



Exhibit D

Tanager Orbital Debris Assessment Report (ODAR)

This report is presented in compliance with NASA-STD-8719.14C, APPENDIX A.

Report Version: 4.0
September 20, 2022

DAS Software Version Used in Analysis: v3.2.1

A handwritten signature in blue ink, consisting of several overlapping loops and a long horizontal stroke, positioned above a horizontal line.

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Planet Labs PBC

Document Data is Not Export Controlled.

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Self-assessment of the ODAR using the format in Appendix A of NASA-STD-8719.14C:

A self-assessment is provided below in accordance with the assessment format provided in Appendix A of NASA-STD-8719.14C.

Orbital Debris Self-Assessment Report Evaluation: Tanager

Rqmnt #	Spacecraft			Comments
	Compliant	Not Compliant	Incomplete	
4.3-1.a	☒	☐	☐	No Debris Released in LEO.
4.3-1.b	☒	☐	☐	No Debris Released in LEO.
4.3-2	☒	☐	☐	No Debris Released in GEO.
4.4-1	☒	☐	☐	Compliant.
4.4-2	☒	☐	☐	Compliant.
4.4-3	☒	☐	☐	No Planned Breakups.
4.4-4	☒	☐	☐	No Planned Breakups.
4.5-1	☒	☐	☐	Compliant.
4.5-2	☒	☐	☐	No Critical Subsystems Needed for EOM Disposal.
4.6-1	☒	☐	☐	Atmospheric Entry.
4.6-2	☒	☐	☐	No Disposal Near GEO.
4.6-3	☒	☐	☐	No Disposal Between LEO and GEO.
4.6-4	☒	☐	☐	Compliant.
4.7-1	☒	☐	☐	Compliant.
4.8-1	☒	☐	☐	No Tethers Used.

Assessment Report Format:

ODAR Technical Sections Format Requirements:

This ODAR follows the format recommended in NASA-STD-8719.14C, Appendix A and includes the content indicated at a minimum in each section 2 through 8 below for the Tanager satellites. Sections 9 through 14 apply to the launch platform and are not covered here.

ODAR Section 1: Program Management and Mission Overview

Project Manager: Planet Labs PBC (Planet)

Foreign government or space agency participation: None

Initial Launch: Expected late 2023

Mission Overview:

The Tanager satellites will be launched into a circular sun-synchronous orbit (SSO) as a secondary payload with an injection orbit of up to 525 km. After launch, the Tanager satellites will be commissioned for approximately one month. During this period, 3-axis control and transmitters will be enabled and the solar arrays will be deployed. Subsequently, the satellite will use onboard propulsion to maneuver to a target operational 406 km circular altitude. At the end of life, the satellite will enter a coarsely controlled attitude state and re-enter the atmosphere under the influence of natural orbital decay.

Planet plans to launch a fleet of 10 simultaneously operating Tanager spacecraft in SSO, equally spaced. After commissioning, each satellite will have an operational life of approximately 5 years.

ODAR Summary: No debris is released in normal operations; no credible scenario for breakups; the collision probability with other objects is compliant with NASA standards; and the estimated nominal decay lifetime due to atmospheric drag is significantly under 25 years (and in fact under 5 years) following operations (as calculated by DAS 3.2.1) for the 406 km operational orbit.

Mission duration:

Nominal mission duration per spacecraft is 5 years.

Launch and deployment profile, including all parking, transfer, and operational orbits with apogee, perigee, and inclination:

A maximum semi-major axis of 6903 km (525 km above sea level) in an SSO orbit is considered for all analyses. The satellites will transfer from the insertion orbit to the nominal 406 km circular operational attitude using onboard electric propulsion. There are no parking orbits.

ODAR Section 2: Spacecraft Description

Physical description of the spacecraft:

The Tanager satellite is a hyperspectral Earth imaging smallsat with a launch mass of no greater than 200 kg. Basic physical dimensions are approximately 2807 mm x 1764 mm x 560 mm in the deployed configuration. There are three deployable solar arrays. Two have two panels each with dimensions 1055.00 mm x 537.80 mm. The third has one panel with dimensions 595.00 mm x 520.00 mm.

Total satellite mass at launch, including all propellants and fluids: 194.2 kg

Dry mass of satellite at launch, excluding solid rocket motor propellants: 189 kg

Description of all propulsion systems (cold gas, mono-propellant, bi-propellant, electric, nuclear):

Electric propulsion, particularly, Hall Effect Thruster with xenon propellant.

Identification, including mass and pressure, of all fluids (liquids and gasses) planned to be on board and a description of the fluid loading plan or strategies, excluding fluids in sealed heat pipes:

Compressed xenon propellant maintained in a supercritical gaseous state using heaters. 6.3 kg of xenon propellant stored in two tanks that are pressurized to 1350 psi (absolute). On-base loading or unloading operations are planned. Discussions with range safety for major US and foreign launch sites are underway with no major blockers anticipated at time of filing.

Fluids in Pressurized Batteries:

None. The satellites use unpressurized, standard COTS Lithium-Ion battery cells. Each battery has a height of 65mm, a diameter of 19mm, and a mass of 49 grams.

Description of attitude control system and indication of the normal attitude of the spacecraft with respect to the velocity vector:

The satellite's attitude control system consists of magnetorquers, reaction wheels, star cameras, horizon sensors, magnetometers, photodiodes, and rate gyros. The nominal imaging attitude will be nadir +/- 30 degrees about the X and Y axes.

Description of any range safety or other pyrotechnic devices:

No pyrotechnic devices are used.

Description of the electrical generation and storage system:

Lithium-Ion battery cells are charged before payload integration and provide electrical energy during the mission. The cells are recharged by InGaAs solar cells mounted on deployable arrays. A battery cell protection circuit manages the charging cycle, performs battery balancing, and protects against over and undercharge conditions.

Identification of any other sources of stored energy not noted above:

Three deployable solar arrays with small mechanical springs. Actively restrained at launch using a mechanical hold-down actuator.

Identification of any radioactive materials on board:

None.

Description of any planned proximity operations or docking:

None.

ODAR Section 3: Assessment of Spacecraft Debris Released During Normal Operations

Identification of any object (>1 mm) expected to be released from the spacecraft any time after launch, including object dimensions, mass, and material:

There are no intentional releases.

Rationale/necessity for release of each object:

N/A.

Time of release of each object, relative to launch time:

N/A.

Release velocity of each object with respect to spacecraft:

N/A.

Expected orbital parameters (apogee, perigee, and inclination) of each object after release:

N/A.

Calculated orbital lifetime of each object, including time spent in Low Earth Orbit (LEO):

N/A.

Assessment of spacecraft compliance with Requirements 4.3-1 and 4.3-2 (per DAS v3.2.1)

4.3-1, Mission Related Debris Passing Through LEO:

COMPLIANT

4.3-2, Mission Related Debris Passing Near GEO:

COMPLIANT

ODAR Section 4: Assessment of Spacecraft Intentional Breakups and Potential for Explosions

Potential causes of spacecraft breakup during deployment and mission operations:

There is no credible scenario that would result in spacecraft breakup during normal deployment and operations.

Summary of failure modes and effects analyses of all credible failure modes which may lead to an accidental explosion:

In-mission failure of a battery cell protection circuit could lead to a short circuit resulting in overheating and a very remote possibility of battery cell explosion. The battery safety systems discussed in the FMEA (see requirement 4.4-1 below) describe the combined faults that must occur for any of seven (7) independent, mutually exclusive failure modes to lead to explosion.

The deployment of the solar arrays will feature small mechanical springs with a mechanical hold down actuator. Deployment is commanded after launch during the commissioning period. The probability of detachment is negligible.

Detailed plan for any designed spacecraft breakup, including explosions and intentional collisions:

There are no planned breakups.

List of components which shall be passivated at End of Mission (EOM) including method of passivation and amount which cannot be passivated:

The batteries will be passivated at End of Mission by sending commands to disable battery charging. The maximum total chemical energy stored in each battery is ~46kJ.

At the start of the mission, there will be 6.3 kg of xenon onboard which will deplete over time as the propulsion system is used to maintain altitude. Any remaining xenon has minimal stored energy.

Rationale for all items which are required to be passivated, but cannot be due to their design:

The battery charge circuits include overcharge protection and a parallel design to limit the risk of battery failure. However, in the unlikely event that a battery cell does explosively rupture, the small size, mass, and potential energy of these small batteries is such that while the spacecraft could be expected to vent gasses, debris from the battery rupture should be contained within the vessel due to the lack of penetration energy.

Assessment of spacecraft compliance with Requirements 4.4-1 through 4.4-4:

Requirement 4.4-1: Limiting the risk to other space systems from accidental explosions during deployment and mission operations while in orbit about Earth or the Moon:

For each spacecraft and launch vehicle orbital stage employed for a mission, the program or project shall demonstrate, via failure mode and effects analyses or equivalent analyses, that the integrated probability of explosion for all credible failure modes of each spacecraft and launch vehicle is less than 0.001 (excluding small particle impacts).

Compliance statement:

Required Probability: 0.001

Expected Probability: 0.000

Supporting Rationale and FMEA details:

Battery explosion:

Effect: All failure modes below might theoretically result in battery explosion with the possibility of orbital debris generation. However, in the unlikely event that a battery cell does explosively rupture, the small size, mass, and potential energy of the selected COTS batteries is such that while the spacecraft could be expected to vent gasses, most debris from the battery rupture should be contained within the vessel due to the lack of penetration energy.

Probability: Extremely Low. It is believed to be a much less than 0.1% probability that multiple independent (not common mode) faults must occur for each failure mode to cause the ultimate effect (explosion).

Failure Mode 1: Internal short circuit.

Mitigation 1: Qualification and acceptance shock, vibration, thermal cycling, and vacuum tests followed by maximum system rate-limited charge and discharge to prove that no internal short circuit sensitivity exists, performed by both the vendor and Planet.

Combined faults required for realized failure: Environmental testing **AND** functional charge/discharge tests must both be ineffective to realize this failure mode.

Failure Mode 2: Internal thermal rise due to high load discharge rate.

Mitigation 2: Cells are tested in the lab for high-load discharge rates in a variety of flight-like configurations to determine the likelihood and impact of an out of control thermal rise in the cell. Cells are also tested in a hot environment to test the upper limit of the cells' capability. Cell selection and pack thermal design avoids potential failure from thermal rise. Cells are similarly tested by the vendor.

Combined faults required for realized failure: Battery pack thermal design must be incorrect **AND** spacecraft thermal design must be incorrect **AND** external over-current detection and disconnect function must all fail to realize this failure mode.

Failure Mode 3: Excessive discharge rate or short circuit due to external device failure or terminal contact with conductors not at battery voltage levels (due to abrasion or inadequate proximity separation).

Mitigation 3: This failure mode is negated by a) qualification-tested short circuit protection on each external circuit, b) design of battery packs and insulators such that no contact

with nearby board traces is possible without being caused by some other mechanical failure, and c) obviation of such other mechanical failures by proto-qualification and acceptance environmental tests (shock, vibration, thermal cycling, and thermal-vacuum tests).

Combined faults required for realized failure: An external load must fail/short-circuit **AND** external over-current detection and disconnect function failure must all occur to realize this failure mode.

Failure Mode 4: Inoperable vents.

Mitigation 4: Internal battery vents are not blocked or inhibited by the battery pack design or the spacecraft.

Combined effects required for realized failure: Vendor vents fail to burst **AND** battery assembler fails to manufacture battery per the design in such a way that the vents are blocked.

Failure Mode 5: Crushing.

Mitigation 5: This mode is negated by spacecraft design. There are no moving parts in the proximity of the batteries.

Combined faults required for realized failure: A catastrophic failure must occur in an external system **AND** the failure must cause a collision sufficient to crush the batteries leading to an internal short circuit **AND** the satellite must be in a naturally sustained orbit at the time the crushing occurs.

Failure Mode 6: Low level current leakage or short-circuit through battery pack case or due to moisture-based degradation of insulators.

Mitigation 6: These modes are negated by a) battery holder/case design made of non-conductive plastic, and b) operation in vacuum such that no moisture can affect insulators.

Combined faults required for realized failure: Abrasion or piercing failure of circuit board coating or wire insulators **AND** dislocation of battery packs **AND** failure of battery terminal insulators **AND** failure to detect such failure modes in environmental tests must occur to realize this failure mode.

Failure Mode 7: Excess temperatures due to orbital environment and high discharge combined.

Mitigation 8: The spacecraft thermal design will negate this possibility. Thermal rise will be analyzed in combination with space environment temperatures to show that batteries do not exceed normal allowable operating temperatures and are well below temperatures of concern for explosions.

Combined faults required for realized failure: Thermal analysis **AND** thermal design **AND** mission simulations in thermal-vacuum chamber testing **AND** over-current monitoring and control must all fail to realize this failure mode.

Requirement 4.4-2: Design for passivation after completion of mission operations while in orbit about Earth or the Moon:

Design of all spacecraft and launch vehicle orbital stages shall include the ability to deplete all onboard sources of stored energy and disconnect all energy generation

sources when they are no longer required for mission operations or post-mission disposal or control to a level which cannot cause an explosion or deflagration large enough to release orbital debris or break up the spacecraft.

Compliance statement:

The battery charge circuits include overcharge protection and a parallel design to limit the risk of battery failure. However, in the unlikely event that a battery cell does explosively rupture, the small size, mass, and potential energy, of these small batteries is such that while the spacecraft could be expected to vent gasses, most debris from the battery rupture should be contained within the vessel due to the lack of penetration energy. The batteries will be passivated at the end of operations by transmission of commands that disable battery charging.

The propulsion is an electric ion system with a gaseous propellant that ionizes only upon application of high voltage electrical power. In an inert state, there is no plausible mechanism for an uncontrolled release of energy and no passivation method is required. Planet plans, however, to fully deplete the propellant tanks before end of mission.

Requirement 4.4-3. Limiting the long-term risk to other space systems from planned breakups:

Compliance statement:

This requirement is not applicable. There are no planned breakups.

Requirement 4.4-4: Limiting the short-term risk to other space systems from planned breakups:

Compliance statement:

This requirement is not applicable. There are no planned breakups.

ODAR Section 5: Assessment of Spacecraft Potential for On-Orbit Collisions

Assessment of spacecraft compliance with Requirements 4.5-1 and 4.5-2 (per DAS v3.2.1, and calculation methods provided in NASA-STD-8719.14C, section 4.5.4):

Requirement 4.5-1: Limiting debris generated by collisions with large objects when in Earth orbit:

For each spacecraft and launch vehicle orbital stage, the program or project shall demonstrate that, during the orbital lifetime of each spacecraft and orbital stage, the probability of accidental collision with space objects larger than 10 cm in diameter is less than 0.001. For the purpose of this assessment, 100 years is used as the maximum orbital lifetime for the storage disposal option.

Large Object Impact and Debris Generation Probability:

Collision Probability (525 km SSO): 3.0229E-05; COMPLIANT.

Collision Probability (406 km SSO): 4.2190E-06; COMPLIANT.

Note that these collision probabilities assume no collision avoidance maneuvers. However, collision avoidance will be a nominal part of operations for the 5-year mission duration. The probability of collision for each satellite should be treated as zero when accounting for the propulsion system, as determined by the FCC.¹ Planet expects to maintain the apogee/perigee of the Tanager satellites within +/- 2 km and the inclination within +/- 1°. The right ascension of the ascending node(s) (RAAN) for the SSO satellites will depend on the launch and will precess at a constant rate of approximately 1°/day to maintain sun synchronous orbit.

See DAS Analysis log at the end of this ODAR

Supporting Deployment and Collision Risk Analysis

The above collision probability is calculated using NASA's DAS 3.2.1 software. This analysis was for a single satellite in a maximum 525 km sun-synchronous orbit.

¹ See 47 C.F.R. § 25.114(d)(14)(iv)(A)(1) ("The collision risk may be assumed zero for a space station during any period in which the space station will be maneuvered effectively to avoid colliding with large objects."); *Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, IB Docket No. 18-313, 35 FCC Rcd 4156, at ¶ 35 (2020) ("[F]or purposes of conducting the analysis, and absent evidence to the contrary, the collision risk with large objects should be assumed zero or near zero during the period of the time when the space station is able to conduct collision avoidance maneuvers."); *Space Exploration Holdings, LLC*, Request for Modification of the Authorization for the SpaceX NGSO Satellite System, Memorandum Opinion and Order, 35 FCC Rcd 5649, at ¶ 20 (2020) ("[I]t is the Commission's established licensing practice to consider satellites equipped with propulsion capability to have a collision risk of zero or near zero, absent specific information to the contrary.").

Requirement 4.5-2: Limiting debris generated by collisions with small objects when operating in Earth orbit:

For each spacecraft, the program or project shall demonstrate that, during the mission of the spacecraft, the probability of accidental collision with orbital debris and meteoroids sufficient to prevent compliance with the applicable post-mission disposal requirements is less than 0.01.

The Tanager satellites will be deployed into very low Earth orbits, and all Tanager satellites will be operated at very low altitudes where the density of resident space objects is low, and therefore the probability of collisions is low. Our expected insertion altitude is 525 km, and the nominal operational orbit is 406 km.

Small debris penetrations will not cause the satellite to break up but may cause the loss of function of the satellite. From the operational flight altitude of 406 km, the Tanager spacecraft will re-enter in less than 5 years from an inert, uncontrolled state. No propulsive maneuvers, passivation activities, or other active commanding or function is required to meet re-entry and disposal requirements. Therefore, the probability that an individual space station will become a source of debris by collision with small debris or meteoroids that would cause loss of control and prevent disposal is zero, which is less than the 0.01 requirement.

Identification of all systems or components required to accomplish any post-mission disposal operation, including passivation and maneuvering:

None. If possible, we will attempt to de-orbit the satellite at a faster rate using any remaining propellant and capability of the electric propulsion system, however, de-orbit within the estimated lifetime presented in this report is not dependent on a functional propulsion system at end of life.

ODAR Section 6: Assessment of Spacecraft Post-Mission Disposal Plans and Procedures

6.1 Description of spacecraft disposal option selected:

The satellite will deorbit naturally by atmospheric re-entry.

6.2 Plan for any spacecraft maneuvers required to accomplish post-mission disposal:

No maneuvers are required for post-mission disposal.

At satellite end of life, the satellite may remain in a stable attitude given its aerodynamic features designed for VLEO operations and therefore no assumption for increased drag or tumbling through de-orbit is made. If possible, any remaining operational capability of the propulsion system will be used to accelerate the rate of decay, but de-orbit within the estimated lifetime presented in this report is not dependent on a functional propulsion system.

6.3 Calculation of area-to-mass ratio after post-mission disposal, if the controlled reentry option is not selected:

Spacecraft Mass (worst-case):	194.2 kg
Average Cross-Sectional Area:	1.3845 m ²
Area to mass ratio:	0.007364 m ² /kg

6.4 Assessment of spacecraft compliance with Requirements 4.6-1 through 4.6-5 (per DAS v 3.2.1 and NASA-STD-8719.14 section):

Requirement 4.6-1: *Natural reentry, direct reentry, or direct retrieval shall comply with the following:*

- a. Natural reentry: Leave the space structure in an orbit in which, using conservative projections for solar activity, atmospheric drag will limit the orbital lifetime to as short as practicable but no more than 25 years after the completion of mission.*
- b. Direct reentry: Maneuver the space structure into a controlled de-orbit trajectory as soon as practical after completion of mission.*
- c. Direct retrieval: Retrieve the space structure and remove it from orbit preferably at completion of mission, but no more than 5 years after completion of mission*

The following plots show apogee and perigee altitude histories for the maximum insertion orbit of 525 km and the proposed 406 km nominal altitude, SSO.

Maximum Orbit - SSO

BOL Orbit: 525 × 525 km SSO

Mission duration: 5 years (*with propulsion*)

Orbit Lifetime: 9.834 years (*without the use of propulsion to maintain altitude*)

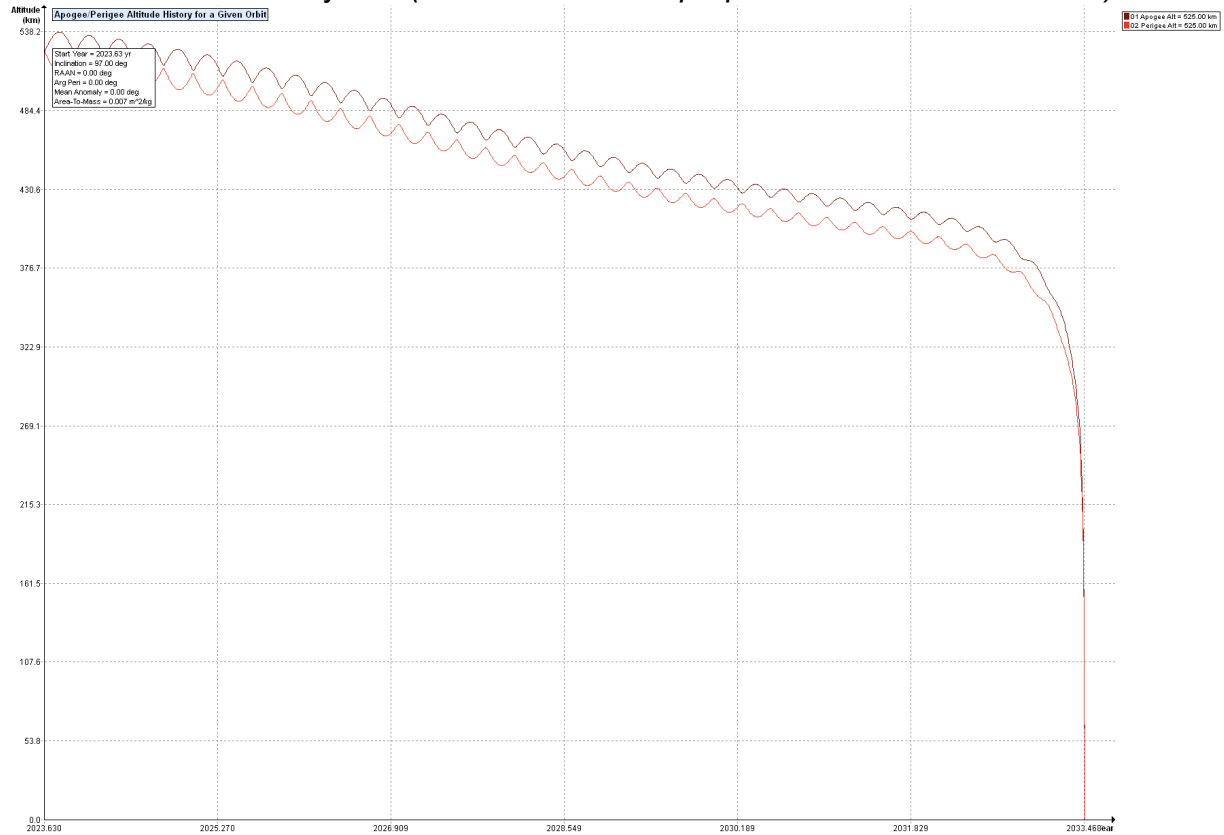


Figure 1 - Apogee and Perigee Lifetime History from 525 km Insertion Orbit, SSO

Nominal Orbit - SSO

BOL Orbit: 406 x 406 km SSO

Mission Duration: 5 years (*with propulsion*)

Orbit Lifetime: 0.887 years (*without the use of propulsion to maintain altitude*)

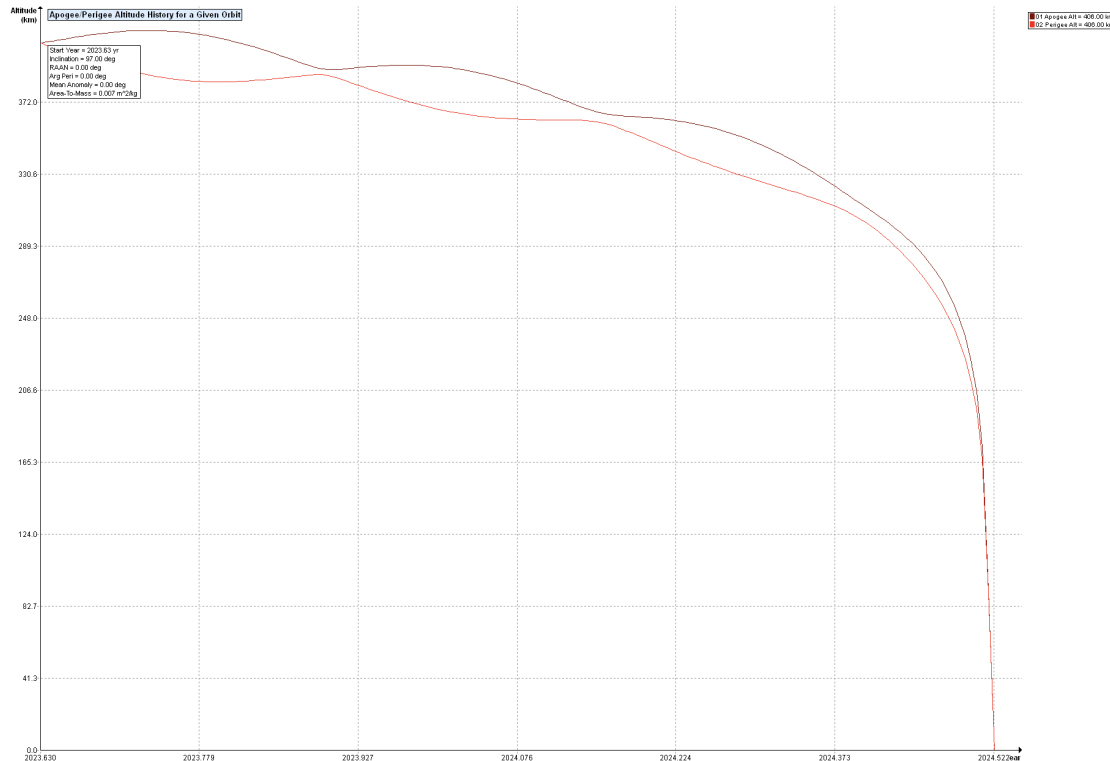


Figure 2 - Apogee and Perigee Lifetime History from 406 km Operational Orbit, SSO

DAS Analysis: The Tanager satellite reentry is COMPLIANT with the 25-year deorbit requirement for the proposed injection orbit. At the nominal 406 km operational orbit, the Tanager satellite reentry is less than 5 years.

Requirement 4.6-2. Storage and Earth escape.

Analysis: N/A.

Requirement 4.6-3. Long-term re-entry for space structures in MEO, Tundra Orbits, highly inclined GEO, and other orbits.

Analysis: N/A.

Requirement 4.6-4. Reliability of Post-mission Disposal Operations.

Analysis: N/A.

ODAR Section 7: Assessment of Spacecraft Reentry Hazards

Assessment of spacecraft compliance with Requirement 4.7-1:

Requirement 4.7-1: Limit the risk of human casualty:

The potential for human casualty is assumed for any object with an impacting kinetic energy in excess of 15 joules:

- a) *For uncontrolled reentry, the risk of human casualty from surviving debris shall not exceed 0.0001 (1:10,000).*

DAS shows a limited probability of parts of the telescope optics and some components of the avionics module surviving reentry. The risk of human casualty is, nonetheless, compliant with the 1:10,000 requirement.

Probability of Risk to Human Casualty:

Probability of Risk of Human Casualty (525 km, SSO): 8.55E-05 (1:11,700)

Probability of Risk of Human Casualty (406 km, SSO): 7.19E-05 (1:13,900)

Planet intends to provide a higher fidelity analysis than that generated using the NASA DAS software in a future filing and, at that time, will also provide a cumulative casualty probability for the 10 proposed Tanager satellites.

See DAS Analysis log at the end of this ODAR

Requirements 4.7-1b, and 4.7-1c are non-applicable requirements as the Tanager satellite does not use controlled reentry. Requirement 4.7-1d is not applicable as Tanager does not use long-term re-entry.

ODAR Section 8: Assessment for Tether Missions

Not applicable. There are no tethers in the Tanager mission.

END of ODAR

(DAS Logs start next page)

APPENDIX

DAS v3.2.1 Analysis Logs

525km x 525km SSO Orbit:

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Project Data

=====

08 16 2022; 12:23:51PM Processing Requirement 4.3-1: Return Status : Not Run

=====

No Project Data Available

=====

===== End of Requirement 4.3-1 =====

08 16 2022; 12:23:47PM Processing Requirement 4.3-2: Return Status : Passed

=====

No Project Data Available

=====

===== End of Requirement 4.3-2 =====

08 16 2022; 12:14:02PM Processing Requirement 4.5-1: Return Status : Passed

=====

Run Data

=====

****INPUT****

Space Structure Name = Tanager
Space Structure Type = Payload
Perigee Altitude = 525.000 (km)
Apogee Altitude = 525.000 (km)
Inclination = 97.000 (deg)
RAAN = 0.000 (deg)
Argument of Perigee = 0.000 (deg)
Mean Anomaly = 0.000 (deg)
Final Area-To-Mass Ratio = 0.0074 (m²/kg)
Start Year = 2023.666 (yr)
Initial Mass = 193.000 (kg)
Final Mass = 188.000 (kg)
Duration = 1.000 (yr)
Station-Kept = True
Abandoned = True
Long-Term Reentry = False

****OUTPUT****

Collision Probability = 3.0229E-05

Returned Message: Normal Processing
Date Range Message: Normal Date Range
Status = Pass

=====

===== End of Requirement 4.5-1 =====

****INPUT****

Space Structure Name = Tanager
Space Structure Type = Payload

Perigee Altitude = 525.000000 (km)
Apogee Altitude = 525.000000 (km)
Inclination = 97.000000 (deg)
RAAN = 0.000000 (deg)
Argument of Perigee = 0.000000 (deg)
Mean Anomaly = 0.000000 (deg)
Area-To-Mass Ratio = 0.007365 (m²/kg)
Start Year = 2023.666000 (yr)
Initial Mass = 193.000000 (kg)
Final Mass = 188.000000 (kg)
Duration = 1.000000 (yr)
Station Kept = True
Abandoned = True
PMD Perigee Altitude = 525.000000 (km)
PMD Apogee Altitude = 525.000000 (km)
PMD Inclination = 97.000000 (deg)
PMD RAAN = 0.000000 (deg)
PMD Argument of Perigee = 0.000000 (deg)
PMD Mean Anomaly = 0.000000 (deg)
Long-Term Reentry = False

****OUTPUT****

Suggested Perigee Altitude = 525.000000 (km)
Suggested Apogee Altitude = 525.000000 (km)
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2034 (yr)
Requirement = 61
Compliance Status = Pass

=====

===== End of Requirement 4.6 =====

=====

*******INPUT******

Item Number = 1

name = Tanager
quantity = 1
parent = 0
materialID = 5
type = Box
Aero Mass = 188.000000
Thermal Mass = 188.000000
Diameter/Width = 0.600000
Length = 1.000000
Height = 0.600000

name = Structural Brackets
quantity = 16
parent = 1
materialID = 5
type = Box
Aero Mass = 0.269000
Thermal Mass = 0.269000
Diameter/Width = 0.050000
Length = 0.100000
Height = 0.020000

name = Avionics Deck
quantity = 1
parent = 1
materialID = -11
type = Box
Aero Mass = 5.000000
Thermal Mass = 5.000000
Diameter/Width = 0.580000
Length = 0.630000
Height = 0.080000

name = Structural Panels
quantity = 4
parent = 1
materialID = -11
type = Box
Aero Mass = 0.999000
Thermal Mass = 0.999000
Diameter/Width = 0.400000
Length = 0.525000
Height = 0.030000

name = Payload Deck
quantity = 1
parent = 1
materialID = -11
type = Box
Aero Mass = 1.330000
Thermal Mass = 1.330000

Diameter/Width = 0.550000
Length = 0.550000
Height = 0.030000

name = Payload Closeout Panels
quantity = 4
parent = 1
materialID = -11
type = Box
Aero Mass = 1.027000
Thermal Mass = 1.027000
Diameter/Width = 0.500000
Length = 0.525000
Height = 0.025000

name = Avionics Brackets
quantity = 6
parent = 1
materialID = 5
type = Box
Aero Mass = 0.134000
Thermal Mass = 0.134000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.025000

name = Hardware
quantity = 200
parent = 1
materialID = 54
type = Cylinder
Aero Mass = 0.017000
Thermal Mass = 0.017000
Diameter/Width = 0.012000
Length = 0.020000

name = SA Release Mechanism
quantity = 2
parent = 1
materialID = 5
type = Box
Aero Mass = 0.124000
Thermal Mass = 0.124000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.050000

name = Heat Pipe
quantity = 1
parent = 1
materialID = 19

type = Cylinder
Aero Mass = 0.182000
Thermal Mass = 0.182000
Diameter/Width = 0.030000
Length = 0.107000

name = MLI Blankets
quantity = 5
parent = 1
materialID = 44
type = Flat Plate
Aero Mass = 0.304000
Thermal Mass = 0.304000
Diameter/Width = 0.132000
Length = 0.255000

name = Heat Straps
quantity = 4
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.030000
Thermal Mass = 0.030000
Diameter/Width = 0.020000
Length = 0.050000

name = Heaters
quantity = 20
parent = 1
materialID = 19
type = Flat Plate
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.025000
Length = 0.050000

name = Temp Sensors
quantity = 25
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.010000
Length = 0.020000

name = Heat Doubler
quantity = 5
parent = 1
materialID = -14
type = Flat Plate

Aero Mass = 0.079000
Thermal Mass = 0.079000
Diameter/Width = 0.060000
Length = 0.180000

name = LVI Ring
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.182000
Thermal Mass = 0.182000
Diameter/Width = 0.345000
Length = 0.350000

name = Trim Mass
quantity = 10
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 0.050000
Thermal Mass = 0.050000
Diameter/Width = 0.025000
Length = 0.015000

name = Solar Panel 1
quantity = 1
parent = 1
materialID = -14
type = Flat Plate
Aero Mass = 7.130000
Thermal Mass = 7.130000
Diameter/Width = 0.630000
Length = 1.050000

name = Solar Panel 2
quantity = 1
parent = 1
materialID = -14
type = Flat Plate
Aero Mass = 7.130000
Thermal Mass = 7.130000
Diameter/Width = 0.630000
Length = 1.050000

name = Ram Solar Panel
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.085000

Thermal Mass = 2.085000
Diameter/Width = 0.520000
Length = 0.520000

name = Batteries
quantity = 4
parent = 1
materialID = -15
type = Box
Aero Mass = 1.690000
Thermal Mass = 1.690000
Diameter/Width = 0.075000
Length = 0.150000
Height = 0.055000

name = Harness
quantity = 35
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.008000
Length = 0.400000

name = Power Electronics
quantity = 4
parent = 1
materialID = -13
type = Box
Aero Mass = 0.700000
Thermal Mass = 0.700000
Diameter/Width = 0.050000
Length = 0.175000
Height = 0.010000

name = Avionics Box
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 6.080000
Thermal Mass = 6.080000
Diameter/Width = 0.130000
Length = 0.350000
Height = 0.050000

name = Payload Box
quantity = 1
parent = 1
materialID = 5

type = Box
Aero Mass = 5.530000
Thermal Mass = 5.530000
Diameter/Width = 0.150000
Length = 0.275000
Height = 0.050000

name = RF TTC Antennas
quantity = 10
parent = 1
materialID = -13
type = Flat Plate
Aero Mass = 0.060000
Thermal Mass = 0.060000
Diameter/Width = 0.040000
Length = 0.050000

name = RF Payload Antenna
quantity = 1
parent = 1
materialID = 5
type = Flat Plate
Aero Mass = 0.270000
Thermal Mass = 0.270000
Diameter/Width = 0.095000
Length = 0.295000

name = RF Harness
quantity = 12
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.120000
Thermal Mass = 0.120000
Diameter/Width = 0.006000
Length = 0.520000

name = RF Brackets
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.370000
Thermal Mass = 0.370000
Diameter/Width = 0.050000
Length = 0.060000
Height = 0.050000

name = RTC Antennas
quantity = 3
parent = 1

materialID = -13
type = Cylinder
Aero Mass = 0.110000
Thermal Mass = 0.110000
Diameter/Width = 0.030000
Length = 0.030000

name = GPS Antennas
quantity = 2
parent = 1
materialID = -13
type = Flat Plate
Aero Mass = 0.120000
Thermal Mass = 0.120000
Diameter/Width = 0.050000
Length = 0.075000

name = Upconverter
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 0.600000
Thermal Mass = 0.600000
Diameter/Width = 0.050000
Length = 0.100000
Height = 0.050000

name = PA
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 1.298000
Thermal Mass = 1.298000
Diameter/Width = 0.100000
Length = 0.100000
Height = 0.050000

name = Reaction Wheels
quantity = 4
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 3.274000
Thermal Mass = 3.274000
Diameter/Width = 0.103000
Length = 0.050000

name = RW Bracket
quantity = 4

parent = 1
materialID = 5
type = Cylinder
Aero Mass = 0.794000
Thermal Mass = 0.794000
Diameter/Width = 0.100000
Length = 0.040000

name = TR
quantity = 3
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.948000
Thermal Mass = 0.948000
Diameter/Width = 0.030000
Length = 0.200000

name = ST
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.496000
Thermal Mass = 0.496000
Diameter/Width = 0.055000
Length = 0.060000
Height = 0.055000

name = ST Bracket
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.118000
Thermal Mass = 0.118000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.025000

name = IMU
quantity = 3
parent = 1
materialID = 19
type = Box
Aero Mass = 0.010000
Thermal Mass = 0.010000
Diameter/Width = 0.010000
Length = 0.024000
Height = 0.010000

name = Magnetometers
quantity = 2
parent = 1
materialID = 5
type = Box
Aero Mass = 0.072000
Thermal Mass = 0.072000
Diameter/Width = 0.040000
Length = 0.050000
Height = 0.025000

name = ST Compute
quantity = 4
parent = 1
materialID = 23
type = Box
Aero Mass = 0.240000
Thermal Mass = 0.240000
Diameter/Width = 0.080000
Length = 0.080000
Height = 0.030000

name = PPU
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 1.441000
Thermal Mass = 1.441000
Diameter/Width = 0.100000
Length = 0.150000
Height = 0.038000

name = Tanks
quantity = 2
parent = 1
materialID = -19
type = Cylinder
Aero Mass = 2.590000
Thermal Mass = 2.590000
Diameter/Width = 0.280000
Length = 0.425000

name = Plumbing
quantity = 18
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.005000

Length = 0.050000

name = Brackets

quantity = 8

parent = 1

materialID = 5

type = Box

Aero Mass = 0.134000

Thermal Mass = 0.134000

Diameter/Width = 0.040000

Length = 0.050000

Height = 0.030000

name = Thruster

quantity = 1

parent = 1

materialID = 66

type = Cylinder

Aero Mass = 0.870000

Thermal Mass = 0.870000

Diameter/Width = 0.090000

Length = 0.040000

name = Radiator

quantity = 1

parent = 1

materialID = 5

type = Flat Plate

Aero Mass = 0.410000

Thermal Mass = 0.410000

Diameter/Width = 0.125000

Length = 0.125000

name = Pressure Components

quantity = 4

parent = 1

materialID = 58

type = Cylinder

Aero Mass = 0.251000

Thermal Mass = 0.251000

Diameter/Width = 0.025000

Length = 0.075000

name = Mechanical Misc

quantity = 6

parent = 1

materialID = 5

type = Box

Aero Mass = 0.143000

Thermal Mass = 0.143000

Diameter/Width = 0.050000

Length = 0.050000
Height = 0.025000

name = Prop Harness
quantity = 2
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.033000
Thermal Mass = 0.033000
Diameter/Width = 0.005000
Length = 0.200000

name = TOP PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 1.300000
Thermal Mass = 1.300000
Diameter/Width = 0.400000
Length = 0.520000

name = FRONT TOP PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.760000
Thermal Mass = 0.760000
Diameter/Width = 0.300000
Length = 0.500000

name = TOP SIDE PANEL LEFT
quantity = 2
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.795000
Thermal Mass = 0.795000
Diameter/Width = 0.250000
Length = 0.750000

name = RADIATOR SIDE PANEL
quantity = 2
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.410000
Thermal Mass = 2.410000
Diameter/Width = 0.450000

Length = 0.700000

name = FRONT PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 1.970000
Thermal Mass = 1.970000
Diameter/Width = 0.500000
Length = 0.599000

name = BOTTOM PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.000000
Thermal Mass = 2.000000
Diameter/Width = 0.470000
Length = 0.690000

name = BACK PANEL
quantity = 1
parent = 1
materialID = 44
type = Flat Plate
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.150000
Length = 0.360000

name = UPPER SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 1.470000
Thermal Mass = 1.470000
Diameter/Width = 0.085000
Length = 0.780000

name = HEAT PIPE SECTIONS
quantity = 1
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 1.630000
Thermal Mass = 1.630000
Diameter/Width = 0.110000
Length = 0.550000

name = TOP SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.690000
Thermal Mass = 0.690000
Diameter/Width = 0.071000
Length = 0.508000

name = TOP CENTER RAIL
quantity = 1
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.400000
Thermal Mass = 0.400000
Diameter/Width = 0.052000
Length = 0.530000

name = FRONT TOP SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.076000
Length = 0.269000

name = FORWARD FRAME
quantity = 1
parent = 1
materialID = -1
type = Flat Plate
Aero Mass = 2.410000
Thermal Mass = 2.410000
Diameter/Width = 0.518000
Length = 0.610000

name = LOWER SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 1.075000
Thermal Mass = 1.075000
Diameter/Width = 0.074000
Length = 0.744000

name = BACK FRAME
quantity = 1
parent = 1
materialID = -2
type = Flat Plate
Aero Mass = 4.970000
Thermal Mass = 4.970000
Diameter/Width = 0.521000
Length = 0.716000

name = CRYOCOOLER COMPRESSOR MOUNT
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.620000
Thermal Mass = 1.620000
Diameter/Width = 0.080000
Length = 0.170000
Height = 0.056000

name = CRYOCOOLER EXPANDER CLAM SHELL
quantity = 1
parent = 1
materialID = 19
type = Box
Aero Mass = 0.760000
Thermal Mass = 0.760000
Diameter/Width = 0.030000
Length = 0.095000
Height = 0.030000

name = THALES LPT9510
quantity = 1
parent = 1
materialID = 5
type = Cylinder
Aero Mass = 2.210000
Thermal Mass = 2.210000
Diameter/Width = 0.080000
Length = 0.156000

name = TELESCOPE FORE BAFFLE TUBE
quantity = 1
parent = 1
materialID = -3
type = Cylinder
Aero Mass = 2.010000
Thermal Mass = 2.010000
Diameter/Width = 0.206000
Length = 0.305000

name = MIRROR 2 BAFFLE
quantity = 1
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.065000
Length = 0.110000

name = MIRROR 1 BAFFLE
quantity = 1
parent = 1
materialID = -4
type = Flat Plate
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.190000
Length = 0.270000

name = MIRROR 3 BAFFLE
quantity = 1
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.050000
Thermal Mass = 0.050000
Diameter/Width = 0.046000
Length = 0.300000

name = MIRROR 2 BAFFLE RING
quantity = 1
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.380000
Thermal Mass = 0.380000
Diameter/Width = 0.036000
Length = 0.178000

name = TELESCOPE BIPOD FITTING SINGLE END
quantity = 2
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.025000
Length = 0.088000

name = TELESCOPE BIPOD FITTING DOUBLE END
quantity = 1
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.330000
Thermal Mass = 0.330000
Diameter/Width = 0.025000
Length = 0.147000

name = LOWER TELESCOPE BIPOD FITTING
quantity = 1
parent = 1
materialID = 65
type = Box
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.039000
Length = 0.070000
Height = 0.028000

name = TELESCOPE BIPOD
quantity = 2
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.160000
Thermal Mass = 0.160000
Diameter/Width = 0.014800
Length = 0.205000

name = TELESCOPE MOUNT PAD
quantity = 2
parent = 1
materialID = 65
type = Box
Aero Mass = 0.205000
Thermal Mass = 0.205000
Diameter/Width = 0.049000
Length = 0.057000
Height = 0.016000

name = M1
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 3.320000
Thermal Mass = 3.320000
Diameter/Width = 0.070000
Length = 0.340000

name = M2
quantity = 1
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 1.100000
Thermal Mass = 1.100000
Diameter/Width = 0.030000
Length = 0.170000

name = M3
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 2.850000
Thermal Mass = 2.850000
Diameter/Width = 0.062000
Length = 0.360000

name = M1 MOUNT BIPOD
quantity = 3
parent = 1
materialID = 65
type = Box
Aero Mass = 0.107000
Thermal Mass = 0.107000
Diameter/Width = 0.024000
Length = 0.075000
Height = 0.013000

name = M3 MOUNT BIPOD
quantity = 3
parent = 1
materialID = 65
type = Box
Aero Mass = 0.107000
Thermal Mass = 0.107000
Diameter/Width = 0.024000
Length = 0.075000
Height = 0.013000

name = STAR TRACKER MOUNT
quantity = 2
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.080000
Thermal Mass = 0.080000
Diameter/Width = 0.051500

Length = 0.065000

name = SPECTROMETER BIPOD OFFSET FITTING

quantity = 1

parent = 1

materialID = 65

type = Box

Aero Mass = 0.140000

Thermal Mass = 0.140000

Diameter/Width = 0.030000

Length = 0.055000

Height = 0.024000

name = SPECTROMETER HOUSING

quantity = 1

parent = 1

materialID = 8

type = Box

Aero Mass = 0.820000

Thermal Mass = 0.820000

Diameter/Width = 0.121000

Length = 0.145000

Height = 0.018000

name = GRATING MOUNT

quantity = 1

parent = 1

materialID = 65

type = Cylinder

Aero Mass = 0.380000

Thermal Mass = 0.380000

Diameter/Width = 0.027000

Length = 0.145000

name = DYSON LENS MOUNT

quantity = 1

parent = 1

materialID = 21

type = Cylinder

Aero Mass = 0.290000

Thermal Mass = 0.290000

Diameter/Width = 0.020000

Length = 0.110000

name = CRYOCOOLER DRIVER

quantity = 1

parent = 1

materialID = 8

type = Box

Aero Mass = 2.101000

Thermal Mass = 2.101000

Diameter/Width = 0.090000
Length = 0.120000
Height = 0.080000

name = FPIE-ANALOG
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.650000
Thermal Mass = 1.650000
Diameter/Width = 0.110000
Length = 0.180000
Height = 0.040000

name = FPIE-PSU
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.100000
Thermal Mass = 1.100000
Diameter/Width = 0.120000
Length = 0.140000
Height = 0.035000

name = IIE
quantity = 1
parent = 1
materialID = -5
type = Box
Aero Mass = 0.950000
Thermal Mass = 0.950000
Diameter/Width = 0.150000
Length = 0.200000
Height = 0.050000

name = FASTENERS
quantity = 5000
parent = 1
materialID = 57
type = Cylinder
Aero Mass = 0.000810
Thermal Mass = 0.000810
Diameter/Width = 0.004000
Length = 0.008000

name = SPECTROMETER BAFFLES
quantity = 3
parent = 1
materialID = 8

type = Cylinder
Aero Mass = 0.020000
Thermal Mass = 0.020000
Diameter/Width = 0.011000
Length = 0.080000

name = COMP PANEL CARBON PARTS
quantity = 1
parent = 1
materialID = -6
type = Box
Aero Mass = 3.200000
Thermal Mass = 3.200000
Diameter/Width = 0.280000
Length = 0.290000
Height = 0.080000

name = THERMAL SHIELD RODS
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 0.170000
Thermal Mass = 0.170000
Diameter/Width = 0.054000
Length = 0.110000
Height = 0.040000

name = MLI PATCHES
quantity = 1
parent = 1
materialID = 44
type = Flat Plate
Aero Mass = 1.460000
Thermal Mass = 1.460000
Diameter/Width = 0.210000
Length = 0.440000

name = FLEX PRINT CABLE
quantity = 1
parent = 1
materialID = -7
type = Flat Plate
Aero Mass = 0.440000
Thermal Mass = 0.440000
Diameter/Width = 0.198000
Length = 0.483000

name = CONDUCTANCE HEAT PIPE BEND
quantity = 1
parent = 1

materialID = -8
type = Flat Plate
Aero Mass = 0.380000
Thermal Mass = 0.380000
Diameter/Width = 0.206000
Length = 0.584000

name = GRATING
quantity = 1
parent = 1
materialID = -20
type = Cylinder
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.015000
Length = 0.043000

name = MISC BRACKETS
quantity = 6
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.010000
Thermal Mass = 0.010000
Diameter/Width = 0.020000
Length = 0.100000

name = CRYOCOOLER MU METAL SHIELD
quantity = 1
parent = 1
materialID = -9
type = Flat Plate
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.300000
Length = 0.300000

name = DYSON LENS
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 0.450000
Thermal Mass = 0.450000
Diameter/Width = 0.042000
Length = 0.125000

name = NADIR SUN SENSOR MAG
quantity = 1
parent = 1
materialID = 8

type = Box
Aero Mass = 0.280000
Thermal Mass = 0.280000
Diameter/Width = 0.060000
Length = 0.090000
Height = 0.020000

name = TELESCOPE UPPER BAFFLE TUBE
quantity = 1
parent = 1
materialID = -10
type = Cylinder
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.140000
Length = 0.300000

name = HEAD MOUNT
quantity = 1
parent = 1
materialID = 8
type = Cylinder
Aero Mass = 0.240000
Thermal Mass = 0.240000
Diameter/Width = 0.030000
Length = 0.125000

name = HARNESS/CABLING
quantity = 1
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 2.390000
Thermal Mass = 2.390000
Diameter/Width = 0.052000
Length = 0.130000

*****OUTPUT****

Item Number = 1

name = Tanager
Demise Altitude = 77.995255
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Structural Brackets
Demise Altitude = 73.058197
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Avionics Deck
Demise Altitude = 65.115784
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Structural Panels
Demise Altitude = 75.865555
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Payload Deck
Demise Altitude = 74.618057
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Payload Closeout Panels
Demise Altitude = 75.534416
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Avionics Brackets
Demise Altitude = 73.685532
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Hardware
Demise Altitude = 72.758263
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = SA Release Mechanism
Demise Altitude = 75.099930
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Pipe
Demise Altitude = 74.897560
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MLI Blankets
Demise Altitude = 77.633270

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Straps
Demise Altitude = 76.687737
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heaters
Demise Altitude = 77.751091
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Temp Sensors
Demise Altitude = 77.382820
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Doubler
Demise Altitude = 77.751457
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LVI Ring
Demise Altitude = 77.389580
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Trim Mass
Demise Altitude = 70.380798
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Solar Panel 1
Demise Altitude = 76.998398
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Solar Panel 2
Demise Altitude = 76.998398
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Ram Solar Panel
Demise Altitude = 71.549660
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Batteries
Demise Altitude = 72.691727
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Harness
Demise Altitude = 76.349083
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Power Electronics
Demise Altitude = 71.978249
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Avionics Box
Demise Altitude = 58.227436
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Payload Box
Demise Altitude = 57.371414
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF TTC Antennas
Demise Altitude = 75.679657
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Payload Antenna
Demise Altitude = 75.936218
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Harness
Demise Altitude = 76.751953

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Brackets
Demise Altitude = 71.224945
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RTC Antennas
Demise Altitude = 72.749420
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GPS Antennas
Demise Altitude = 75.331696
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Upconverter
Demise Altitude = 71.057518
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = PA
Demise Altitude = 64.872086
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Reaction Wheels
Demise Altitude = 51.757607
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RW Bracket
Demise Altitude = 67.199142
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TR
Demise Altitude = 70.107964
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST
Demise Altitude = 69.678162
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST Bracket
Demise Altitude = 74.177971
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = IMU
Demise Altitude = 76.837784
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Magnetometers
Demise Altitude = 75.490150
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST Compute
Demise Altitude = 75.433861
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = PPU
Demise Altitude = 66.789909
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Tanks
Demise Altitude = 77.061768
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Plumbing
Demise Altitude = 76.815239
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Brackets
Demise Altitude = 73.836494

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Thruster
Demise Altitude = 51.590809
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Radiator
Demise Altitude = 72.407410
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Pressure Components
Demise Altitude = 65.785027
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Mechanical Misc
Demise Altitude = 73.420906
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Prop Harness
Demise Altitude = 77.014603
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP PANEL
Demise Altitude = 74.690430
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT TOP PANEL
Demise Altitude = 76.009521
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP SIDE PANEL LEFT
Demise Altitude = 76.257454
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RADIATOR SIDE PANEL
Demise Altitude = 73.038597
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT PANEL
Demise Altitude = 73.067810
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BOTTOM PANEL
Demise Altitude = 73.899063
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BACK PANEL
Demise Altitude = 77.874123
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = UPPER SIDE RAIL
Demise Altitude = 72.626373
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HEAT PIPE SECTIONS
Demise Altitude = 70.117111
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP SIDE RAIL
Demise Altitude = 73.875587
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP CENTER RAIL
Demise Altitude = 75.373085
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT TOP SIDE RAIL
Demise Altitude = 74.843773

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FORWARD FRAME
Demise Altitude = 72.644051
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LOWER SIDE RAIL
Demise Altitude = 73.680473
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BACK FRAME
Demise Altitude = 67.721581
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER COMPRESSOR MOUNT
Demise Altitude = 68.600731
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER EXPANDER CLAM SHELL
Demise Altitude = 69.658020
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = THALES LPT9510
Demise Altitude = 63.752712
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE FORE BAFFLE TUBE
Demise Altitude = 73.585701
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MIRROR 2 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.468619
Impact Kinetic Energy = 91.614700

name = MIRROR 1 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.683094
Impact Kinetic Energy = 39.006786

name = MIRROR 3 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.514768
Impact Kinetic Energy = 2.958284

name = MIRROR 2 BAFFLE RING
Demise Altitude = 0.000000
Debris Casualty Area = 0.462468
Impact Kinetic Energy = 241.245590

name = TELESCOPE BIPOD FITTING SINGLE END
Demise Altitude = 61.724831
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE BIPOD FITTING DOUBLE END
Demise Altitude = 60.716507
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LOWER TELESCOPE BIPOD FITTING
Demise Altitude = 62.358746
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE BIPOD
Demise Altitude = 0.000000
Debris Casualty Area = 0.858264
Impact Kinetic Energy = 92.874947

name = TELESCOPE MOUNT PAD
Demise Altitude = 0.000000
Debris Casualty Area = 0.827003
Impact Kinetic Energy = 220.481293

name = M1
Demise Altitude = 59.720592

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M2
Demise Altitude = 68.142303
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M3
Demise Altitude = 60.989792
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M1 MOUNT BIPOD
Demise Altitude = 65.335251
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M3 MOUNT BIPOD
Demise Altitude = 65.335251
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = STAR TRACKER MOUNT
Demise Altitude = 0.000000
Debris Casualty Area = 0.865553
Impact Kinetic Energy = 31.293482

name = SPECTROMETER BIPOD OFFSET FITTING
Demise Altitude = 65.896194
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = SPECTROMETER HOUSING
Demise Altitude = 70.535683
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GRATING MOUNT
Demise Altitude = 59.963966
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = DYSON LENS MOUNT
Demise Altitude = 72.647942
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER DRIVER
Demise Altitude = 65.324104
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FPIE-ANALOG
Demise Altitude = 68.146164
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FPIE-PSU
Demise Altitude = 69.268219
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = IIE
Demise Altitude = 0.000000
Debris Casualty Area = 0.549706
Impact Kinetic Energy = 458.819489

name = FASTENERS
Demise Altitude = 76.984901
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = SPECTROMETER BAFFLES
Demise Altitude = 76.879311
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = COMP PANEL CARBON PARTS
Demise Altitude = 76.412376
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = THERMAL SHIELD RODS
Demise Altitude = 75.981552

Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MLI PATCHES
Demise Altitude = 77.197212
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FLEX PRINT CABLE
Demise Altitude = 76.691902
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CONDUCTANCE HEAT PIPE BEND
Demise Altitude = 77.033623
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GRATING
Demise Altitude = 57.679562
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MISC BRACKETS
Demise Altitude = 77.395081
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER MU METAL SHIELD
Demise Altitude = 77.574364
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = DYSON LENS
Demise Altitude = 67.323128
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = NADIR SUN SENSOR MAG
Demise Altitude = 73.187561
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE UPPER BAFFLE TUBE
Demise Altitude = 77.443970
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HEAD MOUNT
Demise Altitude = 73.635223
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HARNESS/CABLING
Demise Altitude = 62.668098
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

===== End of Requirement 4.7-1 =====

08 16 2022; 12:06:31PM Project Data Saved To File
08 16 2022; 12:06:42PM Project Data Saved To File
08 16 2022; 12:06:48PM Requirement 4.5-2: Compliant

===== End of Requirement 4.5-2 =====

406 km x 406 km SSO Orbit:

08 16 2022; 12:23:51PM Processing Requirement 4.3-1: Return Status : Not Run

=====

No Project Data Available

=====

===== End of Requirement 4.3-1 =====

=====

Run Data

=====

****INPUT****

Space Structure Name = Tanager
Space Structure Type = Payload
Perigee Altitude = 406.000 (km)
Apogee Altitude = 406.000 (km)
Inclination = 97.000 (deg)

RAAN = 0.000 (deg)
Argument of Perigee = 0.000 (deg)
Mean Anomaly = 0.000 (deg)
Final Area-To-Mass Ratio = 0.0074 (m²/kg)
Start Year = 2023.666 (yr)
Initial Mass = 193.000 (kg)
Final Mass = 188.000 (kg)
Duration = 1.000 (yr)
Station-Kept = True
Abandoned = True
Long-Term Reentry = False

****OUTPUT****

Collision Probability = 4.2190E-06
Returned Message: Normal Processing
Date Range Message: Normal Date Range
Status = Pass

08 16 2022; 12:14:07PM Processing Requirement 4.3-2: Return Status : Passed

=====
No Project Data Available
=====

=====
8 16 2022; 12:23:43PM Processing Requirement 4.5-1: Return Status : Passed

=====
Run Data
=====

****INPUT****

Space Structure Name = Tanager
Space Structure Type = Payload
Perigee Altitude = 406.000 (km)
Apogee Altitude = 406.000 (km)
Inclination = 97.000 (deg)
RAAN = 0.000 (deg)
Argument of Perigee = 0.000 (deg)
Mean Anomaly = 0.000 (deg)
Final Area-To-Mass Ratio = 0.0074 (m²/kg)
Start Year = 2023.666 (yr)
Initial Mass = 193.000 (kg)
Final Mass = 188.000 (kg)
Duration = 1.000 (yr)
Station-Kept = True
Abandoned = True
Long-Term Reentry = False

****OUTPUT****

Collision Probability = 4.2190E-06
Returned Message: Normal Processing
Date Range Message: Normal Date Range
Status = Pass

=====

===== End of Requirement 4.5-1 =====

08 16 2022; 12:19:46PM Project Data Saved To File
08 16 2022; 12:19:50PM Project Data Saved To File
08 16 2022; 12:19:50PM Mission Editor Changes Applied
08 16 2022; 12:19:50PM Project Data Saved To File
08 16 2022; 12:19:50PM Project Data Saved To File
08 16 2022; 12:19:55PM Processing Requirement 4.6 Return Status : Passed

=====

Project Data

=====

****INPUT****

Space Structure Name = Tanager
Space Structure Type = Payload
Perigee Altitude = 406.000000 (km)
Apogee Altitude = 406.000000 (km)
Inclination = 97.000000 (deg)
RAAN = 0.000000 (deg)
Argument of Perigee = 0.000000 (deg)
Mean Anomaly = 0.000000 (deg)
Area-To-Mass Ratio = 0.007365 (m²/kg)
Start Year = 2023.666000 (yr)
Initial Mass = 193.000000 (kg)
Final Mass = 188.000000 (kg)
Duration = 1.000000 (yr)
Station Kept = True
Abandoned = True
PMD Perigee Altitude = 406.000000 (km)
PMD Apogee Altitude = 406.000000 (km)
PMD Inclination = 97.000000 (deg)
PMD RAAN = 0.000000 (deg)
PMD Argument of Perigee = 0.000000 (deg)
PMD Mean Anomaly = 0.000000 (deg)
Long-Term Reentry = False

****OUTPUT****

Suggested Perigee Altitude = 406.000000 (km)

Suggested Apogee Altitude = 406.000000 (km)
Returned Error Message = Passes LEO reentry orbit criteria.

Released Year = 2025 (yr)
Requirement = 61
Compliance Status = Pass

=====

===== End of Requirement 4.6 =====
08 16 2022; 12:20:03PM *****Processing Requirement 4.7-1
Return Status : Passed

*****INPUT****

Item Number = 1

name = Tanager
quantity = 1
parent = 0
materialID = 5
type = Box
Aero Mass = 188.000000
Thermal Mass = 188.000000
Diameter/Width = 0.600000
Length = 1.000000
Height = 0.600000

name = Structural Brackets
quantity = 16
parent = 1
materialID = 5
type = Box
Aero Mass = 0.269000
Thermal Mass = 0.269000
Diameter/Width = 0.050000
Length = 0.100000
Height = 0.020000

name = Avionics Deck
quantity = 1
parent = 1
materialID = -11
type = Box
Aero Mass = 5.000000
Thermal Mass = 5.000000
Diameter/Width = 0.580000
Length = 0.630000
Height = 0.080000

name = Structural Panels
quantity = 4

parent = 1
materialID = -11
type = Box
Aero Mass = 0.999000
Thermal Mass = 0.999000
Diameter/Width = 0.400000
Length = 0.525000
Height = 0.030000

name = Payload Deck
quantity = 1
parent = 1
materialID = -11
type = Box
Aero Mass = 1.330000
Thermal Mass = 1.330000
Diameter/Width = 0.550000
Length = 0.550000
Height = 0.030000

name = Payload Closeout Panels
quantity = 4
parent = 1
materialID = -11
type = Box
Aero Mass = 1.027000
Thermal Mass = 1.027000
Diameter/Width = 0.500000
Length = 0.525000
Height = 0.025000

name = Avionics Brackets
quantity = 6
parent = 1
materialID = 5
type = Box
Aero Mass = 0.134000
Thermal Mass = 0.134000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.025000

name = Hardware
quantity = 200
parent = 1
materialID = 54
type = Cylinder
Aero Mass = 0.017000
Thermal Mass = 0.017000
Diameter/Width = 0.012000
Length = 0.020000

name = SA Release Mechanism
quantity = 2
parent = 1
materialID = 5
type = Box
Aero Mass = 0.124000
Thermal Mass = 0.124000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.050000

name = Heat Pipe
quantity = 1
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.182000
Thermal Mass = 0.182000
Diameter/Width = 0.030000
Length = 0.107000

name = MLI Blankets
quantity = 5
parent = 1
materialID = 44
type = Flat Plate
Aero Mass = 0.304000
Thermal Mass = 0.304000
Diameter/Width = 0.132000
Length = 0.255000

name = Heat Straps
quantity = 4
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.030000
Thermal Mass = 0.030000
Diameter/Width = 0.020000
Length = 0.050000

name = Heaters
quantity = 20
parent = 1
materialID = 19
type = Flat Plate
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.025000
Length = 0.050000

name = Temp Sensors
quantity = 25
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.010000
Length = 0.020000

name = Heat Doubler
quantity = 5
parent = 1
materialID = -14
type = Flat Plate
Aero Mass = 0.079000
Thermal Mass = 0.079000
Diameter/Width = 0.060000
Length = 0.180000

name = LVI Ring
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.182000
Thermal Mass = 0.182000
Diameter/Width = 0.345000
Length = 0.350000

name = Trim Mass
quantity = 10
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 0.050000
Thermal Mass = 0.050000
Diameter/Width = 0.025000
Length = 0.015000

name = Solar Panel 1
quantity = 1
parent = 1
materialID = -14
type = Flat Plate
Aero Mass = 7.130000
Thermal Mass = 7.130000
Diameter/Width = 0.630000
Length = 1.050000

name = Solar Panel 2
quantity = 1
parent = 1
materialID = -14
type = Flat Plate
Aero Mass = 7.130000
Thermal Mass = 7.130000
Diameter/Width = 0.630000
Length = 1.050000

name = Ram Solar Panel
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.085000
Thermal Mass = 2.085000
Diameter/Width = 0.520000
Length = 0.520000

name = Batteries
quantity = 4
parent = 1
materialID = -15
type = Box
Aero Mass = 1.690000
Thermal Mass = 1.690000
Diameter/Width = 0.075000
Length = 0.150000
Height = 0.055000

name = Harness
quantity = 35
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.008000
Length = 0.400000

name = Power Electronics
quantity = 4
parent = 1
materialID = -13
type = Box
Aero Mass = 0.700000
Thermal Mass = 0.700000
Diameter/Width = 0.050000
Length = 0.175000
Height = 0.010000

name = Avionics Box
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 6.080000
Thermal Mass = 6.080000
Diameter/Width = 0.130000
Length = 0.350000
Height = 0.050000

name = Payload Box
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 5.530000
Thermal Mass = 5.530000
Diameter/Width = 0.150000
Length = 0.275000
Height = 0.050000

name = RF TTC Antennas
quantity = 10
parent = 1
materialID = -13
type = Flat Plate
Aero Mass = 0.060000
Thermal Mass = 0.060000
Diameter/Width = 0.040000
Length = 0.050000

name = RF Payload Antenna
quantity = 1
parent = 1
materialID = 5
type = Flat Plate
Aero Mass = 0.270000
Thermal Mass = 0.270000
Diameter/Width = 0.095000
Length = 0.295000

name = RF Harness
quantity = 12
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.120000
Thermal Mass = 0.120000
Diameter/Width = 0.006000

Length = 0.520000

name = RF Brackets
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.370000
Thermal Mass = 0.370000
Diameter/Width = 0.050000
Length = 0.060000
Height = 0.050000

name = RTC Antennas
quantity = 3
parent = 1
materialID = -13
type = Cylinder
Aero Mass = 0.110000
Thermal Mass = 0.110000
Diameter/Width = 0.030000
Length = 0.030000

name = GPS Antennas
quantity = 2
parent = 1
materialID = -13
type = Flat Plate
Aero Mass = 0.120000
Thermal Mass = 0.120000
Diameter/Width = 0.050000
Length = 0.075000

name = Upconverter
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 0.600000
Thermal Mass = 0.600000
Diameter/Width = 0.050000
Length = 0.100000
Height = 0.050000

name = PA
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 1.298000
Thermal Mass = 1.298000

Diameter/Width = 0.100000
Length = 0.100000
Height = 0.050000

name = Reaction Wheels
quantity = 4
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 3.274000
Thermal Mass = 3.274000
Diameter/Width = 0.103000
Length = 0.050000

name = RW Bracket
quantity = 4
parent = 1
materialID = 5
type = Cylinder
Aero Mass = 0.794000
Thermal Mass = 0.794000
Diameter/Width = 0.100000
Length = 0.040000

name = TR
quantity = 3
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.948000
Thermal Mass = 0.948000
Diameter/Width = 0.030000
Length = 0.200000

name = ST
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.496000
Thermal Mass = 0.496000
Diameter/Width = 0.055000
Length = 0.060000
Height = 0.055000

name = ST Bracket
quantity = 4
parent = 1
materialID = 5
type = Box
Aero Mass = 0.118000

Thermal Mass = 0.118000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.025000

name = IMU
quantity = 3
parent = 1
materialID = 19
type = Box
Aero Mass = 0.010000
Thermal Mass = 0.010000
Diameter/Width = 0.010000
Length = 0.024000
Height = 0.010000

name = Magnetometers
quantity = 2
parent = 1
materialID = 5
type = Box
Aero Mass = 0.072000
Thermal Mass = 0.072000
Diameter/Width = 0.040000
Length = 0.050000
Height = 0.025000

name = ST Compute
quantity = 4
parent = 1
materialID = 23
type = Box
Aero Mass = 0.240000
Thermal Mass = 0.240000
Diameter/Width = 0.080000
Length = 0.080000
Height = 0.030000

name = PPU
quantity = 1
parent = 1
materialID = 5
type = Box
Aero Mass = 1.441000
Thermal Mass = 1.441000
Diameter/Width = 0.100000
Length = 0.150000
Height = 0.038000

name = Tanks
quantity = 2

parent = 1
materialID = -19
type = Cylinder
Aero Mass = 2.590000
Thermal Mass = 2.590000
Diameter/Width = 0.280000
Length = 0.425000

name = Plumbing
quantity = 18
parent = 1
materialID = 58
type = Cylinder
Aero Mass = 0.004000
Thermal Mass = 0.004000
Diameter/Width = 0.005000
Length = 0.050000

name = Brackets
quantity = 8
parent = 1
materialID = 5
type = Box
Aero Mass = 0.134000
Thermal Mass = 0.134000
Diameter/Width = 0.040000
Length = 0.050000
Height = 0.030000

name = Thruster
quantity = 1
parent = 1
materialID = 66
type = Cylinder
Aero Mass = 0.870000
Thermal Mass = 0.870000
Diameter/Width = 0.090000
Length = 0.040000

name = Radiator
quantity = 1
parent = 1
materialID = 5
type = Flat Plate
Aero Mass = 0.410000
Thermal Mass = 0.410000
Diameter/Width = 0.125000
Length = 0.125000

name = Pressure Components
quantity = 4

parent = 1
materialID = 58
type = Cylinder
Aero Mass = 0.251000
Thermal Mass = 0.251000
Diameter/Width = 0.025000
Length = 0.075000

name = Mechanical Misc
quantity = 6
parent = 1
materialID = 5
type = Box
Aero Mass = 0.143000
Thermal Mass = 0.143000
Diameter/Width = 0.050000
Length = 0.050000
Height = 0.025000

name = Prop Harness
quantity = 2
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 0.033000
Thermal Mass = 0.033000
Diameter/Width = 0.005000
Length = 0.200000

name = TOP PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 1.300000
Thermal Mass = 1.300000
Diameter/Width = 0.400000
Length = 0.520000

name = FRONT TOP PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.760000
Thermal Mass = 0.760000
Diameter/Width = 0.300000
Length = 0.500000

name = TOP SIDE PANEL LEFT
quantity = 2

parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 0.795000
Thermal Mass = 0.795000
Diameter/Width = 0.250000
Length = 0.750000

name = RADIATOR SIDE PANEL
quantity = 2
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.410000
Thermal Mass = 2.410000
Diameter/Width = 0.450000
Length = 0.700000

name = FRONT PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 1.970000
Thermal Mass = 1.970000
Diameter/Width = 0.500000
Length = 0.599000

name = BOTTOM PANEL
quantity = 1
parent = 1
materialID = -11
type = Flat Plate
Aero Mass = 2.000000
Thermal Mass = 2.000000
Diameter/Width = 0.470000
Length = 0.690000

name = BACK PANEL
quantity = 1
parent = 1
materialID = 44
type = Flat Plate
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.150000
Length = 0.360000

name = UPPER SIDE RAIL
quantity = 2
parent = 1

materialID = 8
type = Flat Plate
Aero Mass = 1.470000
Thermal Mass = 1.470000
Diameter/Width = 0.085000
Length = 0.780000

name = HEAT PIPE SECTIONS
quantity = 1
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 1.630000
Thermal Mass = 1.630000
Diameter/Width = 0.110000
Length = 0.550000

name = TOP SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.690000
Thermal Mass = 0.690000
Diameter/Width = 0.071000
Length = 0.508000

name = TOP CENTER RAIL
quantity = 1
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.400000
Thermal Mass = 0.400000
Diameter/Width = 0.052000
Length = 0.530000

name = FRONT TOP SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.076000
Length = 0.269000

name = FORWARD FRAME
quantity = 1
parent = 1
materialID = -1

type = Flat Plate
Aero Mass = 2.410000
Thermal Mass = 2.410000
Diameter/Width = 0.518000
Length = 0.610000

name = LOWER SIDE RAIL
quantity = 2
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 1.075000
Thermal Mass = 1.075000
Diameter/Width = 0.074000
Length = 0.744000

name = BACK FRAME
quantity = 1
parent = 1
materialID = -2
type = Flat Plate
Aero Mass = 4.970000
Thermal Mass = 4.970000
Diameter/Width = 0.521000
Length = 0.716000

name = CRYOCOOLER COMPRESSOR MOUNT
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.620000
Thermal Mass = 1.620000
Diameter/Width = 0.080000
Length = 0.170000
Height = 0.056000

name = CRYOCOOLER EXPANDER CLAM SHELL
quantity = 1
parent = 1
materialID = 19
type = Box
Aero Mass = 0.760000
Thermal Mass = 0.760000
Diameter/Width = 0.030000
Length = 0.095000
Height = 0.030000

name = THALES LPT9510
quantity = 1
parent = 1

materialID = 5
type = Cylinder
Aero Mass = 2.210000
Thermal Mass = 2.210000
Diameter/Width = 0.080000
Length = 0.156000

name = TELESCOPE FORE BAFFLE TUBE
quantity = 1
parent = 1
materialID = -3
type = Cylinder
Aero Mass = 2.010000
Thermal Mass = 2.010000
Diameter/Width = 0.206000
Length = 0.305000

name = MIRROR 2 BAFFLE
quantity = 1
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.065000
Length = 0.110000

name = MIRROR 1 BAFFLE
quantity = 1
parent = 1
materialID = -4
type = Flat Plate
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.190000
Length = 0.270000

name = MIRROR 3 BAFFLE
quantity = 1
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.050000
Thermal Mass = 0.050000
Diameter/Width = 0.046000
Length = 0.300000

name = MIRROR 2 BAFFLE RING
quantity = 1
parent = 1
materialID = 65

type = Cylinder
Aero Mass = 0.380000
Thermal Mass = 0.380000
Diameter/Width = 0.036000
Length = 0.178000

name = TELESCOPE BIPOD FITTING SINGLE END
quantity = 2
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.025000
Length = 0.088000

name = TELESCOPE BIPOD FITTING DOUBLE END
quantity = 1
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.330000
Thermal Mass = 0.330000
Diameter/Width = 0.025000
Length = 0.147000

name = LOWER TELESCOPE BIPOD FITTING
quantity = 1
parent = 1
materialID = 65
type = Box
Aero Mass = 0.350000
Thermal Mass = 0.350000
Diameter/Width = 0.039000
Length = 0.070000
Height = 0.028000

name = TELESCOPE BIPOD
quantity = 2
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.160000
Thermal Mass = 0.160000
Diameter/Width = 0.014800
Length = 0.205000

name = TELESCOPE MOUNT PAD
quantity = 2
parent = 1
materialID = 65

type = Box
Aero Mass = 0.205000
Thermal Mass = 0.205000
Diameter/Width = 0.049000
Length = 0.057000
Height = 0.016000

name = M1
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 3.320000
Thermal Mass = 3.320000
Diameter/Width = 0.070000
Length = 0.340000

name = M2
quantity = 1
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 1.100000
Thermal Mass = 1.100000
Diameter/Width = 0.030000
Length = 0.170000

name = M3
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 2.850000
Thermal Mass = 2.850000
Diameter/Width = 0.062000
Length = 0.360000

name = M1 MOUNT BIPOD
quantity = 3
parent = 1
materialID = 65
type = Box
Aero Mass = 0.107000
Thermal Mass = 0.107000
Diameter/Width = 0.024000
Length = 0.075000
Height = 0.013000

name = M3 MOUNT BIPOD
quantity = 3
parent = 1

materialID = 65
type = Box
Aero Mass = 0.107000
Thermal Mass = 0.107000
Diameter/Width = 0.024000
Length = 0.075000
Height = 0.013000

name = STAR TRACKER MOUNT
quantity = 2
parent = 1
materialID = 65
type = Flat Plate
Aero Mass = 0.080000
Thermal Mass = 0.080000
Diameter/Width = 0.051500
Length = 0.065000

name = SPECTROMETER BIPOD OFFSET FITTING
quantity = 1
parent = 1
materialID = 65
type = Box
Aero Mass = 0.140000
Thermal Mass = 0.140000
Diameter/Width = 0.030000
Length = 0.055000
Height = 0.024000

name = SPECTROMETER HOUSING
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 0.820000
Thermal Mass = 0.820000
Diameter/Width = 0.121000
Length = 0.145000
Height = 0.018000

name = GRATING MOUNT
quantity = 1
parent = 1
materialID = 65
type = Cylinder
Aero Mass = 0.380000
Thermal Mass = 0.380000
Diameter/Width = 0.027000
Length = 0.145000

name = DYSON LENS MOUNT

quantity = 1
parent = 1
materialID = 21
type = Cylinder
Aero Mass = 0.290000
Thermal Mass = 0.290000
Diameter/Width = 0.020000
Length = 0.110000

name = CRYOCOOLER DRIVER
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 2.101000
Thermal Mass = 2.101000
Diameter/Width = 0.090000
Length = 0.120000
Height = 0.080000

name = FPIE-ANALOG
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.650000
Thermal Mass = 1.650000
Diameter/Width = 0.110000
Length = 0.180000
Height = 0.040000

name = FPIE-PSU
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 1.100000
Thermal Mass = 1.100000
Diameter/Width = 0.120000
Length = 0.140000
Height = 0.035000

name = IIE
quantity = 1
parent = 1
materialID = -5
type = Box
Aero Mass = 0.950000
Thermal Mass = 0.950000
Diameter/Width = 0.150000
Length = 0.200000

Height = 0.050000

name = FASTENERS

quantity = 5000

parent = 1

materialID = 57

type = Cylinder

Aero Mass = 0.000810

Thermal Mass = 0.000810

Diameter/Width = 0.004000

Length = 0.008000

name = SPECTROMETER BAFFLES

quantity = 3

parent = 1

materialID = 8

type = Cylinder

Aero Mass = 0.020000

Thermal Mass = 0.020000

Diameter/Width = 0.011000

Length = 0.080000

name = COMP PANEL CARBON PARTS

quantity = 1

parent = 1

materialID = -6

type = Box

Aero Mass = 3.200000

Thermal Mass = 3.200000

Diameter/Width = 0.280000

Length = 0.290000

Height = 0.080000

name = THERMAL SHIELD RODS

quantity = 1

parent = 1

materialID = 8

type = Box

Aero Mass = 0.170000

Thermal Mass = 0.170000

Diameter/Width = 0.054000

Length = 0.110000

Height = 0.040000

name = MLI PATCHES

quantity = 1

parent = 1

materialID = 44

type = Flat Plate

Aero Mass = 1.460000

Thermal Mass = 1.460000

Diameter/Width = 0.210000
Length = 0.440000

name = FLEX PRINT CABLE
quantity = 1
parent = 1
materialID = -7
type = Flat Plate
Aero Mass = 0.440000
Thermal Mass = 0.440000
Diameter/Width = 0.198000
Length = 0.483000

name = CONDUCTANCE HEAT PIPE BEND
quantity = 1
parent = 1
materialID = -8
type = Flat Plate
Aero Mass = 0.380000
Thermal Mass = 0.380000
Diameter/Width = 0.206000
Length = 0.584000

name = GRATING
quantity = 1
parent = 1
materialID = -20
type = Cylinder
Aero Mass = 0.150000
Thermal Mass = 0.150000
Diameter/Width = 0.015000
Length = 0.043000

name = MISC BRACKETS
quantity = 6
parent = 1
materialID = 8
type = Flat Plate
Aero Mass = 0.010000
Thermal Mass = 0.010000
Diameter/Width = 0.020000
Length = 0.100000

name = CRYOCOOLER MU METAL SHIELD
quantity = 1
parent = 1
materialID = -9
type = Flat Plate
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.300000

Length = 0.300000

name = DYSON LENS
quantity = 1
parent = 1
materialID = 71
type = Cylinder
Aero Mass = 0.450000
Thermal Mass = 0.450000
Diameter/Width = 0.042000
Length = 0.125000

name = NADIR SUN SENSOR MAG
quantity = 1
parent = 1
materialID = 8
type = Box
Aero Mass = 0.280000
Thermal Mass = 0.280000
Diameter/Width = 0.060000
Length = 0.090000
Height = 0.020000

name = TELESCOPE UPPER BAFFLE TUBE
quantity = 1
parent = 1
materialID = -10
type = Cylinder
Aero Mass = 0.200000
Thermal Mass = 0.200000
Diameter/Width = 0.140000
Length = 0.300000

name = HEAD MOUNT
quantity = 1
parent = 1
materialID = 8
type = Cylinder
Aero Mass = 0.240000
Thermal Mass = 0.240000
Diameter/Width = 0.030000
Length = 0.125000

name = HARNESS/CABLING
quantity = 1
parent = 1
materialID = 19
type = Cylinder
Aero Mass = 2.390000
Thermal Mass = 2.390000
Diameter/Width = 0.052000

Length = 0.130000

*****OUTPUT****

Item Number = 1

name = Tanager

Demise Altitude = 77.995255

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Structural Brackets

Demise Altitude = 73.058197

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Avionics Deck

Demise Altitude = 65.115784

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Structural Panels

Demise Altitude = 75.865555

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Payload Deck

Demise Altitude = 74.618057

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Payload Closeout Panels

Demise Altitude = 75.534416

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Avionics Brackets

Demise Altitude = 73.685532

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = Hardware

Demise Altitude = 72.758263

Debris Casualty Area = 0.000000

Impact Kinetic Energy = 0.000000

name = SA Release Mechanism
Demise Altitude = 75.099930
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Pipe
Demise Altitude = 74.897560
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MLI Blankets
Demise Altitude = 77.633270
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Straps
Demise Altitude = 76.687737
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heaters
Demise Altitude = 77.751091
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Temp Sensors
Demise Altitude = 77.382820
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Heat Doubler
Demise Altitude = 77.751457
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LVI Ring
Demise Altitude = 77.389580
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Trim Mass

Demise Altitude = 70.380798
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Solar Panel 1
Demise Altitude = 76.998398
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Solar Panel 2
Demise Altitude = 76.998398
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Ram Solar Panel
Demise Altitude = 71.549660
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Batteries
Demise Altitude = 72.691727
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Harness
Demise Altitude = 76.349083
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Power Electronics
Demise Altitude = 71.978249
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Avionics Box
Demise Altitude = 58.227436
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Payload Box
Demise Altitude = 57.371414
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF TTC Antennas
Demise Altitude = 75.679657
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Payload Antenna
Demise Altitude = 75.936218
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Harness
Demise Altitude = 76.751953
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RF Brackets
Demise Altitude = 71.224945
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RTC Antennas
Demise Altitude = 72.749420
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GPS Antennas
Demise Altitude = 75.331696
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Upconverter
Demise Altitude = 71.057518
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = PA
Demise Altitude = 64.872086
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Reaction Wheels

Demise Altitude = 51.757607
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RW Bracket
Demise Altitude = 67.199142
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TR
Demise Altitude = 70.107964
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST
Demise Altitude = 69.678162
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST Bracket
Demise Altitude = 74.177971
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = IMU
Demise Altitude = 76.837784
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Magnetometers
Demise Altitude = 75.490150
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = ST Compute
Demise Altitude = 75.433861
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = PPU
Demise Altitude = 66.789909
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Tanks
Demise Altitude = 77.061768
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Plumbing
Demise Altitude = 76.815239
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Brackets
Demise Altitude = 73.836494
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Thruster
Demise Altitude = 51.590809
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Radiator
Demise Altitude = 72.407410
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Pressure Components
Demise Altitude = 65.785027
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Mechanical Misc
Demise Altitude = 73.420906
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = Prop Harness
Demise Altitude = 77.014603
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP PANEL

Demise Altitude = 74.690430
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT TOP PANEL
Demise Altitude = 76.009521
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP SIDE PANEL LEFT
Demise Altitude = 76.257454
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = RADIATOR SIDE PANEL
Demise Altitude = 73.038597
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT PANEL
Demise Altitude = 73.067810
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BOTTOM PANEL
Demise Altitude = 73.899063
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BACK PANEL
Demise Altitude = 77.874123
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = UPPER SIDE RAIL
Demise Altitude = 72.626373
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HEAT PIPE SECTIONS
Demise Altitude = 70.117111
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP SIDE RAIL
Demise Altitude = 73.875587
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TOP CENTER RAIL
Demise Altitude = 75.373085
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FRONT TOP SIDE RAIL
Demise Altitude = 74.843773
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FORWARD FRAME
Demise Altitude = 72.644051
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LOWER SIDE RAIL
Demise Altitude = 73.680473
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = BACK FRAME
Demise Altitude = 67.721581
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER COMPRESSOR MOUNT
Demise Altitude = 68.600731
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER EXPANDER CLAM SHELL
Demise Altitude = 69.658020
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = THALES LPT9510

Demise Altitude = 63.752712
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE FORE BAFFLE TUBE
Demise Altitude = 73.585701
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MIRROR 2 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.468619
Impact Kinetic Energy = 91.614700

name = MIRROR 1 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.683094
Impact Kinetic Energy = 39.006786

name = MIRROR 3 BAFFLE
Demise Altitude = 0.000000
Debris Casualty Area = 0.514768
Impact Kinetic Energy = 2.958284

name = MIRROR 2 BAFFLE RING
Demise Altitude = 0.000000
Debris Casualty Area = 0.462468
Impact Kinetic Energy = 241.245590

name = TELESCOPE BIPOD FITTING SINGLE END
Demise Altitude = 61.724831
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE BIPOD FITTING DOUBLE END
Demise Altitude = 60.716507
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = LOWER TELESCOPE BIPOD FITTING
Demise Altitude = 62.358746
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE BIPOD
Demise Altitude = 0.000000
Debris Casualty Area = 0.858264
Impact Kinetic Energy = 92.874947

name = TELESCOPE MOUNT PAD
Demise Altitude = 0.000000
Debris Casualty Area = 0.827003
Impact Kinetic Energy = 220.481293

name = M1
Demise Altitude = 59.720592
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M2
Demise Altitude = 68.142303
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M3
Demise Altitude = 60.989792
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M1 MOUNT BIPOD
Demise Altitude = 65.335251
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = M3 MOUNT BIPOD
Demise Altitude = 65.335251
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = STAR TRACKER MOUNT
Demise Altitude = 0.000000
Debris Casualty Area = 0.865553
Impact Kinetic Energy = 31.293482

name = SPECTROMETER BIPOD OFFSET FITTING

Demise Altitude = 65.896194
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = SPECTROMETER HOUSING
Demise Altitude = 70.535683
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GRATING MOUNT
Demise Altitude = 59.963966
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = DYSON LENS MOUNT
Demise Altitude = 72.647942
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER DRIVER
Demise Altitude = 65.324104
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FPIE-ANALOG
Demise Altitude = 68.146164
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FPIE-PSU
Demise Altitude = 69.268219
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = IIE
Demise Altitude = 0.000000
Debris Casualty Area = 0.549706
Impact Kinetic Energy = 458.819489

name = FASTENERS
Demise Altitude = 76.984901
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = SPECTROMETER BAFFLES
Demise Altitude = 76.879311
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = COMP PANEL CARBON PARTS
Demise Altitude = 76.412376
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = THERMAL SHIELD RODS
Demise Altitude = 75.981552
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MLI PATCHES
Demise Altitude = 77.197212
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = FLEX PRINT CABLE
Demise Altitude = 76.691902
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CONDUCTANCE HEAT PIPE BEND
Demise Altitude = 77.033623
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = GRATING
Demise Altitude = 57.679562
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = MISC BRACKETS
Demise Altitude = 77.395081
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = CRYOCOOLER MU METAL SHIELD

Demise Altitude = 77.574364
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = DYSON LENS
Demise Altitude = 67.323128
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = NADIR SUN SENSOR MAG
Demise Altitude = 73.187561
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = TELESCOPE UPPER BAFFLE TUBE
Demise Altitude = 77.443970
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HEAD MOUNT
Demise Altitude = 73.635223
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

name = HARNESS/CABLING
Demise Altitude = 62.668098
Debris Casualty Area = 0.000000
Impact Kinetic Energy = 0.000000

===== End of Requirement 4.7-1 =====

08 16 2022; 12:20:03PM Project Data Saved To File
08 16 2022; 12:20:18PM Project Data Saved To File
08 16 2022; 12:20:23PM Requirement 4.5-2: Compliant

===== End of Requirement 4.5-2 =====