.12154E-03
TOT EFF MAS	11633.	TOT EF MF	2.11323E-01	EF MP MAS	709.42	EFF MP MF	1.28876E-02	MP MASS	962.11
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	(.13805	LENGTH	25.132	VOLUME	14149.
WBFACT(1)	0.0	WBFACT(2)	0.0	WBFACT(3)	0.C	WBFACT(4)			
AFACT(1)	4.52033E-01	AFACT(2)	5.70255E-01	AFACT(3)	9.67180E-01	AFACT(4)			
DFACT	7.37363E-01	TMAX	C.C	TDJ	-1.7500	TDOX	0.0	ROMAX	0.0
EPTH	1.98435E-01	N-J PSSM	10923.	PROP MASS	56047.	TANK AREA	2963.1	NO OF TNK	1.0000

THE OLD VALUE OF LMED IS 2351101.0

THE NEW VALUE OF LMED IS 2347568.0

SPACESHIP
MASS SUMMARY (lb_m)

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1359539.	818668.	202451.
TOTAL INITIAL PROPELLANT MASS	1023513.1	399717.0	63393.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1023513.04	399717.00	63393.22
PROPELLANT TANK DRY MASS	102351.2	39971.7	41611.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	102351.25	39971.68	41611.27
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14808.7	8617.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14808.68	8617.51
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISGUIDANCE CORRECTION SUBSYSTEM MASS	80342.6	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12136.4	1227.0	1434.2
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	109800.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S332AKOH

*** INPUT ITEMS ***

DESIGN PRESSURE 15.7000 INITIAL ENERGY C.C.

***** RESULTS *****

INS. THICKNESS	21.092	TNS. MASS	17027.	INSUL. WF	2.79002E-01	TANK MASS	134CF.	TANK MF	3
VEHT PRESS	85.223	CRAT MASS	0.0	CRAT WF	0.0	PRES MASS	645.81	PRES MF	1
TOT EFF MAS	42788.	TOT FE WF	6.60656E-01	EF MF MAS	847.04	EFF MP MF	1.22564E-02	MF MASS	1334.4
POILOFF MAS	C.C	FF PC MAS	C.C	WALL TKMS	C.27E25	(FNCTH	9C.257	VOLUME	18303.
WFOACT(1)	C.C	WFOACT(2)	C.C	WFOACT(3)	C.C	WFOACT(4)			
AFOACT(1)	0.01560E-01	AFOACT(2)	1.00042E-00	AFOACT(3)	1.34502E 00	AFOACT(4)			
DFACT	6.347E0E-01	TMAX	9.C	TBU	-1.0000	TBUX	C.C	BCMAX	0.0
FOFH	6.56100E-01	N-J PRESS	41042.	PRCP MASS	43956.	TANK AREA	1382.4	NO CF TAK	1.0000

THE OLD VALUE OF IMFF IS 2499499.C

THE NEW VALUE OF IMFF IS 2480697.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lbm)

	STAGE 1	STAGE 2	STAGE 3
570594			
TOTAL INITIAL STAGE MASS	1259539.	818668.	302451.
TOTAL INITIAL PROPELLANT MASS	1023513.1	359717.0	63393.2
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	1023513.06	359717.00	63393.22
PROPELLANT TANK DRY MASS	102351.2	35971.7	41611.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	102351.25	35971.68	41611.27
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14808.7	8617.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14808.68	8617.51
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MISCOURSE CORRECTION SUBSYSTEM MASS	80342.6	0.0	5495.0
ATTITUDE CONTROL SUBSYSTEM MASS	12136.4	1227.0	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
530991

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

***** RESULTS *****

INS. THNESS	4.1141	INS. MASS	3164.6	INSUL. MF	5.43009E-02	TANK MASS	9465.5	TANK MF	2.5911
VENT PRESS	60.806	COAT MASS	0.0	COAT MF	0.0	PRES MASS	411.32	PRES MF	7.1240E-03
TOT EFF MAS	19092.	TOT EF MF	3.33932E-11	E= MP MAS	761.90	EFF MP MF	1.33255E-02	MP MASS	1.773.
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.19476	LENGTH	26.678	VOLUME	15392
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	0.0	WBOACT(4)			
AFACT(1)	5.73168E-01	AFACT(2)	7.83256E-11	AFACT(3)	1.06900E 00	AFACT(4)			
DFACT	7.09714E-01	TMAX	0.0	TOJ	-1.0000	TDUX	1.0	ROMAX	0.0
EPTH	3.20606E-01	N-J PSSM	18331.	PROP MASS	57175.	TANK AREA	3018.5	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 238421.444

THE NEW VALUE OF IMIED IS 2381080.0

MASS SUMMARY (lb_m)

S309N91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	31113.0	7984.0	27247.0
TOTAL INITIAL PROPELLANT MASS	32214.1	3811.1	50972.0
TOTAL OXIDIZER MASS	.	.	.
TOTAL FUEL MASS	3241.0	3811.1	5577.0
PROPELLANT TANK DRY MASS	41.1	3811.1	1875.0
OXIDIZER TANK DRY MASS	.	.	.
FUEL TANK DRY MASS	3241.1	3816.1	19265.5
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.	.	.
OXIDIZER SUBSYSTEMS MASS	.	.	.
FUEL SUBSYSTEMS MASS	.	.	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	14469.6	14469.6	3263.7
OXIDIZER SUBSYSTEMS MASS	.	.	0.0
FUEL SUBSYSTEMS MASS	.	14469.6	3263.73
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197.0	91.0	530.0
ENGINE DRY MASS	16500.0	2510.0	35000.0
INTERSTAGE STRUCTURE MASS	1497.0	904.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	.	.	.
MIDCOURSE CORRECTION SUBSYSTEM MASS	7674.0	.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11552.3	1165.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	.	.	0.0
PAYLOAD	.	32981.0	132500.0

THEMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S3C9N9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 7.0

**** RESULTS ****

INS. TKNESS	1.0525	INS. MASS	775.25	INSUL. MF	1.38526E-02	TANK MASS	7372.6	TANK MF	2.3054
VENT PRESS	54.056	COAT MASS	0.0	COAT MF	0.0	PRES MASS	359.71	PRES MF	5.62751E-
TOT EFF MAS	14778.	TOT EF MF	2.64058E-01	EF MP MAS	740.87	EFF MP MF	1.32383E-02	MP MASS	1021.7
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	.17378	LENGTH	25.959	VOLUME	1.814.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	0.0	WBOACT(4)			
AFACT(1)	5.05543E-01	AFACT(2)	7.20150E-01	AFACT(3)	1.01210E-01	AFACT(4)			
DEFACT	7.25150E-01	TMAX	0.0	TBJ	-1.0000	TBOUX	0.0	INIMAX	0.0
DEPTH	2.50820E-01	N-J PSSM	14937.	PROP MASS	55964.	TANK AREA	2946.2	NJ JF TNK	1.0

THE OLD VALUE OF IMIFO IS 2365416.

THE NEW VALUE OF IMIFO IS 2362843.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309N9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	137114.6	79472.4	66974.
TOTAL INITIAL PROPELLANT MASS	97487.4	378179.2	55797.4
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	97487.4	378179.10	55797.45
PROPELLANT TANK DRY MASS	97487.7	378179.9	13965.1
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	97487.69	378179.91	13965.11
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14417.5	8312.6
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14417.53	8312.63
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19720.0	9100.0	5300.0
ENGINE DRY MASS	10550.0	35100.0	15000.0
INTERSTAGE STRUCTURE MASS	16007.0	9144.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	7600.0	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11400.0	1150.0	1434.0
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30500.0	132500.0

HEAT PROTECTION SYSTEM OPTIMIZATION RESULTS
S306C3H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKVESS	13.131	INS. MASS	17426.	INSJL. MF	1.74875E-11	TANK MASS	10.975.	TANK MF	3.22159E-01
VENT PRESS	75.073	COAT MASS	0.0	COAT MF	0.0	PRES MASS	531.39	PRES MF	8.89266E-03
TOT EFF MAS	30969.	TOT EF MF	5.19474E-01	EF MP MAS	807.39	EFF MP MF	1.35429E-02	MP MASS	1186.3
BOILOFF MAS	0.0	EF 80 MAS	0.0	WALL TKNS	0.23999	LENGTH	28.242	VOLUME	16550.
WBOACT(1)	3027.3	WBOACT(2)	0.0	WBCACT(3)	0.0	WRJACT(4)			
AFACT(1)	7.00649E-01	AFACT(2)	9.02077E-01	AFACT(3)	1.17615E-01	AFACT(4)			
DFACT	6.80616E-01	TMAX	139.97	TDJ	36.045	TDUX	47.701	NUMAX	12163.
EPH	5.05931E-01	N-J PSSM	30152.	PRCP MASS	59617.	TANK AREA	7175.7	NO OF TNK	1.00000

THE OLD VALUE OF IMIED IS 2421965.0

THE NEW VALUE OF IMIED IS 2433407.0

MASS SUMMARY (lb_m)

S3C6C9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	13301.3	850061.	282240.
TOTAL INITIAL PROPELLANT MASS	1524.16	391154.9	51245.6
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	1774.16	391154.9	51245.6
PROPELLANT TANK DRY MASS	1774.16	391154.9	51245.6
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	1774.16	391154.9	51245.6
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14647.7	8494.8
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14647.7	3494.75
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	137.	91.0	530.0
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	78522.8	0.	3495.0
ATTITUDE CONTROL SUBSYSTEM MASS	1176.1	1100.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	3098.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306C9I

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	2.9482	INS. MASS	2155.2	INSUL. MF	3.85248E-02	TANK MASS	6733.1	TANK MF	2.10618E-01
VENT PRESS	49.344	COAT MASS	0.0	COAT MF	C.0	PRES MASS	330.46	PRES MF	5.90700E-03
TOT EFF MAS	14998.	TOT EF MF	2.68093E-01	EF MP MAS	729.70	EFF MP MF	1.30433E-02	MP MASS	1005.8
BOILOFF MAS	0.0	EF 80 MAS	0.0	WALL TKNS	0.15990	LENGTH	25.739	VOLUME	14637.
WBDACT(1)	386.33	WBDACT(2)	0.0	WBDACT(3)	0.0	WBDACT(4)			
AFACT(1)	5.04188E-01	AFACT(2)	7.18887E-01	AFACT(3)	1.01102E 00	AFACT(4)			
DFACT	7.25459E-01	TMAX	153.98	TDU	55.048	TDUX	62.226	ROMAX	7157.4
EPTH	2.55050E-01	M-J PSSM	14269.	PRDP MASS	55944.	TANK AREA	2924.1	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2365048.0

THE NEW VALUE OF IMIED IS 2363867.0

MASS SUMMARY (lb_m)

S306C91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1301654.	794933.	267284.
TOTAL INITIAL PROPELLANT MASS	975310.9	378565.1	55867.3
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	975310.87	378565.06	55867.27
PROPELLANT TANK DRY MASS	97531.0	37856.5	14249.0
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97531.00	37856.49	14248.95
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14411.0	8298.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14411.02	8298.46
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76118.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11498.3	1156.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S30203H

*** INPUT ITEMS ***

INITIAL ENERGY 01

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. THNESS	13.125	INS. MASS	10414.	INSUL. MF	1.74893E-01	TANK MASS	10900.	TANK MF	2.22690E-01
VENT PRESS	75.177	COAT MASS	0.0	COAT MF	0.	PRES MASS	530.5	PRES MF	5.97933E-03
TOT EFF MAS	30966.	TOT EF MF	5.2052E-01	LT MP MAS	0.7002	EFF MP MF	1.35011E-02	MP MASS	1184.8
BOILOFF MAS	0.0	EF RO MAS	0.	WALL TKNS	1.24124	LENGTH	20.222	VOLUME	16634.
WBOACT(1)	6824.2	WBOACT(2)	0.0	WBOACT(3)	0.	WBOACT(4)	0.		
AFACT(1)	6.96778E-01	AFACT(2)	8.98594E-01	AFACT(3)	1.1730E-01	AFACT(4)	0.		
DFACT	6.81453E-01	TMAX	139.95	TUJ	35.007	TUOX	43.650	HUMAX	12153.
EPFH	5.06492E-01	N-J PSSH	30159.	PJ P MASS	59944.	TANK AREA	3173.8	NO OF TANK	1.000

THE OLD VALUE OF IMIED IS 2420834.

THE NEW VALUE OF IMIED IS 7433574.0

MASS SUMMARY (lbm)

S300C9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	13301.00	31610.00	13229.00
TOTAL INITIAL PROPELLANT MASS	1567.00	36118.00	6355.00
TOTAL OXIDIZER MASS	.	.	.
TOTAL FUEL MASS	1567.00	39118.00	6355.00
PROPELLANT TANK DRY MASS	1567.00	39118.00	6355.00
OXIDIZER TANK DRY MASS	.	.	.
FUEL TANK DRY MASS	1567.00	39118.00	6355.00
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.	.	.
OXIDIZER SUBSYSTEMS MASS	.	.	.
FUEL SUBSYSTEMS MASS	.	.	.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	.	14643.30	4455.00
OXIDIZER SUBSYSTEMS MASS	.	.	.
FUEL SUBSYSTEMS MASS	.	14643.29	4455.00
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.00	6100.00	5000.00
ENGINE DRY MASS	1750.00	3500.00	3500.00
INTERSTAGE STRUCTURE MASS	190.00	600.00	500.00
RETRO PROPULSION SUBSYSTEM MASS	.	.	.
MIDCOURSE CORRECTION SUBSYSTEM MASS	7300.00	.	2495.00
ATTITUDE CONTROL SUBSYSTEM MASS	1179.00	1190.00	1434.00
MISCELLANEOUS EXPENDABLES MASS	.	.	.
PAYLOAD	.	3930.00	13250.00

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309C9I

*** INPUT ITEMS ***

INITIAL ENERGY C.O

DESIGN PRESSURE 19.7000C

**** RESULTS ****

INS. TKNESS	2.9475	INS. MASS	2154.2	INSUL. MF	3.85161E-02	TANK MASS	6725.3	TANK MF	2.10425E-01
VENT PRESS	49.297	COAT MASS	0.0	COAT MF	0.0	PRES MASS	330.09	PRES MF	5.93177E-03
TOT EFF MAS	14983.	TOT EF MF	2.67887E-01	EF MP MAS	729.53	EFF MP MF	1.30435E-02	MP MASS	1005.4
BOILOFF MAS	0.0	EF BO MAS	0.0	WALL TKNS	0.15975	LENGTH	25.732	VOLUME	14632.
WBDFACT(1)	2719.6	WBDFACT(2)	0.0	WBDFACT(3)	0.0	WBDFACT(4)			
AFACT(1)	5.03421E-01	AFACT(2)	7.18172E-01	AFACT(3)	1.01037E 00	AFACT(4)			
DFACT	7.25633E-01	TMAX	154.01	TDJ	55.097	TDUX	62.273	80MAX	7148.3
EPTH	2.54843E-01	N-J PSSM	14254.	PROP MASS	55931.	TANK AREA	2923.5	NO OF TNK	1.000C

THE OLD VALUE OF IMIED IS 2364841.0

THE NEW VALUE OF IMIED IS 2363816.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S3C9C9I

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1301629.	794922.	267268.
TOTAL INITIAL PROPELLANT MASS	975289.3	378555.5	55863.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	975289.31	378555.50	55863.84
PROPELLANT TANK DRØ MASS	97528.9	37855.5	14236.5
OXIDIZER TANK DRØ MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97528.87	37855.54	14236.52
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14410.8	8298.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14410.84	8298.17
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76116.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11498.0	1156.4	1436.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S3C9C9L

*** INDJIT ITEMS ***

DESIGN PRESSURE	19.74000	INITIAL ENERGY	C.O
**** RESULTS ****			
INS. THICKNESS	0.75037	INS. MASS	544.91
VENT PRESS	49.537	COAT MASS	C.O
TOT EFF MAS	11843.	TOT FF MF	2.15094E-01
ROILOFF MAS	C.O	FF BO MAS	C.O
WROACT(1)	1948.7	WROACT(2)	C.O
AFACT(1)	4.52698E-01	AFACT(2)	6.70875E-01
DEACT	7.37212E-01	TMAX	158.42
FOTH	2.02150E-01	N-J PSSM	11130.
		INSUL. MF	9.89536E-03
		COAT MF	0.0
		FF MP MAS	712.8C
		WALL TKNS	0.14235
		WROACT(3)	0.0
		AFACT(3)	9.67740E-01
		TDU	61.624
		PROP MASS	55357.
		TANK MASS	5882.5
		PRES MASS	290.63
		EFF MP MF	1.29466E-02
		LENGTH	25.199
		WROACT(4)	
		AFACT(4)	
		TDUX	68.576
		TANK AREA	2869.8
		VOLUME	14202.
		BOMAX	6170.7
		NO OF TNK	1.0000
		TANK MF	1.86976E-01
		PRES MF	5.27880E-03
		MP MASS	966.89

THE OLD VALUE OF IMFD IS 2351277.0

THE NEW VALUE OF IMFD IS 2350502.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

STAGE 3

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1295032.	792217.	263255.
TOTAL INITIAL PROPELLANT MASS	969795.7	376144.8	55006.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	969795.69	376144.81	55006.51
PROPELLANT TANK DRY MASS	96979.5	37614.5	11119.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96979.50	37614.46	11119.55
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14365.5	8260.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14365.52	8260.00
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
OFF-ORBIT STATION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75635.4	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11425.3	1148.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
GRAVITY	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303V9H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

**** RESULTS ****

DESIGN PRESSURE 19.70000

INS. TRNESS	10.631	INS. MASS	8226.2	INSUL. MF	1.22266E-01	TANK MASS	2817.1	TANK MF	7.32741E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	156.68	PRES MF	2.32892E-03
TOT EFF MAS	27030.	TOT EF MF	4.01755E-01	EF MP MAS	785.68	EFF MP MF	1.16776E-02	MP MASS	1128.4
BOILOFF MAS	11561.	EF 80 MAS	12932.	WALL TKNS	0.63207E-01	LENGTH	27.440	VOLUME	16005.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	11561.	WBOACT(4)			
AFACT(1)	6.32153E-01	AFACT(2)	8.38208E-01	AFACT(3)	1.11858E 00	AFACT(4)			
DFACT	6.96251E-01	TMAX	0.0	TDU	152.46	TDUX	0.0	BOMAX	0.0
EPH	1.97869E-01	N-J PSSM	13313.	PROP MASS	67281.	TANK AREA	3095.1	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2401289.0

THE NEW VALUE OF IMIED IS 2399248.0

MASS SUMMARY (lb_m)

S303V9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1319183.	802121.	277946.
TOTAL INITIAL PROPELLANT MASS	989907.9	384970.6	67330.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	989907.94	384970.56	67330.69
PROPELLANT TANK DRY MASS	98990.7	38497.0	13322.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	98990.75	38497.04	13322.64
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14531.4	8423.3
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14531.45	8423.28
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	77397.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11691.5	1177.8	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
5333V91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 1.0

**** RESULTS ****

INS. TKNESS	2.4928	INS. MASS	1765.8	INSJL. W	3.01927E-2	TANK MASS	2477.6	TANK MF	7.41394E-22
VEVT PRESS	14.700	COAT MASS	2.0	COAT MF	0.0	PRES MASS	135.77	PRES MF	2.92164E-23
TJT EFF MAS	11461.	TOT FF MF	1.95902E-01	EFF MP MAS	667.63	EFF MP MF	1.10312E-12	AP. MASS	943.83
BOILOFF MAS	4755.9	EF BO MAS	4526.3	WALL TKNS	6.7222E-01	LENGTH	64.827	VOLUME	12912.
WBOACT(1)	C.O	WBOACT(2)	0.0	WBOACT(3)	4755.9	WBOACT(4)			
AFACT(1)	4.33616E-01	AFACT(2)	6.53082E-01	AFACT(3)	9.51699E-01	AFACT(4)			
DFACT	7.41566E-01	TMAX	C.O	TUJ	274.29	TUOX		3. MAX	
EPTH	1.06654E-01	N-J PSSM	5237.3	PROP MASS	56481.	TANK AREA	2032.4	WT OF TANK	1.00 J

THE OLD VALUE OF IMIFO IS 2346293.0

THE NEW VALUE OF IMIFO IS 2345746.0



MASS SUMMARY (lb_m)

S303V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	179757.	791251.	461427.
TOTAL INITIAL PROPELLANT MASS	327477.3	375283.7	58487.7
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	907933.31	375283.69	58487.73
PROPELLANT TANK DRY MASS	94703.2	37528.4	6237.2
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	66793.25	37528.35	6237.22
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14340.3	3234.8
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14349.22	8234.82
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	177000.	01000.	53000.
ENGINE DRY MASS	175377.0	350000.	350000.
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75463.4	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11350.2	1145.9	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PROV. MAI	0.	30980.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S3C3V9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7C000 INITIAL ENERGY C.C

**** RESULTS ****

INS. TKNESS 0.65320	INS. MASS 454.17	INSUL. MF 8.00665E-03	TANK MASS 2410.4	TANK MF 7.43655E-02
VENT PRESS 14.70C	COAT MASS C.C	COAT MF 0.C	PRES MASS 131.60	PRES MF 2.32001E-03
TOT EFF MAS 86C5.6	TOT EF MF 1.51711E-01	EF MP MAS 678.4C	EFF MP MF 1.19598E-02	MP MASS 903.36
BOILOFF MAS 34C5.6	EF BO MAS 3123.2	WALL TKNS C.6G187E-01	LENGTH 24.317	VOLUME 13494.
WBOACT(1) 0.C	WBOACT(2) 0.0	WBOACT(3) 3405.6	WBOACT(4)	
AFACT(1) 3.92392E-01	AFACT(2) 6.14642E-01	AFACT(3) 9.17049E-01	AFACT(4)	
DFACT 7.5C975E-01	TMAX 0.C	TDJ 32C.99	TDUX C.0	BO MAX 3.3
EPTH 8.46921E-02	N-J PSSM 4804.0	PROP MASS 56724.	TANK AREA 2781.2	NO OF TNK 1.0000

THE OLD VALUE OF IMIED IS 2335695.C

THE NEW VALUE OF IMIED IS 2335016.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S303V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1287358.	789071.	258588.
TOTAL INITIAL PROPELLANT MASS	963406.4	373341.0	56718.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	963406.37	373341.00	56718.39
PROPELLANT TANK DRY MASS	96340.6	37334.1	4803.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96340.56	37334.09	4803.60
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14312.8	8197.3
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14312.81	8197.28
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19730.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75075.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11340.7	1139.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
***** RESULTS *****			
INS. THNESS	10.276	INS. MASS	8337.1
VENT PRESS	14.700	COAT MF	0.0
TOT EFF MAS	33053.	TOT EF MF	4.56987E-01
		INSUL. MF	1.15268E-01
		EF MP MAS	848.24
BOILOFF MAS	16138.	EF 80 MAS	18423.
WBOACT(1)	458.94	WBOACT(2)	7.6250
AFACT(1)	6.75961E-01	AFACT(2)	8.79057E-01
DFACT	6.86251E-01	TMAX	0.0
EPIN	1.90539E-01	N-J PSSM	13781.
		WALL TRNS	0.64508E-01
		WBOACT(3)	15671.
		AFACT(3)	1.15540E 00
		TDU	56.788
		PROP MASS	72328.
		TANK MASS	3014.5
		PRES MASS	168.78
		EFF MP MF	1.17277E-02
		LENGTH	28.933
		WBOACT(4)	
		AFACT(4)	
		IDUX	0.0
		TANK AREA	3245.2
		BOMAX	0.0
		NO OF TNK	1.0000
		TANK MF	7.29377E-C2
		PHES MF	2.33348E-C3
		MP MASS	1236.0
		VOLUME	17206.

THE OLD VALUE OF IMIED IS 2414403.0

THE NEW VALUE OF IMIED IS 2415283.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S306Y9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1326903.	805282.	283100.
TOTAL INITIAL PROPELLANT MASS	996335.5	387788.2	71990.1
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	996335.50	387788.19	71990.06
PROPELLANT TANK DRY MASS	99633.5	38778.8	13716.9
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	99633.50	38778.80	13716.91
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14584.4	8524.3
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14584.41	8524.27
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	77961.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11776.6	1187.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S375V31

*** INPUT ITEMS ***

INITIAL ENERGY 1.0

***** RESULTS *****

DESIGN PRESSURE 19.7000

INS. THICKNESS	2.7413	INS. MASS	1039.5	INSUL. MF	3.27621E-2	TANK MASS	2557.7	TANK WF	7.39352E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	14.74	PRES WF	2.32351E-03
TOT EFF MAS	13899.	TOT EF MF	2.270466E-1	EFF MP MAS	723.74	EFF MP MF	1.35445E-2	EFF MASS	985.41
BJILOFF MAS	6723.1	EF RO MAS	6574.3	WALL TRIS	6.1347E-1	LEIGHT	25.445	VOLUME	144.19.
MBFACT(1)	0.0	MBFACT(2)	0.0	MFACT(2)	6723.1	MFACT(4)			
AFACT(1)	4.64748E-01	AFACT(2)	6.02111E-01	AFACT(3)	6.77860E-01	AFACT(4)			
DFACT	7.34461E-01	TMAX	0.0	TUJ	128.70	TMAX	0.1	MAX	0.5
EPH	1.08981E-01	N-J PSSM	5621.2	PJOB MASS	572.	TANK AREA	2.096.6	VT OF TANK	1.00

THE OLD VALUE OF IMIED IS 2354467.0

THE NEW VALUE OF IMIED IS 2354047.0

MASS SUMMARY (lb_m)

S306V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1296748.	792937.	264324.
TOTAL INITIAL PROPELLANT MASS	971255.4	376796.7	61573.6
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	371956.44	376785.69	61573.64
PROPELLANT TANK DRY MASS	971255.7	376794.7	6111.4
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	97125.75	37679.65	6111.36
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14377.6	3279.4
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14377.59	8279.44
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19750.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16457.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75763.6	0.	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11444.7	1150.5	1436.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	3030.0	13750.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306V9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY C.0

**** RESULTS ****

INS. TKNESS	0.71351	INS. MASS	5C6.12	INSUL. MF	8.63508E-03	TANK MASS	2482.6	TANK MF	7.41227E-02
VENT PRESS	14.700	COAT MASS	C.C	COAT MF	0.0	PRES MASS	136.08	PRES MF	2.32176E-03
TOT EFF MAS	10597.	TOT EF MF	1.80790E-C1	EF MP MAS	702.81	EFF MP MF	1.19910E-02	MP MASS	943.63
BOILOFF MAS	5221.3	EF BO MAS	4907.0	WALL TKNS	0.60761E-01	LENGTH	24.876	VOLUME	13943.
WBOACT(1)	0.0	WBOACT(2)	0.0	WBOACT(3)	5221.3	WBOACT(4)			
AFACT(1)	4.1944CE-C1	AFACT(2)	6.39863E-C1	AFACT(3)	9.39784E-01	AFACT(4)			
DFACT	7.44802E-01	TMAX	C.C	TDU	233.94	TDUX	C.C	BOMAX	0.0
EPTH	8.50794E-C2	N-J PSSM	4986.7	PROP MASS	58612.	TANK AREA	2837.3	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2342612.0

THE NEW VALUE OF IMIED IS 2342026.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (1b_{TP})

S306V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1290832.	790495.	260701.
TOTAL INITIAL PROPELLANT MASS	966298.6	374610.1	58607.7
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	966298.56	374610.12	58607.74
PROPELLANT TANK DRY MASS	96629.8	37461.0	4986.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96629.81	37461.00	4986.31
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14336.7	8237.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14336.67	8237.55
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105300.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16437.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75328.9	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11379.0	1143.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309V9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS	10.865	INS. MASS	9093.6	INSUL. MF	1.19996E-01	TANK MASS	3150.8	TANK MF	7.27591E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	176.98	PRES MF	2.33530E-03
TOT EFF MAS	36830.	TOT EF MF	4.85998E-01	EF MP MAS	889.75	EFF MP MF	1.17408E-02	MP MASS	1309.7
BOILOFF MAS	19512.	EF BO MAS	21156.	WALL TKNS	0.65355E-01	LENGTH	29.955	VOLUME	18027.
WBOACT(1)	3966.6	WBOACT(2)	7.5391	WBOACT(3)	15537.	WBOACT(4)			
AFACT(1)	7.06198E-01	AFACT(2)	9.07251E-01	AFACT(3)	1.18081E 00	AFACT(4)			
DFACT	6.79350E-01	TMAX	0.0	TDU	61.907	TDUX	0.0	BOMAX	0.0
EPFH	1.95090E-01	N-J PSSM	14784.	PROP MASS	75783.	TANK AREA	3347.9	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2423682.0

THE NEW VALUE OF IMIED IS 2423508.0

MASS SUMMARY (1b_m)

S309V9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1329238.	806241.	288031.
TOTAL INITIAL PROPELLANT MASS	998280.9	388642.0	75774.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	998280.87	388642.00	75774.94
PROPELLANT TANK DRY MASS	99828.0	38864.2	14782.9
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	99828.00	38864.18	14782.93
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14600.5	8603.6
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14600.47	8603.57
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	78131.5	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11802.4	1190.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
539971

*** INPUT ITEMS ***

INITIAL ENERGY

DESIGN PRESSURE 19.7000

***** RESULTS *****

INS. TKNSS	2.9437	INS. MASS	2178.5	INSUL. WT	2.4729E-01	TANK MASS	1641.3	TANK MF	7.3558E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	145.02	PRES MF	7.3256E-03
TOT EFF MAS	16449.	TOT EF ME	2.6716E-01	CF MA MAC	7.2.6	EFF MP MF	1.1959E-02	MP MASS	1031.7
BUILOFF MAS	8788.7	EF BO MAS	7742.4	WALL TKMS	1.5195E-01	LEWGT1	26.100	VOLUME	14926.
WBFACT(1)	0.0	WBFACT(2)	0.0	WBFACT(3)	0.798.7	WBFACT(4)			
AFACT(1)	4.85766E-01	AFACT(2)	7.0173E-01	AFACT(3)	9.0553E-01	AFACT(4)			
DFACT	7.29663E-01	TMAX	6.1	TJJ	0.441	TDIR	1.0	RUMAX	0.0
EPH	1.010716E-01	N-J PSSM	5844.7	U-JP MASS	1.2744.	TANK AREA	2.960.2	NJ OF TANK	1.0000.

THE OLD VALUE OF IMIED IS 236.27

THE NEW VALUE OF IMIED IS 2362624.0

MASS SUMMARY (lb_m)

S309V91

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	13 1337.	79468 .	256289.
TOTAL INITIAL PROPELLANT MASS	372757.1	378339.6	52764.1
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	372757.12	378339.56	52764.14
PROPELLANT TANK DRY MASS	37479.6	37833.9	5349.1
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	37479.62	37833.94	5348.96
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14416.8	8326.1
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14416.78	8326.05
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19707.4	9101.0	5300.1
ENGINE DRY MASS	10500.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	15497.0	9544.0	5140.1
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75773.7	0.	9405.1
ATTITUDE CONTR'L SUBSYSTEM MASS	11411.5	1155.7	1424.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	30981.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309V9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS 0.76559	INS. MASS 553.82	INSUL. MF 9.15358E-03	TANK MASS 2555.1	TANK MF 7.39027E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 140.58	PRES MF 2.32345E-03
TOT EFF MAS 12667.	TOT EF MF 2.09356E-C1	EF MP MAS 726.87	EFF MP MF 1.20137E-02	MP MASS 983.94
BOILOFF MAS 7040.7	EF 80 MAS 6774.1	WALL TKNS 0.61320E-01	LENGTH 25.435	VOLUME 14393.
WRDACT(1) 0.0	WRDACT(2) 0.0	WRDACT(3) 7040.7	WRDACT(4) 0.0	
AFACT(1) 4.46040E-C1	AFACT(2) 6.64666E-01	AFACT(3) 9.62142E-01	AFACT(4) 0.0	
DFACT 7.38730E-01	TMAX 0.0	TDU 144.53	TANK AREA 2893.6	BOMAX 0.0
EPTH 8.53797E-02	N-J PSSM 5165.7	PROP MASS 60503.	TANK AREA 2893.6	NO OF TANK 1.0000

THE OLD VALUE OF IMIEO IS 2349528.0

THE NEW VALUE OF IMIEO IS 2349032.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309V9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1294304.	791918.	262812.
TOTAL INITIAL PROPELLANT MASS	969189.1	375878.6	60499.8
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	969189.12	375878.62	60499.80
PROPELLANT TANK DRY MASS	96918.9	37587.8	5165.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96918.87	37587.85	5165.45
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14360.5	8277.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14360.52	8277.89
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75582.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11417.3	1147.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
530619H

*** INPUT ITEMS ***

INITIAL ENERGY 0.1

***** RESULTS *****

DESIGN PRESSURE 19.7000C

INS. TKNESS	9.1762	INS. MASS	7242.7	INSUL. MF	1.14409E-1	TANK MASS	2998.5	TANK MF	7.31235E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	161.65	PRES MF	2.33034E-03
TOT EFF MAS	28978.	TOT EF MF	4.17734E-1	CF MP MAS	811.96	EFF MP MF	1.17150E-12	MP MASS	1173.1
BOILOFF MAS	13843.	EF BO MAS	15689.	WALL TKNS	5.63755E-1	LENGTH	25.157	VOLUME	1657.2.
WBJACT(1)	3763.3	WBJACT(2)	0.0	WBJACT(3)	13843.	WBJACT(4)			
AFACT(1)	6.49748E-01	AFACT(2)	8.54514E-01	AFACT(3)	1.13337E-01	AFACT(4)			
DFACT	6.92239E-01	TMAX	490.89	TUJ	35.309	TDOX	1.0	BO MAX	0.0
EPH	1.79869E-01	N-J PSSM	12477.	DRIP MASS	69369.	TANK AREA	3157.2	NO OF TNK	1.0000

THE OLD VALUE OF IMED IS 2406511.0

THE NEW VALUE OF IMED IS 2403519.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S306T9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1321290.	302988.	279233.
TOTAL INITIAL PROPELLANT MASS	391633.7	385743.7	69411.4
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	991669.75	385743.69	69411.37
PROPELLANT TANK DRY MASS	59111.9	38574.4	12484.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	531857.94	38574.35	12484.5
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14546.0	3447.7
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14545.98	3447.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1475.0	910.0	5300.0
ENGINE DRY MASS	145000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	14400.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	77552.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	13714.0	1100.0	1434.2
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30580.0	132800.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
SECTION

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	9.1762	INS. MASS	7242.7	INSUL. MF	1.04409E-1	TANK MASS	2998.5	TANK MF	7.31230E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	161.65	PRES MF	2.33334E-03
TOT EFF MAS	28978.	TOT EF MF	4.17734E-01	EF MP MAS	811.96	EFF MP MF	1.17650E-02	MP MASS	1173.0
BOILOFF MAS	13843.	EF RO MAS	15589.	WALL TKNS	0.63755E-01	LENGTH	28.157	VOLUME	16502.
WBDACT(1)	8328.4	WBDACT(2)	0.0	WBDACT(3)	13843.	WBDACT(4)			
AFACT(1)	6.49748E-01	AFACT(2)	8.54614E-01	AFACT(3)	1.13337E-1	AFACT(4)			
DFACT	6.92235E-01	TMAX	490.88	TDJ	35.307	IDUX	0.0	80MAX	0.0
EPTH	1.79863E-01	N-J PSSM	12477.	PROP MASS	69369.	TANK AREA	3157.2	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2406511.C

THE NEW VALUE OF IMIED IS 2403519.0



GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S3C9T9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1321296.	802998.	279233.
TOTAL INITIAL PROPELLANT MASS	991559.7	395743.7	69411.4
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	991559.75	395743.7	69411.4
PROPELLANT TANK DRY MASS	691559.9	395743.7	12494.5
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	691559.9	395743.7	12484.5
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14545.0	9467.7
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14545.0	9467.68
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197.0	9171.0	5377.1
ENGINE DRY MASS	1500.0	3500.0	3500.0
INTERSTAGE STRUCTURE MASS	164.7	6044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	77652.2	0.	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11714.9	110.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	195.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S3C3P9H

*** INPUT ITEMS ***

INITIAL ENERGY 1.0

***** RESULTS *****

DESIGN PRESSURE 19.7000

INS. TKNESS	6.3750	INS. MASS	4662.0	INS J/L MF	7.57236E-02	TANK MASS	2595.9	TANK MF	7.37885E-02
VENT PRESS	14.700	COAT MASS	3.0	COAT MF	0.0	PRES MASS	143.11	PRES MF	2.32457E-03
TOT EFF MAS	17124.	TOT EF MF	2.78145E-01	EF MP MAS	730.33	EFF MP MF	1.18627E-02	MP MASS	1006.6
BOILOFF MAS	6971.4	EF BO MAS	7045.9	WALL TKNS	61628E-01	LENGTH	25.749	VOLUME	14645.
MBJACT(1)	0.0	MBJACT(2)	3.0	WRJACT(3)	6971.4	MBJACT(4)			
AFACT(1)	5.03805E-01	AFACT(2)	7.18536E-01	AFACT(3)	1.0107E 01	AFACT(4)			
DFACT	7.25546E-01	TMAX	0.0	TDJ	72.948	TDUX	1.0	BUMAX	0.0
EPTH	1.51337E-01	N-J PSSH	9347.9	PROP MASS	61566.	TANK AREA	2925.2	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2354945.0

 THE NEW VALUE OF IMIED IS 2366590.0

MASS SUMMARY (lb_m)

S303P0H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1100.0	7054.0	2021.0
TOTAL INITIAL PROPELLANT MASS	37043.7	37057.7	2453.0
TOTAL OXIDIZER MASS	0	0	0
TOTAL FUEL MASS	37043.7	37057.7	2453.0
PROPELLANT TANK DRY MASS	0	0	0
OXIDIZER TANK DRY MASS	0	0	0
FUEL TANK DRY MASS	37043.7	37057.7	2453.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	0	0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	0	0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	1442.0	830.0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	1442.0	830.0
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1970.0	9170.0	530.0
ENGINE DRY MASS	10500.0	3000.0	3500.0
INTERSTAGE STRUCTURE MASS	1500.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0	0	0
MIDCOURSE CORRECTION SUBSYSTEM MASS	7000.0	0	9050.0
ATTITUDE CONTROL SUBSYSTEM MASS	1100.0	1100.0	1430.0
MISCELLANEOUS EXPENDABLES MASS	0	0	0
PAYLOAD	0	3000.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S323P91

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000

INITIAL ENERGY 1.0

***** RESULTS *****

INS. THNESS	1.5598	INS. MASS	1.075.3	INSUL. MF	1.02266E-02	TANK MASS	2381.2	TANK MF	7.44749E-02
VENT PRESS	14.770	COAT MASS	0.0	COAT MF	0.0	PRES MASS	129.72	PRES MF	2.21931E-03
TOT EFF MAS	8292.8	TOT EF MF	1.48271E-01	EF MP MAS	1.56.78	EFF MP MF	1.19216E-02	MP MASS	886.44
BOILOFF MAS	2471.6	EF BO MAS	2255.6	WALL TKNS	0.59941E-01	LENGTH	24.1 R2	VOLUME	13305.
WBDACT(1)	0.0	WBDACT(2)	0.0	WBDACT(3)	2471.6	WBDACT(4)			
AFACT(1)	3.87055E-01	AFACT(2)	6.09666E-01	AFACT(3)	9.12564E-01	AFACT(4)			
DFACT	7.52195E-01	TMAX	0.0	TOJ	224.60	TDUX	1.0	HUMAX	0.0
EPTH	9.60207E-02	N-J PSSM	5370.4	PROP MASS	55931.	TANK AREA	2757.6	NO OF TANK	1.0000

THE OLD VALUE OF IMIED IS 2334343.0

THE NEW VALUE OF IMIED IS 2334219.0

MASS SUMMARY (lb_m)

S302D01

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	14,000	7,500.0	25,000.0
TOTAL INITIAL PROPELLANT MASS	2,000.0	3,710.8	5,923.6
TOTAL OXIDIZER MASS	0	0	0
TOTAL FUEL MASS	2,000.0	3,710.8	5,923.6
PROPELLANT TANK DRY MASS	2,000.0	3,710.8	5,923.6
OXIDIZER TANK DRY MASS	0	0	0
FUEL TANK DRY MASS	2,000.0	3,710.8	5,923.6
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	0	0
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	0	0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0	1,431.0	8180.4
OXIDIZER SUBSYSTEMS MASS	0	0	0
FUEL SUBSYSTEMS MASS	0	1,431.0	8180.4
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	1,370.0	0	530.0
ENGINE DRY MASS	1,370.0	0	530.0
INTERSTAGE STRUCTURE MASS	1,643.0	0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0	0	0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75,000.0	0	9455.0
ATTITUDE CONTROL SUBSYSTEM MASS	11,000.0	11,300.0	14,200.0
MISCELLANEOUS EXPENDABLES MASS	0	0	0
PAYLOAD	0	3,980.0	13,700.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303P9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 0.0

***** RESULTS *****

INS. THNESS 0.41208	INS. MASS 280.56	INSUL. MF 5.12160E-03	TANK MASS 2336.5	TANK MF 7.46418E-02
VENT PRESS 14.700	COAT MASS C.C	COAT MF 0.0	PRFS MASS 126.99	PRES MF 2.31821E-03
TOT EFF MAS 6551.1	TOT EF MF 1.19588E-01	EF MP MAS 653.67	EFF MP MF 1.19326E-02	MP MASS 861.94
ROIL OFF MAS 1574.4	EF BO MAS 1400.9	WALL TKNS C.59579E-01	LENGTH 23.743	VOLUME 13031.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 1574.4	WBOACT(4)	
AFACT(1) 3.59980E-01	AFACT(2) 5.8420E-01	AFACT(3) 8.89806E-01	AFACT(4)	
DFACT 7.58374E-01	TMAX 0.0	TDU 293.77	TDOX C.C	BOMAX 0.0
EPH 8.20815E-02	N-J PSSM 4496.5	PROP MASS 54781.	TANK AREA 2723.4	NO OF TNK 1.0000

THE OLD VALUE OF IMIED IS 2327553.C

THE NEW VALUE OF IMIED IS 2327426.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S3C3P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1283599.	787529.	256301.
TOTAL INITIAL PROPELLANT MASS	960275.0	371966.9	54779.5
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	960275.00	371966.87	54779.51
PROPELLANT TANK DRY MASS	96027.4	37196.7	4496.4
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96027.44	37196.67	4496.38
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14287.0	8155.9
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14286.97	8155.92
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74801.2	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11299.3	1134.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306P9H

*** INPUT ITEMS ***

INITIAL ENERGY 0.0

DESIGN PRESSURE 19.70000

**** RESULTS ****

INS. THKNESS	6.2271	INS. MASS	4668.2	INSUL. MF	7.28993E-02	TANK MASS	2691.2	TANK MF	7.35466E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	148.98	PRES MF	2.32648E-03
TOT EFF MAS	19174.	TOT EF MF	2.99421E-01	EF MP MAS	762.29	EFF MP MF	1.19042E-02	MP MASS	1059.3
BOILOFF MAS	9345.4	EF BO MAS	8884.6	WALL TRNS	0.62325E-01	LENGTH	26.480	VOLUME	15233.
WBOACT(1)	1517.0	WBOACT(2)	3.9570	WBOACT(3)	7824.5	WBOACT(4)			
AFACT(1)	5.29643E-01	AFACT(2)	7.42622E-01	AFACT(3)	1.03241E 00	AFACT(4)			
DFACT	7.19649E-01	TRAX	0.0	TDU	39.596	TDUX	0.0	BOMAX	0.0
EPTH	1.48772E-01	N-J PSSM	9526.7	PROP MASS	64036.	TANK AREA	2998.6	NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2372023.0

THE NEW VALUE OF IMIED IS 2371957.0

MASS SUMMARY (lb_m)

S306P9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1304911.	796266.	270783.
TOTAL INITIAL PROPELLANT MASS	978022.2	379753.4	64033.9
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	978022.19	379753.37	64033.86
PROPELLANT TANK DRY MASS	97802.1	37975.3	9526.5
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97802.12	37975.32	9526.46
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14433.4	8353.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14433.36	8353.23
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76356.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11534.2	1160.4	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
5326P21

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70000 INITIAL ENERGY 1.01

**** RESULTS ****

INS. TKNSS	1.7219	INS. MASS	1199.0	INSJL. MF	2.10854E-02	TANK MASS	2415.8	TANK WF	7.43455E-02
VENT PRESS	14.750	COAT MASS	0.0	COAT MF	0.0	PRFS MASS	131.94	PRFS WF	2.32012E-03
TOT EFF MAS	9331.6	TOT EF MF	1.64104E-01	EF MP MAS	478.67	EFF MP MF	1.09251E-12	MP MASS	375.31
BOILOFF MAS	3344.7	EF RJ MAS	3094.4	WALL TKNSS	1.6231E-1	LENGTH	24.359	VOLUME	1352.7
MBJACT(1)	0.0	MBJACT(2)	0.0	MBJACT(3)	3244.7	MBJACT(4)	0.0		
AFACT(1)	4.01981E-01	AFACT(2)	6.23594E-01	AFACT(3)	9.25109E-01	AFACT(4)	0.0		
DFACT	7.68788E-01	TMAX	0.0	TOTJ	134.26	TANK AREA	1.0945E+4	AJMAX	0.0
EPTH	9.77520E-02	N-J PSSM	5553.6	PRDF MASS	56464.0			MIN OF TKN	1.0

THE OLD VALUE OF IMED IS 0339134.0

THE NEW VALUE OF IMED IS 2338018.0

MASS SUMMARY (lb_m)

S306P9I

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	122888.7	789681.	259493.
TOTAL INITIAL PROPELLANT MASS	96404.9	373384.6	56864.8
TOTAL OXIDIZER MASS	0.	0.	0.
TOTAL FUEL MASS	36544.94	37384.62	56864.79
PROPELLANT TANK DRY MASS	96404.4	37388.4	5558.6
OXIDIZER TANK DRY MASS	0.	0.	0.
FUEL TANK DRY MASS	9644.44	37388.45	5558.64
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	0.	0.
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	0.	0.
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.	14323.0	8200.4
OXIDIZER SUBSYSTEMS MASS	0.	0.	0.
FUEL SUBSYSTEMS MASS	0.	14323.02	8200.37
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197 0.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16487.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.	0.	0.
MIDCOURSE CORRECTION SUBSYSTEM MASS	75184.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11257.1	1140.0	1434.0
MISCELLANEOUS EXPENDABLES MASS	0.	0.	0.
PAYLOAD	0.	3000.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S306P9L

*** INPUT ITEMS ***

DESIGN PRESSURE 19.70600 INITIAL ENERGY 0.0

**** RESULTS ****

INS. THNESS 0.44901	INS. MASS 308.44	INSUL. MF 5.54759E-03	TANK MASS 2367.6	TANK MF 7.45219E-02
VENT PRESS 14.700	COAT MASS 0.0	COAT MF 0.0	PRES MASS 128.93	PRES MF 2.31900E-03
TOT EFF MAS 7369.2	TOT EF MF 1.32541E-01	EF MP MAS 664.45	EFF MP MF 1.19508E-02	MP MASS 879.39
ROILOFF MAS 2359.7	EF 80 MAS 2124.0	WALL TKMS 0.59838E-01	LENGTH 23.985	VOLUME 13226.
WBOACT(1) 0.0	WBOACT(2) 0.0	WBOACT(3) 2359.7	WBOACT(4)	
AFACT(1) 3.72203E-01	AFACT(2) 5.95817E-01	AFACT(3) 9.00079E-01	AFACT(4)	
DFACT 7.55583E-01	TMAX 0.0	TDU 198.79	TDX	80MAX 0.0
EPTH 8.23884E-02	N-J PSSM 4580.7	PROP MASS 55599.	TANK AREA 2747.8	NO OF TNK 1.0000

R24

THE OLD VALUE OF IMIED IS 2330605.C

THE NEW VALUE OF IMIED IS 2330474.0

MASS SUMMARY (lb_m)

S3C6P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1285111.	788149.	257221.
TOTAL INITIAL PROPELLANT MASS	961534.7	372519.6	55598.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	961534.75	372519.62	55597.97
PROPELLANT TANK DRY MASS	96153.4	37251.9	4580.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	96153.44	37251.95	4580.62
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14297.4	8173.4
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14297.37	8173.37
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19790.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	74911.6	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11316.0	1136.3	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309p9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	6.6224	INS. MASS	5058.2
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	20699.	TOT EF MF	3.13909E-01
BOILDOFF MAS	11084.	EF BO MAS	9860.8
WBOACT(1)	3444.8	WBOACT(2)	3.8398
AFACT(1)	5.44953E-01	AFACT(2)	7.56898E-01
DFACT	7.16154E-01	TMAX	0.0
EPTH	1.52419E-01	N-J PSSH	10050.
		WALL TKNS	0.62847E-01
		WBOACT(3)	7634.9
		AFACT(3)	1.04528E 00
		TDU	42.193
		PROP MASS	65939.
		TANK MASS	2765.0
		PRES MASS	153.50
		EFF MP MF	1.19452E-02
		TANK MASS	27.043
		LENGTH	15686.
		WBOACT(4)	
		AFACT(4)	
		TANK AREA	0.0
		BO MAX	0.0
		NO OF TNK	1.0000

THE OLD VALUE OF IMIEO IS 2376273.0

THE NEW VALUE OF IMIEO IS 2375682.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309P9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1305801.	796631.	273252.
TOTAL INITIAL PROPELLANT MASS	978763.5	380078.7	65938.6
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	978763.50	380078.69	65938.56
PROPELLANT TANK DRY MASS	97876.3	38007.9	10050.3
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97876.31	38007.85	10050.28
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14439.5	8393.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14439.48	8393.83
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76421.3	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11544.0	1161.5	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S109Pa1

*** INPUT ITEMS ***

DESIGN PRESSURE 19.700CC

INITIAL ENERGY 0.0

***** RESULTS *****

INS. TKNESS	1.5800	INS. MASS	1114.8	INSUL. MF	1.51961E-2	TANK MASS	2462.1	TANK MF	7.41899E-02
VENT PRESS	14.700	COAT MASS	0.0	COAT MF	0.0	PRES MASS	134.559	PRES MF	2.32168E-03
TOT EFF MAS	10198.	TOT EF MF	1.75521E-1	EF PP MAS	650.91	EFF MP MF	1.10042E-12	MP MASS	972.75
BOILOFF MAS	4523.5	EF 80 MAS	3941.2	WALL TKNS	1.67600E-1	LENGTH	24.725	VOLUME	13821.
WBJACT(1)	517.99	WBJACT(2)	1.9828	WBJACT(3)	4003.6	WBJACT(4)			
AFACT(1)	4.09200E-01	AFACT(2)	6.39315E-01	AFACT(3)	9.31177E-01	AFACT(4)			
DFACT	7.47140E-01	TMAX	0.0	TJJ	75.291	IDUX		BDMAX	
EPFH	9.56936E-02	N-J PSS4	5560.9	PROP MASS	5810.2	TANK AREA		N7 TF T4K	1.0000

THE OLD VALUE OF IMIED IS 2319973.0

THE NEW VALUE OF IMIED IS 2340835.0

MASS SUMMARY (lb_m)

SD 0091

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1200	7117	6714
TOTAL INITIAL PROPELLANT MASS	2637.89	374	53054.81
TOTAL OXIDIZER MASS			1.87
TOTAL FUEL MASS	34567.87	374.11	3153.82
PROPELLANT TANK DRY MASS	5550.3	374.11	5555.4
OXIDIZER TANK DRY MASS			
FUEL TANK DRY MASS	35560.21	374.12	5555.32
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS			9.81
OXIDIZER SUBSYSTEMS MASS			1.87
FUEL SUBSYSTEMS MASS			6.87
EXPENDABLE PROPELLANT SUBSYSTEMS MASS		1437.82	3226.81
OXIDIZER SUBSYSTEMS MASS			6.87
FUEL SUBSYSTEMS MASS		1437.84	3225.98
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	197	911.87	5711.81
ENGINE DRY MASS	11507.8	3511.81	35000.81
INTERSTAGE STRUCTURE MASS	15007.8	7114.81	51411.81
RETRO PROPULSION SUBSYSTEM MASS			6.81
MIDCOURSE CORRECTION SUBSYSTEM MASS	7627.82		2495.81
ATTITUDE CONTROL SUBSYSTEM MASS	3111.87	1147.83	1434.83
MISCELLANEOUS EXPENDABLES MASS			1.81
PAYLOAD		30000.81	13750.81

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309P9L

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	C.O
**** RESULTS ****			
INS. TKNESS	0.48354	INS. MASS	335.10
VENT PRESS	14.700	COAT MASS	0.C
TOT EFF MAS	8201.5	TOT EF MF	1.45373E-C1
		INSUL. MF	5.93976E-03
		COAT MF	0.C
		EF MP MAS	675.15
BOILOFF MAS	3144.6	EF BC MAS	2862.5
WBFACT(1)	0.0	WBFACT(2)	0.C
AFACT(1)	3.84308E-01	AFACT(2)	6.07104E-C1
DFACT	7.52822E-01	TMAX	C.O
EPTH	8.26666E-02	N-J PSSM	4663.8
		TDJ	103.C4
		PROP MASS	56417.
		WALL TKNS	0.60093E-01
		WBFACT(3)	3144.6
		AFACT(3)	9.1C254E-01
		TDUX	C.C
		TANK AREA	2772.1
		TANK MASS	2398.8
		PRES MASS	130.88
		EFF MP MF	1.19672E-02
		LENGTH	24.227
		WBFACT(4)	
		AFACT(4)	
		VOLUME	13421.
		80MAX	0.0
		NO OF TNK	1.0000
		TANK MF	7.44072E-02
		PRES MF	2.31978E-03
		MP MASS	896.83

THE OLD VALUE OF IMIED IS 2333651.C

THE NEW VALUE OF IMIED IS 2333524.0

MASS SUMMARY (lb_m)

S3C9P9L

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1286621.	788768.	258139.
TOTAL OXIDIZER MASS	962791.9	373071.3	56415.8
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	962791.94	373071.31	56415.84
OXIDIZER TANK DRY MASS	96279.1	37307.1	4663.7
FUEL TANK DRY MASS	0.0	0.0	0.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	96279.13	37307.12	4663.71
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14307.7	8190.8
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14307.74	8190.81
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	75021.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11332.6	1138.2	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	30980.0	13250.0

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S303PT9H

*** INPUT ITEMS ***

DESIGN PRESSURE	19.70000	INITIAL ENERGY	0.0
**** RESULTS ****			
INS. TKNESS	5.3325	INS. MASS	3910.5
VENT PRESS	14.700	COAT MASS	0.0
TOT EFF MAS	16845.	TOT EF MF	2.72394E-01
		INSUL. MF	6.32354E-02
		COAT MF	0.0
		EF MP MAS	734.48
BOILOFF MAS	7412.7	WALL TKNS	0.61706E-01
WBOACT(1)	555.77	WBOACT(3)	7412.7
AFACT(1)	5.04246E-01	AFACT(3)	1.01107E 00
DFACT	7.25445E-01	TDU	23.164
EPTH	1.39320E-01	N-J PSSM	8615.6
		PROP MASS	61840.
		TANK MASS	2606.5
		PRES MASS	143.76
		EFF MP MF	1.18770E-02
		TANK MF	7.37600E-02
		PRES MF	2.32466E-03
		MP MASS	1012.5
		VOLUME	14711.
		TDUX	0.0
		TANK AREA	2933.3
		BO MAX	0.0
		NO OF TNK	1.0000

THE OLD VALUE OF IMIED IS 2365064.C

THE NEW VALUE OF IMIED IS 2364958.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

5303PT9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1302195.	795154.	267612.
TOTAL OXIDIZER MASS	975760.2	379762.2	61823.3
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	975760.25	378762.19	61823.27
OXIDIZER TANK DRY MASS	97575.9	37876.2	8613.2
FUEL TANK DRY MASS	0.0	0.0	0.0
	97575.94	37876.20	8613.21
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14414.7	8306.2
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14414.73	8306.17
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76158.1	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11504.3	1157.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S306PT9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS			
TOTAL INITIAL PROPELLANT MASS	1302189.	795152.	267609.
TOTAL OXIDIZER MASS	975756.1	378760.4	61838.8
TOTAL FUEL MASS	0.0	0.0	0.0
PROPELLANT TANK DRY MASS	975756.06	378760.44	61838.77
OXIDIZER TANK DRY MASS	97575.6	37876.0	8594.5
FUEL TANK DRY MASS	0.0	0.0	0.0
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	97575.56	37876.03	8594.54
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14414.7	8306.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14414.70	8306.52
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76157.7	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11594.2	1157.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0

GENERAL DYNAMICS
Fort Worth Division

THERMAL PROTECTION SYSTEM OPTIMIZATION RESULTS
S309PT9H

*** INPUT ITEMS ***

DESIGN PRESSURE 19.7C000 INITIAL ENERGY 0.0

**** RESULTS ****

INS. TKNESS 5.3049	INS. MASS 3891.0	INSUL. MF 6.29002E-02	TANK MASS 2607.3	TANK MF 7.37578E-02
VENT PRESS 14.70C	COAT MASS 0.0	COAT MF 0.0	PRES MASS 143.81	PRES MF 2.32471E-03
TOT EFF MAS 16844.	TOT EF MF 2.72296E-01	EF MP MAS 734.95	EFF MP MF 1.18808E-02	MP MASS 1012.9
BOILOFF MAS 7433.9	EF BO MAS 7511.9	WALL TKNS 0.61712E-01	LENGTH 25.837	VOLUME 14716.
WBOACT(1) 5453.2	WBOACT(2) 0.0	WBOACT(3) 7433.9	WBOACT(4) 0.0	
AFACT(1) 5.03543E-01	AFACT(2) 7.18285E-01	AFACT(3) 1.01047E 00	AFACT(4) 0.0	
DFACT 7.25605E-01	TMAX 782.40	TDU 23.071	TDUX 0.0	BOMAX 0.0
EPTH 1.38903E-01	N-J PSSM 8597.5	PROP MASS 61860.	TANK AREA 2933.9	NO OF TNK 1.0000

THE OLD VALUE OF IMIED IS 2364873.C

THE NEW VALUE OF IMIED IS 2364949.0

GENERAL DYNAMICS
Fort Worth Division

MASS SUMMARY (lb_m)

S309PT9H

	STAGE 1	STAGE 2	STAGE 3
TOTAL INITIAL STAGE MASS	1302190.	795152.	267609.
TOTAL INITIAL PROPELLANT MASS	975756.5	378760.6	61839.0
TOTAL OXIDIZER MASS	0.0	0.0	0.0
TOTAL FUEL MASS	975756.50	378760.62	61839.02
PROPELLANT TANK DRY MASS	97575.6	37876.0	8594.6
OXIDIZER TANK DRY MASS	0.0	0.0	0.0
FUEL TANK DRY MASS	97575.56	37876.05	8594.55
NON-EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	0.0	0.0
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	0.0	0.0
EXPENDABLE PROPELLANT SUBSYSTEMS MASS	0.0	14414.7	8306.5
OXIDIZER SUBSYSTEMS MASS	0.0	0.0	0.0
FUEL SUBSYSTEMS MASS	0.0	14414.70	8306.53
MISCELLANEOUS PROPULSION SUBSYSTEMS MASS	19700.0	9100.0	5300.0
ENGINE DRY MASS	105000.0	35000.0	35000.0
INTERSTAGE STRUCTURE MASS	16497.0	9044.0	5140.0
RETRO PROPULSION SUBSYSTEM MASS	0.0	0.0	0.0
MIDCOURSE CORRECTION SUBSYSTEM MASS	76157.8	0.0	9495.0
ATTITUDE CONTROL SUBSYSTEM MASS	11504.2	1157.1	1434.3
MISCELLANEOUS EXPENDABLES MASS	0.0	0.0	0.0
PAYLOAD	0.0	309800.0	132500.0