DATA ITEM DESCRIPTION

TITLE: Space Systems Technical Data Report (SSTDR)

NUMBER: DI-MGMT-81898 **APPROVAL DATE:** 20130329
AMSC NUMBER: 9351 **LIMITATION:**
DTIC APPLICABLE: **GIDEP APPLICABLE:**
Office of Primary Responsibility: 19 (SMC/FMC)
APPLICABLE FORMS: DD Forms are not yet available. The following forms may be used to submit required information as follows:

SSTDR Format	Form Number	Sample Format No.
Space Hardware Data Summary	1	1
Space Hardware Detail Report	2	None
Space Unit Cost Report	3	3
Space Tech Baseline Report	4	4
GOPC/GT Hardware Detail Report	5	None

USE/RELATIONSHIP: This report consists of five formats for collecting contractors' technical data and unit cost on Department of Defense (DoD) space acquisition contracts.

Format 1 provides unit-level space hardware technical data on product-oriented Work Breakdown Structure (WBS) elements; these WBS data are used for cost model inputs. See Sample Format 1.

Format 2 provides the detailed space hardware technical data associated with the appropriate level of indenture. There is no sample for this format.

Format 3 provides estimate at complete (actuals and estimate to complete) cost information for the units, boxes, assemblies, SEIT/PM, Support Equipment and/or software CSCIs. See Sample Format 3.

Format 4 provides specific technical data to establish the technical baseline of the proposed/contracted system. See Sample Format 4.

Format 5 provides the detailed ground hardware technical data associated with the appropriate level of indenture. There is no sample for this format.

SSTDR data shall be used by DoD component staff, including program managers, engineers, cost estimators, and financial management personnel to: (1) Review and evaluate the baseline reasonableness; (2) Provide technical inputs required to develop a program cost estimate; and (3) Collect technical and cost information to develop estimating relationships (CERs).

SSTDR primary value to the Government is its ability to support the development of program cost estimates. It is important that the data be as accurate as possible so that they may be used for their intended purpose, which is to facilitate improved budgeting.

a. This Data Item Description (DID) contains the format and content preparation instructions for the data product generated by the specific and discrete task requirements as delineated in the contract.

b. This DID shall be used in conjunction with the Contract Work Breakdown Structure (CWBS) DID, DI-MGMT-81334A, CONTRACT PERFORMANCE REPORT (CPR) DID, DI-MGMT-81466A, Cost Data Summary Report DID, DI-FNCL-81565A, Cost & Software Data report DID, DI-FNCL-81, Detailed Mass props Status report DID, DI-GDRQ-81231

The same WBS shall be utilized for the Integrated Master Plan (IMP), Integrated Master Schedule (IMS), CPR, and Contractor Cost Data Report (CCDR) as applicable.

c. The SSTDR shall be used to obtain cost and technical information on contracts for programs that are ACAT 1 or 2 and any other program as designated by the PEO or Comptroller.

d. The SSTDR shall be required no more frequently than yearly. Data contained in the formats shall be as of the accounting month end of the milestones specified, with delivery no more than 90 days after milestone completion. This requirement may be tailored through contract negotiations. All formats are not required (or even normally provided) at the same time. Each format contains unique data that apply mainly to specific program phases and maturity. Format 2 and 5 are recommended at CDR and IOC milestones only and should always be accompanied by Format 1. Format 4 is usually provided only in phase A (to PDR) of the program.

e. Unless otherwise provided in the contract, data reported in the SSTDR shall pertain to all authorized contract work, including both priced and unpriced effort.

f. Submission of Formats 1 & 3 using a product-oriented WBS in accordance with the WBS Handbook, MIL-STD-881, and the CWBS DID, DI-MGMT-81334A, is mandatory. (Note: For contracts that require CCDRs, the CWBS shall be developed, approved, and maintained in accordance with DoD 5000.4-M-1, Cost and Software Data Reporting Manual, and the CWBS DID.).

Certain aspects of the report are subject to negotiation between the Government and the contractor, such as the level of detail to be reported in Format 1 (normally this will be at unit, assembly, or CSCI as defined in MIL-STD-881 for space systems). Although the SSTDR Contract Data Requirements List (CDRL) is subject to tailoring, requiring more information (e.g., additional technical parameters) in the SSTDR CDRL than specified in this DID is contrary to DoD policy. All negotiated reporting provisions shall be specified in the contract.

REQUIREMENTS:

1. Referenced documents. The applicable issue of the documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as cited in the current issue of the DODISS at the time of the solicitation.

2. Format. Use the relevant formats as listed above. All formats shall be submitted electronically in accordance with the following requirements. All formats shall be in a readable digital format: The American National Standards Institute (ANSI) X12 standard (839 transaction set), the United Nations Electronic Data Interchange for Administration, Commerce and Transport (UN/EDIFACT) standard (PROCST message), XML, or Microsoft Office compatible data formats. Contractor formats may be substituted whenever they contain all of the required data elements at the specified reporting levels and are compliant with the above electronic formats and approved by contracting officer. On-line access to the data may be provided to augment formal SSTDR submission. There shall be no hardcopies required, except as identified on the CDRL.

3. Content. The SSTDR shall contain the following:

Reference Appendix A of this DID for all field/data definitions, measurement units, and relevance. Reference Appendix B for sample Formats 1, 3, and 4. A corresponding MS Excel file is available from the Space and Missile Systems Center, Financial Management and Comptroller, Cost and Earned Value Division (SMC/FMC).

3.1 Heading Information – Applies to all Formats. Preparation instructions for Heading Information apply to Formats 1 through 5.

3.1.1 Format_Title
3.1.2 Contractor_Name
3.1.3 Contract_Number

3.1.4 Program_Name
3.1.5 Program_Phase
3.1.6 Report_Date
3.1.7 As_of_Date
3.1.8 Security_Class
3.1.9 POC_Tech
3.1.10 POC_Phone
3.1.11 Version

3.2 Format 1 - Space Hardware Data Summary. Electronic submittal shall be machine readable in a table type format. Use sample format unless otherwise approved.

3.2.0 Sub header information

3.2.0.1 SV_Quantity

3.2.1 Element identification

3.2.1.1 WBS_Code
3.2.1.2 Unit_ID_Code
3.2.1.3 881_ID
3.2.1.4 Subsystem
3.2.1.5 WBS_Name

3.2.2 Mass information

3.2.2.1 Weight_Basic
3.2.2.2 Qty_Per_SV
3.2.2.3 Weight_Growth
3.2.2.4 Predicted_Mass

3.2.3 Number of units produced

3.2.3.1 Units_Engr_Models
3.2.3.2 Units_TQ
3.2.3.3 Units_Engr_GFE
3.2.3.4 Units_Flight_GFE
3.2.3.5 Units_PQ
3.2.3.6 Units_Flight
3.2.3.7 Units_Spare
3.2.3.8 Units_Refurb

3.2.4 Non-recurring design parameters

3.2.4.1 Unique_Comp
3.2.4.2 New_Design

3.2.5 Additional information.
3.2.5.1 Hdwr_Manufacturer
3.2.5.2 TDS_Comments

3.3 Format 2 - Space Hardware Detail Report. Electronic submittal shall be machine readable in contractor format.

3.3.1 Element identification

3.3.1.1 Antenna related elements

3.3.1.1.1 Ant_Efficiency
3.3.1.1.2 Antenna_Type
3.3.1.1.3 Amp_Efficiency
3.3.1.1.4 Array_Act_Elements
3.3.1.1.5 Array_Area
3.3.1.1.6 Array_Beamforming
3.3.1.1.7 Array_Beams
3.3.1.1.8 Array_Pwr_Per_Elemt
3.3.1.1.9 Reflector_Size

3.3.1.2 Communications related elements

3.3.1.2.1 Band
3.3.1.2.2 Channels_Qty
3.3.1.2.3 Data_Rate_Avg_Dlink
3.3.1.2.4 Data_Rate_Avg_Ulink
3.3.1.2.5 Data_Rate_Avg_Xlink
3.3.1.2.6 Data_Rate_Max_Dlink
3.3.1.2.7 Data_Rate_Max_Ulink
3.3.1.2.8 Data_Rate_Max_Xlink
3.3.1.2.9 Downlink_Modes
3.3.1.2.10 EIRP
3.3.1.2.11 Frequency
3.3.1.2.12 Gain
3.3.1.2.13 Max_Frequency
3.3.1.2.14 Min_Frequency
3.3.1.2.15 SNR_Ratio
3.3.1.2.16 Uplink_Modes

3.3.1.3 Electrical Power related elements

3.3.1.3.1 Battery_Capacity
3.3.1.3.2 Battery_Type
3.3.1.3.3 Bus_Voltage
3.3.1.3.4 Solar_Array_Area
3.3.1.3.5 Solar_Array_Config
3.3.1.3.6 Solar_Cell_Area
3.3.1.3.7 Solar_Cell_Type

3.3.1.4 Focal Plane Array related elements

3.3.1.4.1 Chip_Redesign
3.3.1.4.2 FPA_Array_Size
3.3.1.4.3 FPA_Operating_Band
3.3.1.4.4 FPA_Temp
3.3.1.4.5 FPA_Thermal_Type

3.3.1.4.6 Pixel_Qty
3.3.1.4.7 Pixel_Size
3.3.1.4.8 ROIC_Redesign

3.3.1.5 Optical Subsystem related elements

3.3.1.5.1 Aperture_Qty
3.3.1.5.2 Aperture_Size
3.3.1.5.3 Curved_Elements
3.3.1.5.4 F_Number
3.3.1.5.5 Mirror_Qty
3.3.1.5.6 Optical_Axis
3.3.1.5.7 Scan_Mirror

3.3.1.6 Payload related elements

3.3.1.6.1 Field_of_View
3.3.1.6.2 Payload_Gimbaled
3.3.1.6.3 Payload_Type

3.3.1.7 Pointing, Command & Control or Digital related elements

3.3.1.7.1 ADCS_Type
3.3.1.7.2 ASIC_ClockSpeed
3.3.1.7.3 ASIC_Designs
3.3.1.7.4 Data_Storage_Cap
3.3.1.7.5 Gimbal_Type
3.3.1.7.6 GN&C_Method
3.3.1.7.7 OnBoard_Storage_Cap
3.3.1.7.8 Pointing_Accuracy
3.3.1.7.9 Pointing_Knowledge

3.3.1.8 Power related elements

3.3.1.8.1 Power_Avg
3.3.1.8.2 Power_BOL
3.3.1.8.3 Power_EOL
3.3.1.8.4 Peak_Output_Power

3.3.1.9 Program level related elements

3.3.1.9.1 Bus_Model
3.3.1.9.2 Flight_Heritage
3.3.1.9.3 Launch_Availability
3.3.1.9.4 Launch_Vehicle
3.3.1.9.5 Mission_Class
3.3.1.9.6 New_1st_Time_Integ
3.3.1.9.7 Orbit_Inclination
3.3.1.9.8 Sat_in_Constel_No
3.3.1.9.9 Sponsoring_Agncy_No
3.3.1.9.10 System_Name
3.3.1.9.11 Time_Development

3.3.1.10 Structure & Mechanisms related elements

3.3.1.10.1 Articulated_Str_No
3.3.1.10.2 Deployables
3.3.1.10.3 Structures_Material

3.3.1.11 Space Vehicle related elements

3.3.1.11.1 Design_Life
3.3.1.11.2 Impulse_Total
3.3.1.11.3 MLE
3.3.1.11.4 MMD
3.3.1.11.5 Orbit_Altitude
3.3.1.11.6 Orbit_Regime
3.3.1.11.7 Orbital_Apoapsis
3.3.1.11.8 Orbital_Periapsis
3.3.1.11.9 Propulsion_Type
3.3.1.11.10 Rad_Hardened
3.3.1.11.11 Reliability
3.3.1.11.12 Threat_Hardening
3.3.1.11.13 Weight_Ctr_Limit

3.3.1.12 WBS_Level

3.3.1.13 Name

3.2.1.13.1 881_ID
3.2.1.13.2 Subsystem
3.2.1.13.3 Unit_ID_Code
3.2.1.13.4 WBS_Code
3.2.1.13.5 WBS_Name

3.3.2 Technical information

3.3.2.1 Tech_Unit_of_Measure
3.3.2.2 Tech_Value

3.3.3 Optional Items: These items are not to be included within the report unless specifically requested within the CDRL referencing this DID format.

3.3.3.1 ADCS_Box_Type
3.3.3.2 ADCS_Pwr_Dissip
3.3.3.3 ADCS_Sensor_No
3.3.3.4 Comm_Freq_Range
3.3.3.5 Flt_Comp_Act_No
3.3.3.6 Flt_Comp_IRU_No
3.3.3.7 Flt_Comp_Per_Uni_No
3.3.3.8 Flt_Comp_Sensor_No
3.3.3.9 IRU_Gyro_Drift
3.3.3.10 IRU_Stability

3.3.3.11 RF_Freq_Range
3.3.3.12 TWTA_Dyn_Linear_Rang
3.3.3.13 Wheel_Stability
3.3.3.14 Wheel_Max_Moment
3.3.3.15 Wheel_Torque

3.4 Format 3 - Space Unit Cost Report.

3.4.1 Summary Information Area

3.4.1.1 COM_Included
3.4.1.2 G&A_Included

3.4.1.2 Actual Cost of Work Performed Cumulative To Date Area. The values entered within this block shall be the cumulative to-date Actual Cost of Work Performed (ACWP), without regard to ceiling, ending at the time period indicated by Report Date (Item 1). For each entry for which no costs have been incurred, enter a zero or leave blank.

3.4.1.2.1 ACWP_COM
3.4.1.2.2 ACWP_G&A
3.4.1.2.3 ACWP_Total

3.4.1.3 Estimated At Completion Area. These blocks shall present the contractor's estimated costs at completion. These estimates are intended to allow contractor management flexibility to express the most likely possible cost outcomes. Contractors shall provide the most accurate Estimates at Completion (EACs) possible through program-level assessments of factors that may affect the cost, schedule, or technical outcome of the contract. Such program-level assessments shall include consideration of known or anticipated risk areas, and planned risk reductions or cost containment measures. EACs shall be reported without regard to contract ceiling. For each entry for which no costs have been estimated, enter a zero or leave blank.

3.4.1.3.1 EAC_COM
3.4.1.3.2 EAC_G&A
3.4.1.3.3 EAC_Total

3.4.2 Detailed Area

3.4.2.1 WBS_Code
3.4.2.2 Unit_CSCI
3.4.2.3 Subsystem
3.4.2.4 ACWP_NRE
3.4.2.5 ACWP_REC
3.4.2.6 ACWP_Total
3.4.2.7 EAC_NRE
3.4.2.8 EAC_REC
3.4.2.9 EAC_Total
3.4.2.10 Unit_Cost_Comment

3.4.3 Footer Area.

3.4.3.1 Unit_Cost_Remarks

3.5 Format 4 – Technical Baseline Data Report. The data elements below will be submitted in two reports by the contractor(s) chosen for the system technical maturation phase after Government Milestone A (KDP A) Acquisition

Strategy deliberations. The initial report will be delivered at the System Requirements Review (SRR). The final report in this Format will be delivered by the contractor(s) chosen for system maturation prior to the System Functional Review (SFR) in sufficient time to support the development of a government Cost Analysis Requirements Document (CARD-Section 1.2.1 Technical/Physical Description). The CARD will be used for subsequent Milestone B (KDP B) Acquisition Decision Memorandum (ADM) deliberations. Subsequent to Milestone B, Format 2 Reports (see above) will be generated at the appropriate WBS levels and at times specified above. All reports will be consistent with electronic submittal and shall be machine readable in contractor format.

3.5.1 Element identification

3.5.1.1 Data Type ID. The following data type IDs apply to this format:

3.5.2 Detailed Area

3.5.2.1 SYSTEM (Spacecraft) LEVEL & GENERIC DATA ELEMENTS

3.5.2.1.1 Design_Life
3.5.2.1.2 Flight_Heritage
3.5.2.1.3 Launch_Availability
3.5.2.1.4 Mission_Class
3.5.2.1.5 Orbit_Altitude
3.5.2.1.6 Orbit_Inclination
3.5.2.1.7 Orbit_Regime
3.5.2.1.08 Sat_in_Constel_No
3.5.2.1.09 Threat_Hardening
3.5.2.1.10 Time_Development
3.5.2.1.11 Weight_Basic
3.5.2.1.12 Weight_Growth

3.5.2.2 BUS LEVEL DATA ELEMENTS

3.5.2.2.1 ADCS_Type
3.5.2.2.2 Articulated_Str_No
3.5.2.2.3 Battery_Capacity
3.5.2.2.4 Battery_Type
3.5.2.2.5 Bus_Model
3.5.2.2.6 Bus_Voltage
3.5.2.2.7 Deployables
3.5.2.2.8 Frequency
3.5.2.2.9 Impulse_Total
3.5.2.2.10 Peak_Output_Power
3.5.2.2.11 Pointing_Accuracy
3.5.2.2.12 Pointing_Knowledge
3.5.2.2.13 Power_BOL
3.5.2.2.14 Power_EOL
3.5.2.2.15 Processing_Rate
3.5.2.2.16 Propulsion_Type
3.5.2.2.17 Solar_Array_Area
3.5.2.2.18 Solar_Array_Config
3.5.2.2.19 Solar_Cell_Type
3.5.2.2.20 Structures_Material
3.5.2.2.21 Thermal_Type

3.5.2.2.22 Thruster_Tank_No
3.5.2.2.23 TT&C_Standard

3.5.2.3 PAYLOAD PHYSICAL DATA ELEMENTS

3.5.2.3.1 Field_of_View
3.5.2.3.2 Gimbal_Type
3.5.2.3.3 Instruments_No
3.5.2.3.4 OnBoard_Storage_Cap
3.5.2.3.5 Payload_Gimbaled
3.5.2.3.6 Payload_Type
3.5.2.3.7 Power_Avg
3.5.2.3.8 Power_Peak
3.5.2.3.9 SNR_Ratio

3.5.2.4 PAYLOAD ELECTRONICS DATA ELEMENTS

3.5.2.4.1 Antenna_Qty
3.5.2.4.2 ASIC_Designs
3.5.2.4.3 ASIC_GateCount
3.5.2.4.4 Band_Amp_Qty
3.5.2.4.5 Bandwidth_Dlink
3.5.2.4.6 Bandwidth_Ulink
3.5.2.4.7 Bandwidth_Xlink
3.5.2.4.8 Channels_Qty
3.5.2.4.9 Data_Process_Level
3.5.2.4.10 Data_Rate_Avg_Dlink
3.5.2.4.11 Data_Rate_Avg_Ulink
3.5.2.4.12 Data_Rate_Avg_Xlink
3.5.2.4.13 Data_Rate_Max_Dlink
3.5.2.4.14 Data_Rate_Max_Ulink
3.5.2.4.15 Data_Rate_Max_Xlink
3.5.2.4.16 Data_Storage_Cap
3.5.2.4.17 FPGA_Designs
3.5.2.4.18 FPGA_GateCount

3.5.2.5 OPTICAL PAYLOAD DATA ELEMENTS

3.5.2.5.1 Aperture_Size
3.5.2.5.2 Curved_Elements
3.5.2.5.3 F_Number
3.5.2.5.4 Mirror_Qty
3.5.2.5.5 Optical_Axis
3.5.2.5.6 Scan_Mirror

3.5.2.6 IR PAYLOAD DATA ELEMENTS

3.5.2.6.1 Chip_Redesign
3.5.2.6.2 FPA_Array_Size
3.5.2.6.3 FPA_Operating_Band
3.5.2.6.4 FPA_Temp
3.5.2.6.5 FPA_Thermal_Type
3.5.2.6.6 Pixel_Qty

3.5.2.6.7 Pixel_Size
3.5.2.6.8 ROIC_Redesign

3.5.2.7 ANTENNAS AND AMPLIFIERS PAYLOAD

3.5.2.7.1 Amp_Efficiency
3.5.2.7.2 Amp_Type
3.5.2.7.3 Antenna_Type
3.5.2.7.4 Band
3.5.2.7.5 EIRP
3.5.2.7.6 Gain
3.5.2.7.7 Max_Frequency
3.5.2.7.8 Power_Output
3.5.2.7.9 Reflector_Size

3.5.2.8 GROUND DATA ELEMENTS (PHYSICAL)

3.5.2.8.1 GOPC_Qty
3.5.2.8.2 GOPC_Reloc
3.5.2.8.3 Ground_Sites_No
3.5.2.8.4 Ground_Sites_Reloc
3.5.2.8.5 Ground_Storage_Cap

3.5.2.9 FLIGHT & GROUND SOFTWARE DATA ELEMENTS

3.5.2.9.1 Effective_LOC

4. End of DI-MGMT-81898

Technical Data Types - Appendix A

Data Item Description	Unit of Measure	Value Type	Data Group ID
Data Type ID: **881_ID**	N/A	Text	Header
Description: MIL-STD881C Index Number (WBS #)			
Method/Expl: Enter the MIL-STD881C Index Number (WBS #) as defined in the most up-to-date 881 version. This is a unique identifier for each 881 WBS element. For example, in 881C Appendix F Space System WBS, the 881_ID is 1.2.2 for the Bus with the Space Vehicle.			
Applies to: All elements			
CDRL ID: SSTDR-Fmt1			
Data Type ID: **ACWP_COM**	K$	Numeric	Cost
Description: Actuals Cost of Work Performed Cost of Money			
Method/Expl: Enter the total Facilities Capital Cost of Money (COM) applicable to the contract. This value shall be entered irrespective of whether or not COM is included in the values reported within the detailed area (columns D-I) in Blocks 8 and 9.			
Applies to: Total for all detail elements within the report			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **ACWP_G&A**	K$	Numeric	Cost
Description: Actual Cost of Work Performed – G&A			
Method/Expl: Enter the total General and Administrative (G&A) expenses applicable to the contract. This value shall be entered irrespective of whether or not G&A is included in the values reported within the detailed area (columns D-I) in Blocks 8 and 9.			
Applies to: Total for all detail elements within the report			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **ACWP_NRE**	K$	Numeric	Cost
Description: Actual Cost Work Performed (NonRecurring)			
Method/Expl: See the “Definitions” section of this DID for a description of nonrecurring activities. For each Unit/CSCI (or Unit/CSCI Subset) specified in Column A, enter the actual nonrecurring costs incurred to date. See Actual Cost of Work Performed Cumulative To Date (Block 8) above for further definition.			
Applies to: Units/CSCIs			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **ACWP_REC**	K$	Numeric	Cost
Description: Actual Cost Work Performed (Recurring)			
Method/Expl: See the “Definitions” section of this DID for a description of recurring activities. For each Unit/CSCI (or Unit/CSCI Subset) specified in Column A, enter the actual recurring costs incurred to date. See Block 8, Actual Cost of Work Performed Cumulative To Date, above for further definition.			
Applies to: Units/CSCIs			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **ACWP_Total**	K$	Numeric	Cost
Description: Actual Cost of Work Performed			
Method/Expl: Enter the sum of all the “Column F. Actual Cost Work Performed –Total” entries for the entire report. This value should represent the total cumulative actual dollars incurred to date for the entire contract ending at the time period indicated by Report Date (Item 1).			

Applies to: Units/CSCIs

CDRL ID: SSTDR-Fmt3

Data Type ID: **ADCS_Box_Type** N/A Lookup Design

Description: ADCS Box Type

Method/Expl: Enter the Attitude Determination & Control System (ADCS) Box Type (either analog or digital). A box is defined as digital if any portion of the box contains digital components.

Applies to: Attitude Control units/boxes

CDRL ID: SSTDR-Fmt2

Data Lookup Values for: **ADCS_Box_Type**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Analog	0.00	0	Analog (100%)	
Digital	0.00	0	Digital Box (any digital content)	

Data Type ID: **ADCS_Pwr_Dissip** Watts Numeric Design

Description: ADCS Power Dissipation

Method/Expl: Enter the power dissipation in watts.

Applies to: Bus, Attitude Control subsystem

CDRL ID: SSTDR-Fmt2

Data Type ID: **ADCS_Sensor_No** Count Numeric Design

Description: ADCS Sensor Number

Method/Expl: Enter the number of sensors being handled by this element.

Applies to: Bus, Attitude Control, Control Electronics

CDRL ID: SSTDR-Fmt2

Data Type ID: **ADCS_Type** N/A Text Technical

Description: Attitude Determination & Control Subsystem Type

Method/Expl: Enter the primary method of spacecraft/product positioning/stabilization within the Attitude Determination and Control Subsystem (e.g. none, magnetic, Spin, 3-axis stabilized, etc.).

Applies to: SV, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **ADCS_Type**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Thruster	0.00	0	Thruster	

Thrusters are the most common, as they may be used for station keeping as well. Thrusters (often monopropellant rockets), must be organized as a Reaction control system to provide triaxial stabilization.

Data Item Description	Unit of Measure	Value Type	Data Group ID

Spin Stabl 0.00 0 Spin Stabilization

The entire space vehicle itself can be spun up to stabilize the orientation of a single vehicle axis. This method is widely used to stabilize the final stage of a launch vehicle.

Moment Whl 0.00 0 Momentum Wheels

These are electric motor driven rotors made to spin in the direction opposite to that required to re-orient the vehicle.

CMG 0.00 0 Control Moment Gyros

These are rotors spun at constant speed, mounted on gimbals to provide attitude control.

Solar Sail 0.00 0 Solar Sail

Small solar sails, (devices that produce thrust as a reaction force induced by reflecting incident light) may be used to make small attitude control and velocity adjustments.

GGS 0.00 0 Gravity-Gradient Stabilization

In orbit, a spacecraft with one axis much longer than the other two will spontaneously orient so that its long axis points at the planet's center of mass. This system has the virtue of needing no active control system or expenditure of fuel.

Mag Torq 0.00 0 Magnetic Torquers

Coils or (on very small satellites) permanent magnets exert a moment against the local magnetic field.

PPAC 0.00 0 Pure Passive Attitude Control

Gravity Gradient or Magnetic

ADCS_Type 0.00 0 Other (Specify)

Specify ADCS Type

Data Type ID: **Amp_Efficiency** % Numeric Sizing

Description: Amplifier Efficiency

Method/Expl: Enter the amplifier efficiency percentage. Efficiency is a measure of how much of the power source is usefully applied to the amplifier's output.
Class A amplifiers are very inefficient, in the range of 10–20% with a max efficiency of 25% for direct coupling of the output. Inductive coupling of the output can raise their efficiency to a maximum of 50%.
Class B amplifiers have a very high efficiency but are impractical for audio work because of high levels of distortion. In practical design, the result of a tradeoff is the class AB design. Modern Class AB amplifiers commonly have peak efficiencies between 30–55% in audio systems and 50-70% in radio frequency systems with a theoretical maximum of 78.5%.
Commercially available Class D switching amplifiers have reported efficiencies as high as 90%. Amplifiers of Class C-F are usually known to be very high efficiency amplifiers. RCA manufactured an AM broadcast transmitter employing a single class-C low mu triode with an RF efficiency in the 90% range.

Applies to: Amplifiers, Signal Electronics subsystem, TT&C subsystem

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Amp_Type** N/A Text Comm

Description: Amplifier Type

Method/Expl: Describe the Amplifier type (e.g. TWTA, Solid State, LNA).

Applies to: Antennas and Amplifiers Payloads

CDRL ID: SSTDR-Fmt4

Data Lookup Values for: **Amp_Type**

Lookup ID	Complexity	DS	Description	Comments
LNA	0.00	0	Low Noise Amplifier	

Data Item Description		Unit of Measure	Value Type	Data Group ID
TWTA	0.00	0	Traveling Wave Tube Amp	
Other	0.00	0	Other (Specify)	

Data Type ID:	**Ant_Efficiency**	%	Numeric	Comm

Description: Antenna Efficiency

Method/Expl: Enter the antenna efficiency percentage: the ratio (expresses as a percent) of the total power radiated by an antenna to the net power accepted by the antenna from the connected transmitter. It will be frequency dependent.

Applies to: Antennas, Antenna subsystems, Feeds

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Antenna_Qty**	Count	Numeric	Comm

Description: Antenna Quantity

Method/Expl: Enter the total number of antennas required or included for the subject product.

Applies to: SV, Payload

CDRL ID: SSTDR-Fmt4

Data Type ID:	**Antenna_Type**	N/A	Lookup	Technical

Description: Antenna Type

Method/Expl: Enter the type of antenna (or add) from the below Data Lookup Values list. If actual/appropriate Antenna_Type is not included in list, choose the most comparable type from the list and annotate the actual type in the comment field.

Applies to: SV, Bus, TT&C, Payload, Antenna Subsystem, antenna

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Antenna_Type**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Helix	0.00	0	Helix	
Horn	0.00	0	Horn	
OMNI	0.00	0	Omni	
Omni directional Antenna				
Parabolic	0.00	0	Parabolic reflector	
Phased_Arr	0.00	0	Phased Array	

Data Type ID:	**Aperture_Qty**	Count	Numeric	Optical

Description: Aperture Quantity

Method/Expl: Enter the number of apertures. An aperture is an effective area of radiation/energy absorption/generation of the antenna.

Applies to: Optical Subsystem

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Aperture_Size**	Meters	Numeric	Sizing

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Description: Aperture Size

Method/Expl: Enter the aperture size. The aperture of an optical system is the opening that determines the cone angle of a bundle of rays that come to a focus in the image plane.

Applies to: Payloads, Optical Subsystem

Data Type ID:	**Array_Act_Elements**	Count	Numeric	Sizing

Description: Number of elements for the phased array

Method/Expl: Enter the number of active elements for the phase array. Use of the term "active elements" (or "active antennas") is intended to describe elements whose energy output is modified due to the presence of a source of energy in the element (other than the mere signal energy which passes through the circuit) or an element in which the energy output from a source of energy is controlled by the signal input.

Applies to: Units

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Array_Area**	Cm^2	Numeric	Sizing

Description: Area of the active array

Method/Expl: Enter the area of the array in Square Centimeters. The area consists of the sum of all the areas of the active elements excluding the spaces between elements.

Applies to: Payload, Antenna Subsystem

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Array_Beamforming**	N/A	Text	Technical

Description: Array Beam Forming

Method/Expl: Enter either Analog, Digital, or Both depending on the method of beam formation.

Applies to: Antennas

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Array_Beams**	Count	Numeric	Technical

Description: Array Beams

Method/Expl: Enter the Number of Active Array Beams in a multi-beam (multiple access) antenna.

Applies to: Antennas

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Array_Pwr_Per_Elemt**	Watts	Numeric	Power

Description: Array Power per Element

Method/Expl: Enter the Active array highest power required by (supplied to) a single element.

Applies to: Antennas

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Articulated_Str_No**	Count	Numeric	Technical

Description: Number of Articulated Structures

Method/Expl: Enter the number of Articulated Structures found on the subject product.

Data Item Description	Unit of Measure	Value Type	Data Group ID

Applies to: Payload, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **As_Of_Date** DD-MMM-YYYY Text Header

Description: Report as-of Date (DD-MMM-YYYY)

Method/Expl: Enter the date closest to that which the data reflects (often a milestone date or milestone + plus some offset). This is not necessarily the date on which the report was created, but a prior date representative of the point in time which the data represents.

Applies to: Heading Information (All formats)

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5

Data Type ID: **ASIC_ClockSpeed** MHz Numeric Complexity

Description: ASIC Clock Speed

Method/Expl: Enter Application Specific Integrated Circuit (ASIC) clock speed in MHz.

Applies to: ADCS, Bus, Payload

CDRL ID: SSTDR-Fmt2

Data Type ID: **ASIC_Designs** Count Numeric Design

Description: ASIC Designs

Method/Expl: Enter the number of Application Specific Integrated Circuit (ASIC) (unspecified type) designs required.

Applies to: ADCS, Bus, Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **ASIC_GateCount** Count Numeric Sizing

Description: ASIC Gate Count

Method/Expl: Enter Avg Application Specific Integrated Circuit (ASIC) gate count (K gates) not including memory for the ASIC designs required and described by ASIC_Design responses.

Applies to: Payload

CDRL ID: SSTDR-Fmt4

Data Type ID: **Band** N/A Lookup Comm

Description: A section of the spectrum of frequencies which are identified as an individual band.

Method/Expl: Enter the Band from the below Data Lookup Values list. This data element "Band" identifies sections of the spectrum. This includes the radio spectrum communication frequencies, in which channels are usually used. The microwave spectrum is usually defined as electromagnetic energy ranging from approximately 1 GHz to 100 GHz in frequency. These bands are defined within the International Telecommunication Union (ITU) Radio regulations. NATO and IEEE also have named frequency bands; however, the ITU band nomenclature is used. Select a band from the list provided. Actual center frequency of transmit or receive is identified in the data element "frequency."

Other Spectrums are also included here.

Applies to: Comm, Bus, Payload, Amplifiers, Antennas, Feeds

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Band**

Lookup ID	Complexity	DS	Description	Comments
C-Band	0.00	0	C	

Microwave band between frequencies of 4 to 8 GHz. NATO range between 500 MHz and 1000 MHz. Satellite typically use 3.7–4.2 GHz

Cosmi-Band 0.00 0 Cosmic-Ray

D-Band 0.00 0 D

Microwave band between frequencies of 110 to 170 GHz.

E-Band 0.00 0 E

Microwave band between frequencies of 60 to 90 GHz.

EHF-Band 0.00 0 EHF

Extremely high frequency, 30–300 GHz, 10 mm – 1 mm, ITU 11.

ELF-Band 0.00 0 ELF

Extremely low frequency, 3–30 Hz, 100,000 km – 10,000 km, ITU 1.

F-Band 0.00 0 F

Microwave band between frequencies of 90 to 140 GHz.

Gamma-Band 0.00 0 Gamma-Ray

HF-Band 0.00 0 HF

High frequency, 3–30 MHz, 100 m – 10 m, ITU 7.

IR-Band 0.00 0 Infrared

Ka-Band 0.00 0 Ka

K-above, Microwave band between frequencies of 26.5-40GHz.

K-Band 0.00 0 K

Microwave band between 18 and 26.5 GHz. NATO K band between 20 and 40 GHz (7.5–15 mm).

Ku-Band 0.00 0 Ku

K-under, Microwave band between frequencies of 12 to 18 GHz.

L-Band 0.00 0 L

Microwave band between frequencies of 1 to 2 GHz.

LF-Band 0.00 0 LF

Low frequency, 30–300 kHz, 10 km – 1 km, ITU 5.

MF-Band 0.00 0 MF

Medium frequency, 300–3000 kHz, 1 km – 100 m, ITU 6.

Q-Band 0.00 0 Q

Microwave band between frequencies of 30 to 50 GHz.

S-Band 0.00 0 S

Microwave band between frequencies 2 to 4 GHz, crossing the conventional boundary between UHF and SHF at 3.0 GHz.

SHF-Band 0.00 0 SHF

Super high frequency, 3–30 GHz, 100 mm – 10 mm, ITU 10.

Data Item Description	Unit of Measure	Value Type	Data Group ID

SLF-Band 0.00 0 SLF
Super low frequency, 30–300 Hz, 10,000 km – 1000 km, ITU 2.

THz-Band 0.00 0 THz
Terahertz, 300–3,000 GHz, 1 mm – 100 µm, ITU 12.

U-Band 0.00 0 U
Microwave band between frequencies of 40 to 60 GHz.

UHF-Band 0.00 0 UHF
Ultra high frequency, 300–3000 MHz, 1 m – 100 mm, ITU 9.

ULF-Band 0.00 0 ULF
Ultra low frequency, 300–3000 Hz, 1000 km – 100 km, ITU 3.

V-Band 0.00 0 V
Microwave band between frequencies of 50 to 75 GHz.

VHF-Band 0.00 0 VHF
Very high frequency, 30–300 MHz, 10 m – 1 m, ITU 8.

Visib-Band 0.00 0 Visible

VLF-Band 0.00 0 VLF
Very low frequency, 3–30 kHz, 100 km – 10 km, ITU 4.

W-Band 0.00 0 W
Microwave band between frequencies of 75 to 110 GHz.

X-Band 0.00 0 X
Microwave band between frequencies of 8 to 12 GHz.

Xray-Band 0.00 0 X-Ray

Data Type ID: **Band_Amp_Qty** Count Numeric Sizing
Description: Amplifier Qty
Method/Expl: Enter the number of amplifiers required for each frequency band described by the Band element.
Applies to: Payload
CDRL ID: SSTDR-Fmt4

Data Type ID: **Bandwidth_Dlink** MHz Numeric Comm
Description: Downlink Bandwidth
Method/Expl: Enter the frequency range of the downlink portion of a given Satellite Band. See Band.
Applies to: Payload
CDRL ID: SSTDR-Fmt4

Data Type ID: **Bandwidth_Ulink** MHz Numeric Comm
Description: Uplink Bandwidth

Data Item Description	Unit of Measure	Value Type	Data Group ID

Method/Expl: Enter the frequency range of the Uplink portion of a specified Satellite Band. See Band.

CDRL ID: SSTDR-Fmt4

Data Type ID: **Bandwidth_Xlink** MHz Numeric Comm

Description: X-link Bandwidth

Method/Expl: Enter the frequency range of the Crosslink (Xlink) portion of a given Satellite Band. See Band.

Applies to: Payload

CDRL ID: SSTDR-Fmt4

Data Type ID: **Battery_Capacity** Ah Numeric Power

Description: Battery Capacity

Method/Expl: Enter Battery capacity in Amp Hours.

Applies to: Electrical Power, Bus, battery

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Battery_Type** N/A Text Power

Description: Battery Type

Method/Expl: Enter cell type of Battery (e.g. NiCd Nickel-Cadmium , Li-ion Lithium-Ion , NiH2 Nickel-Hydrogen.)

Applies to: Electrical Power, Bus, battery

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Battery_Type**

Lookup ID	Complexity	DS	Description	Comments
Li-ion	0.00	0	Lithium-Ion	
NiH2	0.00	0	Nickel-Hydrogen	
NiCd	0.00	0	Nickel-Cadmuim	

Data Type ID: **Bus_Model** N/A Text Technical

Description: Spacecraft Bus Model

Method/Expl: Enter Model name or designation number, specific to manufacturers, for the space product. (e.g. A2100AX, 601)

Applies to: Space Bus, Vehicle, or Launch Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Bus_Voltage** Volts Numeric Power

Description: Bus Voltage

Method/Expl: Enter common voltage provided by and across Spacecraft Bus available to Bus and Payload Subsystem boxes.

Applies to: Electrical Power, Bus

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Channels_Qty**	Count	Numeric	Sizing
Description: Number of Channels			
Method/Expl: Enter the number of channels (signal paths).			
Applies to: Payload			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Chip_Redesign**	%	Numeric	FPA
Description: Chip Redesign for Focal Plane Array			
Method/Expl: Enter the percentage (0-100) of design required for the FPA chip.			
Applies to: Focal planes, Chips, and ROIC			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **COM_Included**	N/A	Yes/No	Cost
Description: Cost of Money Included			
Method/Expl: Place a “Y” in the box if Cost of Money (FCOM or ICOM) is included within the cost values included within the detailed area (columns D – I). Otherwise put an “N” in the box. Both Actual Cost of Work Performed (Block 8) and Estimated At Completion (Block 9) values shall be reported on a comparable basis (i.e. both shall either include or exclude COM).			
Applies to: Units/CSCIs			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **Comm_Freq_Range**	MHz	Numeric	Comm
Description: Communications Frequency Range			
Method/Expl: Enter the Min and Max frequency range.			
Applies to: Antenna, Feeds, Comm Subsystems, Comm units/boxes			
CDRL ID: SSTDR-Fmt2			
Data Type ID: **Contract_Number**	N/A	Text	Header
Description: Contract Number			
Method/Expl: Enter the Contract number and all the applicable Contract Line Item Number(s) (CLIN(s) which pertain to the Data Item Description (DID) underlying data.			
Applies to: Heading Information (All formats)			
CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID: **Contractor_Name**	N/A	Text	Header
Description: Contractor Name			
Method/Expl: Enter the name of contractor company (usually Prime or Major Sub) under contract to supply product or service described by the subject Data Item Description (DID) format. For data reported which reflects products or services produced/provided by Government entities, enter the name of the responsible agency (e.g. US Navy).			
Applies to: Heading Information (All formats)			
CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID: **Curved_Elements**	Count	Numeric	Optical

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Description: Qty of Curved Elements

Method/Expl: Enter the number of curved optical elements. An optical element is a part within an optical instrument which acts upon the light passing through the instrument, such as a lens, prism, or mirror.

Applies to: Optical Subsystem, Optical Payload

Data Type ID: **Data_Rate_Avg_Dlink** Kbps Numeric Comm

Description: Average Downlink Data Rate in Kbps

Method/Expl: Enter average downlink data rate in kilobits per second (Kbps) for the specified satellite communication Band.

Applies to: SV, Payloads, TT&C both downlink

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Data_Rate_Avg_Ulink** Kbps Numeric Comm

Description: Average Downlink Data Rate

Method/Expl: Enter average uplink data rate in kilobits per second (Kbps) for the specified satellite communication Band.

Applies to: SV, Payloads, TT&C both uplink

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Data_Rate_Avg_Xlink** Kbps Numeric Comm

Description: Crosslink Data Rate

Method/Expl: Enter the average data rate in kilobits per second (Kbps) for the Crosslink (Xlink) portion of a specified satellite communication Band.

Applies to: SV, Payloads, TT&C both downlink

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Data_Rate_Max_Dlink** Kbps Numeric Comm

Description: Max Downlink Data Rate

Method/Expl: Enter maximum data rate in kilobits per second (Kbps) for the Downlink portion of specified satellite communication Band.

Applies to: SV, Payloads, TT&C downlink

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Data_Rate_Max_Ulink** Kbps Numeric Comm

Description: Maximum Uplink Data Rate

Method/Expl: Enter maximum data rate in kilobits per second (Kbps) for Uplink portion of specified satellite communication band.

Applies to: SV, Payloads, TT&C uplink

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Data_Rate_Max_Xlink** Kbps Numeric Comm

Description: Max X-link Data Rate

Method/Expl: Enter maximum data rate in kilobits per second (Kpbs) for Crosslink (Xlink) portion of specified satellite communication Band.

Applies to: SV, Payloads

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Data_Storage_Cap**	Mbytes	Numeric	Sizing
Description: Data Storage Capacity			
Method/Expl: Enter the effective daily data storage capacity (capture ability) in terms of Megabits Per Day as a result of to compression, offline storage, download and other techniques in excess of physical computer/processor memory.			
Applies to: SV, Bus, Payload, TT&C			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Deployables**	Count	Numeric	Technical
Description: Number of Deployed Structures			
Method/Expl: Enter the number of deployable appendages -- e.g. enter antenna deployables at Antenna S/S level and total deployables at Space Vehicle (SV) and Bus levels.			
Applies to: SV, Bus, Payload, Antenna			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Design_Life**	Months	Numeric	Technical
Description: Design Life			
Method/Expl: Enter the period of time during which the Space Vehicle (SV) is expected by its designers to work within its specified parameters; in other words, the life expectancy of the SV. This is the length of time between placement into service of a single SV and the onset of its wearout.			
Applies to: Mission & SV			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Downlink_Modes**	N/A	Text	Complexity
Description: downlink modes to payload			
Method/Expl: Enter the band types, which include bands such as Ka, x, s, etc.			
Applies to: Comm, Bus, Payload			
CDRL ID: SSTDR-Fmt2			
Data Type ID: **EAC_COM**	K$	Numeric	Cost
Description: Estimated At Completion – COM			
Method/Expl: Enter the estimated Facilities Capital Cost of Money applicable to the contract at its completion. This value shall be entered irrespective of whether or not COM is included in the values reported within the detailed area (columns D-I) in Blocks 8 and 9.			
Applies to: Total for all detail elements within the report			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **EAC_G&A**	K$	Numeric	Cost
Description: Estimated At Completion - G&A			
Method/Expl: Enter the estimated General & Administrative (G&A) expenses applicable to the contract at its completion. This value shall be entered irrespective of whether or not G&A is included in the values reported within the detailed area (columns D-I) in Blocks 8 and 9.			
Applies to: Total for all detail elements within the report			
CDRL ID: SSTDR-Fmt3			
Data Type ID: **EAC_NRE**	K$	Numeric	Cost

Description: Estimated At Completion (NonRecurring)

Method/Expl: See the "Definitions" section of this Data Item Description (DID) for a description of nonrecurring activities. For each Unit/CSCI (or Unit/CSCI Subset) specified in Column A, enter the estimated nonrecurring costs at completion.

A) Initial Report(s):
i. Initial Report if before IBR: For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter proposed nonrecurring costs.

ii. Initial Report if after IBR: For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter current estimated nonrecurring costs at completion.

B) Interim Report(s): For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter the current estimate of nonrecurring costs at completion.

C) Final Report(s): For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter the actual nonrecurring costs incurred to date plus an estimate of any nonrecurring costs expected to be incurred before contract completion.

Applies to: Units/CSCIs

Data Type ID: **EAC_REC** K$ Numeric Cost

Description: Estimated At Completion (Recurring)

Method/Expl: See the "Definitions" section of this Data Item Description (DID) for a description of recurring activities. For each Unit/CSCI (or Unit/CSCI Subset) specified in Column A, enter the estimated recurring costs at completion.

A) Initial Report(s):
i. Initial Report if before IBR: For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter proposed recurring costs.

ii. Initial Report if after IBR: For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter current estimated recurring costs at completion.

B) Interim Report(s): For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter the current estimate of recurring costs at completion.

C) Final Report(s): For each Unit/CSCI (or Unit/CSCI subset) specified in Column A, enter the actual nonrecurring costs incurred to date plus an estimate of any recurring costs expected to be incurred before contract completion.

Applies to: Units/CSCIs

CDRL ID: SSTDR-Fmt3

Data Type ID: **EAC_Total** K$ Numeric Cost

Description: Estimated At Completion

Method/Expl: Enter the sum of all the "Column I. Estimated at Completion – Total" entries for the entire report. This value should represent the total cumulative dollars anticipated for the entire contract at closeout.

Applies to: Total for all detail elements within the report

CDRL ID: SSTDR-Fmt3

Data Type ID: **Effective_LOC** Count Numeric Sizing

Description: Effective Lines of Code

Method/Expl: Enter effective lines of code. An effective line of code or eLOC is the measurement of all lines that are not comments, blanks, standalone braces or parentheses, or imports.

Applies to: Space Vehicle, Bus, Ground Terminals, Ground Ops, Payloads, and CSCI

CDRL ID: SSTDR-Fmt4

Data Type ID: **EIRP** dBW Numeric Comm

Description: Equivalent Isotropically Radiated Power

Method/Expl: Enter the Equivalent Isotropically Radiated Power (EIRP) or, alternatively, Effective Isotropically Radiated Power in decibel Watts; this is the amount of power that a theoretical isotropic antenna (which evenly distributes power in all directions) would emit to produce the peak power density observed in the direction of maximum antenna gain.

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **F_Number** f-stop Numeric Optical

Description: Focal ratio number (F-Stop)

Method/Expl: Enter the F-number (sometimes called focal ratio, f-ratio, f-stop, or relative aperture) of the optical system expressing the diameter of the entrance pupil in terms of the focal length of the lens; in simpler terms, the F-number is the focal length divided by the "effective" aperture diameter.

Applies to: Optical Subsystem, Optical Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Field_of_View** Degrees Numeric Technical

Description: Field of View

Method/Expl: Enter the instantaneous angle of view from which the signal is received by the device/sensor at one time.

Applies to: Sensor, Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Flight_Heritage** N/A Text Program

Description: Flight Heritage

Method/Expl: Enter the heritage or most similar previous product from which the subject product was derived.

Applies to: Bus, Payload, Program

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Flt_Comp_Act_No** Count Numeric Design

Description: Flight Computer Actuator Number

Method/Expl: Enter the number of Actuators being handled by the flight Computers and Processors.

Applies to: Bus, TT&C, Computers and Processors

CDRL ID: SSTDR-Fmt2

Data Type ID: **Flt_Comp_IRU_No** Count Numeric Design

Description: Flight Computer Inertial Reference Unit Number

Method/Expl: Enter the number of Inertial Reference Units (IRUs) (or equivalent gyroscopic sensor) being handled by the flight Computers and Processors.

Applies to: Bus, TT&C, Computers and Processors

CDRL ID: SSTDR-Fmt2

Data Type ID: **Flt_Comp_Per_Unit_No** Count Numeric Design

Description: Flight Computer Unit Number

Method/Expl: Enter the number of processors within a given unit

Applies to: Bus, Bus electronic boxes

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

CDRL ID: SSTDR-Fmt2

Data Type ID: **Flt_Comp_Sensor_No** Count Numeric Design

Description: Flight Computer Sensor Number

Method/Expl: Enter the number of Sensors (star tracker, sun sensor, etc) being handled by the flight Computers and Processors

Applies to: Bus, TT&C, Computers and Processors

CDRL ID: SSTDR-Fmt2

Data Type ID: **Format_Title** N/A Text Header

Description: Format Title

Method/Expl: Title of the DID format to which the underlying data applies. For SSTDR reporting the title must be one of the following:

Space Hardware Data Summary
Space Hardware Detail Report
Space Unit Cost Report
Space Tech Baseline Report
GOPC/GT Hardware Detail Report

Applies to: Heading Information (All formats)

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5

Data Type ID: **FPA_Array_Size** cm^2 Numeric FPA

Description: FPA Array Size (area)

Method/Expl: Enter the size (area) of the Focal Plane Array (FPA) in square centimeters.

Applies to: Each unique focal plane

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **FPA_Operating_Band** um Numeric FPA

Description: FPA Operating Band

Method/Expl: Enter the frequency band (wavelength) in which the Focal Plane Array (FPA) is operative. Specify the units if not in µm (micro-meters). For multiband FPAs, list each operating band or wavelength (e.g. MWIR 3 to 5 µm, LWIR 8 to 12µm)

Applies to: FPA, IR Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **FPA_Temp** K Numeric FPA

Description: FPA Operating Temperature

Method/Expl: Enter the temperature (Kelvin) at which the Focal Plane Array (FPA) operates.

Applies to: FPA, IR Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **FPA_Thermal_Type** N/A Lookup FPA

Description: Focal Plane Array Thermal Type

Method/Expl: Enter the methodology used for controlling the FPA temperature (e.g. MLI, cryocooler, heater)

Applies to: Focal Plane Array related elements

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **FPA_Thermal_Type**

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
cryocooler	0.00	0		
Heater	0.00	0		
MLI	0.00	0		

Data Type ID:	**FPGA_Designs**	Count	Numeric	Design
Description:	Number of Field Programmable Gate Arrays (FPGA)			
Method/Expl:	Enter the number of Field Programmable Gate Arrays - FPGA (of unspecified type) designs (prior to programming) required.			
Applies to:	Payload			
CDRL ID:	SSTDR-Fmt4			
Data Type ID:	**FPGA_GateCount**	Count	Numeric	Sizing
Description:	FPGA gate count NOT including memory			
Method/Expl:	Enter the number of Field Programmable Gate Array (FPGA) gates NOT including memory gates.			
Applies to:	Payload electronics data elements			
CDRL ID:	SSTDR-Fmt4			
Data Type ID:	**Frequency**	MHz	Numeric	Comm
Description:	Center Frequency of Comm Band/Channel			
Method/Expl:	Enter the center frequency of the specified product. The center frequency of a filter or channel is a measure of a central frequency between the upper and lower cutoff frequencies. It is usually defined as either the arithmetic mean or the geometric mean of the lower cutoff frequency and the upper cutoff frequency of a band-pass system or a band-stop system.			
Applies to:	Comm, Bus, Payload, Amplifiers			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**G&A_Included**	N/A	Yes/No	Cost
Description:	G&A Included			
Method/Expl:	Place a “Y” in the box if General & Administrative (G&A) expense is included within the cost values included within the detailed area (columns D – I). Otherwise put an “N” in the box. Both Actual Cost of Work Performed (Block 8) and Estimated At Completion (Block 9) values shall be reported on a comparable basis (i.e. both shall either include or exclude G&A).			
Applies to:	All detail elements within the report			
CDRL ID:	SSTDR-Fmt3			
Data Type ID:	**Gain**	N/A	Text	Comm
Description:	Antenna Gain Type			
Method/Expl:	Enter the gain of the antenna (either High or Low). A low-gain antenna (LGA) is an antenna with a broad radiowave beam width. This very wide beam allows for a more reliable signal that is best used in mountainous regions, where the signal will propagate reasonably well regardless of terrain. Low gain antennas are often used in spacecraft as a backup to the high-gain antenna, which transmits a much narrower beam and is therefore susceptible to loss of signal.			
Applies to:	Comm, Bus, Payload			

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Gimbal_Type**	Count	Numeric	Technical
Description: Gimbal_Type			
Method/Expl: Enter the number of gimbaled axes (1,2, or 3) for the subject product.			
Applies to: Payload, Antenna, Sensor, Solar Array, Structure			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **GN&C_Method**	N/A	Text	Complexity
Description: Guidance Navigation & Control Subsystem			
Method/Expl: The Guidance Navigation and Control (GN&C) subsystem provides the equipment used to support satellite GN&C subsystem, On-Board Computer software, Interface, Open-Loop and Closed-Loop stability testing in satellite level test environments.			
Applies to: Comm, Bus			
CDRL ID: SSTDR-Fmt2			
Data Type ID: **GOPC_Qty**	Count	Numeric	Sizing
Description: GOPC Quantity			
Method/Expl: Enter the number of Ground Operational Processing Centers (GOPCs) required for the mission. This number is inclusive of both fixed and relocatable GOPCs.			
Applies to: Ground Systems			
CDRL ID: SSTDR-Fmt4			
Data Type ID: **GOPC_Reloc**	N/A	Yes/No	Complexity
Description: Relocatable Ground Operations Centers			
Method/Expl: Enter "Yes" if the element has Relocatable Ground Operations Centers; otherwise enter "No". Relocatable Ground Operations Centers provide satellite communication, operating and/ or processing facilities for users who need functionality that can be easily relocated from one operating site to another if requirements or priorities change.			
Applies to: Ground Systems			
CDRL ID: SSTDR-Fmt4			
Data Type ID: **Ground_Sites_No**	Count	Numeric	Sizing
Description: Number of Ground Stations (Fixed and Mobile)			
Method/Expl: Enter the number of Ground Terminals (GTs) or Ground Stations (GSs) required for the mission. This number is inclusive of both fixed and relocatable GTs.			
Applies to: Ground Systems			
CDRL ID: SSTDR-Fmt4			
Data Type ID: **Ground_Sites_Reloc**	N/A	Yes/No	Complexity
Description: Relocatable Ground Terminals			
Method/Expl: Enter "Yes" if the element has Relocatable Ground Terminals; otherwise enter "No". Relocatable Ground Terminals provide satellite communication facilities for users who need ground terminals that can be easily relocated from one operating site to another if requirements or priorities change.			
Applies to: Ground Systems			
CDRL ID: SSTDR-Fmt4			
Data Type ID: **Ground_Storage_Cap**	Tbytes	Numeric	Sizing

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Description: Ground Data Storage

Method/Expl: Enter the storage (memory) capacity of a Ground System product.

Applies to: Ground Operations Centers

Data Type ID:	**Hdwr_Manufacturer**	N/A	Text	Program

Description: Hardware Manufacturer

Method/Expl: Enter the name of the Manufacturer of the unit/box/assembly. The Manufacturer entry should be the subcontracted company that was responsible for the predominate portion of the manufacturing of the product. If primarily manufactured by the Prime contractor, enter "Prime". Values not equal to "Prime" will be assumed to be subcontracted or procured items.

Applies to: Unit

CDRL ID: SSTDR-Fmt1

Data Type ID:	**Impulse_Total**	m/sec	Numeric	Technical

Description: Total Impulse (Delta-V) in m/sec

Method/Expl: Enter total impulse (Delta-V) for the subject product.

Applies to: Bus, SV, Propulsion, Thruster

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID:	**Instruments_No**	Count	Numeric	Sizing

Description: Instruments per Spacecraft

Method/Expl: Enter the number of Payloads or instruments on the Space Vehicle (SV). This value is distinguished from Unique_Payloads in that multiple occurrences of the same unique payload are also counted.

Applies to: SV

CDRL ID: SSTDR-Fmt4

Data Type ID:	**IRU_Gyro_Drift**	Milimeters	Numeric	Design

Description: IRU Gyro Drift

Method/Expl: Enter the Inertial Reference Unit (IRU) gyroscopic drift in milimeters.

Applies to: Bus, Attitude Control, IRUs/IMUs

CDRL ID: SSTDR-Fmt2

Data Type ID:	**IRU_Stability**	Resolution	Numeric	Design

Description: IRU Stability

Method/Expl: Enter the Inertial Reference Unit (IRU) Stability.

Applies to: Bus, Attitude Control, IRUs/IMUs

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Launch_Availability**	Date	Text	Schedule

Description: Launch Availability Date

Method/Expl: Enter earliest date the Space Vehicle (SV) is first available (designed, built and tested) for launch, in DD-MMM-YYYY format.

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Applies to: Systems, Space Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID:	**Launch_Vehicle**	N/A	Lookup	Program

Description: Launch Vehicle Model

Method/Expl: Provide the Launch Vehicles (LV's) from the below Data Lookup Values list that the Space Vehicle (SV) is compatible with and if known the actual launch vehicle that the SV is launched on.

Applies to: Program Level

CDRL ID: SSTDR-Fmt2

Data Lookup Values for: **Launch_Vehicle**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Ariane4	0.00	0	Ariane 4	
Ariane5	0.00	0	Ariane 5	
Atlas2A	0.00	0	Atlas 2A	
Atlas2AS	0.00	0		
Atlas3A	0.00	0		
Atlas5_401	0.00	0	Atlas 5 401	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 4M fairing and 0 strap-ons.				
Atlas5_411	0.00	0	Atlas 5 411	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 4M fairing and 1 strap-on.				
Atlas5_421	0.00	0	Atlas 5 421	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 4M fairing and 2 strap-ons.				
Atlas5_431	0.00	0	Atlas 5 431	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 4M fairing and 3 strap-ons.				
Atlas5_501	0.00	0	Atlas 5 501	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 0 strap-ons.				
Atlas5_511	0.00	0	Atlas 5 511	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 1 strap-on.				
Atlas5_521	0.00	0	Atlas 5 521	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 2 strap-ons.				
Atlas5_531	0.00	0	Atlas 5 531	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 3 strap-ons.				
Atlas5_541	0.00	0	Atlas 5 541	
Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 4 strap-ons.				

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Atlas5_551 0.00 0 Atlas 5 551

Lockheed Martin Astronautics Atlas 5 LV (Medium EELV) with 5M fairing and 5 strap-ons.

Delta_II 0.00 0 Delta II

Boeing Delta II LV.

Delta_III 0.00 0 Delta III

DeltaIV_40 0.00 0 Delta IV Medium 4, 0

Boeing Delta IV Medium LV with 4M fairing and 0 strap-ons.

DeltaIV_42 0.00 0 Delta IV Medium 4, 2

Boeing Delta IV Medium LV with 4M fairing and 2 strap-ons.

DeltaIV_52 0.00 0 Delta IV Medium 5, 2

Boeing Delta IV Medium LV with 5M fairing and 2 strap-ons.

DeltaIV_54 0.00 0 Delta IV Medium 5, 4

Boeing Delta IV Medium LV with 5M fairing and 4 strap-ons.

DeltaIV_HV 0.00 0 Delta IV Heavy

Boeing Delta IV Heavy LV with 5M fairing and 2 added stages/strap-ons.

PegasusXL 0.00 0 Pegasus XL

SeaLaunch 0.00 0 Sea Launch

SpcShuttle 0.00 0 Space Shuttle

Data Type ID:	**Max_Frequency**	MHz	Numeric	Technical
Description:	Maximum Operating Frequency			
Method/Expl:	Enter the maximum operating frequency.			
Applies to:	Antenna, Payload			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**Min_Frequency**	MHz	Numeric	Technical
Description:	Minimum Operating Frequency			
Method/Expl:	Enter the minimum operating frequency.			
Applies to:	Antenna, Payload			
CDRL ID:	SSTDR-Fmt2			
Data Type ID:	**Mirror_Qty**	Count	Numeric	Optical
Description:	Mirrors Quantity			
Method/Expl:	Enter the number of mirrors employed in the design.			
Applies to:	Optical Subsystem, Optical Payload			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Data Type ID: **Mission_Class** N/A Lookup Program

Description: Mission Class

Method/Expl: Select the Mission Class (A through D) from the below Data Lookup Values list
Ref NPR 8705.4 Appendix A - Classification Considerations for NASA Class A-D Payloads
For DoD Ref: MIL-STD-1540, DoD-HDBK-343 (USAF)

Four risk levels or classifications have been characterized. These classification considerations provide a structured approach for defining a hierarchy of risk combinations for NASA payloads by considering such factors as criticality to the Agency Strategic Plan, national significance, availability of alternative research opportunities or re-flight opportunities, success criteria, magnitude of investment, and other relevant factors. Additional or alternate classification considerations may be applied to a specific payload or payload element. The importance weighting assigned to each consideration is at the discretion of the responsible Mission Directorate.

Applies to: Program, System, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Mission_Class**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Class-A	0.00	0	A	
Mission with full redundancy, warm backups, extensive testing; typically a flagship mission. Missions that are High priority with very low acceptable risk, Very High National significance, Very High to High Complexity, Long mission life > 5 years, High Cost, Critical Launch Constraints, In-Flight Maintenance N/A, No alternative or re-flight opportunities, All practical measures taken to achieve minimum risk to achieving mission success, and highest assurance standards used.				
Class-A/B	0.00	0	A/B	
Mission with full redundancy, cold backups, fairly extensive testing.				
Class-B	0.00	0	B	
Mission with mostly full redundancy except for subsystems that can justify single-string, slightly less testing than a Class A mission.				
Class-B/C	0.00	0	B/C	
Mission with partial redundancy (full redundancy only on critical items), less testing than a Class A mission.				
Class-C	0.00	0	C	
Mission that is single-string, little testing needed.				
Class-D	0.00	0	D	
Missions that are Low priority with high acceptable risk, Low to medium National significance, Medium to low Complexity, Short mission life < 2 years, Low Cost, Few to none Launch Constraints, In-Flight Maintenance may be feasible and planned, Significant alternative or re-flight opportunities, Medium or significant risk of not achieving mission success is permitted. Minimal assurance standards are permitted.				

Data Type ID: **MLE** Years Numeric Technical

Description: Mean Life Expectancy (MLE)

Method/Expl: Enter the Mean Life Expectancy.

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2

Data Type ID: **MMD** Years Numeric Technical

Description: Mean Mission Duration (MMD)

Method/Expl: Enter the Mean Mission Duration.

Data Item Description	Unit of Measure	Value Type	Data Group ID

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2

Data Type ID: **New_1st_Time_Integ** N/A Yes/No Complexity

Description: New vehicle, bus, payload, customer or launch vehicle; 1st time integration

Method/Expl: Enter Yes if this is a New 1st Time Integration; otherwise enter No.

Applies to: Systems

CDRL ID: SSTDR-Fmt2

Data Type ID: **New_Design** % Numeric Design

Description: Percent New Design (value of 0 to 100)

Method/Expl: Enter percentage of new design for the hardware unit/assembly. Percent new design characterizes the relative amount of composite design effort required to design unique electrical and unique mechanical portions of an assembly or box, where 100% represents a completely new design and 0% represents an existing design that requires no modification. This parameter reflects heritage from previous designs, if there is any.

See TBD Document for complete guidance on this value.

Applies to: SV, Bus, Payload, Subsystems, & Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **OnBoard_Storage_Cap** Mbytes Numeric Sizing

Description: On-Board Storage Capacity in Mbytes

Method/Expl: Enter the physical data storage (memory) capacity at a single instance in time. This includes capacity from compression, recorders, other storage devices.

Applies to: SV; Bus; Payload;Data Storage Handling, and Interface units, Multiplexers/Demultiplexers,

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Optical_Axis** N/A Lookup Optical

Description: Optical Axis

Method/Expl: On-Axis or Off-Axis of the aperture. Enter "Off-Axis" if the optical axis of the aperture is not coincident (inline) with the mechanical center of the aperture. Otherwise enter On-Axis.

Applies to: Optical Subsystem, Optical Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Optical_Axis**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Off-Axis	0.00	0		
On-Axis	0.00	0		

Data Type ID: **Orbit_Altitude** km Numeric Technical

Description: Altitude of orbiting satellite

Method/Expl: For planet orbiting vehicles (satellites) enter the average orbital altitude of the vehicle from planet surface. For earth orbiting satellites, enter the average height above sea level.

Applies to: SV/Satellite in circular orbits (not elliptical).

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Orbit_Inclination** | Degrees | Numeric | Technical

Description: Orbital Inclination

Method/Expl: Enter the angular distance (in degrees) of the Space Vehicle (SV) orbital plane from the equator or the ecliptic from the orbited object.

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Orbit_Regime** | N/A | Lookup | Technical

Description: Orbit Regime or Apoapsis Class

Method/Expl: Enter best fit from the below Data Lookup Values list. For Geocentric (Earth) orbits, the geocentric orbit type (inclination, eccentricity, etc.) or altitude classification (LEO, GEO, etc.). For non-Earth orbits specify Planetary. Apoapsis refers to the point at which an object is furthest from the body it is orbiting. Describe any further details about the orbit in comments fields where applicable.

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Orbit_Regime**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
GEO	0.00	0		

Geocentric circular orbit with an altitude of 35,786 kilometers (22,236 mi). The period of the orbit equals one sidereal day, coinciding with the rotation period of the Earth. The speed is approximately 3,000 meters per second (9,800 ft/s).

HEO	0.00	0		

Geocentric orbits with altitudes at apogee higher than that of the geosynchronous orbit. A special case of high Earth orbit is the highly elliptical orbit, where altitude at perigee is less than 2,000 kilometers (1,200 mi).

Lagrange	0.00	0	Lagrange Points	

The orbit of an object located at one of the Lagrangian points. Lagrangian points are the five positions in an orbital configuration where a small object affected only by gravity can theoretically be stationary relative to two larger objects (such as a satellite with respect to the Earth and Moon). The Lagrange points mark positions where the combined gravitational pull of the two large masses provides precisely the centripetal force required to rotate with them. Lagrangian points are analogous to geostationary orbits in that they allow an object to be in a fixed position in space rather than an orbit in which its relative position changes continuously.

LEO_28	0.00	0	LEO-28.5 degrees	

A satellite in Low Earth Orbit with standard 28.5 degrees inclination. Generically, Low Earth Orbits are Geocentric orbits ranging in altitude from 160 kilometers (100 statute miles) to 2,000 kilometers (1,200 mi) above mean sea level. At 160 km, one revolution takes approximately 90 minutes, and the circular orbital speed is 8,000 meters per second (26,000 ft/s).

LEO_Polar	0.00	0	LEO Polar	

A satellite in Low Earth Orbit that passes above or nearly above both poles of the planet on each revolution. Therefore it has an inclination of (or very close to) 90 degrees. Generically, Low Earth Orbits are Geocentric orbits ranging in altitude from 160 kilometers (100 statute miles) to 2,000 kilometers (1,200 mi) above mean sea level. At 160 km, one revolution takes approximately 90 minutes, and the circular orbital speed is 8,000 meters per second (26,000 ft/s).

LEO_Sun	0.00	0	LEO-Sun Sync	

A satellite in Low earth Orbit which combines altitude and inclination in such a way that an object on that orbit ascends or descends over any given point of the Earth's surface at the same local mean solar time. The surface illumination angle will be nearly the same every time. This consistent lighting is a useful characteristic for satellites that image the Earth's surface in visible or infrared wavelengths (e.g. weather and spy satellites) and for other remote sensing satellites (e.g. those carrying ocean and atmospheric remote sensing instruments that require sunlight). Generic LEO orbits range in altitude from 160 kilometers (100 statute miles) to 2,000 kilometers (1,200 mi) above mean sea level. At 160 km, one revolution takes approximately 90 minutes, and the circular orbital speed is 8,000 meters per second (26,000 ft/s).

Data Item Description	Unit of Measure	Value Type	Data Group ID

Planetary	0.00	0	Planetary

Non-earth (Geocentric) orbit or flight path.

Data Type ID:	**Orbital_Apoapsis**	km	Numeric	Technical

Description: Orbital Apoapsis

Method/Expl: Enter the Orbital Apoapsis in kilometers (km). This is the point of greatest distance of the Space Vehicle (SV) from the center of its elliptical or eccentric orbit.

Applies to: SV/Satellite in elliptical orbits (not circular). For Circular orbits Apoapsis and Periapsis are equal.

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Orbital_Periapsis**	km	Numeric	Technical

Description: Orbital Periapsis

Method/Expl: Enter the Orbital Periapsis in kilometers (km). This is the point of closest approach of the Space Vehicle (SV) from the center of its elliptical or eccentric orbit.

Applies to: SV/Satellite in elliptical orbits (not circular). For Circular orbits Apoapsis and Periapsis are equal.

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Payload_Gimbaled**	N/A	Yes/No	Technical

Description: Payload Gimbaled

Method/Expl: If the payload is gimbaled (pivoted) or on a gimbaled platform enter "Yes" otherwise enter "No". Gimbaled implies capable of continuous, full rotation allowed about a particular axis.

Applies to: Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID:	**Payload_Type**	N/A	Lookup	Technical

Description: Type of Payloads/Instruments on Vehicle

Method/Expl: Enter the closest type of major function performed by the Payload from the below Data Lookup Values list.

Applies to: Payload

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Payload_Type**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Comm-PL	0.00	0	Communication	
Imaging-PL	0.00	0	Imaging	
Signal-PL	0.00	0	Signal collection	

Data Type ID:	**Peak_Output_Power**	Watts	Numeric	Power

Description: Peak Payload Power

Method/Expl: Enter the maximum power output by the product in watts.

Applies to: Transmitter, Amplifier, TT&C, Power Related, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Item Description	Unit of Measure	Value Type	Data Group ID

Data Type ID:	**Pixel_Qty**	Count	Numeric	FPA
Description:	Pixel Quantity			
Method/Expl:	Enter the number of Pixels in the element (e.g. Focal Plane Array). See Pixel_Size.			
Applies to:	Focal Plane Array, Payload			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**Pixel_Size**	um	Numeric	FPA
Description:	Pixel Size			
Method/Expl:	Enter Pixel size (pitch) in micro-meters. Pixel Size or Pitch is a specification for a computer display, computer printer, image scanner, or other pixel-based device that describes the distance. The distance from the center of a pixel to the center of the next pixel. For example, between dots (sub-pixels) of the same color on the inside of a display screen. In the case of a color display dot pitch is a measure of the size of a triad plus the distance between the triads. Lower pixel size corresponds to higher resolution.			
Applies to:	Payload, Sensor, Camera, Focal Plane Array			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**POC_Phone**	N/A	Text	Header
Description:	Point of Contact Phone			
Method/Expl:	Enter the Phone number of the technical contact (POC_Tech) for the contractor representing the data within the report.			
Applies to:	Heading Information (All formats)			
CDRL ID:	SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID:	**POC_Tech**	N/A	Text	Header
Description:	Technical Point of Contact			
Method/Expl:	Enter the name of the contractor Point of Contact (POC) for coordinating questions and comments regarding this report.			
Applies to:	Heading Information (All formats)			
CDRL ID:	SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID:	**Pointing_Accuracy**	Degrees	Numeric	Technical
Description:	Pointing Accuracy			
Method/Expl:	Enter pointing accuracy in degrees using an appropriate number of significant digits.			
Applies to:	SV, Bus, & Payload and specific units such as star tracker, Inertial Reference Unit-IRU / Inertial Measurement Unit-IMU, Rate Gyros			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**Pointing_Knowledge**	Degrees	Numeric	Technical
Description:	Pointing Knowledge			
Method/Expl:	Enter pointing knowledge in degrees using an appropriate number of significant digits.			
Applies to:	SV, Bus, Payload and ADCS.			
CDRL ID:	SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID:	**Power_Avg**	Watts	Numeric	Power
Description:	Average Power			

Method/Expl: Enter average power usage (consumption) in watts.

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Power_BOL** Watts Numeric Power

Description: Beginning of Life Power

Method/Expl: Enter the Beginning of Life Power (BOL) in Watts. Initial power requirement when spacecraft has reached its operational orbit such that the degradation of power over the Design Life does not decrease the available power beyond requirements at End-Of-Life (EOL).

Applies to: Solar Arrays, Amplifiers, Bus Power Related

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Power_EOL** Watts Numeric Power

Description: End of Life Power

Method/Expl: Enter the End of Life (EOL) Power in Watts. Power requirement required at end of Design Life.

Applies to: Solar Arrays, Amplifiers, Bus Power Related

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Power_Output** Watts Numeric Power

Description: Output Power

Method/Expl: Enter output power in watts.

Applies to: Amplifiers and power generation units

CDRL ID: SSTDR-Fmt4

Data Type ID: **Power_Peak** Watts Numeric Power

Description: Peak Power

Method/Expl: Enter maximum power usage in watts.

Applies to: SV, Payloads, Bus, & Active Units

CDRL ID: SSTDR-Fmt4

Data Type ID: **Predicted_Mass** kg Numeric Mass

Description: Predicted Mass

Method/Expl: Enter the Predicted Mass of the product/unit/assembly/box. This value is typically a calculation of the weight, including contingency, of the sum all the flight units of a particular unit/boc/assembly or lot of combined parts. It is the Basic Mass times the flight (ship set) quantity required per Space Vehicle (SV) within the next higher level assembly plus the Mass Growth Allowance.

Predicted_Mass = Weight_Basic * Qty_Per_SV + Weight_Growth

Applies to: SV, Bus, Payload, and units

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt4

Data Type ID: **Program_Name** N/A Text Program

Description: Program or contract name & acronym

Method/Expl: Enter the Program or System name. This is the name of the system/item being acquired that data will support. Include any relevant acronym. For example, Global Positioning Satellite (GPS).

Data Item Description	Unit of Measure	Value Type	Data Group ID

Applies to: Heading Information (All formats)

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5

Data Type ID: **Program_Phase** N/A Text Header

Description: Program Phase or Milestone

Method/Expl: Enter the current phase and most recent milestone for the program. (E.g. Phase B - CDR).

Applies to: Heading Information (All formats)

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5

Data Type ID: **Propulsion_Type** N/A Text Technical

Description: Propulsion system type

Method/Expl: Enter the primary methodology of providing propulsion or reaction control functions (None, Liquid, Ion, Mixed).

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Qty_Per_SV** Count Numeric Sizing

Description: Quantity Per Space Vehicle (QPSV)

Method/Expl: Enter the flight Quantity Per Space Vehicle (QPSV) required for the next higher level WBS element for a single Space Vehicle (SV). The flight Quantity = GFE Flight Units + Proto Flight units + Full production Flight units. For example, if there are three identical propellant tanks per vehicle, QPSV = 3. For lines representing collections of different items, such as propulsion subsystem lines, valves, filters, and sensors, QPSV = 1 (set), with the possible exception of replicated equipment groupings. For example, two sets of microwave components, each set identical to the other, would have a Weight_Basic equal to the weight of one set and a QPSV value of 2. The Quantity Per Space Vehicle value is always an integer.

Applies to: Systems

CDRL ID: SSTDR-Fmt1

Data Type ID: **Rad_Hardened** N/A Yes/No Technical

Description: Radiation Hardening

Method/Expl: Enter "Yes" if some accommodation for radiation survivability is included within the design. Otherwise enter "No".

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2

Data Type ID: **Reflector_Size** Meters Numeric Sizing

Description: Reflector Size (Diameter)

Method/Expl: Enter the size (diameter) of the reflector in meters (m).

Applies to: Antennas, Payloads

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Reliability** Decimal Numeric Technical

Description: Reliability

Method/Expl: Entered at 3 different levels of WBS; Bus, Payload, and Space Vehicle (SV).

Applies to: Space Vehicle, Payload, Bus

Data Item Description	Unit of Measure	Value Type	Data Group ID
CDRL ID: SSTDR-Fmt2			
Data Type ID: **Report_Date**	Date	Text	Program
Description: Report Date			
Method/Expl: Enter the date which the Report or Contract Data Requirements List (CDRL) was prepared in DD/MMM/YYYY format.			
Applies to: Heading Information (All formats)			
CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID: **RF_Freq_Range**	RF Frequency	Numeric	Design
Description: RF Frequency Range			
Method/Expl: Enter the RF frequency range.			
Applies to: Bus			
CDRL ID: SSTDR-Fmt2			
Data Type ID: **ROIC_Redesign**	%	Numeric	FPA
Description: ROIC Redesign			
Method/Expl: Enter the percent of new design required for the FPA ReadOut Integrated Circuit (ROIC).			
Applies to: Focal Plane Array, Payloads			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Sat_in_Constel_No**	Count	Numeric	Sizing
Description: Number of Satellites in Constellation			
Method/Expl: Enter the number (quantity) of operating satellites required for the mission.			
Applies to: Systems			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Scan_Mirror**	N/A	Yes/No	Optical
Description: Scan Mirrors			
Method/Expl: If the Payload employs Scanning Mirror technology enter "Yes", otherwise enter "No". In a typical optical scanning design, the intermediate image formed by the first lens(es) is matched with a slit that “cuts” a small section from the image. As the process continues, this image moves along the slit but remains in the slit’s plane. A second lens (scanning lens or mirror) transfers the image from the slit to a sensor in the form of a ring outside or inside a rotating drum, whose axis of rotation is parallel to the slit.			
Applies to: Optical Subsystem, Optical Payload			
CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4			
Data Type ID: **Security_Class**	N/A	Text	Header
Description: Security Classification Level			
Method/Expl: Security_Class should be entered at the top and bottom of each page of the report. The highest security level of any data element contained within the report. It is usually "Unclassified", but can be "Secret", "Top Secret" , or some other security designation.			
Applies to: Heading Information (All formats)			
CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5			
Data Type ID: **SNR_Ratio**	Ratio	Numeric	Technical

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Description: Signal-to-Noise Ratio (SNR)

Method/Expl: Enter the ratio of average signal power to the average noise power corrupting the signal (signal power / signal noise).

Applies to: Comm, Bus, Payload

Data Type ID: **Solar_Array_Area** Meters^2 Numeric Power

Description: Solar Array Area in Meters square

Method/Expl: Enter Solar Array Area in meters squared. This value includes the area of all panels (fixed and deployable) summed together.

Applies to: Solar Array, Bus, Electrical Power

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Solar_Array_Config** N/A Lookup Power

Description: Solar Array Configuration

Method/Expl: Enter the manner(s) in which the Solar Array is attached to the Space Vehicle (SV) from the below Data Lookup Values list. This could be a combination configurations. If only one configuration is entered, enter the most complex configuration employed.

Applies to: Solar Array, Electrical Power, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Solar_Array_Config**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*
Articulate	0.00	0	Articulated	
Articulated				
Body-Fixed	0.00	0	Body	
Body Fixed				
Depl-1a	0.00	0	1-Axis	
Deployable 1-axis				

Data Type ID: **Solar_Cell_Area** Meters^2 Numeric Power

Description: Solar Cell Area

Method/Expl: Enter the Solar Cell Area in Meters^2. This value is for the area of a single solar cell.

Applies to: EPS Solar Panel, Electrical Power

CDRL ID: SSTDR-Fmt2

Data Type ID: **Solar_Cell_Type** N/A Lookup Power

Description: Type of Solar Cell

Method/Expl: Select a type of Solar Cell from the below Data Lookup Values list, or add a new entry.

Applies to: Electrical Power, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Lookup Values for: **Solar_Cell_Type**

Lookup ID	*Complexity*	*DS*	*Description*	*Comments*

Data Item Description	Unit of Measure	Value Type	Data Group ID

ITJ 0.00 0 ITJ

Improved Triple Junction (ITJ) Solar Cells with BOL overall efficiency of 26.8%. GaInP2/GaAs/Ge solar cells.

NTJ 0.00 0 NTJ

NeXt Triple Junction (XTJ) Solar Cells with BOL overall efficiency of 29.5%. GaInP2/GaAs/Ge solar cells.

Si 0.00 0 Si

Silicon.

UTJ 0.00 0 UTJ

Ultra Triple Junction (UTJ) Solar Cells with BOL overall efficiency of 28.3%. GaInP2/GaAs/Ge solar cells.

Data Type ID: **Sponsoring_Agncy_No** Count Numeric Sizing

Description: Number of Sponsoring agencies

Method/Expl: Enter the number of sponsoring agencies.

Applies to: Systems

CDRL ID: SSTDR-Fmt2

Data Type ID: **Structures_Material** N/A Text Technical

Description: Structures Material

Method/Expl: Enter material predominately used to for structural portion of product.

Applies to: SV, Bus

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Subsystem** N/A Text Program

Description: Subsystem

Method/Expl: Enter the Subsystem title corresponding to level 4 of MIL-STD-881 Appendix F WBS. This may be represent a Bus or Payload subsystem, integrated assembly, or equipment group.

Applies to: Level 4 of MIL-STD-881C Appendix F, and Element identification

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt3

Data Type ID: **SV_Quantity** Count Numeric Sizing

Description: Number of SV Delivered

Method/Expl: Enter the number of Space Vehicles (SV) delivered represented by the report data.

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt1

Data Type ID: **System_Name** N/A Text Program

Description: System Name

Method/Expl: Enter the name of the system that this program applies to.

Applies to: Program Level

CDRL ID: SSTDR-Fmt2

Data Item Description	Unit of Measure	Value Type	Data Group ID

Data Type ID: **TDS_Comment** N/A Text Program

Description: Comment

Method/Expl: Enter the Technical Data Summary CDRL Comment. Supply brief comments that describe unique characteristics of the product, assembly or box. They should provide insight into the type of hardware to be produced and reasoning behind selections for the more subjective values (Units_Refurb, %_New_Design, Unique_Design, etc.) entered on the Technical Data Summary CDRL.

Applies to: Additional Information

CDRL ID: SSTDR-Fmt1

Data Type ID: **Tech_Unit_of_Measure** N/A Text Design

Description: Unit of Measure

Method/Expl: For each of the elements in Space Hardware Detail Report, enter the Unit of Measure value, if applicable, consistent with appendix.

Applies to: Units, Subsystems

CDRL ID: SSTDR-Fmt2

Data Type ID: **Tech_Value** Decimal Numeric Design

Description: Technical Value

Method/Expl: For each of the elements in Space Hardware Detail Report, enter the unique value.

Applies to: Units, Subsystems

CDRL ID: SSTDR-Fmt2

Data Type ID: **Thermal_Type** N/A Lookup Technical

Description: Thermal Type

Method/Expl: Select primary methodology from the below Data Lookup Values list for maintaining equipment within temperature limits from the list of Thermal Types.

Applies to: SV

CDRL ID: SSTDR-Fmt4

Data Lookup Values for: **Thermal_Type**

Lookup ID	Complexity	DS	Description	Comments
TM_A_Cryo	0.00	0	Active Using Cryocooler	
TM_A_Heat	0.00	0	Active Using Heaters	
TM_M_Semi	0.00	0	Passive with some Active	
TM_P_MLI	0.00	0	Passive using MLI & Heat Pipes	

Data Type ID: **Threat_Hardening** N/A Text Technical

Description: Hardening Threat Type(s)

Method/Expl: Enter one or more threats to survivability accommodated within design.
1) Natural Space Radiation / Enhanced Radiation from Nuclear Bursts
2) Collateral Nuclear Burst
3) Redout - sensor tolerance to background radiation
4) Ground Based Laser
5) High Power Microwave and EMP
6) RF Jamming/Blackout

Applies to: Space Vehicle

CDRL ID: SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **Thruster_Tank_No** Count Numeric Sizing

Description: Number of Thrusters and Tanks

Method/Expl: Enter the total number of thrusters added to the total number of Propulsion (Reaction Control) tanks.

Applies to: Bus

CDRL ID: SSTDR-Fmt4

Data Type ID: **Time_Development** Months Numeric Schedule

Description: Development Time

Method/Expl: Time duration (number of months) from design start until ready for integration to next higher level. Nominally, this value is intended to capture the amount of time required to design, manufacture, integrate, and test a product. Storage and shipment durations should not be included in this value.

For a Space Vehicle (SV), this is the time duration (number of months) from Authority to Proceed (ATP) until available for launch. Nominally, this value is intended to capture the amount of time required to design, manufacture, integrate, and test a Space Vehicle. SV storage and shipment durations should not be included in this value.

Applies to: All products, SV

CDRL ID: IMS, SSTDR-Fmt2, SSTDR-Fmt4

Data Type ID: **TT&C_Standard** N/A Text Comm

Description: TT&C Standard Band/Frequency

Method/Expl: Enter the TT&C Standard (Transpondes/Transceivers: S-Band, SGLS, SGLS S-Band, SGLS/USB).

Applies to: Bus

CDRL ID: SSTDR-Fmt4

Data Type ID: **TWTA_Dyn_Linear_Rang** MHz Numeric Design

Description: TWTA Dynamic Linear Range

Method/Expl: Enter the Traveling Wave Tube Amplifier (TWTA) Dynamic linear range.

Applies to: Bus, TWTAs

CDRL ID: SSTDR-Fmt2

Data Type ID: **Unique_Comp** % Numeric Design

Description: Percent Unique Design (value of 0 to 100)

Method/Expl: Enter the Unique Percent - Composite value. This is the percentage of hardware items or subassemblies in the assembly or box that is unique, as opposed to items or subassemblies that are “repeats” or replications of the unique items / subassemblies within the design. This parameter is established by the amount of design repetition within the unit and has nothing to do with the design heritage of the item or how many units are to be produced.

The parameter name “Percent Unique Design” is shortened for convenience to “percent unique” or “%Unique” in the following discussion.

A value of 100% unique represents no design repetition, whereas 50% represents two-fold repetition of all portions of the unit. Thus, if an electronics box has simple (two-fold) redundancy it could have an electrical percent unique value of 50% if all electrical components can be physically separated into two identical sets of hardware; however, if there are any electrical components that are not really redundant, or where the redundancy is embedded in the component (e.g., a circuit board with on-board redundancy), then the percent unique value would be greater than 50%.

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

See TBD Document for complete guidance on this value.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID:	**Unit_Cost_Comment**	N/A	Text	Cost

Description: SSTDR Detail Area Comments

Method/Expl: Enter an optional textual comment related to a single Unit/CSCI entry which explains any value entered or relationship of values which is non-intuitive or non-standard (e.g. Estimate At Completion costs which are less than the Actual Cost of Work already performed). The Comment could also include explanations regarding ambiguous Subsystem or Unit/CSCI names, substantial adjustments from previous submittals, or any aid that the contractor deems helpful to the report user.

Applies to: Units/CSCIs

CDRL ID: SSTDR-Fmt3

Data Type ID:	**Unit_Cost_Remarks**	N/A	Text	Cost

Description: SSTDR Footer Area Remarks

Method/Expl: Enter optional textual remarks common to the entire report or groups of Unit/CSCI entries which explain any value(s) entered or relationship of values which are non-intuitive or non-standard (e.g. Estimate At Completion costs which are less than the Actual Cost of Work already performed). The Remarks could also include explanations regarding potentially confusing naming conventions, substantial adjustments from previous submittals, or any aid that the contractor deems helpful to the report user.

Applies to: Entire report or multiple detail entries

CDRL ID: SSTDR-Fmt3

Data Type ID:	**Unit_CSCI**	N/A	Text	Cost

Description: Unit/CSCI

Method/Expl: Column B - Unit/CSCI. Enter the name or description of the Unit, assembly, box, Computer Software Configuration Item (CSCI), or SEIT/PM and Support Equipment related element (SEPM; Assembly, Integration & Test; or Support Equipment). The Unit/CSCI should be a contractor representative name for an equivalently defined element of the MIL-STD-881C at Level 4 or 5. For the purpose of this report, these elements or collections of items are defined by MIL-STD-881C Appendix F at Level 5 within the Space Vehicle and the Ground Operations & Processing Center (GOPC) definitions and at Level 4 within a Ground Terminal/Gateway (GT).

Applies to: Units/CSCIs

CDRL ID: SSTDR-Fmt3

Data Type ID:	**Unit_ID_Code**	N/A	Text	Program

Description: Unit Identifier Coding

Method/Expl: Enter the name or ID which uniquely identifies the unit from others units including others of the same 881 WBS element. For example, If two types of Star Trackers are included within the report, Near Field Of View (NFOV) Star Tracker and Wide Field Of View (WFOV) Star Tracker would uniquely identify the two units.

Applies to: Units or Boxes, and Element identification

CDRL ID: SSTDR-Fmt1

Data Type ID:	**Units_Engr_GFE**	Count	Numeric	Sizing

Description: Quantity of NRE GFE Units

Method/Expl: Enter the Quantity of Engineering Units (non-flight) that have been provided or transferred from previous contract and used on the current contract. See Engineering Units (EM) for further definition. These are Government Furnished Units (GFE) transferred at no cost.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Data Type ID: **Units_Engr_Models** Count Numeric Sizing

Description: Quantity of Engineering Units (EM)

Method/Expl: Engineering Units (EM): This represents the equivalent number of units built to confirm the basic design elements of a box during its development. Engineering units may or may not be built exactly to flight configuration and may include other than flight quality parts. Also, they may not be complete. A fractional value for EM should be used in cases where the unit is incomplete. Document the rationale for the fractional EM value, describing a calculation if that is how the fractional EM value was derived.

For example, an engineering unit for an internally redundant electronic box may be mechanically complete (whole) but may include just one of the two strings of electronics that will be incorporated into the flight unit. In this example, if the mechanical portion of the complete box represents about 30 percent of the total cost and the electrical portion represents 70 percent, a fractional value for EM of 0.3 x 1.0 + 0.7 x 0.5 = 0.65 would be reasonable (1.0 and 0.5 are the fractions of total mechanical and electronic hardware present in the engineering units, respectively).

If an engineering unit is complete (all hardware elements included), then a value of 1.0 is entered for EM. If there are multiple engineering units, the value entered is the sum of the fractional values for each unit. The value of EM should not be reduced just because the unit is not built to flight configuration or with flight quality parts.

If more than one engineering unit is proposed, then provide an explanation (i.e., how each unit will be used) in a comment field/area. Also identify the missing hardware subassemblies or components in the comment when EM includes one or more fractional unit values.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_Flight** Count Numeric Sizing

Description: Quantity of Flight Units (F)

Method/Expl: Flight Units (F): Flight units are “production” units that are typically subjected to acceptance testing only. Exclude GFE units (e.g., units from a previous contract provided at no cost). Enter GFE units separately as a Units_Flight_GFE data type value entry. This quantity must be an integer number.

Applies to: Units/Boxes

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_Flight_GFE** Count Numeric Sizing

Description: Quantity of GFE Flight

Method/Expl: Enter the Flight Units Quantity that have been provided or left from previous contract at no or substantially discounted cost. See Units_Flight.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_PQ** Count Numeric Sizing

Description: Quantity of Protoqual Units (PQ)

Method/Expl: Enter the Quantity of Protoqual Units (PQ). This is a flight unit that is tested to protoqual levels. The quantity is a integer number. These units are usually flown on the first spacecraft produced on the contract. Protoqual testing level provided for higher/more stringent testing than acceptance test levels.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_Refurb** Count Numeric Sizing

Description: Quantity of Refurbished and Retro-fitted Units

Method/Expl: Refurbished and Retro-fitted Units (R): This value represents the effort required to refurbish or retrofit units to flight configuration and quality. Normally, TQ or PQ units are those refurbished, while engineering units and GFE units from prior contracts can also be retrofitted. The R-value is expressed in terms of a fraction of the cost of producing and testing a complete flight unit. R should be left at 0 for small refurbishment efforts (5% of a flight unit cost or less).

If any refurbishment or retrofitting is indicated (by R>0), enter in the Comment field information explaining the source of the units (E, TQ, PQ, or GFE) and the nature of refurbishment or retrofitting to be performed. Document the rationale for the fractional R value, describing a calculation, if that is how the fractional R value was determined.

For each case above, when multiple units are produced, then the fractional values for each must be added together and entered in the appropriate column. For example, if both a complete qualification unit and a complete life test unit are produced, then a value of 2.0 would be entered in the TQ column and an explanation for this value placed in the comment field.

Where the box represented on a line of the data sheet requires a set of identical items to make up a flight vehicle ship set (NSY total items), the number of flight units (F) will typically be equal to NSY times the number of vehicles to be produced (over the contract period of performance or system life cycle), less the number of new PQ units, GFE flight units available from previous contracts, and units refurbished or retrofitted to flight quality. For example, suppose three new vehicles will need two identical boxes each (primary and redundant units). They are the same as flight boxes produced on a previous contract, and one spare from that contract will be used as a flight unit on the first of the three vehicles. The other unit (the first unit to be produced on the new contract) will be a PQ unit because the design needs to be re-qualified for different environments.

Where the line represents a collection of different (not identical) items, then the number of flight units would be equal to the number of systems, or hardware ship sets, produced less 1, if a protoqual approach is used for all of the items. If only some of the items are PQs, then fractional PQ and F values may be used. Specify the formula or method used to calculate the fractional PQ and Fs in this case.

When GFE flight units are proposed, identify the quantity and source in the HARDWARE UNITS field (column X). Call out the GFE units in the HARDWARE UNITS column, Item 18 below, identifying which spacecraft contract provided them and whether they are a TQ, PQ, flight, or spare unit on this contract.

For all types of units described above, if fractional values were obtained by calculations, provide these calculations–or a description of them–in the HARDWARE UNITS field (column X).

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_Spare** Count Numeric Sizing

Description: Quantity of Spare Units (S)

Method/Expl: Enter the Quantity of Spare Units (S). Spare units are flight units, or major portions thereof, that are produced in accordance with the sparing philosophy of a program. Piece parts, extra material, and spare circuit boards are not to be included in the S value. Fractional values for S are used when major subassemblies are spared (and complete spare boxes are not proposed). When fractional values are used, identify the major subassemblies that will be spared in the comment field. Document the rationale for the fractional S value, describing a calculation, if that is how the fractional S value was derived.

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID: **Units_TQ** Count Numeric Sizing

Description: Quantity of Traditional Qualification Units (TQ)

Method/Expl: Enter the Quantity of Traditional Qualification Units (TQ). This represents the number of units that are built to flight configuration standards and subsequently subjected to qualification testing to ensure that the hardware item functions satisfactorily after experiencing the launch and space environments – typically to “full qual” levels and durations. They may also be subjected to additional tests not performed on flight units.

TQ units may be refurbished and used as flight hardware–see subparagraph f) below.

Life test units are also counted as TQ units because they are assumed to be built to flight standards.

TQ and life test units may have fractional quantities depending on their completeness compared to fully configured flight units. Notable examples of this are solar arrays with only a fraction of their solar cells or single-string electronic boxes, like the engineering unit (EM) example. The same type of fractions should be used for TQ and life test units as for engineering units; i.e., the relative cost of the major components of the box should be considered in establishing the fraction. Document the rationale for a fractional TQ value, describing a calculation if that is how the fractional TQ value was determined. When there are both a TQ and life test unit, the TQ value is the sum of the (fractional) values for each of these two units.

For all TQ units proposed, provide an explanation in the Comment field of how each unit will be used and why a TQ is being proposed to qualify the hardware item. Certain types of hardware items, like wheel devices, solar arrays, high power amplifiers, and inertial reference units will frequently have a life test unit if the item has a new or substantially modified design. Propulsion tanks will frequently have a TQ unit for the first vehicle produced on the contract; the TQ unit will be used to prove the tank’s structural integrity usually under internal pressure sufficient to cause it to burst. Also identify missing subassemblies or components in this field when TQ includes one or more fractional unit values.

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

Applies to: Units

CDRL ID: SSTDR-Fmt1

Data Type ID:	**Uplink_Modes**	N/A	Text	Complexity

Description: uplink modes for payload

Method/Expl: Enter the band type. Band types include bands such as Ka, x, s, etc.

Applies to: Comm, Bus, Payload

CDRL ID: SSTDR-Fmt2

Data Type ID:	**Version**	N/A	Text	Header

Description: Version

Method/Expl: Enter Report or Contract Data Requirements List (CDRL) Version identifier. This should be a unique identifier which distinguishes the configuration being documented (e.g. preliminary, final, conceptual, etc.) and also distinguishes which submittal of this report or CDRL from earlier versions. Enter “Original” if this is the initial submission for this system; “Revision n” if it is the nth submission, or “Final” if this is the last submission for a completed system. Enter any other descriptive information that will help the recipient understand differences between configurations that may develop as a design matures. This information helps to track various versions of CDRL submissions that may exist.

Applies to: Heading Information (All formats)

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt2, SSTDR-Fmt3, SSTDR-Fmt4, SSTDR-Fmt5

Data Type ID:	**WBS_Code**	N/A	Text	Program

Description: WBS Code (CWBS identifier)

Method/Expl: Enter the Work Breakdown Structure (WBS) identifier for the specified item. Identifies the full WBS number for the unit, assembly, box, or non-hardware cost element (e.g., flight software, subsystem I&T).

The WBS Code represents the lowest level of the Contract Work Breakdown Structure (CWBS) identifier for all elements for which costs are reported. CWBS elements and levels reported shall be those specified in the contract. Note that a CWBS element at the lowest level may encompass more than one Unit/CSCI (see Column B. Unit/CSCI below). Thus, the CWBS identifier shall be repeated for each Unit/CSCI (and the costs of the CWBS segregated into individual Unit/CSCIs). A CWBS identifier may also represent only a portion of a UNIT/CSCI (a UNIT/CSCI Subset). In this case, a CWBS shall be listed only once, and the Unit/CSCI name repeated for multiple CWBS entries.

Applies to: Program, All Products, and Element identification

CDRL ID: SSTDR-Fmt1, SSTDR-Fmt3

Data Type ID:	**WBS_Level**	N/A	Text	Technical

Description: WBS Level

Method/Expl: Enter the Work Breakdown Structure (WBS) level this item refers to.

Applies to: Element identification

CDRL ID: SSTDR-Fmt2

Data Type ID:	**WBS_Name**	N/A	Text	Program

Description: WBS Element Name

Method/Expl: Enter the name (title) of the Work Breakdown Structure (WBS) element. Typically, this is the name or description of an assembly, box, cost element or a summary level title.

Applies to: Element Identification

Data Item Description	*Unit of Measure*	*Value Type*	*Data Group ID*

CDRL ID: SSTDR-Fmt1

Data Type ID: **Weight_Basic** | kg | Numeric | Mass

Description: Mass (Est or Measured) - Basic Mass

Method/Expl: Enter the basic mass in kilograms (kg):

Value is based on an assessment of the most recent baseline design, excluding mass growth allowance. Total dry weight of the product or box in kilograms (exclude propellants, pressurants, refrigerants, etc.). The weight excludes weight growth (contingency). Where the line-item described by the weight is being used to represent N identical items (assemblies or boxes), the weight is the weight of one assembly or box. Where the line-item represents a collection of different items, such as a collection of propulsion subsystem valves, filters and sensors, the unit weight is the sum of the weights of all of the items represented.

Applies to: SV, Bus, Payloads, Subsystems, Units, Antennas and Amplifiers Payloads

CDRL ID: MassProp, SSTDR-Fmt1, SSTDR-Fmt4

Data Type ID: **Weight_Ctr_Limit** | kg | Numeric | Mass

Description: Contractor SV Mass Limit

Method/Expl: Enter the contractor Space Vehicle (SV) mass limit in kilograms (kg). Value is the predicted mass plus a margin to allow for uncertainties during the design cycle.

Applies to: SV (mission equipment/payload) only

CDRL ID: MassProp, SSTDR-Fmt2

Data Type ID: **Weight_Growth** | kg | Numeric | Mass

Description: Mass Growth Allowance

Method/Expl: Enter the mass growth allowance in kilograms (kg). Value is the likely change to the basic mass based on an assessment of the design maturity, allowing for design changes that may occur, excluding changes due to contract/requirements changes.

Applies to: SV, Bus, Payloads, Subsystems, Units, Antennas and Amplifiers Payloads

CDRL ID: MassProp, SSTDR-Fmt1, SSTDR-Fmt4

Data Type ID: **Wheel_Max_Momentum** | Decimal | Numeric | Design

Description: Reaction Wheel Maximum Momentum

Method/Expl: Enter the reaction wheel maximum momentum.

Applies to: Bus, Attitude Control, Spin Control Devices

CDRL ID: SSTDR-Fmt2

Data Type ID: **Wheel_Stability** | Decimal | Numeric | Design

Description: Reaction Wheel Stability

Method/Expl: Enter the reaction wheel stability.

Applies to: Bus, Attitude Control, Spin Control Devices

CDRL ID: SSTDR-Fmt2

Data Type ID: **Wheel_Torque** | Nm | Numeric | Design

Description: Reaction Wheel Torque

Method/Expl: Enter the reaction wheel output torque in Newton metres.

Applies to: Bus, Attitude Control, Spin Control Devices

CDRL ID: SSTDR-Fmt2

Appendix B – FORMAT 1

1. Format_Title	Space Hardware Data Summary						
2. Contractor_Name		5. Program_Phase		8. As_of_Date		10. POC_Tech	
3. Contract_Number		6. Report_Date		9. Security_Class		11. POC_Phone	
4. Program_Name		7. Version					
12. SV_Quantity							

WBS_ Code	Unit_ID _Code	881_ID	Subsystem	WBS_Name	Weight_ Basic	QTY_ Per_ SV	Weight_ Growth	Predict ed_ Mass	Units_ Engr_ Models	Units_ TQ	Units_ Engr_ GFE	Units_ Flight_ GFE	Units_ PQ	Units_ Flight	Units_ Spare	Units_ Refurb	Unique_ Design	New_ Design	Hdwr_ Manufacturer	TDS_COMMENTS
				TOTAL Space Vehicle					kg											

Appendix B – FORMAT 1

1. Format_Title	Space Hardware Data Summary						
2. Contractor_Name	Applied Satellite Inc.	5. Program_Phase	EMD	8. As_of_Date	27-Mar-2012	10. POC_Tech	M.R. Engines
3. Contract_Number	RBLF-7&8 CN 100020174567	6. Report_Date	26-Apr-2012	9. Security_Class	Unclassified	11. POC_Phone	310-555-1234
4. Program_Name	Basic Low Frequency Program 7,8	7. Version	CDR				
12. SV_Quantity	2						

WBS_ Code	Unit_ID _Code	881_ID	Subsystem	WBS_Name	Weight_ Basic	QTY_ Per_ SV	Weight_ Growth	Predicted_ Mass	Units_ Engr_ Models	Units_ TQ	Units_ Engr_ GFE	Units_ Flight_ GFE	Units_ PQ	Units_ Flight	Units_ Spare	Units_ Refurb	Unique_ Design	New_ Design	Hdwr_ Manufacturer	TDS_COMMENTS
1.2.2.4.3			EPS	Solar Array	25.0	4	3.0	103.0	1.0			1	1	6			80	30	Prime	Electrical design heritage from Program X. Difficult mech design; simple electrical design. Lightweight, high strength design requires expensive materials.
1.2.2.4.4			EPS	Battery	7.0	2	5.0	19.0	0.7	1.0	1.0	1		3		0.3	100	0	Company XYZ	Modified design with a partial engineering unit. Subcontracted to Company XYZ. Heritage from Program A, Vehicle 4
1.2.2.5.5			ACS	Reaction Control Wheel	12.0	4	2.0	50.0	2.0				1	7			95	75	Vendor B	Heritage from Program B, Vehicle 2. Externally redundant. New board has embedded microprocessor.
				TOTAL Space Vehicle				172.0	kg											

Appendix B – FORMAT 3

1. FORMAT_TITLE		Space Unit Cost Report (dollars in thousands)								
2. CONTRACTOR_NAME		3. CONTRACT_NUMBER				4. PROGRAM_NAME			5. PROGRAM_PHASE	
6. REPORT_DATE		7. AS_OF_DATE		8. SECURITY_CLASS		9. POC_TECH				
10. POC_PHONE		COM_Included		ACWP_COM	ACWP_G&A	ACWP_Total	EAC_COM	EAC_G&A	EAC_Total	
11. VERSION		G&A_Included		$ -	$ -	$ -	$ -	$ -	$ -	
WBS_CODE A	UNIT_CSCI B	SUBSYSTEM C		ACWP_NRE D	ACWP_REC E	ACWP_Total F	EAC_NRE G	EAC_REC H	EAC_Total I	Comment J

UNIT_COST_REMARKS

Appendix B – FORMAT 3

1. FORMAT_TITLE	Space Unit Cost Report (dollars in thousands)								
2. CONTRACTOR_NAME		3. CONTRACT_NUMBER				4. PROGRAM_NAME			5. PROGRAM_PHASE
Applied Satellites Inc.		RBLF-7&8 CN 100020174567				Basic Low Frequency Program 7,8			EMD
6. REPORT_DATE	3/29/2010	7. AS_OF_DATE	2/26/2010	8. SECURITY_CLASS	UNCLASSIFIED	9. POC_TECH	Mr. John Doe		
10. POC_PHONE	(123) 456-7890	COM_Included	N	ACWP_COM	ACWP_G&A	ACWP_Total	EAC_COM	EAC_G&A	EAC_Total
11. VERSION	Post CDR - Revision 4 - update 1	G&A_Included	Y	$ -	$ 122.53	$ 4,615.87	$ -	$ 15.21	$ 70,724.16

WBS_CODE A	UNIT_CSCI B	SUBSYSTEM C	ACWP_NRE D	ACWP_REC E	ACWP_Total F	EAC_NRE G	EAC_REC H	EAC_Total I	Comment J
1.2.4.1	Payload SEIT PM & Support Equipment	N/A							Payload-Level SEIT/PM & Support Equipment
1.2.4.2	Phased Array Subsystem	N/A							
1.2.4.2.1	SEIT PM & Support Equipment	PA (SEPM)	1,235.00		1,235.00	1,605.50	1,477.20	3,082.70	Common Phased Array (including Subsystem Integration and Test)
1.2.4.2.2	Phased Array - Uplink Module	PA (Payload Antenna)		149.67	149.67		2,993.40	2,993.40	Common Receive & Transmit Array
1.2.4.2.3	Phased Array - Downlink Module	PA (Payload Antenna)		60.15	60.15		1,203.00	1,203.00	Common Receive & Transmit Array
1.2.4.2.4	PAC	PA (PC&CI)					547.30	547.30	Phased Array Controller (PAC)
1.2.4.2.5	Power Converter	PA (EP)		31.82	31.82		636.30	636.30	High Efficiency Converter (HEC)
1.2.4.2.6	Cable&Harness	PA (EP)					3,535.50	3,535.50	Unit Cable/Harness
1.2.4.3	Nuller Subsystem								
1.2.4.3.2	BFN	Nuller Antenna					930.50	930.50	Active Beam Controller (ABC)
1.2.4.4	Crosslink Subsystem	N/A							
1.2.4.1	MBA	XLINK-MBA (Antenna)					1,855.60	1,855.60	Crosslink Antenna Assembly
1.2.4.2	MBA	XLINK-MBA (Antenna)					6,427.30	6,427.30	Crosslink Electronics Assembly
1.2.4.3	LNA	XLINK-MBA (Signal Electronics)		98.98	98.98		1,979.60	1,979.60	Crosslink LNA Assembly
1.2.4.4	SSPA	XLINK-MBA (Signal Electronics)					591.90	591.90	Crosslink High Power Amp
1.2.4.5	Payload Common								
1.2.4.5.1	SEIT PM & Support Equipment	GDA (Payload Antenna)					1,293.50	1,293.50	Gimbaled Dish Antenna (GDA)
1.2.4.5.2	GDA Antenna	GDA (Payload Antenna)					1,293.50	1,293.50	GDA Antenna Assembly
1.2.4.5.3	ECA Antenna	ECA (Payload Antenna)					34.80	34.80	Earth Coverage Horns (ECH)
1.2.4.5.4	Time & Frequency Unit (TSU)	Common (Signal Electronics)		172.75	172.75		3,454.90	3,454.90	Radio Frequency (RF) Electronics
1.2.4.5.5	HighSpeed Downconverter Assembly (SDA)	Common (Signal Electronics)					4,436.10	4,436.10	Radio Frequency (RF) Electronics
1.2.4.5.6	Switch Matrix	Common (Signal Electronics)					2,062.90	2,062.90	Radio Frequency (RF) Electronics
1.2.4.5.7	Super High Frequency Exciter (SHFE)	Common (Signal Electronics)					4,565.40	4,565.40	Radio Frequency (RF) Electronics
1.2.4.5.8	Traveling Wave Tube Amplifier (TWTA)	Common (Signal Electronics)					6,269.20	6,269.20	Radio Frequency (RF) Electronics
1.2.4.5.9	Low Noise Amplifier (LNA)	Common (Signal Electronics)		123.93	123.93		2,478.60	2,478.60	Radio Frequency (RF) Electronics
1.2.4.5.10	Cable & Harness	Common (Elec Power)					275.00	275.00	Radio Frequency (RF) Electronics
1.2.4.5.11	Demod	Common (Signal Electronics)	2,700.06		2,700.06	2,700.06	13,486.00	16,186.06	Demodulator
1.2.4.5.12	OBC-Router	Common (PC&CI)					2,850.50	2,850.50	On-Board Router
1.2.4.5.13	SECCON	Common (PC&CI)		43.52	43.52		870.30	870.30	Resource Controller
1.2.4.5.14	Power Converters	Common (Elec Power)					870.30	870.30	Power Converter

UNIT_COST_REMARKS

Previous submittal did not include CWBS 1.2.4.3 Low Noise Amplifier which was not part of original design and added subsequently. Also G&A rate was substantially reduced per DCAA final negotiation. Thus G&A is less than previous submission.

Appendix B – Format 4

Security Classification: Unclassified

HEADING INFORMATION			
Format_Title	Space Tech Baseline Report	Version	
Contractor_Name		As_of_Date	
Contract_Number		Security_Class	
Program_Name		POC_Tech	
Program_Phase		POC_Phone	
Report_Date		SV_Quantity	
SYSTEM (Spacecraft) LEVEL DATA ELEMENTS			
Design_Life		Orbit_Regime	
Flight_Heritage		Sat_in_Constel_No	
Launch_Availability		Threat_Hardening	
Mission_Class		Time_Development	
Orbit_Altitude		Weight_Basic	
Orbit_Inclination		Weight_Growth	
BUS LEVEL DATA ELEMENTS			
Bus_Model		Power_BOL	
ADCS_Type		Power_EOL	
Articulated_Str_No		Processing_Rate	
Battery_Capacity		Propulsion_Type	
Battery_Type		Solar_Array_Area	
Bus_Voltage		Solar_Array_Config	
Deployables		Solar_Cell_Type	
Frequency		Structures_Material	
Impulse_Total		Thermal_Type	
Peak_Output_Power		Thruster_Tank_No	
Pointing_Accuracy		TT&C_Standard	
Pointing_Knowledge			
GROUND DATA ELEMENTS (Physical)			
GOPC_Qty		Ground_Sites_Reloc	
GOPC_Reloc		Ground_Storage_Cap	
Ground_Sites_No			
FLIGHT & GROUND SOFTWARE DATA ELEMENTS			
Effective_LOC			

SSTDR Format 4 - Part1 **Security Classification: Unclassified**

Appendix B – Format 4

Security Classification: Unclassified

PAYLOAD PHYSICAL DATA ELEMENTS			
Field_of_View		Payload_Heritage	
Gimbal_Type		Payload_Type	
Instruments_No		Power_Avg	
OnBoard_Storage_Cap		Power_Peak	
Payload_Gimbaled		SNR_Ratio	
PAYLOAD ELECTRONICS DATA ELEMENTS			
ASIC_Designs		Data_Rate_Avg_Dlink	
Antenna_Qty		Data_Rate_Avg_Ulink	
ASIC_GateCount		Data_Rate_Avg_Xlink	
Band_Amp_Qty		Data_Rate_Max_Dlink	
Bandwidth_Dlink		Data_Rate_Max_Ulink	
Bandwidth_Ulink		Data_Rate_Max_Xlink	
Bandwidth_Xlink		Data_Storage_Cap	
Channels_Qty		FPGA_Designs	
Data_Process_Level		FPGA_GateCount	
OPTICAL PAYLOAD DATA ELEMENTS			
Aperture_Size		Mirror_Qty	
Curved_Elements		Optical_Axis	
F_Number		Scan_Mirror	
IR PAYLOAD DATA ELEMENTS			
Chip_Redesign		FPA_Thermal_Type	
FPA_Array_Size		Pixel_Qty	
FPA_Operating_Band		Pixel_Size	
FPA_Temp		ROIC_Redesign	
ANTENNAS AND AMPLIFIERS PAYLOAD			
Amp_Type	GoTo Amplifer Table	Band	GoTo Band Table
Antenna_Type	GoTo Antenna Table		

SSTDR Format 4 - Part2 **Security Classification: Unclassified**

Appendix B – Format 4

Security Classification: Unclassified

Amplifier Table	Amp1	Amp2	Amp3	Amp4	Amp5	Amp6	Amp7	Amp8	Amp9
Amp_Type									
Amp_Efficiency									
Flight_Heritage									
Power_Output									
Weight_Basic									
Weight_Growth									
Antenna Table	Antenna1	Antenna2	Antenna3	Antenna4	Antenna5	Antenna6	Antenna7	Antenna8	Antenna9
Antenna_Type									
Max_Frequency									
EIRP									
Flight_Heritage									
Gain									
Reflector_Size									
Weight_Basic									
Weight_Growth									
Band Table	Band1	Band2	Band3	Band4	Band5	Band6	Band7	Band8	Band9
Band									
Bandwidth_Dlink									
Bandwitdh_Ulink									
Bandwidth_Xlink									
Data_Rate_Avg_Dlink									
Data_Rate_Avg_Ulink									
Data_Rate_Avg_Xlink									
Data_Rate_Max_Dlink									
Data_Rate_Max_Ulink									
Data_Rate_Max_Xlink									

Appendix B – Format 4

Security Classification: Unclassified

HEADING INFORMATION			
Format_Title	Space Tech Baseline Report	Version	CDR
Contractor_Name	Applied Satellite Inc.	As_of_Date	27-Mar-2012
Contract_Number	BLF-7&8 CN 100020174567	Security_Class	Unclassified
Program_Name	Basic Low Frequency Program	POC_Tech	M.R. Engines
Program_Phase	EMD	POC_Phone	310-555-1234
Report_Date	26-Apr-2012	SV_Quantity	2
SYSTEM (Spacecraft) LEVEL DATA ELEMENTS			
Design_Life	120	Orbit_Regime	LEO
Flight_Heritage	AEHF	Sat_in_Constel_No	4
Launch_Available	30-Oct-2015	Threat_Hardening	6-RF Jamming
Mission_Class	A - Very High Priority	Time_Development	42
Orbit_Altitude	250	Weight_Basic	240
Orbit_Inclination	30	Weight_Growth	50
BUS LEVEL DATA ELEMENTS			
Bus_Model	A2100AX	Power_BOL	12,600
ADCS_Type	3-Axis	Power_EOL	10,500
Articulated_Str_No	1	Processing_Rate	1.7
Battery_Capacity	240	Propulsion_Type	Bipropellant
Battery_Type	NiH2	Solar_Array_Area	50
Bus_Voltage	50	Solar_Array_Config	Articulate
Deployables	2	Solar_Cell_Type	UTJ
Frequency	4	Structures_Material	Aluminum/Composite
Impulse_Total	667.5	Thermal_Type	Heater
Peak_Output_Power	113.2	Thruster_Tank_No	8
Pointing_Accuracy	2	TT&C_Standard	1553
Pointing_Knowledge	1		
GROUND DATA ELEMENTS (Physical)			
GOPC_Qty	2	Ground_Sites_Reloc	Yes
GOPC_Reloc	Yes	Ground_Storage_Cap	5.40
Ground_Sites_No	2		
FLIGHT & GROUND SOFTWARE DATA ELEMENTS			
Effective_LOC	1,500		

SSTDR Format 4 - Part1 **Security Classification: Unclassified**

Appendix B – Format 4

Security Classification: Unclassified

PAYLOAD PHYSICAL DATA ELEMENTS			
Field_of_View	72	Payload_Heritage	AEHF
Gimbal_Type	2	Payload_Type	Comm-PL
Instruments_No	2	Power_Avg	6,215
OnBoard_Storage_Cap	500	Power_Peak	6,320
Payload_Gimbaled	Yes	SNR_Ratio	1.1
PAYLOAD ELECTRONICS DATA ELEMENTS			
ASIC_Designs	4	Data_Rate_Avg_Dlink	636
Antenna_Qty	4	Data_Rate_Avg_Ulink	636
ASIC_GateCount	3,000,000	Data_Rate_Avg_Xlink	636
Band_Amp_Qty	50	Data_Rate_Max_Dlink	102,140
Bandwidth_Dlink	25	Data_Rate_Max_Ulink	102,140
Bandwidth_Ulink	25	Data_Rate_Max_Xlink	102,140
Bandwidth_Xlink	80	Data_Storage_Cap	500
Channels_Qty	90	FPGA_Designs	5
Data_Process_Level	Level 1 Raw Data	FPGA_GateCount	500,000
OPTICAL PAYLOAD DATA ELEMENTS			
Aperture_Size	0.3	Mirror_Qty	3
Curved_Elements	2	Optical_Axis	On-Axis
F_Number	2	Scan_Mirror	Yes
IR PAYLOAD DATA ELEMENTS			
Chip_Redesign	50%	FPA_Thermal_Type	Cryocooler
FPA_Array_Size	4	Pixel_Qty	4,500,000
FPA_Operating_Band	10	Pixel_Size	20
FPA_Temp	45	ROIC_Redesign	10%
ANTENNAS AND AMPLIFIERS PAYLOAD			
Amp_Type	GoTo Amplifer Table	Band	GoTo Band Table
Antenna_Type	GoTo Antenna Table		

SSTDR Format 4 - Part2

Security Classification: Unclassified

Security Classification: Unclassified

Amplifier Table	Amp1	Amp2	Amp3	Amp4	Amp5	Amp6	Amp7	Amp8	Amp9
Amp_Type	TWTA	TWTA							
Amp_Efficiency	35%	20%							
Flight_Heritage	TESAT	TESAT							
Power_Output	75	50							
Weight_Basic	2.4	1.2							
Weight_Growth	0.3	0.1							
Antenna Table	Antenna1	Antenna2	Antenna3	Antenna4	Antenna5	Antenna6	Antenna7	Antenna8	Antenna9
Antenna_Type	OMNI	Horn							
Max_Frequency	16,000	8,000							
EIRP	32	15							
Flight_Heritage	AEHF	AEHF							
Gain	High	High							
Reflector_Size	7.5	3							
Weight_Basic	175	105							
Weight_Growth	10	5							
Band Table	Band1	Band2	Band3	Band4	Band5	Band6	Band7	Band8	Band9
Band	EHF-Band	Ka-Band							
Bandwidth_Dlink	25	5							
Bandwitdh_Ulink	25	5							
Bandwidth_Xlink	80	60							
Data_Rate_Avg_Dlink	636	477							
Data_Rate_Avg_Ulink	636	477							
Data_Rate_Avg_Xlink	636	477							
Data_Rate_Max_Dlink	102,140	51,070							
Data_Rate_Max_Ulink	102,140	51,070							
Data_Rate_Max_Xlink	102,140	51,070							