CCR 505-01-35-081A (errata only) to the EDOS - EGS Elements ICD
CERES Data to LATIS
June 11, 1998

0	Section	Change From...	Change To...	Rationale
1	EDOS-EGS ICD			
2	Page 8-9, Table 8.1.2.3-1, last items in Table	[new] Reserved for future use, 19-255, N/A [old table]	Langley TRMM Information System (LATIS), 19, LAT Reserved for future use, 20-255, N/A [new table is attached below]	Add LATIS as a new destination for EDSs and PDSs. Make EOC, DAAC and SMC tables for Source/Destination Identification identical for consistency throughout the ICD.
3	Page 5-8, Table 5.1.2.1-4	[old table]	[new table is attached below]	Add LATIS as a new destination for EDSs and PDSs. Make EOC, DAAC and SMC tables for Source/Destination Identification identical for consistency throughout the ICD.
4	Page 10-7 (CCR 505-01-35-082), Table 10.1.2.4-1	[old table]	[new table is attached below]	Add LATIS as a new destination for EDSs and PDSs. Make EOC, DAAC and SMC tables for Source/Destination Identification identical for consistency throughout the ICD.
5	EDOS-EGS IRD			
6	Page 4-11	[new]	4.1.9 EDOS - LATIS Functional Requirements	LATIS is a new EGS Element, just like LaRC DAAC.

0	Section	Change From...	Change To...	Rationale
7		[new]	4.1.9.1 EDOS shall interface with the Langley TRMM Information System (LATIS) to transfer Operations Management Data, PDSs, EDSs, Mission Test Data, and Operations Management Test Data.	LATIS is a new EGS Element, just like LaRC DAAC.
8		[new]	4.1.9.2 EDOS shall interface with LATIS to receive Operations Management Data, and Operations Management Test Data.	LATIS is a new EGS Element, just like LaRC DAAC.
9		[new]	4.1.9.3 EDOS shall provide the capability to transfer PDS Delivery Records as specified in Applicable Document 1 to LATIS following the delivery of each PDS.	LATIS is a new EGS Element, just like LaRC DAAC.
10		[new]	4.1.9.4 EDOS shall provide the capability to transfer EDS Delivery Records as specified in Applicable Document 1 to LATIS following the delivery of each EDS.	LATIS is a new EGS Element, just like LaRC DAAC.
11		[new]	4.1.9.5 EDOS shall conform to Internet protocol standards as specified in Applicable Documents 2, 3, 4, and 5 for communications services to provide guaranteed data delivery for the following data types: a. PDS Delivery Records b. EDS Delivery Records c. PDSs d. EDSs	LATIS is a new EGS Element, just like LaRC DAAC.
12		[new]	4.1.9.6 EDOS shall provide the capability to receive Operations Management data from LATIS as specified in Applicable Document 1, including: a. PDS/EDS Acceptance Notifications	LATIS is a new EGS Element, just like LaRC DAAC.

0	Section	Change From...	Change To...	Rationale
13		[new]	4.1.9.7 EDOS shall conform to Internet protocol standards as specified in Applicable Documents 2, 3, 4, and 5 for communications service to provide receipt for the following: a. PDS / EDS Acceptance Notifications	LATIS is a new EGS Element, just like LaRC DAAC.
14	[Reserved]			
15	[Reserved]			
16	Page 4-14	[new]	4.2.9 EDOS - LATIS Performance Requirements	LATIS is a new EGS Element, just like LaRC DAAC.
17		[new]	4.2.9.1 The EDOS-LATIS interface shall provide the capability to support the transfer of Operations Management data to LATIS at a rate of up to 49 kbps.	LATIS is a new EGS Element, just like LaRC DAAC.
18		[new]	4.2.9.2 The EDOS-LATIS interface shall provide the capability to support the transfer of expedited and production data sets at a rate of up to 28 Mbps.	LATIS is a new EGS Element, just like LaRC DAAC.
19	Page 4-16	[new]	4.3.9 LATIS - EDOS Performance Requirements	LATIS is a new EGS Element, just like LaRC DAAC.
20		[new]	4.3.9.1 LATIS shall provide the capability to initiate transfer of the PDS/EDS Acceptance Notification to EDOS within a time period of 15 minutes plus an additional 15 minutes for each gigabyte of PDS/EDS data, after successful receipt of the PDS/EDS Delivery Record from EDOS.	LATIS is a new EGS Element, just like LaRC DAAC.

Three new Tables (5.1.2.1-4, 8.1.2.3-1, and 10.1.2.4-1) for EDOS Source/Destination Identification

Tables: 5.1.2.1-4, 8.1.2.3-1, and 10.1.2.4-1.

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Langley TRMM Information System (LATIS)	19	LAT
Reserved for future use	20- 255	N/A

ACRONYM

LIST

Acronym List

AGS	Alaska Ground Station
AM-1	EOS Mission - Morning Crossing (Descending)
AOS	Advanced Orbiting Systems
APID	Applications Process Identifier (CCSDS)
ASCII	American Standard Code for Information Interchange
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
bps	bits per second
BPSK	Binary Phase Shift Key
CADU	Channel Access Data Unit
CCD	Charge Coupled Device
CCR	Configuration Change Request
CCSDS	Consultative Committee for Space Data Systems
CDB	Command Data Block
CDRL	Contract Data Requirements List
CEB	Command Echo Block
CTB	Command Test Block
CERES	Clouds and Earth's Radiant Energy System
CLCW	Command Link Control Word
CLTU	Command Link Transmission Unit
CODA	Customer Operations Data Accounting
CRC	Cyclic Redundancy Check
CSMS	Communications and System Management Segment
CVCDU	Coded Virtual Channel Data Unit
CVCDU-ID	CVCDU Identifier
DAAC	Distributed Active Archive Center
DAF	Data Archive Facility
DCN	Document Change Notice
DFRD	Data Format Requirements Document
DG	Data Group
DIF	Data Interface Facility
EBnet	EOSDIS Backbone Network
ECS	EOSDIS Core System
EDC	EROS Data Center
EDOS	Earth Observing System (EOS) Data and Operations System
EDS	Expedited Data Set
EDU	EDOS Data Unit
EGS	EOSDIS Ground System
EIRP	Effective Isotropic Radiated Power
EOC	EOS Operations Center
EOS	Earth Observing System

EOSDIS	Earth Observing System (EOS) Data and Information System
EOT	EDOS Operations Timeline
EPGS	EOS Polar Ground Station
EROS	Earth Resources Observation System
ESDIS	Earth Science Data and Information System
ESDT	Earth Science Data Type
ESH	EDOS Service Header
FLPF	Forward Link Processing Function
FLSS	Forward Link Service Status
FOS	Flight Operations Segment
F&PS	Functional and Performance Specification
FTP	File Transfer Protocol
GByte(s)	Gigabyte(s)
GMT	Greenwich Mean Time
GSFC	Goddard Space Flight Center
GMT	Greenwich Mean Time
H/K	Housekeeping
H/S	Health and Safety
ICD	Interface Control Document
ID	Identifier
IP	Internet Protocol
IRD	Interface Requirements Document
IRIG-B	Inter-range Instrumentation Group-Time Code Format B
IRIG-G	Inter-range Instrumentation Group-Time Code Format G
IT&V	Integration, Test, and Verification
Kbps	Kilobits per second
Deleted	
KSA	K-band Single Access
LaRC	Langley Research Center
LATIS	Langley TRMM Information System
LCP	Left Circular Polarization
LSB	Least Significant Bit
LSD	Least Significant Digit
LSM	Local System Management
LZPF	Level Zero Processing Facility
MA	Multiple Access
Mbps	Megabits Per Second
MISR	Multi-angle Imaging Spectro Radiometer
MO&DSD	Mission Operations and Data Systems Directorate
MODIS	Moderate Resolution Imaging Spectrometer

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MOPITT	Measurements of Pollution in the Troposphere
MSB	Most Significant Bit
MTTRes	Mean Time to Restore
NASA	National Aeronautics and Space Administration
Nascom	NASA Communications Network
NCC	Network Control Center
NOAA	National Oceanic and Atmospheric Administration
NRZ	Nonreturn to Zero
NRZ-L	Nonreturn to Zero-Level
NRZ-M	Nonreturn to Zero-Mark
OA	Operations Agreement
OM	Operations Management
PB-5	(time format)
PCMB	Project Configuration Management Board
PDS	Production Data Set
PMUDL	Physical Media Unit Delivery Letter
PMUDR	Physical Media Unit Delivery Record
PN	Pseudorandom noise
QPSK	Quadrature Phase Shift Key
RCP	Right Circular Polarization
RFC	Request for Comment
RLGC	Return Link Ground Communications
RLPC	Return Link Physical Channel
RLPF	Return Link Processing Function
RLSS	Return Link Service Session
SCID	Spacecraft Identifier
SCS	Spacecraft Contact Session
SDPS	Science and Data Processing Segment
SDN	Schedule Deletion Notification
SDU	Service Data Unit
SEF	System Engineering Facility
SGS	Svalbard Ground Station (Norway)
SMC	System Monitoring and Coordination Center
SN	Space Network
SSA	S-band Single Access
SSC	Source Sequence Counter
STGT	Second TDRSS Ground Terminal
SUPIDEN	Support Identifier
SWIR	Short-wavelength Infrared Radiometer
TBD	To Be Determined
TBR	To Be Resolved
TBS	To Be Supplied

TCP	Transmission Control Protocol
TCP/IP	Transmission Control Protocol/ Internet Protocol
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TGT	TDRS Ground Terminals
TIR	Thermal Infrared Radiometer
TRMM	Tropical Rainfall Measuring Mission
UDP	User Datagram Protocol
UPS	User Planning System
USM	User Schedule Message
UTC	Universal Time, Coordinated
VC	Virtual Channel
VCDU	Virtual Channel Data Unit
VCDU-ID	VCDU Identifier
VCID	Virtual Channel Identifier
VNIR	Visible and Near Infrared Radiometer
WOTS	Wallops Orbital Tracking Station
WSC	White Sands Complex
WSGT	White Sands Ground Terminal
WSGTU	White Sands Ground Terminal Upgrade

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GLOSSARY

Glossary

Applications Process Identifier (APID): Concatenation of the Spacecraft Identifier (SCID) and packet Applications Process Identifier.

Byte: An eight bit word. Byte and Octet are used interchangeably.

CCSDS Packet: A variable length, delimited data unit whose structure and header information is specified by the CCSDS, as specified in Applicable Document 1 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

CCSDS Services: Services which are described in the CCSDS Recommendations for Space Data Systems Standards, as specified in Applicable Documents 1, 2, and 3 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

Channel Access Data Unit (CADU): A VCDU or CVCDU that has been prefixed and delimited by a synchronization marker, as specified in Applicable Document 1 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

Command Link Transmission Unit (CLTU): The SDU used to transmit forward link data using the CCSDS Telecommand recommendation, as specified in Applicable Document 3 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

Command Link Control Word (CLCW) The CLCW is the primary mechanism within the Telecommand (TC) System for reporting command transfer status and verification information to the sending end. The CLCW contains information regarding the receipt of TC Transfer Frames command uplink status (errors, omissions, and successes).

Customer Operations Data Accounting (CODA) Report: A report that is generated by EDOS during a spacecraft contact session that summarizes the status of real-time services provided by the SN, EDOS and EBnet as they relate to a specific EGS element.

EDOS Data Unit (EDU): A variable length, delimited data unit whose structure and header information is specified by EDOS. The EDU consists of an SDU concatenated with an ESH.

EDOS Ground Communication Service Status Block: A portion of the CODA that indicates the status of EDOS ground communication services during real-time Mission Data processing.

EDOS Physical Channel Status Block: A portion of the CODA that indicates the status of EDOS physical channel processing during Mission Data real-time processing.

EDOS Service Header (ESH): A header generated by the DIF containing accounting information that is appended to each return link SDU.

EDS Construction Record: Data generated by EDOS describing the contents and quality of a EDS.

EDS Delivery Record: A record generated by EDOS that describes the delivery of an EDS to a DAAC.

ECS element: An entity receiving EDOS services. Examples of ECS elements include, but are not limited to Distributed Active Archive Centers (DAACs), EOS Operations Center (EOC), National Oceanic and Atmospheric Administration (NOAA), and International Partners (IPs).

ECS element ID: A unique identifier assigned by EDOS for each ECS element.

ESH Version ID: An identifier of the ESH version used in an EDU.

Expedited data processing: Processing performed on return link CCSDS packet data from a single SCS which includes the following functions:

a. Sort packets by SCID and APID or by SCID, APID and secondary header quick-look flag

b. Forward time order packets

c. Identify data gaps

d. Produce summary quality and accounting information

e. Create an EDS from the resulting packets

Expedited data processing may be performed on up to 2% of each ECS element's (ASTER instrument) return link data received over a 24 hour period. Note: As part of Expedited data processing, these data do not receive production data processing services such as data merging, and redundant packet deletion. All of these packets are retained for production data processing.

Expedited Data Set (EDS): An EDS consists of CCSDS packets from a single SCID/APID from a single SCS, and an EDS Construction Record. An EDS is generated from Expedited data processing.

Forward link data: Mission data originating on the ground for transmission to a spacecraft.

Frame Synchronization: A digital data handling procedure that recognizes a defined data pattern to determine the boundaries of a frame of data.

Granule: The smallest aggregation of data that is independently managed (i.e., described, inventoried, retrievable) by ECS.

Identification: The process that enables recognition of an entity by a system, generally by the use of unique machine-readable user names.

Initialization: Configuring the functions of a facility to a pre-determined state prior to supporting operations.

Mean Time to Restore (MTTRes): The mean time required to restore functionality, performance, and the operational state existing prior to any failure.

MEDIAID: ECS supplied Volume ID (or bar code).

Mission Data: Spacecraft, instrument, and other data for a specific mission. Mission data includes spacecraft forward and return link data in raw and processed form.

Octet: An eight bit word. Octet and Byte are used interchangeably.

Operational Availability (Ao): For each EDOS processing function there shall be an operational availability associated with the data processing functions, from the point of receiving the data to the point of delivering the data unit, measured over a 10,000 hour interval. The Operational Availability for each EDOS processing function is determined from the following formula:

$$A_o = \frac{\text{Time the Processing Function is available}}{\left(\begin{array}{l}\text{Time the Processing Function is available } + \\ \text{Time the Processing Function is not available}\end{array}\right)}$$

The time that the processing function is available is measured over a contiguous 10,000 hour interval except that any loss of availability due to the loss of facility services, such as power or air conditioning, is not counted. The processing function is counted as being unavailable for the period of time when the processing function cannot be provided at the specified functionality and performance, and all the times that the processing function is not available due to corrective maintenance downtime, preventive maintenance downtime, administrative downtime and logistics supply downtime.

Operations management data: A generic term to describe any data that is used to manage EDOS operations and its interfaces.

Packet fragment: A portion of a CCSDS Packet. Packet fragments result from the loss of a CADU containing packets in the CCSDS Path Service spanning more than one VCDU.

PDS Construction Record: Data generated by EDOS describing the contents and quality of a PDS.

PDS Delivery Record: Data generated by EDOS describing the electronic delivery of a PDS to a DAAC.

PDS-ID: A unique identifier for each PDS generated by EDOS.

Physical Port ID: A unique identifier for each EDOS facility external interface physical port.

Playback Data: Data that has been recorded onboard a spacecraft for later transmission.

Production data processing: Processing performed on return link CCSDS packet data which includes the following functions:

a. Sort packets by SCID and APID

b. Forward time order packets

c. Identify data gaps

d. Produce summary quality and accounting information

e. Create a PDS containing merged data from multiple SCSs

f. Identify and delete redundant packets between multiple SCSs

Production Data Set (PDS): A PDS consists of CCSDS packets from one (normally) SCID/APID and a PDS Construction Record. A PDS is generated from production data processing.

Rate buffered data: Mission return link data that has been received by EDOS for delivery at a lower rate than it was originally received.

Rate buffering: The data communications process in which data from an EOS spacecraft that is transmitted to the ground during a SCS, is completely received by EDOS at one data rate and transmitted to a destination at a lower data rate negotiated with the destination.

Real-time processing: Processing performed on Mission Data with minimized delay through EDOS.

Return link data: Mission data originating on a spacecraft for transmission to the ground.

Service Data Unit (SDU): Any of the EDOS supported CCSDS standard data units associated with CCSDS services, including the following: CVCDU/VCDU, CCSDS Version 1 packet, Command Link Control Word, and Command Link Transmission Unit.

SDSRV: Science Data Server: A software component of the ECS Data Server Subsystem (DSS) responsible for managing the access to and storage of a collection of earth science and related data (i.e., ancillary data), except documents.

SDU Identifier (SDU-ID): The CCSDS identifier(s) associated with an SDU for each CCSDS service. The types of SDUs and their corresponding identifiers are as follows:

SDU Type	SDU Identifier
CVCDU/VCDU	VCDU-ID
CCSDS Version 1 Packet	VCDU-ID and APID
Command Link Transmission Unit	TCTF-ID

Spacecraft Contact Session: A Spacecraft Contact Session is the duration of a spacecraft contact between acquisition of signal and loss of signal, assumed to nominally be 10 minutes in duration for EDOS considerations.

Status Data: Data which define the characteristics of current system operations. Status data includes configuration, performance, fault, data accounting, and security information.

TDRSS Ground Terminals (TGTs): A generic expression which refers to the WSGTU and STGT at White Sands Complex, New Mexico.

TDRSS Service: A TDRSS service is defined as telecommunications between TDRSS and an EOS spacecraft at a specific frequency and access type as defined in the SN User's Guide.

Test Data: Data used for testing and/or diagnostics. Test Data include simulated or actual input data, and actual and expected test results.

Test Execution Scenario: A test operations procedure that controls the sequencing of a non-interactive simulation of EDOS operations and incorporates interface simulators and test data transmission and reception.

Test Execution Scenario Identifier: A unique identifier for a given Test Execution Scenario.

SCS Summary Report: A report that summarizes the Mission Data quality and accounting results of real-time services for an entire spacecraft contact session (SCS).

Virtual Channels: A CCSDS architectural concept whereby a single physical channel may be shared by different users by creating multiple, apparently parallel "virtual" paths through the physical channel, as specified in Applicable Document 1 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

Virtual Channel Data Unit (VCDU): A fixed length CCSDS Advanced Orbiting Systems data structure which is used bidirectionally for space/space or space/ground communications. A VCDU that includes forward error correction coding is referred to as a coded VCDU (CVCDU) and is implied by references to VCDUs, as specified in Applicable Document 1 of the EDOS Functional and Performance Specification, 560-EDOS-0202.0004, November 23, 1992.

APPENDIX A

LIST OF OPEN ISSUES AS OF 8/9/96

Appendix A - List of Open Issues as of 8/9/96

At the time this EDOS-EGS Elements ICD was published, there are several known problems and concerns regarding the implementation of this interface. These issues are identified below. They fall into two main categories: 1) those issues of a technical nature that can be resolved by additional negotiations between EDOS and ECS (EOC, DAAC and SMC) engineers, and 2) those issues involving requirements which can only be resolved by the Government.

A. Technical Issues:

1. The specification and exchange processes as well as the format of the DAAC to EDOS Data Sets (DEDS) are TBR. Resolution is required for EDOS development by December 8, 1997.
   a. ECS has not described the specification and exchange processes of DEDS.
   b. Although ECS will have a mapping between L0 and L1A products, the format of the product itself as well as the format of the media carrying it remain TBD..
2. Entries in Table 8.1.3.1-5, DATA_TYPE Values, remain to be confirmed. Resolution is required for EDOS development by December 2, 1996.

B. Requirements and Documentation Issues:

Both issues require resolution by October 13, 1998.

1. EOC to supply to EDOS a copy of the EOC to EOSDIS Ground Station ICD.
2. EOSDIS Ground Station Schedule Format and Content are TBR by EDOS and the EOC.

C. Map of Open Issues to Reference Paragraphs

The following table maps the open issues enumerated above into their corresponding locations within this ICD.

Section	Description	Due Date
6.1.1, 6.1.2.1, 6.5.1, 6.6.1	The EDOS Ground Station Schedule message format, content, and timing need to be defined.	10/13/98
6.7.2, 6.7.3	The EDOS Ground Station Schedule Message and Message Header formats need to be defined in the ECS to EOSDIS Ground Station ICD.	10/13/98
8.1.3.1	Entries in the DATA_TYPE table must be confirmed.	12/2/96
7.1.1, 8.1.1, 8.1.3.5, 8.1.4.2	The content and format of the DAAC to EDOS Data Sets (DEDS), DEDS Request and DEDS Delivery Letter need to be defined.	12/8/97

EARTH OBSERVING SYSTEM (EOS)
DATA AND OPERATIONS SYSTEM (EDOS)

Interface Control Document
Between The Earth Observing System (EOS) Data and Operations System (EDOS)
and the
EOS Ground System (EGS) Elements
CDRL B301

January 23, 1998

Revision 1

Prepared for

GODDARD SPACE FLIGHT CENTER
Greenbelt, Maryland

by

TRW

under

CONTRACT NAS 5-32660

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Preface

This document is under the control of the EDOS Project Configuration Management Board (PCMB). Changes to this document shall be made by document change notice (DCN). Questions and proposed changes concerning this document shall be addressed to:

EOS Data and Operations System Project
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Goddard Space Flight Center
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Abstract

This Interface Control Document (ICD) defines the interface between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System elements, specifically the EOS Data and Information System (EOSDIS) Core System (ECS).

This ICD provides a detailed definition for the exchange of information between EDOS and the ECS.

Keywords:

AM-1	First EOS spacecraft
APID	Applications Process Identifier (CCSDS Packets identify the APID as supplied by the Spacecraft Instrument; EDOS identifies the APID as a concatenation of Spacecraft Identifier (SCID) and the APID).
CLCW	Command Link Control Word
CODA	Customer Operations Data Accounting
DAAC	Distributed Active Archive Center
EDOS	Earth Observing System (EOS) Data and Operations System
EDS	Expedited Data Set
EDU	EDOS Data Unit
EGS	EOS Ground System
EOC	EOS Operations Center
EOSDIS	Earth Observing System Data and Information System
GSFC	Goddard Space Flight Center (DAAC)
ICD	Interface Control Document
LaRC	Langley Research Center (DAAC)
Level 0	Level Zero
PDS	Production Data Set
SCS	Spacecraft Contact Session
SMC	System Monitoring and Coordination

CHANGE INFORMATION PAGE

LIST OF EFFECTIVE PAGES			
PAGE NUMBER(S)	**ISSUE**	**PAGE NUMBER(S)**	**ISSUE**
Title	Revision 1	8-29 and 8-30	Revision 1
Signature (2)	Revision 1	8-31 through 8-35A	Revision 1, DCN-4
iii and iv	Revision 1	8-36 through 8-39	Revision 1
v and vi	Revision 1, DCN-4	8-40	Revision 1, DCN-4
vii through x	Revision 1	8-41	Revision 1, DCN-1
xi through xiv	Revision 1, DCN-2	8-42	Revision 1
xv	Revision 1	8-43	Revision 1, DCN-1
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5-1 through 5-7	Revision 1	8-54 through 8-60	Revision 1
5-8	Revision 1, DCN-4	8-61 through 8-64	Revision 1, DCN-1
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6-1 through 6-9	Revision 1	9-1 through 9-4	Revision 1, DCN-2
7-1	Revision 1	10-1 through 10-5	Revision 1, DCN-2
7-2	Revision 1, DCN-4	10-5A and 10-6	Revision 1, DCN-4
7-3	Revision 1, DCN-2	10-7 through 10-11	Revision 1
7-4 through 7-6	Revision 1	10-12 through 10-25	Revision 1, DCN-2
8-1 and 8-2	Revision 1	11-1 through 11-6 (deleted)	Revision 1, DCN-2
8-3	Revision 1, DCN-1	12-1 through 12-45 (deleted)	Revision 1, DCN-2
8-4 through 8-7	Revision 1	A-1 through A-2	Revision 1
8-8 and 8-9	Revision 1, DCN-4	AL-1	Revision 1
8-10 through 8-20	Revision 1	AL-2	Revision 1, DCN-4
8-21 and 8-22	Revision 1, DCN-1	AL-3	Revision 1
8-23 through 8-27	Revision 1	AL-4	Revision 1, DCN-4
8-28	Revision 1, DCN-4	GL-1 through GL-6	Revision 1

DOCUMENT HISTORY			
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TRW 2311 B301.00	Original	August 9, 1996	
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TRW 2311 B301.00	DCN-2	July 30, 1997	97-0010
TRW 2311 B301.01	Revision 1	January 23, 1998	505-01-35-075B
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TRW 2311 B301.01	Revision 1, DCN-3	August 4, 1998	98-0012
TRW 2311 B301.01	Revision 1, DCN-4	October 15, 1998	98-0013R1

DCN Control Sheet

Use this control sheet to record the DCN changes to this document.

DCN No.	DCN Date	Section	Date	Initials
1	04/24/98	8	04/24/98	
2	06/16/98	Change Info. & DCN Control	06/16/98	
2	06/16/98	TOC	06/16/98	
2	06/16/98	2	06/16/98	
2	06/16/98	7	06/16/98	
2	06/16/98	8	06/16/98	
2	06/16/98	9	06/16/98	
2	06/16/98	10	06/16/98	
2	06/16/98	11	06/16/98	
2	06/16/98	12	06/16/98	
3	08/04/98	Change Info. & DCN Control	08/04/98	
3	08/04/98	8	08/04/98	
4	10/15/98	Change Info. & DCN Control	10/15/98	
4	10/15/98	5	10/15/98	
4	10/15/98	7	10/15/98	
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4	10/15/98	10	10/15/98	
4	10/15/98	Acronym List	10/15/98	

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Error! Not a valid link. Error! Not a valid link.**Error! Not a valid link.**Error! Not a valid link.

Error! Not a valid link.**Acronym List**

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SECTION 1

INTRODUCTION

Section 1 - Introduction

1.1 Purpose

This document presents the design details for the interface between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) elements. Although there are many EGS elements, this Interface Control Document (ICD) only focuses on the EOS Data and Information System (EOSDIS) Core System (ECS). EDOS interfaces with other EGS elements such as the Japanese Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS), and the National Oceanic and Atmospheric Administration (NOAA) which are discussed in separate ICDs.

The ECS consists of three segments: the Flight Operations Segment (FOS), the Science and Data Processing Segment (SDPS), and the Communications and Systems Management Segment (CSMS). The EOS Operations Center (EOC) is part of the FOS. The System Monitoring and Coordination Center (SMC) is part of the CSMS and is located at Goddard Space Flight Center (GSFC). The SDPS is a distributed system that includes functional elements located at the Distributed Active Archive Centers (DAACs) such as GSFC, LaRC, and EDC.

EDOS provides capabilities for return link data capture, data handling, data distribution, archival data storage, and forward link data handling.

The SDPS interfaces with EDOS to provide a set of ingest, processing, and distribution services for the entire EOSDIS. The SDPS processes Level 0 EOS spacecraft instrument data that it receives from EDOS into Level 1-4 data products. It provides short and long-term data storage, and distributes the data to other EOS users. The SDPS contains a distributed data and information management function, including a catalog system in support of user data selection and ordering.

The EOC provides Command Data Blocks, including Command Link Transmission Units (CLTUs) and acquisition sequences, to EDOS which transfers this forward link data to the EOS spacecraft. In addition, the EOC forwards the Space Network (SN) and EOS Ground Stations schedules to EDOS. EDOS transmits real-time and rate buffered telemetry data to the EOC via the EOSDIS Backbone Network (EBnet).

For background information on the EDOS to EGS interface's functional and performance requirements, reference the Interface Requirement Document (IRD) between the EDOS and the EOS Ground System (EGS) Elements, (reference ICD Section 2, Applicable Document 3). For background information on the content of the data products delivered by EDOS, refer to the EDOS Functional and Performance Specification (reference ICD Section 2, Applicable Document 2), and the EDOS Data Format Requirements Document (DFRD), (reference ICD Section 2, Applicable Document 1).

For background information on the ECS's functional and performance requirements, refer to the Functional and Performance Requirement Specification for the ECS (reference ICD Section 2, Applicable Document 19).

For additional information on the EDOS to ASTER interface refer to ICD Section 2, Reference Document 14. For additional information on the EDOS to NOAA interface refer to ICD Section 2, Reference Document 14.

1.2 Scope

This ICD defines the interface and describes the connectivity and the information exchanged between EDOS and the ECS. It is intended for all parties needing information as it describes the functional and performance interfaces between EDOS and ECS.

1.3 Interface Responsibilities

This ICD issue, and future changes (routine and contingency), require agreement between the EDOS Project at the NASA/Goddard Space Flight Center (GSFC) (Code 510.1), the Earth Science Data and Information System (ESDIS) (Code 505), and the EGS element representatives. Each organization has the responsibility to approve this ICD, and future changes, upon resolution of issues and discrepancies as agreed upon by all parties. The approval process is finalized by signing this ICD, any future revised ICD version, or any future Document Change Notice (DCN).

1.4 Operations Agreements

The EDOS Project, at the NASA/GSFC (Code 510.1), writes Operations Agreements, which, in conjunction with this ICD, define operational aspects which affect the EDOS-ECS interfaces. (Reference ICD Section 2, Applicable Documents 10, 13, and 21).

SECTION 2

DOCUMENTS

Section 2 - Documents

2.1 Relevant Documentation

This section identifies those documents that directly apply in defining this interface and those reference documents that indirectly apply to obtain background information relative to the interface.

2.1.1 Applicable Documents

The following applicable documents, of the date of issue indicated, apply to this ICD in their entirety unless cited otherwise herein.

1. GSFC/MO&DSD, 560-EDOS 0230.0001, EDOS Data Format Requirements Document (DFRD), December 18, 1992 (with DCN 008, March 15, 1996).
2. GSFC/MO&DSD, 560-EDOS-0202.0004, EDOS Functional and Performance Specification (F&PS), November 23, 1992 (with DCN 016, April 1, 1996).
3. Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements, December 18, 1992 (with DCN 008, April 1, 1996).
4. EDOS - EOSDIS Backbone Network (EBnet) Interface Control Document (ICD), June 6, 1996.
5. Request For Comment (RFC) 959, File Transfer Protocol, October 1985.
6. RFC 1123, Requirements for Internet Hosts -- Application and Support, October 1989.
7. RFC 768, User Datagram Protocol, August 1980.
8. Interface Control Document (ICD) Data Format Control Book for EOS-AM Spacecraft, (ICD-106), April 19, 1996.
9. PB-5 Time Code 1982-05-27, Aerospace Data Systems Standard, Part 5: Clock and Time Code Standard, Standard 5.6 Parallel Grouped Binary Time Code For Space And Ground Applications - PB-5.

10. Operations Agreement Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Data and Information System (EOSDIS) Core System (ECS) Science and Data Processing Segment (SDPS, Draft, October 1995.

11. GSFC/MO&DSD, 560-EDOS-0211.0004R1, Interface Requirements Document between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOSDIS Backbone Network (EBnet), Revision 1, April 1996

12. 530-ICD-NCCDS/MOC, Interface Control Document Between the Network Control Center (NCC) and Mission Operations Centers, April 1997.

13. Operations Agreement Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Data and Information System (EOSDIS) Core System (ECS) EOS Operations Center (EOC), Draft, November 1995.

14. Support Identification Code Dictionary, 534-808, March, 1993.

15. Reserved

16. 540-031, EOC - EOSDIS Backbone Network (EBnet) Interface Control Document (ICD), August 1996.

17. 540-032, DAAC - EOSDIS Backbone Network (EBnet) Interface Control Document (ICD), November 1995.

18. RFC 793, Transmission Control Protocol, September 1,1981.

19. 423-41-02, Functional and Performance Requirement Specification for the ECS.

20. Request For Comment (RFC) 791, Internet Protocol: DARPA Internet Program Protocol Specification, September 1981.

21. Reserved CCR 98-0001

22. IEEE 1278.2 Standard for Distributed Interactive Simulation - Communication Services and Profiles, IEEE ballot review draft, August 1995.

23. Reserved

2.1.2 Reference Documents

The following documents are listed for the convenience of the user. These documents do not form a part of the ICD and should be used as related background reference.

1. GSFC/MO&DSD, 560-EDOS-0106.0002, Earth Observing System (EOS) Data and Operations System (EDOS) Operations Concept, December 18, 1992 (Rev. 1, April 1, 1996).

2. Reserved

3. Consultative Committee for Space Data Systems (CCSDS), CCSDS 701.0-B-2, Recommendation for Space Data System Standards, Advanced Orbiting Systems, Networks and Data Links: Architectural Specification, Blue Book, Issue-2, November 1992.

4. Consultative Committee for Space Data Systems (CCSDS), CCSDS 202.0-B-2, Recommendation for Space Data System Standards: Telecommand, Part 2: Data Routing Service, Blue Book, November 1992.

5. Consultative Committee for Space Data Systems (CCSDS), CCSDS 201.0-B-1, Recommendation for Space Data System Standards; Telecommand, Part 1; Channel Service, Architectural Specification, Blue Book, Issue-1, January 1987.

6. Earth Observing System (EOS)-AM-1 Project Data Systems and Operations Information Exchange Document, August 28, 1992.

7. Presentation Material from the EOS AM-1 Spacecraft Operations Working Group Meeting, August 27-28, 1992.

8. Consultative Committee for Space Data Systems, Recommendations for Time Code Formats Data Management Service, CCSDS 301.0-B-1, January 1987.

9. Command and Telemetry Handbook for EOS-AM spacecraft, IS20008578, January 13,1995.

10. Consultative Committee for Space Data Systems (CCSDS), CCSDS 201.0-B-1, Recommendation for Space Data System Standards; Parameter Value Language Specification (CCSD 0006), CCSDS 641.0-B-1, Blue Book, May 1992.

11. GSFC/MO&DSD, 560-EDOS-0915.0003, Earth Observing System (EOS) Data and Operations System (EDOS) and EDOS Communications (Ecom) Traffic Model (TM), December 18, 1992 (with DCN 007, October 14, 1996).

12. 604-CD-001-004, Operations Concept for the ECS Project.

13. EDOS - Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) Ground Data System (GDS) Interface Control Document (ICD), June 21, 1996.

14. EDOS - National Oceanic Atmospheric Administration (NOAA) Interface Control Document (ICD), June 6, 1996.

SECTION 3

INTERFACE OVERVIEW

Section 3 - Interface Overview

This section provides an overview of the EDOS, the ECS EOC, the ECS presence at the DAACs and the ECS SMC. It also explains the organization of the ICD, document conventions, data transfer protocols, and test data.

3.1 EDOS Overview

EDOS is an EOS data handling, processing and delivery system maintained and operated by the Mission Operations and Data Systems Directorate (MO&DSD). EDOS development and implementation is being managed by the Mission Operations and System Development Division (MOSDD), Code 510, of the MO&DSD at the GSFC. EDOS provides capabilities for EOS spacecraft data that adhere to recommendations established by the Consultative Committee for Space Data Systems (CCSDS).

3.1.1 EDOS Facilities

EDOS is distributed over several facilities: the Ground Station Interface Facilities (GSIFs); one located close to the White Sands Ground Terminal Upgrade (WSGTU) and the Second Tracking and Data Relay Satellite System (TDRSS) Ground Terminal (STGT) at the White Sands Complex (WSC) near Las Cruces, New Mexico; another near Fairbanks, Alaska, and a third in Spitzbergen, Norway; the Level Zero Processing Facility (LZPF), at Goddard Space Flight Center (GSFC) in Greenbelt, Maryland.; the Sustaining Engineering Facility (SEF); and the EDOS Data Archive Facility (DAF) located in Fairmont, West Virginia. EDOS communicates with the ECS ground facilities and other interfaces via the EOSDIS Backbone Network (EBnet) (reference ICD Section 2, Applicable Document 4). For information regarding ECS communication via EBnet reference ICD Section 2, Applicable Documents 16 and 17.

The GSIFs provide high rate data capture and short-term storage. The LZPF provides real-time CCSDS processing, level zero processing, playback processing, rate buffering of data, and distribution of the return link data, as well as transmission of forward link data to a ground terminal. It provides production data processing and expedited data processing including creation and distribution of Production Data Sets (PDSs) and Expedited Data Sets (EDSs).

The SEF provides engineering support services including: EDOS hardware and software development and enhancements; operations management service for operations monitoring for GSFC EDOS management personnel; Integration, Test and Verification (IT&V) and maintenance services for EDOS.

The DAF provides a Level 0 data archive service.

3.2 ECS EOC Overview

The EOC is responsible for mission planning, scheduling, control, monitoring, and analysis in support of mission operations for EOS spacecraft and instruments. The EOC is located at GSFC and is an element of the FOS. The EOC is responsible for integration of command loads for the spacecraft and the instruments. The EOC provides all forward link data, formatted in Command Data Blocks (CDB), to EDOS. EDOS then transfers the forward link data to the TDRSS Ground Terminal (TGT), an EOS Ground Terminal (EGT), or a contingency ground station for uplink to the related EOS spacecraft. The EOC receives rate buffered and real-time housekeeping data, and Command Link Control Words (CLCWs) to confirm spacecraft commanding from EDOS.

3.3 ECS SDPS Overview

The ECS SDPS includes a presence at the DAACs.

The ECS SDPS provides a set of ingest, processing, and distribution services for the EOSDIS. The ECS SDPS processes data from the EOS instruments to Level 1-4 data products. The ECS SDPS also provides short and long-term storage for EOS, other Earth observing missions, and other related data, software, and results; and distributes the data to EOS users. The ECS SDPS contains a distributed data and information management function and user services suite for the ECS, including a catalog system in support of user data selection and ordering. EDOS will interface with ECS SDPS elements which are distributed at several DAACs.

3.3.1 DAAC Operational Overview

The DAACs receive science and housekeeping data generated by the instruments aboard the EOS spacecraft, starting with AM-1. The set of instrument data to be processed will be established before the mission. GSFC and LaRC DAACs interface with EDOS to receive mission data (Expedited Data Sets (EDSs) and Production Data Sets (PDSs)) to be used as input in the generation of data products, while other DAACs will interface with each other to receive data products as the input for science data product generation. The ECS SDPS elements at the DAACs will interface with EDOS as required to receive PDSs which serve as input to Level 1-4 science data processing.

The GSFC DAAC will also receive ASTER EDSs.

The EDC DAAC will receive only archive data sets from EDOS. EDOS will receive ASTER DEDS from the EDC DAAC.

3.3.2 SMC Operational Overview

The SMC is part of the ECS CSMS.

The SMC provides system level monitoring and coordination services for ECS elements including the EOC and DAAC sites. Local sites provide SMC with production plans and schedules, information on real-time events of potential system level significance, trouble tickets, and fault and performance statistics. SMC uses this local site provided information along with information from external systems such as EBnet and EDOS to perform such services as adjudicating intersite schedule conflicts, correlating faults, and analyzing trends across ECS sites.

3.4 ICD Overview

This section describes the contents, conventions, and special characteristics of this ICD.

3.4.1 Document Organization

This document is organized into twelve sections, a glossary, an acronym list and an appendix.

Section 1 defines document purpose, scope and responsibilities.

Section 2 contains the list of applicable and reference documents pertinent to the definition of this interface.

Section 3 provides an overview of EDOS, EOC, SMC, and the DAACs. In addition, conventions used in preparing the document are included, as are materials on network protocols, terminology, and test data.

Section 4 provides the details of the EDOS - EOC interface. This section includes the data/information exchanged across the interface, data flow description, data processing, and performance characteristics.

Section 5 provides the EDOS - EOC interface design details. This section defines the data formats.

Section 6 provides the EDOS - EOC schedule interface design details. This section provides the schedule messages and defines the schedule formats.

Section 7 provides the details of the EDOS - DAAC(s) interface (including the GSFC, Langley Research Center (LaRC) and the EDC DAACs). This section includes the data/information exchanged across the interface, data flow description, data processing, and performance characteristics.

Section 8 has the EDOS - DAAC interface design details. This section defines the data formats.

Section 9 provides the details of the EDOS - SMC interface. This section includes the data/information exchanged across the interface, data flow description, data processing, and performance characteristics.

Section 10 provides the EDOS - SMC interface design details. This section defines the data formats.

Section 11 provides the EDOS interface details of those messages that are to be implemented at EDOS System Upgrade #1.

Section 12 provides the EDOS interface design details of those messages that are to be implemented at EDOS System Upgrade #1.

Appendix A contains a list of issues to be resolved affecting this interface. This Appendix will be removed when all open issues have been resolved.

A Glossary is appended to the end of the document.

An Acronym List follows the Glossary.

3.4.2 Document Conventions

The following document conventions are used throughout this ICD and apply to all interfaces herein.

3.4.2.1 Terminology

The terminology used in this document attempts to be consistent with other MO&DSD and EDOS documentation.

Magnetic tape is often called a Removable Physical Media Unit or Physical Media.

Configuration of Effectivity - To support synchronization of changes by all affected parties, approval of documentation of revised interfaces needs to include an effectivity date. Notation in this document has been implemented to distinguish the revised interface from the preceding configured interface. The notation is based upon EDOS deliverable configurations:

- C1 - denotes AM-1 Initial Operations Capability, the configuration supporting AM-1 launch
- C2 - denotes AM-1 Archive Operations Capability, the configuration supporting the EDOS DAF and subsequent configurations

- C3 - denotes AM-1 Full Operations Capability, and subsequent configurations
- C4 - denotes System Upgrade #1 (SU#1)

3.4.2.2 Bit Numbering And Transmission Convention

The EDOS and EGS Element data transmissions described in this ICD follow the CCSDS bit ordering and bit significance convention for serial telemetry links as shown in Figure 3.4.2.2-1. The first bit in a field of N bits is defined as "Bit 0" (i.e., the most left justified, appears first in this ICD and is the first transmitted); the following bit is defined as "Bit 1" and so on up to "Bit N-1".

Data fields are grouped into 8-bit "words" called octets or bytes. Each byte contains an American Standard Code for Information Interchange (ASCII) character or binary data and is consistent with TCP/IP; i.e., big-endian ordering. ASCII characters have the parity bit (bit 2^7) set to zero for transmission. The parity bit occurs first in a serial transmission. For example, a message type of 02 in ASCII format is transmitted as shown in Figure 3.4.2.2-1. Binary data is situated within an N bit field so that the most significant bit occurs first and is transmitted first.

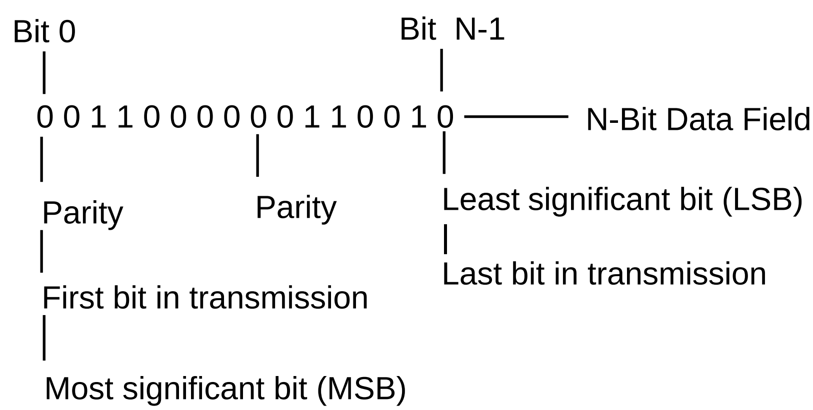

Figure 3.4.2.2-1. EDOS Bit Numbering And Transmission Convention

Whenever a multi-byte field contains a numeric quantity, the left most bit of the whole field is the most significant bit. When a multi-byte quantity is transmitted, the most significant byte is transmitted first.

Fields specified with an ASCII format, and containing a specified number of bytes, do not include the null character used to terminate the string (as in the manner of the C programming language).

3.4.2.3 Contingency Mode Operations

Under normal operating conditions, EDOS communicates with the EOS AM-1 spacecraft via the Space Network (SN). If for any reason the SN is unavailable (e.g., TDRSS is unavailable), EOC will direct EDOS to switch into a contingency mode of operation.

Contingency modes exist to support operations during spacecraft failures and spacecraft/ground communications failures. These failures could be in the S-band or Ku-band communications links. For AM-1, the EOS Polar Ground Stations (EPGSs), composed of the Alaska Ground Station (AGS) and Svalbard Ground Station (SGS), as well as, the Wallops Orbital Tracking Station (WOTS) will act as contingency sites for forward link and S-band return link data. For low rate, the EDOS interfaces to these facilities through EBnet are functionally identical to the TGT interface. For failures in the Ku-band downlink, the EPGSs have the capability to receive the spacecraft X-band downlink and capture the raw high rate data on tape. The tapes are then shipped to the EDOS LZPF facility for level zero processing and distribution. In the PM-1 time-frame and beyond, the EPGSs will be upgraded with an EDOS GSIF identical to the GSIF at WSC and will be the primary interface for both S-band and X-band communication links. TDRSS will continue to provide routine S-band support and WOTS will continue to provide contingency support.

While in the Contingency Mode, EDOS does not receive any instrument (i.e., science) data. Only the low rate channel housekeeping and playback data will be received. The housekeeping and playback data is sent to the EGS elements in the same manner as during normal mode operations in the form of Real-Time EDUs and Rate Buffered Data. The message structure and contents for the housekeeping return link data and the forward link data are not affected by the Contingency Mode. Whether the contact is via a TDRSS Ground Terminal or via a contingency site ground terminal, EDOS transfers CODA Reports during the contact and a SCS Summary Report upon completion of the rate buffering services related to the contact session.

3.4.2.4 Use of the Parameter Value Language

EDOS uses the Parameter Value Language (PVL) formatted statements to describe the contents of certain records (PDS/EDS Delivery Record, PDS Physical Media Unit Delivery Record, EDOS Activity Plan (EAP), EDOS Operations Timeline (EOT), EOT Change Notification, and the Summary Performance Report). PVL statements are expressed as ASCII strings, in the form of: "Parameter = Value;". Each PVL statement is terminated by a semicolon (;) as a delimiter character. The value strings include pre-defined values (enclosed within single quote marks in the Tables of this ICD) and processor determined values. Processor determined values include ASCII alphanumerics, ASCII numeric values to be filled in by the originating system's processor, i.e., the record preparer, during message creation. Two constructs provide the basis of PVL statement formation, the assignment statement and the aggregation block. The assignment statement has the general form Parameter = Value. The aggregation block allows naming of a collection of statements in the aggregation block construct, which has the following general form: Object = Block Name, followed by a collection of assignment statements and/or aggregation blocks, and ending with the statement End Object = Block Name.

EDOS adheres to the PVL syntax rules:

1. Statement syntax: The basic syntax 'Parameter = Value;' will be followed for each statement in the record where the PVL assignment symbol (consisting of an ASCII blank, an ASCII equal sign, and an ASCII blank) will separate the parameter from the value, and the PVL statement delimiter (an ASCII semicolon) will immediately follow the value. Each PVL statement after the first will begin with an ASCII carriage return character followed by an ASCII line feed character. To enhance human readability, there may be up to 32 ASCII blank characters immediately preceding the PVL parameter in any EDOS PVL statement.

2. OBJECT syntax: A PVL OBJECT is a set of statements that may be repeated. For example, if a PDS consists of more than one file, we can define an OBJECT, called FILE_SPEC, that contains the file specification parameters, and repeat the set of statements for each of the files.

Refer to the PVL example in Table 3.4.2.4-1.

EDOS does not use a PVL "compiler" but defines the PVL statements to be used and establishes the proper sequence of these PVL statements in this ICD. This requires the ICD to be specific in describing the records to be written in PVL to avoid ambiguity in interpreting the PVL statements. This does not guarantee that the PVL statements are truly compliant to PVL syntax rules; it guarantees that both sides of the interface will treat the ASCII strings, written in PVL-like notation, in an identical manner.

Table 3.4.2.4-1. Example of PVL Parameters

Item No.	Parameter	Description	Format & Size	Value
1	ARCHIVE_TIME	ISO Time that data will migrate from disk storage to the archive	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
2	HOST_NAME	Name of destination computer on which the data set files reside	ASCII 30 Bytes	e.g. 'ecs.gsfc.nasa.gov'
3	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
3.1	DIRECTORY_ID	File directory name (i.e., path name)	ASCII 256 Bytes (including FILE_ID, but excluding null terminator)	e.g. '/EDOS/Level0/'
3.2	FILE_ID	File name	ASCII 256 Bytes (including DIRECTORY_ID, but excluding null terminator)	file name (Reference the EDOS file naming convention)
3.3	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	≤ 9999999999
3.4	END_OBJECT	End of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'

Table 3.4.2.4-1. Example of PVL Parameters (Continued)

Item No.	Parameter	Description	Format & Size	Value
4	BEGINNING_DATE/TIME	ISO Start time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
5	ENDING_DATE/TIME	ISO End time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals

The following is an example of the PVL message based on the parameters in Table 3.4.2.4-1:

```
ARCHIVE_TIME = 1995-12-25T03:23:01Z;
HOST_NAME = ecs.gsfc.nasa.gov;
OBJECT = FILE_SPEC;
        DIRECTORY_ID = /EDOS/Level0/;
        FILE_ID = /EDOS/Level0/ P0420257AAAAAAAAAAAAAA95360123453700.PDS;
        FILE_SIZE = 6031;
END_OBJECT = FILE_SPEC;
OBJECT = FILE_SPEC;
        DIRECTORY_ID = /EDOS/Level0/;
        FILE_ID = /EDOS/Level0/P0420257AAAAAAAAAAAAAA95360123453701.PDS;
        FILE_SIZE = 23456031;
END_OBJECT = FILE_SPEC;
BEGINNING_DATE/TIME = 1995-12-25T01:02:03Z;
ENDING_DATE/TIME = 1995-12-25T01:02:19Z;
```

3.5 Data Transfer Protocols

EDOS transfers data to EGS elements in a variety of ways. This section describes each data transfer protocol utilized for EDOS-EGS data transfer.

3.5.1 Internet Protocol

The Internet Protocol (IP), reference ICD paragraph 2.1.1, Applicable Document 20, supports network layer data exchanges between EDOS and the EGS Elements. The network layer provides the transparent transfer of data between transport entities. The IP addresses for the network nodes and data hosts are specified in Applicable Documents 10, 13, and 21.

3.5.2 Transmission Control Protocol (TCP)

Connection-oriented transport service is implemented using TCP. TCP is a connection-oriented, end-to-end reliable protocol designed to fit into a layered hierarchy of protocols which support multi-network applications (reference ICD Section 2, Applicable Document 18). It provides guaranteed delivery of data between pairs of processors in host computers attached to networks within and outside of EDOS.

3.5.3 File Transfer Protocol (FTP)

The objectives of using FTP include the automated, reliable, and efficient transfer of files across computing platforms while shielding the sender or recipient platforms from variations in file storage systems among platforms. Details of the protocol are described in RFC 959, Applicable Document 5, in Section 2.1.1.

Host names, IP addresses, destination directories will be specified in the Operations Agreement.

The attributes for all FTP data transfers will be:

1. Type: Binary
2. Format Control: Nonprint
3. Structure: File
4. Transmission Mode: Stream

3.5.3.1 Signaling the Completion of a FTP File Transfer

The exchange of files between EDOS and its data customers and vice versa is based on a “push” concept. The recipient platform is ready to receive data files sent via FTP at all times. The recipient platform will continuously monitor the directory for new data files. In order to improve the efficiency and minimize the complexity of the interface, a “signal” file is used by the sending platform to inform the receiving platform that a data file transfer has been completed. The efficiency improvement due to using the “signal” file increases with large files. The receiving platform need not read the data file repeatedly with the expectations of reading an end-of-file. The signal file contains only the full name of the data file, and its extensions, in ASCII code.

The concept is for the recipient platform to monitor the directory receiving data files for the signal file and to use the presence of the signal file to identify the data file. The signal file will have the same name as the data file with an additional extension field that will be set to the ASCII code string “.XFR”. This enables the recipient platform to scan for files with the “.XFR” extension and use the signal file to locate the transferred data file.

Prior to sending the data and signal files, the sender platform shall reset the “x” permission flags for “User” and “Other”, according to UNIX convention, to “not executable”.

3.5.4 Reserved

Deleted

3.5.5 Multicast Services

Reference Paragraph 2.1.1 of this ICD, Applicable Document 22, which describes the Multicast protocol.

Multicast is a transmission mode in which a single message is sent to multiple network destinations, i.e., one-to-many. This contrasts with unicast transmission in which a message is sent to a single destination, and with broadcast, in which a message is sent to all destinations on a given network. There is a range of possible multicast services, with the choice depending on the requirements of a particular application and the capabilities of the network technologies being used. Multicasts described in this document shall comply with the protocol defined in RFC 1112.

3.5.6 User Datagram Protocol (UDP)

Reference Paragraph 2.1.1 of this ICD, Applicable Document 7, which describes implementation of the User Datagram Protocol (UDP).

EDOS will transmit the messages to a specified IP address and destination port. There are no status indicators for messages sent via UDP. If the message delivery is unsuccessful, the message is lost. UDP does not guarantee delivery.

IP addresses and UDP ports will be specified in the applicable OA.

3.6 Test Data

Test data serve to validate EDOS data formatting and to accomplish end-to-end testing of both mission data and operations management data.

Test data can consist of one, or any combination, of the following EDOS products:

A. EDOS archived Production Data Sets (PDSs) on magnetic tape, with the test flag set in the Construction Record

B. EDOS PDS(s) and Expedited Data Sets (EDSs) sent electronically to a Distributed Active Archive Center (DAAC), with the test flag set in the Construction Record

C. Real-Time Path Service EDOS Data Units (EDUs), with the test flag set in the EDOS Service Header (ESH)

D. Rate Buffered Data, with the test flag set in the ESH of each EDU

E. Command Link Control Word EDOS Data Unit, with the test flag set in the ESH

F. Command Data Block, with the Message Type Field reflecting a test message in the EDOS Ground Message Header

G. Operations Management data, with the Message Type field reflecting a test message in the EDOS Ground Message Header

H. Command Test Block, with the Message Type Field reflecting a test message in the EDOS Ground Message Header

Operations Management reports include:

- CODA Report
- SCS Summary Report
- Physical Media Unit Delivery Record
- PDS and EDS Delivery Records
- PDS/EDS Acceptance Notification
- Schedule Messages
- EDOS Activity Plan
- EDOS Operations Timeline
- EDOS Operations Timeline Change Notification
- Service Request
- Service Request Disposition
- Summary Performance Report

The test data indicator field in the EDOS Service Header (ESH), and/or the Construction Record is set to one (1) to denote test data; zero (0) denotes operational data. The Message Type Field in the EDOS Ground Message Header will indicate the nature of the message, operational or test.

Test data sent to the EOC will be routed to separate ports designated for such test data. EDOS will send test data files to a directory reserved for test data and UDP data to specific UDP ports. Operations data will be directed to designated operational directories or UDP ports. IP addresses, directories, and UDP port addresses for operations data and test data is defined in the applicable OA.

3.7 EDOS Interface Recovery Operations

This section describes procedures to be followed in the event of communications outage or transmission failure.

3.7.1 Real-Time Service Communications Outage

If a communication outage exists, or the Real-Time EDUs cannot be transmitted electronically, EDOS will not be able to electronically transmit these EDUs. The service will be resumed once the communication capability is restored.

3.7.2 Rate Buffered Service Communications Outage

EDOS tries to transfer the Rate Buffered Path Service EDUs for up to 24 hours. If the communication outage lasts longer than 24 hours, or the Rate Buffered Path Service EDUs cannot be transferred within 24 hours, see the EDOS-EOC Operations Agreement, Applicable Document 13, for interface recovery details.

3.7.3 Transmission Priorities

If for any reason a transmission conflict exists, EDOS gives priority to transmitting the Real-Time Path Service EDUs over the Rate Buffered Path Service EDUs (housekeeping playback data).

3.7.4 FTP Transmission Failure

If an FTP transmission failure occurs, then an alert is raised to the EDOS system operator. Recovery procedures are described in the applicable OA.

3.7.5 UDP Transmission Failure

No transmission status indicators exist for messages sent via UDP and UDP doesn't guarantee data delivery. If the message is not received, then the affected EGS element should consider it lost.

3.7.6 Bad EDS Format or Information

If the data in the EDS is found to be bad, EDOS will reprocess the data (if no more than 24 hours have elapsed since data capture) and will deliver the EDS electronically. EDSs older than 24 hours will be considered lost. The data contained in those EDSs can be found in corresponding PDSs.

3.7.7 Bad PDS Format or Information

If the data in the PDS is found to be bad, EDOS will reprocess the data (if no more than 30 days have elapsed since data capture) and will deliver the PDS electronically. Data older than 30 days may be requested from the DAF for delivery via physical media.

Section 3 - Interface Overview1

SECTION 4

EDOS-EOC INTERFACE CHARACTERISTICS

Section 4 - EDOS-EOC Interface Characteristics

This section defines those characteristics that are specific to the interface between EDOS and EOC.

4.1 Data Flow

The data products exchanged between the EDOS and EOC are as shown in Figure 4.1-1.

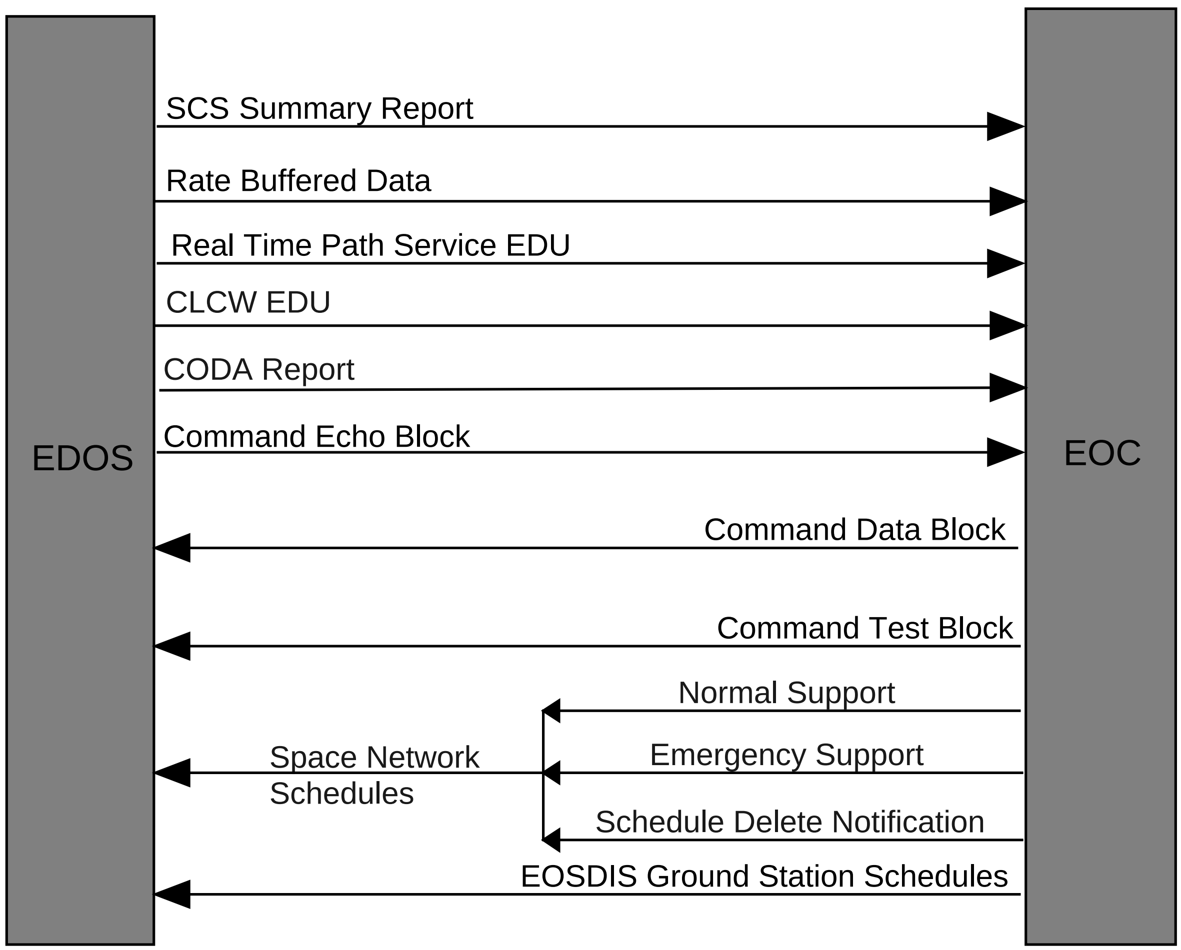

Figure 4.1-1. EDOS - EOC Data Flow Interfaces

4.1.1 EDOS-EOC Data Flow Description

The following paragraphs describe the data flow presented in Figure 4.1-1.

Real-time Telemetry Processing: During an SCS, the EOS Spacecraft returns data through the Space Network (SN), contingency sites, or EOSDIS Ground Stations to EDOS. EDOS demultiplexes the return link nonreturn to zero-level (NRZ-L) encoded data by separating individual Virtual Channel Data Units (VCDUs) based upon identifying information in the VCDU header. This identifying information is provided by the VCDU Identifier (VCDU-ID), consisting of the Spacecraft Identifier (SCID) and the Virtual Channel Identifier (VCID) found in the VCDU header. Subsequent processing is determined by the VCDU-ID fields, together with EDOS management information. CCSDS packets are demultiplexed from the VCDUs designated by management information to contain multiplexed packets. The resulting packet is the Service Data Unit (SDU) that is used to form the EDOS Data Unit (EDU). Each SDU is accompanied by quality and accounting data. The quality and accounting data are formatted into the EDOS Service Header (ESH) and are concatenated with the SDU to form the Path Service EDU. Path Service EDUs are transferred in the same order as the corresponding SDUs are received. EDOS electronically transmits the Path Service EDUs, in real-time, to the EOC (reference paragraph 5.3.2 of this ICD).

During contingency situations involving a failure of the TDRSS S-band link, spacecraft contacts will be handled via WOTS, AGS, and SGS. Only the low rate non-science data will be transmitted, via EBnet, over the contingency networks to EDOS.

SCS Summary Report: Following the RLSS and the transfer of SCS-related rate buffered data to their destinations, i.e., the rate buffering services, EDOS electronically transmits a SCS Summary Report to the EOC (reference paragraph 5.2.2 of this ICD).

Customer Operations Data Accounting Report: During the SCS, EDOS forwards Customer Operations Data Accounting (CODA) Reports to the EOC. These reports summarize EDOS activities, and provide accounting and quality information accumulated since the beginning of the SCS. CODA reports are transmitted to the EOC once every five seconds during the SCS.

Command Link Control Word (CLCW) EDU: The mechanism within the Telecommand (TC) System for reporting command transfer status and verification information to the sending end (EOC) is the CLCW. The CLCW contains information regarding the receipt of TC Transfer Frames and command uplink status (errors, omissions, and successes) by the EOS spacecraft.

EDOS supports CCSDS Advanced Orbiting System (AOS) Grade-2 and Grade-3 services with the EOS spacecraft. EDOS extracts CLCWs from designated Virtual Channel Data Units (VCDUs). EDOS then builds a CLCW EDU to contain the ESH and the CLCW, and transmits the CLCW EDU in real time to the EOC.

Rate Buffered Data: EDOS provides a rate buffered service for the Spacecraft's Housekeeping (H/K) Telemetry Playback data. The rate buffered data file contains all Path Service EDUs for a single APID for a single contact period (SCS). EDOS electronically transmits the file to the EOC within 5 minutes of the end of the Spacecraft Contact Session (reference paragraph 5.3.3 of this ICD).

The file containing VCDUs with unknown VCIDs, i.e., VCDUs in the EOS Spacecraft "Trash Buffer", is also sent to the EOC as rate buffered data.

EDOS provides the flexibility to specify the maximum size of the files that contain EOC Rate Buffered data. In other words Rate Buffered data can reside in more than one file. The maximum file size is identified in the applicable OA and may be: less than or equal to 0.5 Gigabytes (GB), 1.0 GB, 1.5 GB, or 2.0 GB. The selected file size applies to all Rate Buffered data that EDOS sends to the EOC.

Rate Buffered Path Service Test Data: EDOS can forward source, internally generated, or simulated telemetry CCSDS packets as Rate Buffered Path Service EDUs to the EOC, to validate EDOS rate buffered data formatting and to accomplish end-to-end testing. The test data indicator field in the ESH is set to 1 to denote test data; zero (0) denotes operational (mission) data (reference Section 2, Reference Document 14).

Test Data: Test data serves to validate EDOS data formatting and to accomplish end-to-end testing of both mission data and operations management data. EDOS supports Rate Buffered Path Service EDU and CLCW EDU testing by setting the test data indicator field in the ESH. The ESH test data indicator field is set to one (1) to denote test data; zero (0) denotes operational data. EDOS supports Command Data Block, Command Test Block, Command Echo Block, CODA, and SCS Summary Report testing by setting the message type in the EDOS Ground Message Header. In addition, EDOS will direct test messages to EOC ports dedicated to supporting testing.

Command Data Block: EDOS receives the forward link Command Data Block, containing an EDOS Ground Message Header (NRZ-L encoded) and forward link data (nonreturn to zero-mark (NRZ-M) encoded), from the EOC. The Command Data Block is completely constructed and ready for subsequent processing. EDOS doesn't perform any verification on these Command Data Blocks. EDOS forwards the Command Data Blocks to the SN TGT at White Sands Complex or EOSDIS Ground Station for forwarding to the spacecraft. In the event of a Space Network outage or emergency, EDOS will send the forward link data to an EBnet port for transfer to a contingency site (WOTS, AGS, or SGS) from which it is then uplinked to the EOS spacecraft.

Command Test Block: EOC sends a Command Test Block (CTB) to EDOS to verify that the EBnet pathway, routers, EDOS forward link processors, and EDOS software are configured and ready to support forward link commands to the spacecraft. If EDOS is configured and ready, then EDOS returns a Command Echo Block (CEB) as a response to the EOC.

Schedules: EDOS receives the SN, EOSDIS Ground Station, and test schedules from the EOC via FTP.

4.2 EDOS to EOC Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EDOS and the EOC for all messages and data products exchanged via internet protocols. Refer to the EDOS-EBnet ICD (reference Section 2, Applicable Document number 4) and EOC - EBnet ICD (reference Section 2, Applicable Document 16) for a detailed physical description of these interfaces.

Table 4.2-1 identifies the type of network IP addresses and protocol(s) that govern the EDOS - EOC electronic interface.

Table 4.2-1. Addresses and Protocols for Electronic Data Products Sent from EDOS to EOC

EDOS to EOC Data Product	Protocol -Address
CLCW EDU	User Data Protocol (UDP) - Internet Protocol (IP) Class D (Multicast) IP Address and UDP Port Number
CODA Report	UDP - IP Class D (Multicast) IP Address and UDP Port Number
Real-time Path Service EDU	UDP - IP Class D (Multicast) IP Address and UDP Port Number
Rate Buffered Data File	FTP - IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
SCS Summary Report	FTP - IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
Command Echo Block	UDP - IP Class D (Multicast) IP Address and UDP Port Number

Reference Section 3 of this ICD, paragraph 3.5, Data Transfer Protocols for additional information regarding protocols.

EOC requires two IP Addresses and ports per mission, one for Operational (mission) data and one for test data.

4.2.1 Rate Buffered APIDs

EDOS performs Rate Buffered data processing as defined in paragraphs 4.1.1 and 5.3.3 of this ICD. The rate buffered data file size is defined in the applicable OA. Playback Path SDUs received within the VCIDs and the APIDs shown in Table 4.2.1-1 are rate buffered as Path Service EDUs. There is one rate buffered transmission per APID. EDOS will use the playback flag in the telemetry to distinguish between real-time and playback data. Trash Buffer EDUs, i.e., VCDU EDUs with unknown VCIDs are also transmitted as rate buffered data. EDOS electronically transfers the data to the EOC at the end of the SCS, via FTP.

Table 4.2.1-1. VCIDs/APIDs Containing Playback Data for Rate Buffered Processing

Data Type	Virtual Channel Identifier	APIDs Within The Rate Buffered Data	Return Link Data Rate
H/K Playback	1 = x'1'	1 = x'1'	256 Kbps
H/K Playback	1 = x'1'	1 = x'1'	512 Kbps
H/K Playback	11 = x'B'	1 = x'1'	150 Mbps
Trash Buffer	Unknown	N/A	N/A

4.2.2 Real-time VCIDs/APIDs

EDOS performs Real-time data processing as defined in paragraph 4.1.1 of this ICD. Only the Path Service Data Units received for the VCIDs/APIDs shown in Table 4.2.2-1 below are electronically transferred to the EOC as Real-time Path Service EDUs.

4.2.3 VCIDs for CLCW EDUs

EDOS builds CLCW EDUs for the VCIDs shown in Table 4.2.2-1.

Table 4.2.2-1. VCIDs/APIDs Containing Data for Real-time Processing

Data Type	Virtual Channel Identifier	APIDs Within The Real-time Data	Return Link Data Rate
Housekeeping	1 = x'1'	1 = x'1'	16 Kbps
Health & Safety	2 = x'2'	2 = x'2'	1 Kbps
Diagnostic	3 = x'3'	3 = x'3'	16 Kbps
Diagnostic	3 = x'3'	6 = x'6'	1 Kbps
Standby	2 = x'2'	5= x'5'	1 Kbps

4.2.4 Test Messages

EOC requires a separate IP address and port to receive test data. For those messages utilizing the EDOS Service Header, (CLCW EDUs, Real-time EDUs, and Rate Buffered Data EDUs), EDOS will set the ESH in accordance with table 4.2.4-1 to differentiate test data from operational data.

Table 4.2.4-1. Message Types Utilizing EDOS Service Header.

Message Type	Value Of Test Data Indicator Field, Item 8 of the EDOS Service Header
Operational Message	0
Test Message	1

For those messages utilizing the EDOS Ground Message Header, (CODA Report, SCS Summary Report, CDB, CTB, CEB, and the SN and Ground Station Schedules), EDOS shall set the Message Type field in the EDOS ground message header in accordance with Table 4.2.4-2 to differentiate test data from operational data.

Table 4.2.4-2. Message Types Utilizing Ground Message Header

Message Type	Messages Value Of Message Type Field, Item 1 of the EDOS Ground Message Header			
	CODA	SCS	CDB	CTB / CEB
Operational Data	20	16	3	1
Test Data	148	144	131	129

Note: For the SN and Ground Station schedule formats refer to Section 6.

4.2.5 Protocols

Reference Section 3, paragraph 3.5 of this ICD for additional information about protocols.

The names of files transferred via FTP will follow the file name convention as defined in Table 5.4.1-1 of this ICD.

4.2.5.1 Addresses

EDOS delivers CODA Reports, via UDP, to specific multicast IP addresses and UDP ports per mission as defined in the applicable OA. Port selection is based on APID (SCID and APID), TGT port, and data type (operational or test). EOC requires two IP Addresses and ports per mission, one for Operational (mission) data and one for test data.

EDOS delivers CLCW EDUs and Command Echo Blocks, via UDP, to specific multicast IP addresses and UDP ports (operational and test) per mission as defined in the applicable OA. Port selection is based on APID (SCID and APID), TGT port, and data type (operational or test). EOC requires two IP Addresses and ports per mission, one for Operational (mission) data and one for test data.

EDOS delivers real-time Path Service EDUs via UDP, to specific multicast IP addresses (operational and test) and UDP ports per mission as defined in the applicable OA. Port selection is based on APID (SCID and APID), TGT port, and data type (operational or test).

EDOS delivers Rate Buffered data and the SCS Summary Report via the FTP. EOC Users IDs, IP addresses, host names, and file directories are defined in the applicable OA.

4.2.5.2 Reserved

Deleted

4.2.5.3 Passwords

In order for EDOS to complete an exchange of data, EDOS requires access to EOC Data Servers. The EOC shall supply EDOS, the necessary password(s) to allow EDOS access. The applicable OA shall specify the password exchange procedure.

4.2.5.4 Signaling the Completion of an FTP File Transfer

For data files sent via FTP, EDOS will provide a “signal” file, as defined in section 3, paragraph 3.5 of this ICD, that will inform the EOC recipient platform that a data file transfer has been completed.

4.3 EOC to EDOS Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EOC and EDOS for all messages and data products exchanged electronically. Refer to the EDOS-EBnet ICD (reference Section 2, Applicable Document 4) for a detailed physical description of this interface.

Table 4.3-1 defines the network IP addresses and protocols that govern the EOC to EDOS electronic interface.

Table 4.3-1. Addresses and Protocols for Electronic Data Products Sent from EOC to EDOS

EOC to EDOS Data Product	Protocol -Address
Command Data Block	UDP - IP Class D (Multicast) IP Address, and UDP Port Number
Command Test Block	UDP- IP Class D (Multicast) IP Address and UDP Port number
Space Network Schedules	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
Ground Station Schedules	FTP - IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.

4.3.1 Data Provided by EOC

The EOC transmits a Command Test Block to determine if EDOS is configured to support forward link operations, as defined in paragraph 5.5.3 of this ICD.

The EOC transmits Command Data Blocks to EDOS for forward link transmission, as defined in Paragraph 5.5.2 of this ICD.

The EOC transmits the Space Network and the EOSDIS Ground Station schedule messages to EDOS, as defined in Section 6 of this ICD.

4.3.2 Protocols

Reference Section 3, Paragraph 3.5 for additional information about protocols.

4.3.2.1 Addresses

EOC transmits CDBs and CTBs via UDP to a specific multicast IP address and UDP port. EDOS will use the same IP address for the test messages that is used for the operational messages.

EDOS UDP port numbers are defined in the applicable OA.

EOC delivers the Space Network Schedules and the EOSDIS ground station schedules via the FTP. EDOS IP addresses, host names, accounts, passwords, port numbers, and directories are defined in the applicable OA. EDOS will use the same EBnet IP address for the test messages that is used for the operational messages.

4.3.2.1.1 Signaling the Completion of an FTP File Transfer

For data files sent via FTP, EOC will provide a "signal" file, as defined in section 3, paragraph 3.5 of this ICD, that will inform the EDOS recipient platform that a data file transfer has been completed.

4.3.2.2 Reserved

Deleted

4.3.2.3 Passwords

In order for EOC to send message files via FTP to EDOS, EOC requires access to EDOS Data Servers. EDOS shall supply the necessary password(s) to allow EOC access. The OA shall specify the password exchange procedure.

4.4 Performance Characteristics

The following paragraphs define the performance characteristics of the EDOS - EOC interface.

4.4.1 EDOS to EOC Performance Rates

Performance requirements specifying the rates of transfer can be found in the Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements (refer to Section 2, Applicable Document 3).

4.4.1.1 Operations Management Delivery Rate

EDOS shall transfer OM data and OM test data (i.e., CODA Report and SCS Summary Report) at a rate up to 49 Kilobits per second (Kbps).

4.4.1.2 Real-time Return Link Delivery Rate

EDOS shall provide the capability to transfer real-time return link data, including Path Service EDUs (Housekeeping, Diagnostic, Health and Safety, and Standby data), CLCW EDUs and real time test data at a rate of up to 32 Kbps as per Section 2 of this ICD, Applicable Document 3.

4.4.1.3 Rate Buffered Return Link Delivery Rate

EDOS shall provide the capability to transfer rate buffered return link data, including housekeeping playback data and rate buffered test data at a rate up to 1.5 Mbps as per Section 2 of this ICD, Applicable Document 3.

4.4.2 EDOS to EOC Delivery Timing

This section describes the frequency at which various data is transferred between EDOS and EGS.

4.4.2.1 CODA Report Delivery Timing

EDOS sends the CODA Report to the EOC every 5 seconds during the SCS.

4.4.2.2 Rate Buffered Data Delivery Timing

EDOS initiates transfer of the rate buffered Path Service EDUs to the EOC within 5 minutes after the end of the RLSS.

4.4.2.3 SCS Summary Report Delivery Timing

EDOS initiates transfer of the SCS Summary Report to the EOC within 5 minutes of the termination of rate buffering services associated with the SCS.

4.4.2.4 CLCW EDU

EDOS initiates transfer of the CLCW EDU to the EOC in near real-time as received.

4.4.2.5 Command Echo Block

When EDOS is configured and ready to support forward link operations, it issues a CEB within 5 seconds of receipt of the CTB from EOC. EDOS does not respond to a CTB when the EDOS Forward Link processor is not configured to support forward link operations.

4.4.3 EOC to EDOS Performance

This section describes performance characteristics of all data transmitted from EOC to EDOS.

4.4.3.1 Forward Link Rate

EDOS shall provide the capability to accept forward link data including test data, from the EOC at the EOC transmitted rates of up to 10 Kbps.

Section 4 - EDOS-EOC Interface Characteristics 1

SECTION 5

EOC INTERFACE DESIGN

Section 5 - EOC Interface Design

5.1 Data Description and Formats

These paragraphs define the content and format for each interface data product exchanged, as defined in Figure 4.1-1, including data items, data representation and data structures.

5.1.1 Data Format Overview

The following paragraphs identify the items within Operations Management Data and Operations Management Test Data that are sent to EGS.

Customer Operations Data Accounting (CODA) Report:

A. EDOS Ground Message Header
B. CODA Report Content indicators
C. CODA Sequence Count for the SCS
D. SCS Identification
E. EDOS Return Link Physical Channel Status Block. by Ground Terminal (GT) Physical Port Identification:
  a. GT and EDOS Physical Port Identification
  b. Frame-synchronization status (polarity, bit order, and sync mode)
  c. Count of frame synchronization pattern errors
  d. Count of CADUs received
  e. Count of flywheel CADUs
  f. Count of frame synchronization losses
  g. Count of correctable VCDUs, by VCDU-ID (SCID and VCID)
  h. Count of uncorrectable VCDUs
  i. Count of symbols corrected for VCDUs, by VCDU-ID
  j. Count of VCDUs with Cyclic Redundancy Check (CRC) errors (Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon).
F. EDOS Forward Link Status Block:
  a. Count of Command Data Blocks received, by SCID
  b. Count of Command Data Blocks Discarded, by SCID
  c. Count of out of sequence Message Sequence Numbers in Ground Message Headers received from the EOC
  d. Count of Command Data Blocks transferred by Ground Station Physical Port Identification
G. EDOS CCSDS VCDU Processing Status Block
  a. For this VCID, Count of VCDU Sequence Counter discontinuities, for this VCDU-ID
  b. For this VCID, Count of stored return link VCDU EDUs, for this VCDU-ID

EDOS Ground Message Header

A. Message Type/Test Message Type
B. Mission's Spacecraft Identification
C. Message Sequence Number
D. Source Identification
E. Destination Identification
F. EDOS Software Version Number
G. Message Generation Date and Time
H. Message Length

EDOS Service Header (ESH):

A. ESH version number
B. SDU Type
C. Date and Time annotation of EDOS receipt
D. EDOS Physical Port ID
E. Source VCDU sequence counter discontinuity
F. Indicator that VCDU is playback data
G. Recovery processing indicator
H. Test data indicator
I. CRC failure indicator. (Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon).
J. Path SDU source sequence counter discontinuity (not applicable for VCDU Service)
K. Packet Fill Indicator
L. Source VCDU-ID, copied from the VCDU
M. Location of first octet of EDOS generated fill data for a Path SDU (not applicable for VCDU Service)
N. Source VCDU error decode results (corrected or error-free)

Command Data Block

A. EDOS Ground Message Header
B. Forward Link Data

Command Link Control Word EDOS Data Unit (EDU):

A. ESH
B. Command Link Control Word (CLCW)

Real-time Path Service EDOS Data Unit (EDU):

A. ESH
B. Path Service Data Unit

Rate Buffered Path Service EDUs:

A. ESH
B. Path Service Data Unit (SDU)
C. Continuous repetition of the next/following ESH and Path SDU

Rate Buffered VCDU EDUs (from EOS Spacecraft Trash Buffer):

A. ESH

B. VCDU

C. Continuous repetition of the next/following ESH and VCDU.

SCS Summary Report

The SCS summary report contains the following:

A. EDOS Ground Message Header
B. SCS Identification
C. Return Link Physical Channel Quality and Accounting Summary Data for each return link GT Physical Port active during a SCS:
   a. GT and EDOS Physical Port Identification
   b. Initial time of frame synchronization lock
   c. Last time of frame synchronization lock
   d. Forward/Reverse frame synchronization indicator
   e. Last time of frame synchronization lock drop
   f. Percent of time in frame lock since initial lock
   g. Count of frame synchronization lock drops
   h. Count of flywheel CADUs
   i. Count of CADUs received
   j. Count of CADUs discarded
   k. Count of fill VCDUs
   l. Estimated bit error rate based on R-S symbol errors during the SCS
   m. Estimated bit error rate based on CRC symbol errors during the SCS (Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon).
D. Return Link VCDU Service Quality and Accounting Summary Data for each VCDU-ID:
   a. Virtual Channel Identification
   b. Count of VCDUs without errors
   c. Count of VCDUs with corrected errors
   d. Count of VCDU headers without errors
   e. Count of VCDU headers with corrected errors
   f. Count of playback VCDUs
   g. Count of VCDU Sequence Counter discontinuities
   h. Count of VCDUs with CRC errors (Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon).
   i. Playback/Reverse Indicator
E. Return Link Path Service Quality and Accounting Summary Data by APID:
   a. Virtual Channel Identifier
   b. APIDs
   c. Count of Path SDUs demultiplexed from VCDUs, by APID
   d. Count of Path SDU fragments filled, by APID
   e. Count of Path SDU Source Sequence Counter discontinuities, by APID
   f. Count of source VCDU Sequence Counter discontinuities
F. Forward Link Quality and Accounting Summary Data by Physical Channel:

a. Not applicable at this time.

G. Forward Link Quality and Accounting Summary Data by Spacecraft:

a. Count of Command Data Blocks received
b. Volume of Forward link data in octets transferred
c. Count of Command Data Blocks discarded (e.g., due to invalid format)
d. Count of out-of-sequence Command Data Blocks received

H. Ground Communications Service Status Block (Return link interface accounting summary data):

a. Count of Real-Time EDUs transferred to each destination
b. Count of CLCW EDUs transferred to each destination
c. Count of transferred Rate Buffered Path Service EDUs to each destination
d. Count of transferred return link VCDU EDUs (the Spacecraft Trash Buffer) to each destination.

File Name Convention for Rate Buffered Path Service EDUs:

A. Rate Buffered File Identification
B. APID
C. Ground Location Identification
D. Time of SCS Initiation
E. Unique File Number (Identifies a portion of the Rate Buffered data for this APID)
F. File Name Extension (".RBD")

Depending on type, data will be sent to either the test directory or operations directory as specified by the EOC.

File Name Convention for a SCS Summary Report:

A. SCS Summary File Identification
B. Mission Identification
C. Ground Location Identification
D. Time of SCS Initiation
E. File Name Extension (".CSR")

Depending on type, data will be sent to either the test directory or operations directory as specified by the EOC.

File Name Convention for a Trash Buffer:

A. Trash Buffer File Identification
B. Ground Location Identification
C. Time of SCS Initiation
D. Unique File number (Identifies each portion/file storing Trash Buffer rate buffered VCDU EDUs)
E. File Name Extension (".TRD")

Depending on type, data will be sent to either the test directory or operations directory as specified by the EOC.

5.1.2 General Data Formats

The format and content of these general data records are found in multiple Operations Management data messages and/or Operations Management data.

5.1.2.1 EDOS Ground Message Header

EDOS shall apply the Ground Message Header (Table 5.1.2.1-1) preceding the CODA Report, the SCS Summary Report, and the Command Echo Block sent to the EOC.

EOC shall apply the EDOS Ground Message Header to the Command Data Blocks, the Command Test Blocks, and the Space Network and EOSDIS Ground Station schedules prior to sending them to EDOS.

Table 5.1.2.1-1. EDOS Ground Message Header

Item No.	Name	Format & Size	Data Characteristics
1	Message Type/Test Message Type	Unsigned Integer 1 Byte	Range for Message Type -> 0-127, and Range for Test Message type > 128-255 (Test Message Type equals Message Type plus 128). Refer to Table 5.1.2.1-2 for EDOS External Message Type Definitions. This field uniquely identifies the message, and indicates to the receiver what message format to expect and process.
2	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
3	Source Identification	Unsigned Integer 1 Byte	Range -> 0-255, Value -> 1='EDOS', 4='EOC'
4	Destination Identification	Unsigned Integer 1 Byte	Range -> 0-255, Value -> 1='EDOS', 4='EOC'
5	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
6	Message Generation (Date and Time)	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 5.1.2.1-3 for the NASA PB-5 Code Format (containing GMT).
7	Mission's Spacecraft Identification	Unsigned Integer 2 Bytes	Value -> 0=Not applicable for this message, otherwise => 42 = AM-1; Reference ICD Table 5.1.3-2. Spacecraft Identification for the Mission associated with this message.
8	Message Sequence Number	Unsigned Integer 2 Bytes	Range -> 0-65,535; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up per Source Identification, and is assigned by the originator.
9	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0-255 (first byte - identifies a major EDOS release) and 0-255 (second byte - represents a version of the major release - initial version or an update version). For EDOS use only. Other EOS elements may set to zero.
10	Message Length	Unsigned Integer 2 Bytes	Range -> 24 - 65,535 Number of bytes in the message. This value includes the EDOS Ground Message Header plus the attached message's length. A length of 24 means the EDOS Ground Message Header is self contained. A value of zero (0)) indicates that the message is longer than 65,535 bytes (however, messages exchanged via UDP must not be larger than 65,535 bytes)
11	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
Total of 24 bytes exist in the EDOS Ground Message Header.			

Table 5.1.2.1-2. EDOS External Message Type Definitions

EDOS External Message Name	Message Type
Command Test Block	1
Reserved	2
Command Data Block	3

Reserved	4-15
Spacecraft Contact Session (SCS) Summary Report	16
Reserved	17-19
Customer Operations Data Accounting (CODA) Report	20
Reserved	21-23
SN Schedules: 1) S-Band Single Access (SSA) Forward Service, 2) Multiple Access (MA) Forward Service, 3) S-Band Single Access (SSA) Return Service, 4) Multiple Access (MA) Return Service, and 5) K-Band Single Access (KSA) Return Service	24
EPGS Schedules: 1) X-Band Service 2) S-Band Service	25
Reserved	26-127
Test Message Type - equals Message Type plus 128	128-255

Table 5.1.2.1-3. NASA PB-5 Code Format (Option C)

Item No.	Name	Format & Size	Data Characteristics
PB-5 is the format in which the Greenwich Mean Time (GMT) is stored.			
1	Flag Bit	Integer 1 Bit	Value = 1, Reference PB-5 Time Code “option C”.
2	Truncated Julian Day	Unsigned Integer 14 Bits	Range -> Variable; Truncate the most significant decimal digits, retaining only the four least significant decimal digits ranging from 0000 to 9999; The current Julian day epoch begins on October 10, 1995 and continues for a period of 27.379 years.
3	Seconds of Day	Unsigned Integer 17 Bits	Range -> Variable, Seconds-of-day from 0 to 86,399.
4	Milliseconds of a Second	Unsigned Integer 10 Bits	Range -> 0-999
5	Microseconds of a Millisecond	Unsigned Integer 10 Bits	Range -> 0-999
6	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bits	Value -> zero (0).
NASA PB-5 code format (Option C) has 6 items placed within 7 bytes. Refer to Section 2 - Applicable Document 9, for additional information.			

Table 5.1.2.1-4. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Langley TRMM Information System (LATIS)	19	LAT
Reserved for future use	20- 255	N/A

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5.1.3 EDOS Service Header (ESH)

The ESH is generated by EDOS to provide quality and accounting data that is prepended to each return link SDU. Included in the ESH is the Greenwich Mean Time (GMT) in PB-5 format (Table 5.1.2.1-3), spacecraft ID (Table 5.1.3-2), and Virtual Channel Identifier (VCID) (Table 5.3-1). Table 5.1.3-1 defines the ESH.

Table 5.1.3-1. EDOS Service Header

Item No.	Name	Format & Size	Data Characteristics
1	ESH Version Number	Unsigned Integer 4 Bits	Range -> 0- 15. (0=initial version, and incremented by 1 for each ESH modification thereafter)
2	SDU Type	Unsigned Integer 4 Bits	Value -> 0=VCDU, 1= CCSDS Packet (Path SDU), and 2=CLCW. Note: AM-1 provides VCDUs for the spacecraft AM-1 Trash Buffer.
3	Date and Time Annotation of return link SDU receipt at EDOS.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 5.1.2.1-3 for the NASA PB-5 Code Format (containing GMT).
4	EDOS Physical Port Identification	Unsigned Integer 1 Byte	Range -> 0-63
5	Source VCDU Sequence Counter Discontinuity	Logical Bit 1 Bit	Values -> 0=false (No source VCDU discontinuity) and 1=true (source VCDU discontinuity) (EDOS detected discontinuity in the VCDU sequence number-Placed in the ESH of the first SDU from within the first detectable source VCDU following the discontinuity)
6	VCDU contains Playback data	Logical Bit 1 Bit	Values -> 0 = False (non playback data) and 1 = True (playback data) (Data from the on-board spacecraft recorder)
7	Recovery Processing Indicator	Logical Bit 1 Bit	Values -> 0=false (live) and 1=true (data capture playback) (Data is from EDOS's data capture recovery processing).
8	Test data indicator	Logical Bit 1 Bit	Values -> 0=false (live-operational data) and 1=true (EDOS test data)
9	Cyclic Redundancy Check (CRC) failure indicator	Logical Bit 1 Bit	Field is present, but it is not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon. Value=0 (FALSE) for AM-1

Table 5.1.3-1. EDOS Service Header (Continued)

Item No.	Name	Format & Size	Data Characteristics

Table 5.1.3-1. EDOS Service Header (Continued)

Item No.	Name	Format & Size	Data Characteristics
10	Path SDU Source Sequence Counter Discontinuity	Logical Bit 1 Bit	Values -> 0=false (no discontinuity); 1=true (packet discontinuity); EDOS detected discontinuity in SSC for the APID. Not applicable for a VCDU or CLCW.
11	Packet Length Error	Logical Bit 1 Bit	Value -> 0=no detected length error; 1=Detected length error. Flag indicates if an error exists between the Path SDU packet header length field and the actual packet length. This flag does not apply for errors caused by lost data. Not applicable for a VCDU or CLCW.
12	Packet Fill Indicator	Logical Bit 1 Bit	Value -> 0=packet doesn't contain fill data; 1=packet contains fill data. Not applicable for a VCDU or CLCW (flag is set to 0).
13	Fill/Spare, reserved for future use.	Unsigned Integer 2 Bits	Value -> zero (0).
14	Source VCDU-ID	Unsigned Integer 14 Bits	Spacecraft ID and VCID (SCID-8 Bits (Refer to Table 5.1.3-2), and followed by VCID-6 Bits (Refer to Table 5.3-1). (Extracted from VCDU)
15	Location of first octet of EDOS generated fill data for a Path SDU	Unsigned Integer 2 Bytes	Range -> 0 - 65535 (integer offset to start of fill data in Application data field of a Path SDU. 0 points to first octet in Application data field. Not applicable for a VCDU or CLCW.
16	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
17	Reed-Solomon Error Control Flag	Logical Bit 1 Bit	Values -> 0=correctable or no errors; 1=Failed/uncorectable. Flag indicates whether the VCDU failed or passed R-S decoding.

Table 5.1.3-1. EDOS Service Header (Continued)

Item No.	Name	Format & Size	Data Characteristics
18	Source VCDU Header Error Decode Results	Unsigned Integer 5 Bits	Values -> 0=error free. Field contains the number of corrected symbols within the VCDU header. For VCDU service, each ESH is associated with a single VCDU, and contains the statistics generated from that VCDU. For a packet service, each ESH is associated with the statistics summed from all VCDU headers containing a portion of the entire packet (sum of the fields from the parent VCDUs associated with a single packet spanning multiple VCDUs). Field is not applicable for a CLCW.
1 9	Source VCDU error decode results	Unsigned Integer 10 Bits	Values -> 0=error free. Field contains the number of corrected symbols from the entire VCDU. Field is applicable for Grade 2 (with Reed-Solomon) service only. This field is applicable if the Reed-Solomon Error Control Flag contains a value of 0. For VCDU service, each ESH is associated with a single VCDU, and contains the statistics generated from that VCDU. For a packet service, each ESH is associated with the statistics summed from all VCDU headers containing a portion of the entire packet (sum of the fields from the parent VCDUs associated with a single packet spanning multiple VCDUs). For a CLCW, each ESH is associated with the parent VCDU.
The EDOS Service Header has a total of twenty bytes.			

Table 5.1.3-2. Spacecraft Identifier (SCID)

Spacecraft	Identifier *

Refer to Applicable Document 8, Paragraph 6.1.3.1.2.1	
EOS AM-1	42 = x'2A'
*The Return Link identifier is used as the Spacecraft ID.	

5.2 Operations Management Data

The following paragraphs define the content of the Operations Management Data.

For information regarding Operations Management Test Data refer to Paragraph 3.6 of this ICD. EDOS will direct test messages to EOC IP addresses and ports dedicated to test support.

5.2.1 Customer Operations Data Accounting (CODA) Report

EDOS generates CODA Reports during the SCS to describe the operational activities of EDOS per spacecraft, including summary quality information. It does not record information relative to Operations Management data. The summary information reflect statistics about VCDU and packet processing from the low rate channels and physical channel processing from the high rate channels. Complete statistics about data from both the low and high rate channels are provided in the SCS summary report. The reason for this accounting latency is that EDOS neither processes VCDUs from the high rate channels into packets nor provides rate buffering services to its customers until after these VCDUs are transferred from the EDOS GSIF to the EDOS LZPF. During the SCS, high rate VCDUs are stored at the GSIF. The RLSS is initiated after the termination of the SCS, where the data is read from storage at the GSIF and transferred to the LZPF.

Each report contains the updated, accumulated statistics from the beginning of the SCS.

The EOC receives quality and accounting data about the EDOS Return Link Service Status, Forward Link Service Status, and VCDU Service Status as specified in the applicable OA.

Table 5.2.1-1. CODA Report

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 5.1.2.1-1 for a definition of the EDOS Ground Message Header.
CODA Report content indicators			
2	EDOS Return Link Physical Channel Status Block Content Indicator	Logical Bit 1 Bit	Values ->1=True (Information is present)

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
3	EDOS Forward Link Status Block Content Indicator	Logical Bit 1 Bit	Values ->1=True (Information is present)
4	EDOS CCSDS VCDU Service Status Block Content Indicator	Logical Bit 1 Bit	Values -> 1=True (Information is present)
5	EDOS CCSDS Path Service Status Block Content Indicator	Logical Bit 1 Bit	Values -> 0=False (Information is not present
6	Ground Communication Service Status Block Content Indicator	Logical Bit 1 Bit	Values -> 0=False (Information is not present
7	Fill/Spare, reserved for future use.	Unsigned Integer 1 Bit	Value -> zero (0).
8	Fill/Spare, reserved for future use.	Unsigned Integer 1 Bit	Value -> zero (0).
9	Fill/Spare, reserved for future use.	Unsigned Integer 1 Bit	Value -> zero (0).
10	Fill/Spare, reserved for future use.	Unsigned Integer 9 Bytes	Value -> zero (0).
Values specific to this CODA Report for the SCS			
11	CODA Sequence Count for this SCS	Unsigned Integer 2 Bytes	Value -> 0 through 65,535, one-up counter that wraps around, on reaching the largest value, to smallest value.
12	SCS Identification	ASCII 20 Bytes	Unique SCS Identification, assigned by EDOS. (Refer to Table 5.4.5-1)
13	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
EDOS Return Link (RL) Physical Channel Status Block by TGT/EGT Port ID (Note: GSIF statistics for high rate data found in this block are available only by Physical Port ID. The VCID of high rate GSIF data cannot be determined. Low rate data statistics collected at the LZPF are available by VCID.) (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header).			
14	Number of Return Link Physical Ports (RLPP) present	Unsigned Integer 1 Byte	Range -> 0 through 24. If zero, items 14-1.1 through 14-1.16 will not be present.

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
14-1	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
14-1.1	For this RLPP, TGT/EGT Physical Port Identification	ASCII 8 Bytes	Value -> TGT/EGT Port ID or pseudo "Contingency Contact Session" port ID. Left Justified and blank filled on the right.
14-1.2	For this RLPP, EDOS Physical Port Identification	Unsigned Integer 1 Byte	Range -> 0 through 63 EDOS Port ID that receives the data sent via the TGT/EGT Physical Port or "Contingency Contact Session" port ID)
14-1.3	For this RLPP, Fill/Spare, reserved for future use.	Unsigned Integer 4 Bits	Value -> zero (0).
14-1.4	For this RLPP, Frame-synchronization status, Frame Polarity	Logical Bit 1 Bit	Values -> 0=Bits are upright (normal) 1=Bits are inverted (0->1 & 1->0; EDOS changes these bits back to the upright position.
14-1.5	For this RLPP, Frame-synchronization status, Frame Bit Order	Logical Bit 1 Bit	Values -> 0=Bits within a CADU are received in forward order (Always true for AM-1); 1=Bits within a CADU are received in reverse order; EDOS changes these bits within a CADU to their normal forward order position.
14-1.6	For this RLPP, Frame-synchronization status, Frame Synchronization Mode	Unsigned Integer 2 Bits	Values -> 0=Lockon=continuous good frame sync patterns exist. 1=Flywheel=in lock with less than "n" CADUs received with a bad frame synch pattern (between lockon and search). 2=Search(ing) for a good frame sync pattern. 3=Check=some good frame sync patterns received, checking for "n" good frame sync patterns (prior to Lockon).
14-1.7	For this RLPP, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
14-1.8	For this RLPP, Count of frame synchronization pattern errors	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of Frame Sync patterns received with bit errors (within tolerance - between Lockon Mode and Flywheel Mode).

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
14-1.9	For this RLPP, Count of Channel Access Data Units (CADUs) received.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Total number CADUs received.
14-1.10	For this RLPP, Count of flywheel CADUs	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number instances when still in the Lock Mode that a valid frame sync pattern was not detected.
14-1.11	For this RLPP, Count of frame synchronization losses	Unsigned Integer 4 Bytes	Value -> 0 through 4,294,967,295 Number instances when frame sync went from Lock Mode to the Search Mode (exceeded the frame sync Flywheel error threshold)
14-1.12	For this RLPP, Count of uncorrectable VCDUs	Unsigned Integer 4 Bytes	Value -> 0 through 4,294,967,295 Number of VCDUs with errors that were uncorrectable by Reed Solomon (Grade 2 service for AM-1).
14-1.13	For this RLPP, Count of VCDUs with Cyclic Redundancy Check (CRC) errors	Unsigned Integer 4 Bytes	Value -> 0 through 4,294,967,295 Note: Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon.
14-1.14	For this RLPP, Number of Virtual Channel Identifiers (VCIDs) found	Unsigned Integer 1 Byte	Range -> 0 through 255. If zero, items 14-1.14.2 through 14-1.14.8 will not be present. For GSIF RLPP, Value -> one (1)
14-1.14.1	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
14-1.14.2	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
14-1.14.3	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 10 Bits	Value -> zero (0).
14-1.14.4	VCID	Unsigned Integer 6 Bits	Range -> 1 through 63 for LZPF RLPP, Refer to Table 5.3-1. For GSIF RLPP, Value -> zero (0)

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
14-1.14.5	For this VCID, Count of correctable VCDUs, by VCDU-ID	Unsigned Integer 4 Bytes	Value -> 0 through 4,294,967,295 Number of VCDUs corrected by Reed Solomon (Grade 2 service for AM-1), plus VCDUs with no errors (VCDU-ID = SCID & VCID). For GSIF RLPP (high rate) data, the value represents the aggregate count for all VCIDs. For LZPF SCS (low rate) data, the value represents the count for this VCID.
14-1.14.6	For this VCID, Count of symbols corrected for VCDUs, by VCDU-ID	Unsigned Integer 4 Bytes	Value -> 0 through 4,294,967,295 Number of symbols with errors that were corrected by Reed Solomon (Grade 2 service for AM-1) (VCDU-ID = SCID & VCID). For GSIF RLPP (high rate) data, the value represents the aggregate count for all VCIDs. For LZPF SCS (low rate) data, the value represents the count for this VCID.
14-1.14.7	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
14-1.14.8	For the next VCID, repeat the above items (14-1.14.2 through 14-1.14.7) (if applicable)		
14-1.15	For this RLPP, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
14-1.16	For the next RLPP, repeat the above items (14-1.1 through 14-1.15) (if applicable)		
EDOS Forward Link (FL) Status Block (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header.)			
15	For this Spacecraft (SC), Count of Command Data Blocks received	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power, less 1).
15-1	For this SC, Count of Command Data Blocks discarded due to EDOS buffer overflow or invalid EDOS Ground Header	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power, less 1).
15-2	For this SC, Count of out of sequence Message Sequence Numbers in Ground Message Headers' received from the EOC	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 (2 to the 32nd power, less 1).
15-3	For this SC, Number of Forward Link Physical Ports (FLPP)	Unsigned Integer 1 Byte	Range -> 0 through 6. If zero, items 15-3.2 through 15-3.7 will not be present.

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
15-3.1	For the FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
15-3.2	For this FLPP, TGT/EGT Physical Port Identification	ASCII 8 Bytes	Value -> TGT/EGT Port ID or pseudo "Contingency Contact Session" port ID. Left Justified and blank filled on the right.
15-3.3	For this FLPP, EDOS Physical Port Identification	Unsigned Integer 1 Byte	Range -> 0 through 63 EDOS Port ID that sent the data sent via the TGT/EGT Physical Port or "Contingency Contact Session" port ID).
15-3.4	For this FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
15-3.5	For this FLPP, Count of Command Data Blocks transferred by TGT/EGT FLPP ID.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power, less 1).
15-3.6	For this FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
15-3.7	For the next FLPP, repeat items (15-3.2 through 15-3.6) above (if applicable)		
15-4	For this SC, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
EDOS CCSDS VCDU Processing Status Block (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header.)).			
16	Number of VCIDs for this SCID	Unsigned Integer 1 Byte	Range -> 0 through 255 If zero, items 16-1.1 through 16-3 will not be present.
16-1	For this VCID, Fill/Spare. reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
16-1.1	For this VCID, Fill/Spare. reserved for future use.	Unsigned Integer 10 Bits	Value -> zero (0).
16-1.2	VCID	Unsigned Integer 6 Bits	Range -> 0 through 63, Refer to table 5.3-1.

Table 5.2.1-1. CODA Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
16-1.3	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
16-1.4	For this VCID, Count of VCDU Sequence Counter discontinuities, for this VCDU-ID	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Note: Number of discontinuities in the VCDU sequence numbers (VCDU-ID = SCID & VCID).
16-1.5	For this VCID, Count of stored return link VCDU EDUs, for this VCDU-ID	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of stored return link VCDU EDUs, by SCID and VCID.
16-2	For this VCID, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
16-3	For the next VCID, repeat the above items (16-1.1 through 16-2) (if applicable)		

5.2.2 SCS Summary Report

EDOS transmits the SCS Summary Report to the EOC within five (5) minutes of the completion of rate buffered services. It contains a statistical summary for the SCS and associated CODA Reports sent during that single contact period as shown in Table 5.2.2-1.

Table 5.2.2-1. SCS Summary Report

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 5.1.2.1-1 for a definition of the EDOS Ground Message Header.
2	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
3	Values specific to this SCS Summary Report for the SCS		
3-1	SCS Identification	ASCII 20 Bytes	Unique SCS Identification, assigned by EDOS. (Refer to Table 5.4.5-1)
3-2	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
4	Return Link Physical Channel Quality and Accounting Summary Data, by Ground Terminal Physical Port that was active during this SCS. (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header).		

4-1	Number of Return Link (RL) Physical Ports present	Unsigned Integer 1 Byte	Range -> 0-24. If zero, items 4-1.2 through 4-1.20 will not be present
4-1.1	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-1.2	For this RLPP, Ground Terminal Physical Port Identification	ASCII 8 Bytes	Value -> Ground Terminal Port ID or pseudo “Contingency Contact Session” port ID. Left Justified and blank filled on the right.

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-1.3	For this RLPP, EDOS Physical Port Identification	Unsigned Integer 1 Byte	Range -> 0-63 EDOS Port ID that receives the data sent via the Ground Terminal Physical Port or "Contingency Contact Session" port ID.
4-1.4	For this RL Ground Terminal Physical Port, initial time of frame synchronization lock	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 5.1.2.1-3 for the NASA PB-5 Code Format (containing GMT).
4-1.5	For this RL Ground Terminal Physical Port, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4-1.6	For this RL Ground Terminal Physical Port, last time of frame synchronization lock	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 5.1.2.1-3 for the NASA PB-5 Code Format (containing GMT).
4-1.7	For this RL TGT/EGT Physical Port, fill/Spare, reserved for future use.	Unsigned Integer 7 Bits	Value -> zero (0).
4-1.8	For this RL Ground Terminal Physical Port, forward/Reverse frame synchronization indicator	Logical Bit 1 Bit	Values -> 0=Bits within a CADU are received in forward order (Always true for AM-1); 1=Bits within a CADU are received in reverse order; EDOS changes these bits within a CADU to their normal forward order position.
4-1.9	For this Ground Terminal Physical Port, last time of frame synchronization lock drop	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 5.1.2.1-3 for the NASA PB-5 Code Format (containing GMT).
4-1.10	For this RL Ground Terminal Physical Port, percent of time in frame lock since initial lock	Unsigned Integer 2 Bytes	Range -> 0- 10,000 (Multiply the original percent value by 10,000 and insert here, and divide the value stored here by 10,000 to obtain the original percent (represents a number from 0 through 1, to include 4 decimal places (Example: .9999)) Time in frame sync lock divided by (Time SCS terminated minus time of initial SCS lock)
4-1.11	Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
4-1.12	For this RL Ground Terminal Physical Port, count of frame synchronization lock drops	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number instances when frame sync went from Lock Mode to the Search Mode (exceeded the frame sync Flywheel error threshold)
4-1.13	For this RL Ground Terminal Physical Port, count of flywheel CADUs	Unsigned Integer 4 Bytes	Range -> 1-4,294,967,295 Number instances when still in the Lock Mode that a valid frame sync pattern was not detected.
4-1.14	For this RL Ground Terminal Physical Port, count of CADUs received	Unsigned Integer 4 Bytes	Range -> 1-4,294,967,295 Total number CADUs received.

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-1.15	For this RL Ground Terminal Physical Port, count of CADUs discarded	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 EDOS informs its Return Link Formatter Component to discard or forward uncorrectable CADUs (CVCDUs/VCDUs). When discarded, this item contains the number of CADUs (CVCDUs/VCDUs) that were uncorrectable/discarded. When forwarded, this item contains a value of zero (0).
4-1.16	For this RL Ground Terminal Physical Port, count of fill VCDUs	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 (Instruments do not generate data at the spacecraft's downlink rate of 150 Mbits per second, so the spacecraft generates fill CADUs (for the real-time science data) to make up the difference between the two rates)
4-1.17	For this RL Ground Terminal Physical Port, estimated bit error rate based on R-S symbol errors during the SCS	Unsigned Integer 2 Bytes	Range -> 0- 10,000 (Multiply the original percent value by 10,000 and insert here, and divide the value store here by 10,000 to obtain the original percent (represents a number from 0 through 1, to include 4 decimal places (Example: .9999)) ((Number of R-S symbols corrected times the number of bits per symbol) plus (the number of uncorrectable VCDUs times the number of bits per VCDU)) divided by (the number of VCDUs received times the number of bits per VCDU).
4-1.18	For this RL Ground Terminal Physical Port, estimated bit error rate based on Cyclic Redundancy Check (CRC) symbol errors during the SCS	Unsigned Integer 2 Bytes	Range -> 0- 10,000 (Multiply the original percent value by 10,000 and insert here, and divide the value store here by 10,000 to obtain the original percent (represents a number from 0 through 1, to include 4 decimal places (Example: .9999)) Field is present, but its not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon. Number of uncorrectable VCDUs divided by the number of VCDUs received.
4-1.19	For this RL Ground Terminal Physical Port, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
4-1.20	For the next Return Link Physical Port, repeat items (4-1.2 - 4-1.19)		
5	Return Link VCDU Processing Quality and Accounting Summary Data, by VCDU-ID (SCID & VCID) for this SCS (Except for fill VCDUs (For AM-1 VCID 63 = x'3F')) (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header.)		
5-1	Number of VCIDs	Unsigned Integer 1 Byte	Range -> 0-255. If zero, items 5-1.2 through 5-1.14 will not be present.
5-1.1	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
5-1.2	Virtual Channel Identifier (VCID)	Unsigned Integer 1 Byte	Range -> 0-63, Refer to Table 5.3-1.
5-1.3	For this VCID, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
5-1.4	For this VCID, count of VCDUs without errors	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number VCDUs containing no errors.
5-1.5	For this VCID, count of VCDUs with corrected errors	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of VCDUs corrected by Reed Solomon (Grade 2 service for AM-1),
5-1.6	For this VCID, count of VCDU headers without errors	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number VCDU headers containing no errors.
5-1.7	For this VCID, count of VCDU headers with corrected errors	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number VCDUs that didn't pass the error checks but were able to be corrected.
5-1.8	For this VCID, count of playback VCDUs	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of VCDUs played back from the on-board spacecraft recorder.
5-1.9	For this VCID, count of VCDU Sequence Counter discontinuities	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Note: Number of discontinuities in the VCDU sequence numbers.
5-1.10	For this VCID, count of VCDUs with Cyclic Redundancy Check (CRC) errors	Unsigned Integer 4 Bytes	Value -> 0-4,294,967,295 Note: Field is present, but it is not applicable for AM-1. AM-1 is a Grade 2 service using Reed-Solomon.
5-1.11	For this VCID, fill/Spare, reserved for future use.	Unsigned Integer 7 Bits	Value -> zero (0).
5-1.12	For this VCID, Playback/Reverse Indicator	Logical Bit 1 Bit	Values -> 0=Bits are received in forward order (Always true for AM-1); 1=Bits are received in reverse order; EDOS changes these bits to their normal forward order position.
5-1.13	For this VCID, fill/Spare, reserved for future use.	Unsigned Integer 7 Bytes	Value -> zero (0).
5-1.14	For the next VCID, repeat items (5-1.2 - 5-1.13) if applicable		
6	Return Link CCSDS Packet Processing Quality and Accounting Summary Data by APID for this SCS (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header.)		
6-1	Number of VCIDs	Unsigned Integer 1 Byte	Range -> 0-255. If zero, items 6-1.2 through 6-1.5 will not be present.
6.1-1	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
6-1.2	Virtual Channel Identifier (VCID)	Unsigned Integer 1 Byte	Range -> 0-63, Refer to Table 5.3-1
6-1.3	For this VCID, number of APIDs	Unsigned Integer 1 Byte	Range -> 0-255
6-1.3.1	Fill/Spare, reserved for future use.	Unsigned Integer 2 Byte	Value -> zero (0).
6-1.3.2	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
6-1.3.3	For this VCID, APID (SCID and APID)	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 5.1.3-2), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 5.3.1-1)).
6-1.3.4	For this VCID and APID, count of Path SDUs demultiplexed from VCDUs, for this APID and VCDU-ID	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of Path SDUs extracted, for this VCID and APID.
6-1.3.5	For this VCID and APID, count of Path SDU fragments filled, for this APID and VCDU-ID	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Count of Path SDUs padded to fill to the indicated length in the packet header, for this VCID and APID pair.
6-1.3.6	For this VCID and APID, count of Path SDU Source Sequence Counter discontinuities	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Note: Number of discontinuities in the Path SDU SSC.
6-1.3.7	For this VCID and APID, count of source VCDU Sequence Counter discontinuities	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Note: Number of discontinuities in the VCDU sequence numbers.
6-1.3.8	For this VCID and APID, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
6-1.3.9	For the next APID for this VCID, repeat items (6-1.3.2 - 6-1.3.8) (if applicable)		
6-1.4	For this VCID, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
6-1.5	For the next VCID, repeat items (6-1.2 - 6-1.4).		
7	Forward Link Quality and Accounting Summary Data by Physical Channel for this SCS		
7-1	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
8	Forward Link Quality and Accounting Summary Data by SCID for each SCS (Note: The spacecraft identifier is shown Table 5.1.3-2 and in item 7 of the EDOS Ground Message Header.)		
8-1	For this SCID, count of Command Data Blocks received	Unsigned Integer 8 Bytes	Range -> 0 - (2 to the 64th power, less 1).

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
8-2	For this SCID, volume of Forward link data in octets transferred	Unsigned Integer 8 Bytes	Range -> 0 - (2 to the 64th power, less 1).
8-3	For this SCID, count of Command Data Blocks discarded due to invalid format	Unsigned Integer 8 Bytes	Range -> 0 - (2 to the 64th power, less 1).
8-4	For this SCID, count of out-of sequence Command Data Blocks received	Unsigned Integer 8 Bytes	Range -> 0 - (2 to the 64th power, less 1).
8-5	For this SCID, Number of Forward Link Physical Ports (FLPP)	Unsigned Integer 2 Bytes	Range -> 0 through 6. If zero, items 8-5.2 through 8-5.7 will not be present.
8-5.1	For the FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
8-5.2	For this FLPP, Ground Terminal Physical Port Identification	ASCII 8 Bytes	Value -> Ground Terminal Port ID or pseudo “Contingency Contact Session” port ID. Left Justified and blank filled on the right.
8-5.3	For this FLPP, EDOS Physical Port Identification	Unsigned Integer 2 Bytes	Range -> 0 through 63 EDOS Port ID that sent the data sent via the Ground Station Physical Port or “Contingency Contact Session” port ID).
8-5.4	For this FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
8-5.5	For this FLPP, Count of Command Data Blocks transferred by Ground Station FLPP ID.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 (2 to the 32nd power, less 1).
8-5.6	For this FLPP, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
8-5.7	For the next FLPP, repeat items (8-5.2 through 8-5.6) above (if applicable)		
8-6	For this SCID, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
9	Ground Communications Service Status Block (EDOS-EGS element return link interface accounting summary data)		
9-1	Number destinations EDOS transferred EDUs for this SCS	Unsigned Integer 1 Byte	Range -> 0-255 If zero, items 9-1.2 through 9-1.9 will not present.
9-1.1	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 5.2.2-1. SCS Summary Report (Continued)

Item No.	Name	Format & Size	Data Characteristics
9-1.2	Destination Identification	Unsigned Integer 1 Byte	Range -> 0-255, Reference ICD Table 5.1.2.1-4.
9-1.3	Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
9-1.4	For this destination, count of transferred return link Real-time EDUs via the Real-time service.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of transferred return link EDUs.
9-1.5	For this destination, count of transferred return link CLCW EDUs via the Real-time service.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of transferred return link EDUs.
9-1.6	For this destination, count of transferred return link EDUs via the Rate Buffer service.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of return link EDUs delivered to this destination as rate buffered EDUs.
9-1.7	For this destination, count of transferred return link VCDU EDUs.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295 Number of return link AM-1 Trash Buffer EDUs delivered to this destination.
9-1.8	For this destination, fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
9-1.9	For the next destination, repeat the above items (9-1.2 - 9-1.8) (if applicable)		

5.3 Mission Data

The following paragraphs define the content of the Mission Data.

Refer to Section 3 of this ICD, Paragraph 3.6 for information regarding mission test data. In addition, EDOS will direct test messages to EOC ports dedicated to test support as described in paragraph 4.1.1 of this ICD.

Table 5.3-1. Virtual Channel Identifier

Virtual Channel	Identifier (VCID)
Refer to Section 2, Applicable Document 8, Paragraph 6.1.3.1.2.2	
H/K Telemetry and Playback	1 = x'1'
H&S Telemetry and Standby Telemetry	2 = x'2'
Diagnostic Telemetry	3 = x'3'
CERES, MOPITT, Ancillary Data, and H/K Telemetry Playback	11 = x'B'
Visible and Near Infrared Radiometer (VNIR(1))	17 = x'11'

Short-wavelength Infrared Radiometer (SWIR)	18 = x'12'
Thermal Infrared Radiometer (TIR)	23 = x'17'
Visible and Near Infrared Radiometer (VNIR(2))	30 = x'1E'
MISR	41 = x'29'
MODIS	42 = x'2A'
Fill CADUs	63 = x'3F'

5.3.1 Path SDU Description

The spacecraft returns Advanced Orbiting Systems (AOS) Version 1 CCSDS Packets through the Space Network and ground terminals to EDOS. Path Service (Section 2 of this ICD, Applicable Document 8 - Paragraph 6.1.1 and Applicable Document 4 - Paragraphs 2.3.1.2.a and 3.3.3.a) transfers variable-length application-layer SDUs (Version-1 CCSDS Packets) through the Space Network to the Ground Network. Each SDU contains a delimited string of octets of user application data. The Path Service is asynchronous and non-sequence preserving. It is primarily used for transferring, at moderate to very-high data rates, large volumes of structured delimited data units between fairly static source and destination associations.

The Path SDU (Figure 5.3.1-1), referred to as a Version-1 CCSDS Packet, consists of a Primary Header, which is 6 octets long, a Secondary Header, which is 9 octets long, and the Application Data which is variable in length.

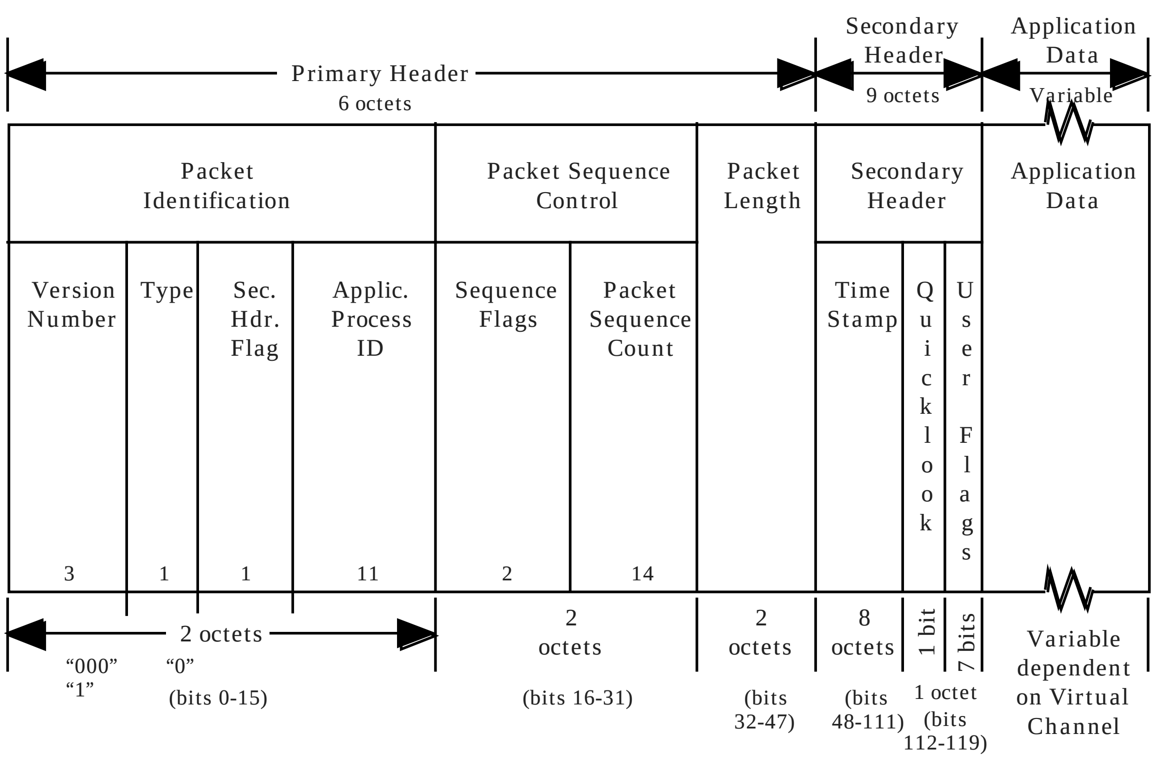

Figure 5.3.1-1. Path Service Data Unit (SDU) (Version-1 CCSDS Packet Format)

Primary Header: The Primary Header consists of 2 octets of packet identification, 2 octets of packet sequence control, and 2 octets of packet length

- Packet Identification (2 Octets)

Bits 0 through 2 contain the Version Number. These three bits shall be set to "000", signifying the Version-1 CCSDS Packet.

Bit 3 contains the Type bit. The Type bit is not used within the CCSDS Advanced Orbiting Systems; however, the Type bit is set to "0" indicating a telemetry packet

Bit 4 contains the Secondary Header Flag. All spacecraft telemetry and science data packets have secondary headers. The flag is set to value "1".

Bits 5 through 15 contain the Application Process Identifier (APID). The APID uniquely identifies the individual application process within the Spacecraft which created the application data in the CCSDS Packet. The APIDs for H/K telemetry, Health and Safety (H&S) telemetry and diagnostic telemetry are the same as their virtual channel identification numbers in the downlink. The non-science APID assignments of interest to EOC are as shown in Table 5.3.1-1. APIDs remain fixed throughout the spacecraft's mission life.

- Packet Sequence Control (2 Octets)

Bits 16 and 17 contain the Sequence Flags. The Sequence Flags indicate the sequence of the data in the VCDU relative to a packet. These flags are not processed by EDOS.

Table 5.3.1-1. Source (Instrument) Identification/APID Allocations

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s)
Non-Science Data		
Housekeeping	1 = x'1'	1 = x'1'
Housekeeping Playback	11 = x'B'	1 = x'1'
Health & Safety	2 = x'2'	2 = x'2'
Diagnostic	3 = x'3'	3 = x'3'
	[row deleted from proposed revision of the table]	
Standby	2 = x'2'	5 = x'5'
Diagnostic	3 = x'3'	6 = x'6'
Trash Buffer	"Other" than the valid VCIDs listed in Table 5.3-1	(high rate dump)
Command Link Control Word	0 = x'0'	(NONE) They only arrive in 1 and 16 Kbps channels
Forward Link Command Data Block	0 = x'0'	0 = x'0'

Bits 18 through 31 contain the Packet Sequence Count. All telemetry packets contain a sequence number. This field is a monotonically increasing field returning to zero upon exceeding the maximum value of 16,383.

- Packet Length (2 Octets)

Bits 32 through 47 contain the Packet Length. The Packet Length field contains a sequential 16-bit binary count of the length "C" (in octets) of the packet excluding the primary header. The field shall be the count of the total number of octets which occur in the packet following the last bit of the Primary Header, expressed as: C = { (number of octets) -1 }.

Secondary Header: The Secondary Header contains the Time Stamp within 8 octets, and the Quick-Look and User Flags within 1 octet.

Bits 48 through 111, the Time Stamp (Time Code) field (Table 5.3.1-2), contains the 64-bit CCSDS Day Segmented Time Code (Reference Document number 11, Section 2.1.2 of this ICD)). This applies to the H/K telemetry, the H&S telemetry, the diagnostic telemetry, and the science data.

Bit 112, the Quick-Look flag is set and reset by command. The Quick-Look flag is true when its value is "1".

Bits 113 through 119 contain the User Flags. The seven flags, 1-bit each, are reserved and are set to "0".

Table 5.3.1-2. Spacecraft Time Format (Time Stamp/Time Code)

Data Word No. (*)	Starting (MSB) Bit (**)	No. Bits (***)	Description	Units	Format	Scaling
1	0	16	Days since 1958 January 1 (****)	Days	US	0
2/3	0	32	Millisecond of Day (number milliseconds since beginning of current day)	msec	US	0
4	0	16	Microsecond of Millisecond (number microseconds in current millisecond)	micro-sec	US	0

Notes:

(*) - Word 1 is the first data word transmitted

(**) - Bit 0 is the first bit transmitted

(***) - Values which extend beyond the end of a 16-bit data word are continued starting bit 0 of the next data word.

**** - The first seven bits of the day field, the P field, are implied and not actually transmitted (i.e., this information is not included in the Spacecraft Time Stamp). These seven bits are: "1000001" (reading left to right: bits "100"=Day Segmented, "0"=1958 1 epoch, "0"=16-bit day segment, and "01"=Microsecond resolution.

US - Unsigned

MSB - Most significant bit

- Application Data: The Application Data contains the variable length Telemetry data characteristics.

The application data contains the source data from the corresponding sensor/instrument.

5.3.2 Real-time Path Service EDU

The Spacecraft returns Version 1 CCSDS Packets through the Space Network and ground terminals to EDOS. EDOS demultiplexes the CCSDS packets from the VCDUs designated by management information to contain multiplexed packets. The resulting packet is the Path Service Data Unit (SDU). The packet quality and accounting data are placed in the ESH. EDOS attaches the ESH to the low-rate, non-science Path SDUs (refer to Table 5.3.2-1), and transmits them as Real-time Path Service EDUs to the EOC. EDUs are transferred to EOC in the same order as the corresponding SDUs are received by EDOS.

Table 5.3.2-1. Real-time Path Service EDU

Item No.	Name	Format	Data Characteristics
1	EDOS Service Header (ESH) (Refer to Table 5.1.3-1)	Integer Formatted 20 Bytes	Variable
2	Path SDU	Integer Formatted Variable	Variable - Refer to Figure 5.3.1-1.

5.3.3 Rate Buffered Data

EDOS performs the rate buffering service on a Return Link Channel containing H/K Telemetry Playback Path Service data. Throughout a SCS, an EDOS Service Header (ESH) is added to the front of each non-science, H/K telemetry Playback Path SDU (refer to paragraph 4.2.1 of this ICD to compose an EDU. EDUs are sequentially stored/buffered as a Path Service EDU for a specific APID. Path Service EDUs are stored in the order of receipt of the Path SDUs as shown in Table 5.3.3-1.

Rate buffered data also include VCDU EDUs that contain VCDUs with unknown VCIDs (i.e., the Spacecraft Trash Buffer contents). The VCDU EDUs are sequentially stored in a file in the same order in which that EDOS received the relevant VCDUs.

EDOS stores Rate Buffered Path Service EDUs in files up to the maximum size specified in the applicable OA (refer to paragraph 5.4.1 of this ICD for the file naming convention). An EDU (ESH and Path SDU pair) shall not be split across file boundaries.

Table 5.3.3-1. Rate Buffered EDU

Item No.	Name	Format & Size	Data Characteristics
1	EDUs (ESH and SDUs)		
1-1	EDOS Service Header (ESH)	Integer Formatted 20 Bytes	Variable -> Refer to paragraph 5.1.3
1-2	SDU	Integer Formatted for Path SDUs or 1024 bytes for VCDUs	Variable -> Refer to Figure 5.3.1-1.
1-3	Repeat of items 1-1 and 1-2 for each EDU for the entire SCS		

5.4 File Name Conventions

The name of a file that stores EDOS data sent electronically via FTP follows one of the conventions shown below.

5.4.1 File Name Convention for Rate Buffered Path Service EDUs

When EDOS stores a file containing rate buffered data in an EOC directory via FTP, the file name will be a string of ASCII characters in the format shown in Table 5.4.1-1. Content of the items for the Ground Location Identification and time are an exact copy of the fields in the corresponding SCS Identification for this Rate Buffered data.

Test EDUs will be transmitted to a test directory; operations data will be transmitted to an operations directory.

Table 5.4.1-1. Rate Buffered Path Service EDU File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> R; Identifies the file as containing Rate Buffered Path Service EDUs.
2	APID for the Rate Buffered Path Service EDUs	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 5.1.3-2), followed by APID-4 Bytes (Refer to Table 4.2.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left).
3	Ground Location Identification	ASCII 3 Bytes	Value -> Refer to Table 5.1.2.1-4 for the EDOS Source Identification (Ground Location receiving the Spacecraft return link data in CCSDS format). This value is a copy of the Ground Location Identification in the SCS Identification in Table 5.4.5-1.
4	Time of SCS initiation	ASCII 11 Bytes	Value -> Refer to Table 5.4.6-1 for a definition of the GMT/ZULU time, in ASCII format, when the SCS and this Rate Buffered Path Service, was initiated. This time is a copy of the GMT time in the SCS Identification in Table 5.4.5-1.
5	Unique File number.	ASCII 2 Bytes	Range -> 00 through 99 Rate Buffered Path Service EDUs (EDUs for one APID within one SCS) reside in one or more File(s), and this file number uniquely identifies each portion/file storing those EDUs.
6	Rate Buffered Data File Extension	ASCII 4 Bytes	Value-> ".RBD"
A Rate Buffered Path Service EDU File Name contains a total of 28 Bytes. Example: R0420001WSG9515523595900.RBD			

5.4.2 File Name Convention for a SCS Summary Report

When EDOS stores a SCS Summary Report in an EOC directory via FTP, the file name storing the report is shown in Table 5.4.2-1. Content of the items for the Mission Identification, Ground Location Identification, and time are an exact copy of the fields in the SCS corresponding Identification when the SCS was initiated.

Test files will be transmitted to a test directory; operations data will be transmitted to an operations directory.

Table 5.4.2-1. SCS Summary Report File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> S; Identifies the file as containing a SCS Summary Report.

2	Mission Identification	ASCII 3 Bytes	Value -> SCID Return Link Identification -> Refer to Table 5.1.3-2. (Contains a decimal value that is right justified and, if necessary, zero filled on left). This value is a copy of the Mission Identification in the SCS Identification in paragraph 5.4.5 from when the SCS was initiated.
3	Ground Location Identification	ASCII 3 Bytes	Value -> Refer to Table 5.1.2.1-4 for the EDOS Source Identification (Ground Location receiving the Spacecraft return link data in CCSDS format). This value is a copy of the Ground Location Identification in the SCS Identification in paragraph 5.4.5 from when the SCS was initiated.
4	Time of SCS initiation	ASCII 11 Bytes	Value -> Refer to Table 5.4.6-1 for a definition of the GMT/ZULU time in ASCII format. This time is a copy of the GMT time in the SCS Identification in paragraph 5.4.5 from when the SCS was initiated.
5	SCSSR File Name Extension	ASCII 4 Bytes	Value->".CSR"
A SCS File name contains a total of 22 Bytes. Example: S042WSG95123235959.CSR			

5.4.3 File Name Convention for Spacecraft Trash Buffer VCDUs

File names that identify files storing the Spacecraft's Trash Buffer data EDUs contain all ASCII characters shown in Table 5.4.3-1. Content of the items for the Ground Location Identification and time are an exact copy of the fields in the corresponding SCS Identification for this Trash Buffer data.

Test EDUs will be transmitted to a test directory; operations data will be transmitted to an operations directory.

Table 5.4.3-1. Trash Buffer File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> T; Identifies the file as containing Trash Buffer data (VCDU EDU).
2	Ground Location Identification	ASCII 3 Bytes	Value -> Refer to Table 5.1.2.1-4 for the EDOS Source Identification (Ground Location receiving the Spacecraft return link data in CCSDS format). This value is a copy of the Ground Location Identification in the SCS Identification in paragraph 5.4.5-1 from when the SCS was initiated.
3	Time of SCS initiation	ASCII 11 Bytes	Value -> Refer to Table 5.4.6-1 for a definition of the GMT/ZULU time, in ASCII format, when the SCS, was initiated. This time is a copy of the GMT time in the SCS Identification in paragraph 5.4.5-1 from when the SCS was initiated.

4	Unique File number.	ASCII 2 Bytes	Range -> 00 through 99 Trash Buffer data (VCDUs with invalid AM-1 VCIDs for one SCS) reside in one or more files, and this file number uniquely identifies each portion/file storing this data.
5	Trash Buffer File Name Extension	ASCII 4 Bytes	Value->".TRD"
A Trash Buffer File Name contains a total of 21 Bytes. Example: TWSG9515523595900.TRD			

5.4.4 Signal File Naming Convention

The signal file name consists of the extension ".XFR" appended to the name of the data file referenced by the signal file, including its file name extensions. See the description of the signal file in Section 3.5 of this ICD.

The following example (Table 5.4.4-1) illustrates a signal file for rate buffered data.

Table 5.4.4-1. Signal File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	Name of file to transferred via FTP	ASCII String	For example, A Rate Buffered Path Service EDU File Name contains a total of 28 Bytes. Example: R0420001WSG9515523595900.RBD
2	Transfer File Name Extension	ASCII 4 Bytes	Value->".XFR"
A Rate Buffered Path Service EDU Signal File Name contains a total of 32 Bytes. Example: R0420001WSG9515523595900.RBD.XFR			

5.4.5 SCS Identification

A SCS identification contains all ASCII characters in the format shown in Table 5.4.5-1. The time item within this identification records when the SCS was initiated on EDOS.

Table 5.4.5-1. SCS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> T. Identifies the data structure as a SCS Identification.
2	Mission Identification.	ASCII 3 Bytes	Value -> SCID Return Link Identification -> Refer to Table 5.1.3-2 (Contains SCID decimal value, right justified and, if necessary, zero filled on left).

3	Ground Location Identification	ASCII 3 Bytes	Value ->Refer to Table 5.1.2.1-4
4	Time of SCS initiation.	ASCII 11 Bytes	Value -> YYDDDHHMMSS where YY=last 2 digits of year, DDD=day of year, HH=hour, MM=minute, SS=second
5	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> “00”
A SCS Identification contains a total of 20 Bytes. Example: T042WSG9536623595900			

5.4.6 Greenwich Mean Time (GMT) in ASCII Format

The GMT data structure, in ASCII format that is used throughout this ICD, is as shown in Table 5.4.6-1.

Table 5.4.6-1. Greenwich Mean Time in ASCII Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	ASCII 2 Bytes	Value ->00 - 99; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian Day	ASCII 3 Bytes	Value -> 001-366; contains the Julian day (from the GMT/ZULU).
3	Hour	ASCII 2 Bytes	Value -> 00 - 23; contains the hour (from the GMT/ZULU).
4	Minute	ASCII 2 Bytes	Value -> 00 - 59; contains the minute (from the GMT/ZULU).
5	Second	ASCII 2 Bytes	Value -> 00 - 59; contains the second (from the GMT/ZULU).
This GMT/ZULU ASCII format contains 11 bytes. Example: 95366235959			

5.5 Command Link

The Spacecraft returns Telemetry (TM) VCDUs containing the Command Link Control Word (CLCW) (Section 2 of this ICD, Applicable Document 8, and Reference Document 4 - Paragraph 5.1.5.1) through the ground terminals to EDOS.

The primary mechanism within the Telecommand (TC) System for reporting command transfer status and verification information to the sending end (EOC) is the CLCW. The CLCW contains information regarding the receipt of TC Transfer Frames command uplink status (errors, omissions, and successes). The CLCW is periodically sampled by the TM System and is returned to the sending end of the Telecommand System via the CLCW word in the trailer of the standard CCSDS TM Transfer Frame. The information conveyed in the CLCW is used by the sending end of the Telecommand System to continue, retransmit or otherwise modify the transmission of the stream of TC Transfer Frames.

5.5.1 Command Link Control Word (CLCW) EDOS Data Unit (EDU)

EDOS supports CCSDS Advanced Orbiting System (AOS) Grade-2 and Grade-3 services with the EOS spacecraft. EDOS extracts CLCWs from the Coded Virtual Channel Data Units (CVCDUs) of the return link Virtual Channel (VC). EDOS builds the CLCW EDU (as shown in Table 5.5.1-1) to contain the EDOS Service Header and the CLCW; and transmits the CLCW EDU in real-time to the EOC in support of Telecommand operations procedures.

Table 5.5.1-1. CLCW EDU

Item No.	Name	Format & Size	Data Characteristics
1	ESH	Integer Formatted 20 Bytes	Variable -> Refer to Table 5.1.3-1
2	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
3	Command Link Control Word (CLCW)	Integer 4 Bytes	Range -> Refer to Paragraph 5.5.

5.5.2 Command Data Block

EDOS receives the forward link Command Data Block, (Table 5.5.2-1), containing an EDOS Ground Message Header and Command Data Blocks, from the EOC. The Command Data Block is completely constructed and ready for subsequent processing. EDOS does not perform any verification on Command Data Blocks. EDOS forwards the Command Data Blocks to the ground stations for forwarding to the spacecraft.

In the event of a Space Network outage or emergency, EOC will send the forward link data to EDOS, and direct EDOS to transmit this data, via EBnet, to a contingency network (WOTS, AGS, or SGS) for uplink to the AM-1 spacecraft.

Table 5.5.2-1. Command Data Block

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 5.1.2.1-1 for a definition of the EDOS Ground Message Header.
2	Forward Link Data	Variable format Variable Size	Data that is completely formatted and ready for EDOS to forward to the TGT for forwarding to the spacecraft. Contains up to a maximum of 6,000 bytes of Command Link Transmission Unit(s), Acquisition Sequence(s), etc.

The CDB can be an operational or test message as shown in Table 5.5.2-2.

Table 5.5.2-2. Message Type Field Values in the EDOS Ground Message Header for a CDB.

Message Type	Value Of Message Type Field, Item 1 of the EDOS Ground Message Header
Operational Message	3
Test Message	131

5.5.3 Command Test Block

EDOS receives a CTB from the EOC to verify that the EBnet pathway, routers, EDOS's forward link processor and software are configured to support transmission of forward link commands to the spacecraft. EDOS could receive the CTB at any time (before, during, or after a SCS or contingency operation). The CTB only includes the EDOS Ground Message Header data although it is not defined as Operations Management data.

The CTB can be an operational or test message as shown in Table 5.5.3.-1.

Table 5.5.3-1. Message Type Field Values in the EDOS Ground Message Header for a CTB.

Message Type	Value Of Message Type Field, Item 1 of the EDOS Ground Message Header
Operational Message	1
Test Message	129

5.5.4 Command Echo Block

Whether the CTB is an operational or test message, EDOS's forward link processor still responds to the CTB according to it's status, "ready" or "not ready", as specified below.

EDOS returns a CEB to EOC when a forward link processor is "ready" to support the mission identified in the CTB. EOC expects a maximum of one CEB per CTB. The CEB items "Message Type" and "Message Sequence Number" returned to EOC, contain the same value as that of the CTB received from EOC. The CEB includes EDOS Ground Message Header data although it is not defined as Operations Management data.

EDOS does not return a CEB to EOC when a forward link processor is "not ready" to support the specified mission.

Section 5 - EOC Interface Design 1

SECTION 6

EOC-TO-EDOS SCHEDULE INTERFACES

Section 6 - EOC-to-EDOS Schedule Interfaces

6.1 EOC Provided Schedule Information

The EOC receives the Space Network (SN) schedules from the Network Control Center (NCC) and generates the EOSDIS Ground Station Schedules. The EOC transmits these schedules as well as test schedules to EDOS in accordance with the following paragraphs.

6.1.1 Schedule Messages

The following are as described in Applicable Document 12, Section 2 of this ICD:

a. User Schedule Message (USM), Message Type 94, message class 01 (Normal Support)

b. User Schedule Message (USM), Message Type 94, message class 02 (Emergency Support)

c. Schedule Coordination Message, Message Type 99, message class 01 (Schedule Deletion Notification Message (SDN))

6.1.1.1 EPGS Schedule Messages

EOS Polar Ground Station (EPGS) schedule messages are described in (TBD). The format of these messages differs considerably from the format of SN schedule messages.

6.1.2 Schedule Message Conventions

The following paragraphs apply to both the SN USMs and the EOSDIS ground station schedules message types.

6.1.2.1 Schedule Message Protocols

EOC shall transmit the SN USMs and the EOSDIS ground station schedules via FTP. Files transferred via FTP will follow the file name convention as defined in Table 6.1.2.1.1-1. Each SN schedule message will be in its own file. Each EOSDIS Ground Station Schedule Message will be in its own file.

6.1.2.1.1 Signaling the Completion of an FTP File Transfer

For data files sent via FTP, EOC will provide a “signal” file, as defined in section 3, paragraph 3.5, that will inform the EDOS recipient platform that a data file transfer has been completed.

Table 6.1.2.1.1-1. File Name Convention for Schedule Messages

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> “K” identifies a Space Network Schedule Message Value -> “L” identifies a EOSDIS Ground Station Schedule Message
2	Mission Identifier	ASCII 3 Bytes	Value->Refer to Table 6.1.2.1.1-2 for mission identifiers
3	Time of File Creation	ASCII 14 Bytes	Value -> YYDDDHHMMSSMMM where YY=last 2 digits of year, DDD=day of year, HH=hour, MM=minute, SS=second, MMM=millisecond
4	Extension	ASCII 4 Bytes	“.SCH” for User Schedule Messages “.SDN” for Schedule Deletion Notification
File names contains a total of 22 Bytes. Examples: KAM195030231459000.SCH, and KLA195365235959500.SCH			

Table 6.1.2.1.1-2. EOS Mission IDs in Schedule Message File Name

Mission	AM-1	PM-1	Laser ALT-1	CHEM-1	AM-2	PM-2	Laser ALT-2	CHEM-2	AM-3	PM-3	Laser ALT-3	CHEM-3
Mission Identifier in filename (Table 6.1.2.1.1-1)	AM1	PM1	LA1	CM1	AM2	PM2	LA2	CM2	AM3	PM3	LA3	CM3

6.1.2.2 Addresses

EDOS User IDs, IP addresses (data server), host names, data server destination directory, and password shall be as defined in the OA, Applicable Document #13.

6.1.2.3 Passwords

In order for EOC to send the SN USMs and the EOSDIS ground station schedule message files via FTP, EOC requires access to EDOS Data Servers. EDOS shall supply the necessary password(s) to allow EOC access. The OA shall specify the password exchange procedure.

6.1.2.4 Test Schedules

EDOS will use the same EBnet IP address for the test schedules that is used for the schedule messages. EOC shall set the message type field in the EDOS ground message header in accordance with Table 6.1.2.4-1 to differentiate test schedule data from operational schedule data.

Table 6.1.2.4-1. Message Types

Message Type	Messages Value Of Message Type Field, Item 1 of the EDOS Ground Message Header	
	SN schedule	EOSDIS Ground Station Schedule
Operational Data	24	25
Test Data	152	153

6.1.3 SN User Schedule Message Content

The content of the SN USM shall consist of the EDOS ground message header, the schedule message header, and the service formats as shown in Figure 6.2.1-1.

6.1.3.1 EDOS Ground Message Header

EOC shall attach the EDOS ground message header (reference Section 5, paragraph 5.1.2.1 of this ICD, and as specified in Table 5.1.2.1-1) prior to transmitting the SN USM.

6.1.3.2 User Schedule Message Header Format

A USM Header will consist of a Schedule Data Message Header as defined in Section 2 of this ICD, Applicable Document 12.

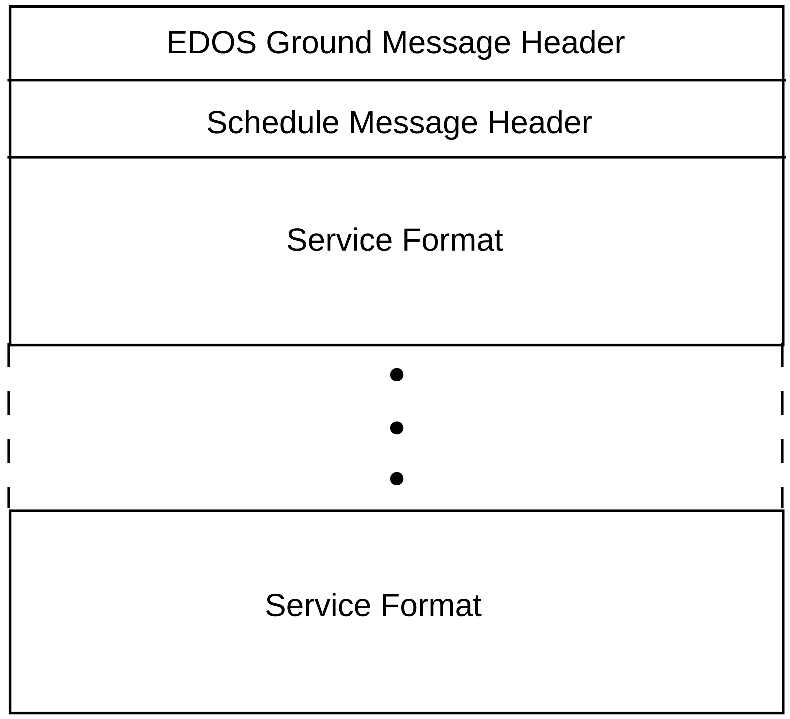

Figure 6.2.1-1. User Schedule Message File Format

6.2 User Schedule Message Formats

A single USM will include all tracking, forward link, and return link services for a single TDRS and a single SUPIDEN for one continuous SN support period. A USM will consist of an EDOS Ground Message Header followed by a Schedule Data Message Header, and one or more service descriptions as shown in Figure 6.2.1-1 and as defined in Section 2 of this ICD, Applicable Document 12.

6.2.1 SSA Forward Service Format

The S-band Single Access (SSA) Forward Service Format for the fixed and reconfigurable parameters for SSA Forward Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.2 MA Forward Service Format

The Multiple Access (MA) Forward Service Format for the fixed and reconfigurable parameters for MA Forward Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.3 SSA Return Service Format

The SSA Return Service Format for the fixed and reconfigurable parameters for SSA Return Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.4 MA Return Service Format

The MA Return Service Format for the fixed and reconfigurable parameters for MA Return Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.5 KSA Return Service Format

The KSA Return Service Format for the fixed and reconfigurable parameters for KSA Return Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.6 Normal Tracking Service Format

The format for the parameters for the Normal Tracking Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.7 Cross-Support Tracking Service Format

The format for the parameters for the Cross-Support Tracking Service shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.2.8 Reserved

6.3 Schedule Message Delivery Timing

The following paragraphs describe the SN USM and SN test schedule delivery timing.

6.3.1 SN User Schedule Message Delivery Timing

The EOC shall transmit to EDOS SN USM each time one is received from the NCC.

6.3.2 Test Schedules

The EOC shall transmit test schedules to EDOS as specified in the OA.

6.4 Schedule Deletion Notification Message

The Schedule Deletion Notification (SDN) message is sent to the EDOS by the EOC whenever the NCC deletes a scheduled event. The SDN message, message type 99, class 01, is described in the following paragraphs.

6.4.1 Schedule Deletion Notification Message Content

The content of the SDN shall consist of the EDOS ground message header and the service format shown in Figure 6.4.1-1.

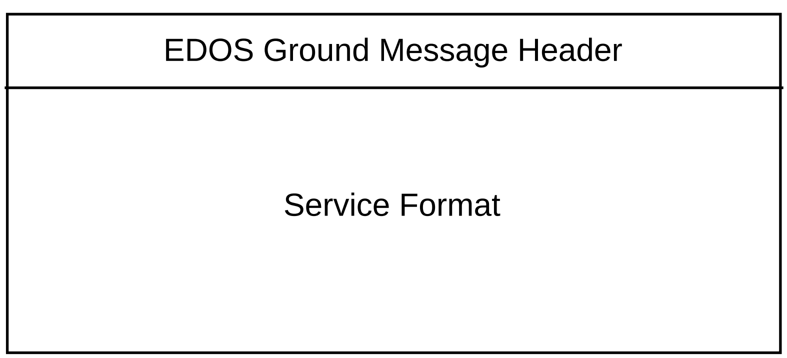

Figure 6.4.1-1. Schedule Deletion Notification File Format

6.4.2 EDOS Ground Message Header

EOC shall attach the EDOS ground message header (reference Section 5, paragraph 5.1.2.1 of this ICD, and as specified in Table 5.1.2.1-1) prior to transmitting the SDN.

6.4.3 Schedule Deletion Notification Format

The SDN Service Format shall be as defined in Section 2 of this ICD, Applicable Document 12.

6.5 EOSDIS Ground Station Schedule

EOC transmits the EOSDIS ground station schedule to EDOS. EDOS will route the schedule to the appropriate internal element.

6.5.1 EOSDIS Ground Station Schedule Messages

The following EOSDIS Ground Station Schedule message is described in this section:

TBS

6.5.2 EOSDIS Ground Station Schedule Message Content

The EOSDIS ground station schedule message shall consist of the EDOS ground message header. The remainder of the EOSDIS ground station schedule message content is TBD. The EOSDIS ground station schedule message shall be as depicted in Figure 6.5.2-1.

TBS

Figure 6.5.2-1. EOSDIS Ground Station Schedule Message File Format

6.6 EOSDIS Ground Station Schedule Message Delivery Timing

The following paragraphs describe the EOSDIS ground station schedule message and the test schedule delivery timing.

6.6.1 EOSDIS Ground Station Schedule Message Delivery Timing

TBS

6.6.2 EOSDIS Ground Station Test Schedules

The EOC will transmit EOSDIS ground station test schedules to EDOS as specified in the OA, Applicable Document 13.

6.7 EOSDIS Ground Station Schedule Message Formats

The following paragraphs describe the EOSDIS ground station schedule format.

6.7.1 EDOS Ground Message Header

EOC shall attach the EDOS ground message header (reference Section 5, paragraph 5.1.2.1 of this ICD, and as specified in Table 5.1.2.1-1) prior to transmitting the EOSDIS ground station schedule message.

6.7.2 EOSDIS Ground Station Schedule Message Header Format

The EOSDIS Ground Station Schedule Header(s) will be as defined in the ECS to EOSDIS Ground Station ICD. (TBR)

6.7.3 EOSDIS Ground Station Schedule Message Format

The EOSDIS ground station schedule format will be as defined in the ECS to EOSDIS Ground Station ICD. (TBR)

6.8 Contingency Spacecraft Contact Session Schedules

In the event that the SN is not available for normal operations, the EOC operator, utilizing voice communications, will direct the EDOS operator to switch to contingency operations. Contingency operations as used here mean non-SN operations, either WOTS, AGS, or SGS. There is no electronic communication for contingency schedules, (i.e., non-SN schedules). Contingency schedules are handled manually.

Section 6 - EOC-to-EDOS Schedule Interfaces 1

SECTION 7

EDOS - DAAC INTERFACES

Section 7 - EDOS - DAAC Interfaces

This section defines the characteristics of the interfaces between EDOS and the DAACs, and the next section defines the content and format of each message exchanged between these interfaces. EDOS interfaces with the GSFC DAAC , the LaRC, and the EDC DAACs.

The GSFC DAAC receives the EDSs (for AM-1 ASTER instruments VNIR(1), VNIR(2), SWIR, and TIR) destined for the ASTER GDS (Reference the EDOS - ASTER GDS ICD, Section 2 of this ICD, Reference Document Number 13; and reference Table 8.1.4.1.1-1 of this ICD). EDSs destined for the ASTER GDS contain a unique format.

ECS will ingest PDSs and EDSs that contain a single APID per data set, as well as ASTER EDSs which contain multiple APIDs per data set.

7.1 Data Flow

Figure 7.1-1 identifies the data products exchanged between the EDOS and the DAACs.

The request for DAAC to EDOS Data Sets (DEDS) will be generated on a workstation (or personal computer) used by EDOS operations personnel. The workstation is not part of the EDOS design.

7.1.1 EDOS - DAAC Data Exchange Overview

The following paragraphs describe the data products presented in Figure 7.1-1 of this ICD.

Expedited Data Set (EDS): If the CCSDS version 1 packets received by EDOS have the quick-look flag set by the sending instrument, or in response to receipt of an EOC approved request for EDOS to build an EDS for a SCS, EDOS builds the EDS and electronically transmits the EDS to the appropriate DAAC as requested by the EOC.

PDS: EDOS builds a PDS from the CCSDS version 1 packets according to the PDS construction criteria in Applicable Document 10.

PDS and EDS File Sizes: EDOS provides the flexibility to specify the maximum size of the files that contain PDSs and EDSs. A PDS, and an EDS, each reside in two or more files. The selectable file size to store this data is less than or equal to .5 Gigabytes (GB), 1 GB, 1.5 GB, or 2 GB. Applicable Document 10 identifies the file size selected and describes the process for changing the file size.

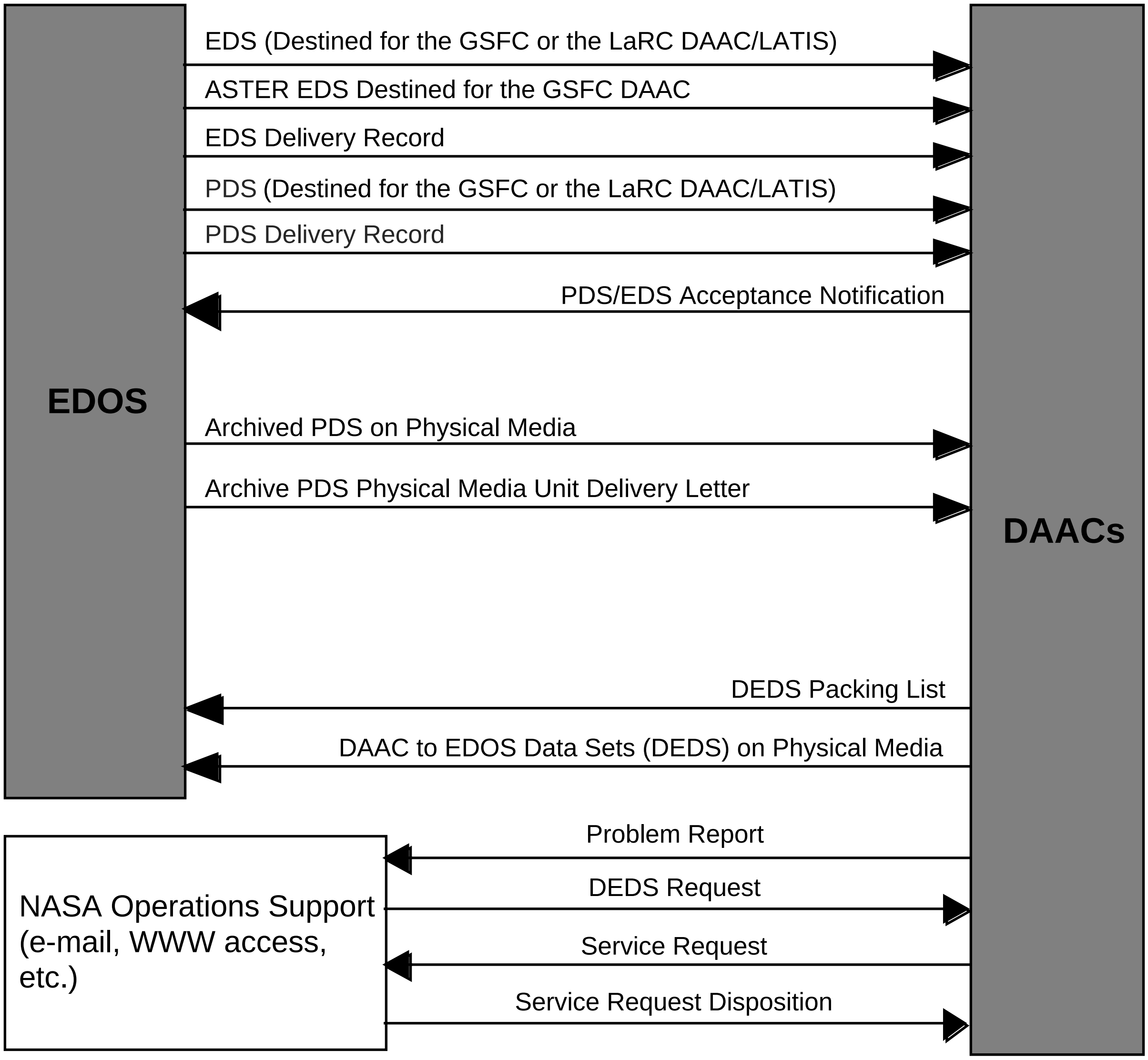

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Figure 7.1-1. EDOS - DAAC Functional Interfaces

PDS and EDS Delivery Records: After successfully transmitting a PDS, or an EDS, EDOS electronically transmits the corresponding, i.e., PDS or EDS, Delivery Record to the DAAC providing a notification of the presence of the data set.

PDS/EDS Acceptance Notification: Once a DAAC receives a PDS or an EDS and the accompanying Delivery Record, the DAAC returns a PDS/EDS Acceptance Notification notifying EDOS of the DAAC's ingest of the data set.

Archived PDSs on Magnetic Tape: EDOS stores processed CCSDS version 1 packets as PDSs on magnetic tape. On request, per Applicable Document 10, EDOS sends an exact duplicate of the original archived tape that stores the requested PDS(s) to the requesting DAAC.

Physical Media Unit Delivery Letter: When EDOS sends a tape containing archived data, a Physical Media Unit Delivery Letter, describing the contents of the tape, accompanies the tape.

DAAC to EDOS Data Set (DEDS): The EDOS can recover lost or damaged PDSs by requesting and receiving DAAC to EDOS Data Sets (DEDSs) from a DAAC. DEDS become part of the EDOS data archive. EDOS personnel request DEDS by contacting the DAAC as described in Applicable Document 10. A DEDS shipment consists of magnetic tape(s) containing one or more Level 0 PDS files previously formatted and transmitted by EDOS. If Level 0 data is no longer available (i.e., after one year of storage), the DAAC will ship Level 1A data. A hardcopy DEDS Packing List, detailing the contents of the tape, is packed with the physical media. It is also the first file on the first tape of the shipment. A DEDS Media Description File is included on each DEDS tape. It lists the contents of that single tape.

DEDS Packing List: When a DAAC sends a tape of archived data, a hardcopy DEDS Packing List describing the contents of the tape(s) accompanies the tape shipment.

DEDS Request: Requests for either L0 or L1 products may be accomplished by specifying the desired L0 product by its PDS ID, specifying the L1 products by the PDS ID of the L0 product that spawned them, or by specifying the desired products by stating their APID and the observation period (i.e., begin and end times of data collection period on the spacecraft). Details are discussed in the EDOS-ECS/SDPS Operations Agreement.

Service Request: The EDOS operator receives a Service Request from a DAAC requesting a change to one or more EDOS services agreed to in Applicable Document 10, or a previously implemented Service Request. A change implemented due to a Service Request will remain in effect until EDOS receives another Service Request that again changes that service. A pending Service Request may be canceled or modified by a subsequent Service Request.

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Service Request Disposition: The EDOS operator may transmit a Service Request Disposition to a DAAC in response to receipt of a Service Request from that DAAC as described in Applicable Document 10.

7.2 EDOS to DAAC Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EDOS and the DAACs for all data products exchanged electronically. Refer to the EDOS-EBnet ICD (Reference Paragraph 2.1.1, Applicable Document 4) for a detailed physical description of this interface.

Table 7.2-1 defines the type of network addresses and protocol(s) that govern the EDOS - DAAC electronic interface.

Table 7.2-1. Addresses and Protocols for Data Sent from EDOS to DAACs

EDOS - DAAC Data Product	Protocol/Address
EDS	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
PDS	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EDS Delivery Record	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
PDS Delivery Record	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.

7.2.1 Protocols

Reference Section 3 of this ICD, Paragraph 3.5 for additional information about Protocols.

Files transferred via FTP follow the file name convention defined in Table 8.1.2.9-1 for EDSs and PDSs, Table 8.1.2.10-1 of this ICD for the PDS and EDS Delivery Records, and Table 8.1.2.12-1 of this ICD for the PDS Physical Media Unit Delivery Record.

7.2.1.1 Addresses

Each DAAC's IP address(es), host name(s), login(s), password(s) and directory(ies) that receive PDSs, EDSs, and PDS/EDS Delivery Records shall be as defined in the EDOS - DAAC OA.

7.2.1.2 Reserved

Deleted

7.3 DAAC to EDOS Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EDOS and the DAACs for all messages and data products exchanged via internet protocols. Refer to the EDOS-EBnet ICD (reference Paragraph 2.1.1, Applicable Document number 4) and the DAAC - EBnet ICD (Applicable Document 16) for a detailed physical description of these interfaces.

Table 7.3-1 defines the type of network addresses and protocol(s) that govern the DAAC to EDOS electronic interface.

Table 7.3-1. Addresses and Protocols for Data Sent by a DAAC to EDOS

DAAC to EDOS Data Product	Protocol/Address
PDS/EDS Acceptance Notification	FTP- IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.

7.3.1 Protocols

Reference Section 3 of this ICD, Paragraph 3.5 for additional information regarding Protocols.

Files transferred via FTP follow the file name convention defined in Table 8.1.2.11-1 of this ICD for the PDS/EDS Acceptance Notification.

7.3.1.1 Addresses

EDOS's IP address(es), host name(s), login(s), password(s) and directory(ies) that receive the PDS/EDS Acceptance Notification shall be as defined in the EDOS - DAAC OA.

7.3.1.2 Reserved

Deleted

7.4 EDOS to DAAC Performance Characteristics

Performance requirements specifying the rates for transfer and receipt of data between the EDOS and the DAACs are described in the Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements (Reference Section 2 of this ICD, Applicable Document 3).

7.4.1 Operations Management Data Delivery Rate

EDOS shall transfer OM data (PDS and EDS Delivery Records) to the DAACs at a rate up to 49 Kilobits per second (Kbps).

7.4.2 PDS/EDS Delivery Rate

EDOS shall transfer expedited and production data sets to the GSFC DAAC at a rate up to 68 Mbps. EDOS shall transfer expedited and production data sets to the LaRC DAAC at a rate up to 28 Mbps.

7.4.3 EDS Delivery Initiation

EDOS shall initiate the transfer of an EDS within 60 minutes of completion of the RLSS associated with the SCS containing the expedited data.

7.4.4 PDS/EDS Delivery Record

EDOS shall initiate transfer of the PDS and EDS Delivery Records to a DAAC within 60 seconds of successful PDS and EDS delivery.

7.5 DAAC to EDOS Performance Characteristics

Performance requirements for data transferred from a DAAC to EDOS is specified in the following sections.

7.5.1 PDS and EDS Acceptance Notification Delivery

The DAACs shall transfer the PDS/EDS Acceptance Notification to EDOS within 15 minutes, plus an additional 15 minutes for each Gigabyte of PDS/EDS data, after successful receipt of the EDOS PDS and EDS Delivery Records.

Section 7 - EDOS - DAAC Interfaces 1

SECTION 8

EDOS - DAAC INTERFACE DESIGN

Section 8 - EDOS - DAAC Interface Design

8.1 Data Description and Formats

The following paragraphs define the content and format for each interface message and data product exchanged between the EDOS and the DAACs, including data items, data representation, and data structures.

8.1.1 Data Format Overview

DAAC to EDOS Data Set (DEDS):

A. DEDS Packing List
B. DEDS Media Description File
C. Level 0 or Level 1A Data Sets

DEDS Packing List:

A. Packing List Preamble
B. MediaID
C. Granule UR
D. ESDT
E. Files
   1. Distribution File Name
   2. Size
   3. Estimated Size
   4. Compression Status

DEDS Media Description File:

A. Unique File Name
B. Requested File Name
C. File Size
D. Data Source
E. Compression Type

Level 1A Data:

TBD

Expedited Data Set (EDS) and Production Data Set (PDS) Construction Records:

A. Software version number
B. Data Set Identification
C. Data Set Test Flag

D. List of scheduled SCS start times for the Data Set
E. List of scheduled SCS stop times for the Data Set
F. Count of packets containing EDOS generated fill data
G. Count of packets with discrepancies between packet header length field and actual packet length
H. CCSDS binary time code in the secondary header of first packet in the data set
I. CCSDS binary time code in the secondary header of last packet in the data set
J. ESH date and time annotation of first packet in the Data Set
K. ESH date and time annotation of last packet in the Data Set
L. Count of packets from VCDUs with errors corrected by R-S decoding
M. Count of packets in the Data Set
N. Data Set size (in octets)
O. Count of packets with SSC discontinuities
P. Time of Data Set completion
Q. Identify APID(s) associated with the Data Set
R. By APID, identify an index to the first packet, containing the APID, in the Data Set
S. By APID, identify the VCDU-IDs (SCID and VCID) associated with the APID
T. By APID, count of packets with SSC discontinuities
U. By APID, list missing packet SSCs for the Data Set (not applicable for packet secondary header expedited flagged data)
    a. Identify first missing packet SSC in the gap
    b. Identify index into data set to missing packet, with the same APID, that is immediately after the SSC gap in the Data Set
    c. Count of packet SSCs missing within a gap
    d. CCSDS binary time code from the secondary header of the packet, with the same APID, that is immediately before the SSC gap in the Data Set
    e. CCSDS binary time code from the secondary header of the packet, with the same APID, that is immediately after the SSC gap in the Data Set
    f. ESH date and time annotation of the packet, with the same APID, that is immediately before the SSC gap in the data set
    g. ESH date and time annotation of the packet, with the same APID, that is immediately after the SSC gap in the data set
V. By APID, list packets containing EDOS generated fill data including location of first fill octet for each packet
W. By APID, index into the Data Set to the fill packet
X. By APID, count of octets of EDOS generated fill data
Y. By APID, count of packets with discrepancies between packet header length field and actual packet length
    a. For this APID, list SSCs of packets with length discrepancy.
Z. By APID, CCSDS binary time code in the secondary header of first packet in the Data Set

AA. By APID, CCSDS binary time code in the secondary header of last packet in the Data Set
AB. By APID, ESH date and time annotation of first packet in the Data Set
AC. By APID, ESH date and time annotation of last packet in the Data Set
AD. By APID, count of packets from VCDUs with errors corrected by R-S decoding
AE. By APID, count of packets in the Data Set
AF. By APID, size (in octets)
AG. For the data set, Number of Files storing Path SDUs
  a. For each File, file name
  b. For each File, APIDs present
  c. For each File and APID, CCSDS timecode from first and last packet

Expedited Data Set (EDS):

A. EDS Construction Record
B. Path Service Data Units

EDOS Archive Removable Physical Media Unit:

A. PDS Physical Media Unit Delivery Record File
End of first “tar” file
B. PDS number "1" (Two or more files are present, each being less than or equal to the maximum size specified in the EDOS-DAAC OA. The first file only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.)
C. PDS files for additional PDSs (if applicable)
D. PDS number "n"
End of second “tar” file
End of tape

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EDOS Ground Message Header:

A. Message Type/Test Message Type
B. Source Identification
C. Destination Identification
D. Message Generation Date and Time
E. Mission’s Spacecraft Identification
F. Message Sequence Number
G. EDOS Software Version Number
H. Message Length

File Name Convention for a PDS and an EDS:

A. File Type (EDS or PDS)
B. APID(s) in the data set
C. Time of PDS/EDS creation
D. Numeric Identification (one-up counter)
E. File Name Extension (".PDS" or ".EDS")

File Name Convention for a PDS and an EDS Delivery Record:

A. File Type (EDS or PDS Delivery Record)
B. APID(s) in the data set
C. Time of PDS/EDS creation
D. Numeric Identification (one-up counter)
E. File Name Extension (".PDR" or ".EDR")

File Name Convention for a PDS/EDS Acceptance Notification:

A. File Type (EDS or PDS Acceptance Notification)
B. Time of file creation
C. File Name Extension (".PAN" or ".EAN")

File Name Convention for a PDS Physical Media Unit Delivery Record:

A. File Type (PDS Physical Media Unit Delivery Record)
B. Bar Code Label/Serial Tape Number
C. File Name Extension (".MDR")

File Name Convention for the Signal file (See Section 3.5)

A. Name of file to be sent via FTP
B. Signal File Name Extension (.XFR)

Production Data Set (PDS):

A. PDS Construction Record
B. Path Service Data Units

PDS/EDS Acceptance Notification:

A. EDOS Ground Message Header
B. Message Type
C. Message Length
D. PDS/EDS Delivery Record Sequence Number
E. For each file transmitted:
    a. File Directory
    b. File Name
    c. File Transfer Disposition

PDS and EDS Delivery Records:

A. EDOS Ground Message Header
B. Exchange Data Unit Label
C. PDS/EDS Delivery Record Label
D. Originating System
E. Consumer System
F. Product Name
G. Mission
H. Data Set Identification
I. Name of Sensor or Instrument
J. Directory Name
K. File names and sizes
L. Data Set transfer start date and time
M. Data Set transfer end date and time

PDS/EDS Identification:

A. Data Structure Identification Character
B. First APID in the Data Set
C. Second APID in the Data Set
D. Third APID in the Data Set
E. Time of EDS/PDS creation
F. Numeric Identification

PDS Physical Media Unit Delivery Record:

A. Exchange Data Unit Label
B. PDS/EDS Delivery Record Label
C. Record Type (Message Type)
D. Destination Identification
E. EDOS software Version Number
F. Physical Media Unit ID (Bar Code Label/Serial Tape Number)
G. Date and time of physical media unit completion
H. For each PDS on the physical media unit:
    a. PDS Identification
    b. CCSDS binary timecode of first packet in the PDS
    c. CCSDS binary timecode of last packet in the PDS
    d. Count of packets in the PDS
    e. Size (in octets)
    f. Test flag indicator
    g. List of APIDs
    h. File name(s) and their size for each file storing a part of a PDS

EDOS Archive Physical Media Unit Delivery Letter:

A. Message Type
B. Originating System
C. Destination System
D. Request Sequence Number

E. Number of requested data sets on the physical medium
F. Requested Data Sets Identification
G. Data Set Identification
H. Data Set Level

8.1.2 General Data Format and Description

8.1.2.1 EDOS Ground Message Header

This EDOS Ground Message Header (Table 8.1.2.1-1) precedes each of the following messages sent by, and/or received at, EDOS (PDS and EDS Delivery Records and PDS/EDS Acceptance Notification).

Table 8.1.2.1-1. EDOS Ground Message Header*

Item No.	Name	Format & Size	Data Characteristics
1	Message Type/Test Message Type	Unsigned Integer 1 Byte	Range for Message Type -> 0 through 127, and Range for Test Message type > 128 through 255 (Test Message Type equals Message Type plus 128). Refer to Table 8.1.2.2-1 for EDOS External Message Type Definitions. This field uniquely identifies the message, and indicates to the receiver what message format to expect and process.
2	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
3	Source Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 8.1.2.3-1.
4	Destination Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 8.1.2.3-1.
5	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
6	Message Generation Date and Time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).

Table 8.1.2.1-1. EDOS Ground Message Header* (Continued)

Item No.	Name	Format & Size	Data Characteristics
7	Mission's Spacecraft Identification	Unsigned Integer 2 Bytes	Value -> 0=Not applicable for this message; otherwise => 42 = AM-1; Reference ICD Table 5.1.3-2. Spacecraft identification for the Mission associated with this message.
8	Message Sequence Number	Unsigned Integer 2 Bytes	Range -> 0 through 65,535; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up per Source Identification, and is assigned by the originator.
9	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0 through 255 (first byte - identifies a major EDOS release) and 0 through 255 (second byte - represents a version of the major release - initial version or an update version)
10	Message Length	Unsigned Integer 2 Bytes	Range -> 24 through 65,535 Number of bytes in the message. This value includes the EDOS Ground Message Header plus the attached message's length. A length of 24 means the EDOS Ground Message Header is self contained. A length of zero (0) indicates that the message is longer than 65,535 bytes (however, messages exchanged via UDP must not be larger than 65,535 bytes)
11	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
Total of 24 bytes exist in the EDOS Ground Message Header.			

*Not used by ECS

8.1.2.2 EDOS External Message Type Definitions

Table 8.1.2.2-1 - EDOS External Message Type Definitions identifies the message type within the EDOS Ground Message Header (in Binary format).

Table 8.1.2.2-1. EDOS External Message Type Definitions

EDOS External Message Name	Message Type
Reserved	0-8
PDS Delivery Record	9
Reserved	10
EDS Delivery Record	11
PDS and EDS Acceptance Notification	12
Reserved	13-127
Test Message Type - equals Message Type plus 128	128-255

8.1.2.3 EDOS Source/Destination Identification

Table 8.1.2.3-1 - EDOS Source/Destination Identification identifies EDOS and all its external interfaces in order to identify the source and destination within the data structures for this interface.

Table 8.1.2.3-1. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP

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Table 8.1.2.3-1. EDOS Source/Destination Identification (Continued)

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Langley TRMM Information System (LATIS)	19	LAT
Reserved for future use	20- 255	N/A

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8.1.2.4 NASA PB-5 Code Format

Table 8.1.2.4-1 - NASA PB-5 Code Format (Option C) identifies the Greenwich Mean Time (GMT) time of an event, in PB-5 format (Reference ICD Section 2 of this ICD, Applicable Document 9), that is used in the data structures for this interface.

Table 8.1.2.4-1. NASA PB-5 Code Format (Option C)

Item No.	Name	Format & Size	Data Characteristics
PB-5 is the format in which the Greenwich Mean Time (GMT) is stored.			
1	Flag Bit	Integer 1 Bit	Value = 1, Reference PB-5 Time Code “option C”.
2	Truncated Julian Day	Unsigned Integer 14 Bits	Range -> Variable; Truncate the most significant decimal digits, retaining only the four least significant decimal digits ranging from 0000 to 9999; The current Julian day epoch begins on October 10, 1995 and continues for a period of 27.379 years.
3	Seconds of Day	Unsigned Integer 17 Bits	Range -> Variable, Seconds-of-day from 0 to 86,399.

Table 8.1.2.4-1. NASA PB-5 Code Format (Option C) (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Milliseconds of a Second	Unsigned Integer 10 Bits	Range -> 0 through 999
5	Microseconds of a Millisecond	Unsigned Integer 10 Bits	Range -> 0 through 999
6	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bits	Value -> zero (0).
NASA PB-5 code format (Option C) has 6 items placed within 7 bytes. Reference Section 1 - Applicable Document 9, for additional information.			

8.1.2.5 Spacecraft Identification (SCID)

Table 8.1.2.5-1 - Spacecraft Identification (SCID) identifies the forward and return link spacecraft identification within the data structure for this interface.

Table 8.1.2.5-1. Spacecraft Identification (SCID)

Spacecraft	Identifier *
Refer to Applicable Document 8, Paragraph 6.1.3.1.2.1	
EOS AM-1	42 = x'2A'
* The Return Link identifier is used as the Spacecraft ID.	

8.1.2.6 Greenwich Mean Time (GMT) in ASCII Format

Table 8.1.2.6-1 - Greenwich Mean Time (GMT) in ASCII Format identifies the GMT in ASCII format used within the data structure for this interface.

Table 8.1.2.6-1. Greenwich Mean Time (GMT) in ASCII Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	ASCII 2 Bytes	Value -> "00" through "99"; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian Day	ASCII 3 Bytes	Value -> "001" through "366"; contains the Julian day (from the GMT/ZULU).
3	Hour	ASCII 2 Bytes	Value -> "00" through "23"; contains the hour (from the GMT/ZULU).

4	Minute	ASCII 2 Bytes	Value -> “00” through “59”; contains the minute (from the GMT/ZULU).
5	Second	ASCII 2 Bytes	Value -> “00” through “59”; contains the second (from the GMT/ZULU).
This GMT/ZULU ASCII format contains 11 bytes. Example: 95366235959			

8.1.2.7 PDS and EDS Construction Record

A PDS and an EDS Construction Record (Table 8.1.2.7-1) records quality and accounting information, respectively, for a PDS and an EDS.

Table 8.1.2.7-1. PDS/EDS Construction Record

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0 through 255 (first byte - identifies a major EDOS release) and 0 through 255 (second byte - represents a version of the major release - initial version or an update version)
2	Construction Record Type	Unsigned Integer 1 Byte	Value -> 1=PDS, 2=EDS (expedited data sets based on APID), and 3=EDS (expedited data sets based on Secondary Header quick-look flag being set by the sending instrument).
3	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4	PDS/EDS Identification	ASCII 36 Bytes	PDS/EDS Identification -> Refer to Table 8.1.2.8-1
5	Fill/Spare, reserved for future use.	Unsigned Integer 7 Bits	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
6	Test Flag	Logical Flag 1 Bit	Value -> 0=Operational Data 1=Test Data
7-1	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
7-2	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
For the PDS/EDS, identify the SCS start and stop times			

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
8	For the PDS/EDS, Identify number of scheduled SCS start-stop times	Unsigned Integer 2 Bytes	Range -> 1 through 65,535, one up counter.
8-1	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
8-2	For this PDS/EDS SCS Start & Stop time pair, SCS start time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).
8-3	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
8-4	For this PDS/EDS SCS Start & Stop time pair, SCS stop time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT).
8-5	For the next SCS start and stop time pair, repeat the above items (8-1 through 8-4) (if applicable)		
9	For the PDS/EDS, count of octets of EDOS generated fill data.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) Count of octets of EDOS generated fill data (within the entire data set)
10	For the PDS/EDS, count of packets that had discrepancies between packet header length item and actual packet length.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Note: Counter increments whenever the packet length identified in the packet header was different than the actual packet's length during Return Link Service Processing.
11	For the PDS/EDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet in the PDS/EDS.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
12	For the PDS/EDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet in the PDS/EDS.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
13	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
14	For the PDS/EDS, ESH date and time annotation of first packet in the PDS/EDS	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the first packet in the acquisition session.
15	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
16	For the PDS/EDS, ESH time and date annotation of last packet in the PDS/EDS	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the last packet in the acquisition session.
17	For the PDS/EDS, count of packets from VCDUs with errors corrected by R-S decoding.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of VCDUs corrected by Reed Solomon (R-S) (R-S is a grade 2 service for AM-1. This count is incremented whenever the ESH item - R-S Error Control Flag contains a zero and then the ESH item -Source VCDU Error Decode Results contains a value other than zero.)
18	For the PDS/EDS, count of packets in the PDS/EDS	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295
19	For the PDS/EDS, size (in octets).	Unsigned Integer 8 Bytes	Range -> 7 through (2 to the 64th power less 1). Total number of octets for all CCSDS packets in the PDS/EDS.
20	For the PDS/EDS, identify number of packets with SSC discontinuities.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295. Increment counter by 1 for each gap in the (SSC) number sequence. Note: A gap may exist at the beginning of a PDS/EDS if one or more missing SSC(s) exist between the last SSC in the PDS/EDS immediately preceding the current PDS/EDS under construction and the first SSC in the current PDS/EDS under construction. EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0.
21	For the PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
22	For this PDS/EDS, time of completion.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Actual time EDOS completed constructing the complete Data Set (Construction Record and Data Set).
23	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 7 Bytes	Value -> zero (0).
For the PDS/EDS, identify the APIDs and their associated information.			
24	For the PDS/EDS, Identify number of APIDs in the PDS/EDS.	Unsigned Integer 1 Byte	Value -> 1 through 3; one-up counter. [Non-ASTER data contains 1 APID per PDS/EDS]
24-1	For the APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-2	APID (SCID and APID) in the data set.	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 8.1.2.5-1-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-3	For this APID, index (Byte Offset) to the first packet in the PDS/EDS.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet.
24-4	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
For this APID, identify the VCID(s)			
24-5	For this APID, identify number of VCIDs in the PDS/EDS	Unsigned Integer 1 Byte	Value -> 1 through 2; one-up counter.
24-5.1	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
24-5.2	VCDU-ID (SCID and VCID)	Unsigned Integer 2 Bytes	Spacecraft ID and VCID (Fill Bits-2 Bits, SCID-8 Bits (Refer to Table 8.1.2.5-1), and followed by VCID-6 Bits (Refer to Table 8.1.4.1.1-2)).
24-5.3	For the next VCID, repeat the above items (24-5.1 through 24-5.2).		
24-6	For this APID, identify number of packets with SSC discontinuities.	Unsigned Integer 4 Bytes	Range -> 0-4,294,967,295. Increment counter by 1 for each gap in the (SSC) number sequence. Note: A gap may exist at the beginning of an APID in a PDS/EDS if one or more missing SSC(s) exist between the last SSC for this APID in the PDS/EDS immediately preceding the current PDS/EDS under construction and the first SSC in the current APID for the PDS/EDS under construction. EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0. If zero, items 24-6.1 through 24-6.10 do NOT exist for an EDS or a PDS.
For this APID, list missing packet SSCs for the PDS and EDS (EDOS does not consider it a gap when the SSC wraps naturally, from 16,383 to 0. Therefore no entry exists here when the SSC wraps naturally.)(Items 24-6.1 through 24-6.10 are NOT applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.)			
24-6.1	For this APID gap, identity of the first Missing Packet SSC in the gap.	Unsigned Integer 4 Bytes	Range -> 0 through 16,383 Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-6.2	For this APID gap, index (byte offset) into the data set to the missing packet (points to packet, with the same APID, that is immediately after the SSC gap in the data set).	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.3	For this APID gap, number of packet SSCs missed within the gap.	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295 Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.4	For this APID gap, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of the packet, with the same APID, that is immediately before the SSC gap in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.
24-6.5	For this APID gap, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of the packet, with the same APID, that is immediately after the SSC gap in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument,.
24-6.6	For this APID gap, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-6.7	For this APID gap, ESH date and time annotation of the packet, with the same APID, that is immediately before the SSC gap in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument. This is a copy of the time of receipt from within the ESH that belongs with the packet.
24-6.8	For this APID gap, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-6.9	For this APID gap, ESH date and time annotation of the packet, with the same APID, that is immediately after the SSC gap in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument. This is a copy of the time of receipt from within the ESH that belongs with the packet.
24-6.10	For the next missing packet SSC (gap), repeat the above items (24-6.1 through 24-6.9) (when applicable). Not applicable for an EDS which has the packet secondary header quick-look flag set by the sending instrument.		
	For this APID, list packets containing EDOS generated fill data		
24-7	For this APID, number of entries in list of packets containing EDOS generated fill data	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295. If zero, items 24-7.1 through 24-7.4 will not be present. Count of packets containing EDOS generated fill data, for this APID.
24-7.1	For this APID, SSC of packet containing EDOS generated fill data (SSC from CCSDS packet)	Unsigned Integer 4 Bytes	Range -> 0 through 16,383
24-7.2	For this APID, index (byte offset) into the data set to the fill packet.	Unsigned Integer 8 Bytes	Range -> 0 through (2 to the 64th power less 1) 0 equates to the first byte/octet of the first packet in the entire PDS/EDS (This is an index into the entire Data Set, NOT an index into a file containing only part of the data set). This index points to the first byte of the packet.
24-7.3	For this APID, index to the first fill octet for the above packet	Unsigned Integer 4 Bytes	Range -> 0 through 1,000 (Note: 0 equates to the first octet of the application data.)
24-7.4	For the next fill packet identification, repeat the above items (24-7.1 through 24-7.3) (if applicable).		
24-8	For this APID, count of octets of EDOS generated fill data	Unsigned Integer 8 Bytes	Range -> 0- through (2 to the 64th power less 1) Count of octets of EDOS generated fill data (within the entire data set), for this APID.
24-9	For this APID, count of packets that had discrepancies between packet header length item and actual packet length.	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Note: Counter increments whenever the packet length identified in the packet header was different than the actual packet's length during Return Link Service Processing. If zero, items 24-9.1 and 24-9.2 will not be present.
24-9.1	For this APID, SSC of packet with length discrepancy	Unsigned Integer 4 Bytes	Range -> 0 through 16,383
24-9.2	For the next packet with length discrepancy, repeat above item (24-9.1)(if applicable)		
24-10	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
24-11	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2.
24-12	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-13	For this APID, ESH date and time annotation of first packet in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the first packet For this APID in the acquisition session.
24-14	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
24-15	For this APID, ESH time and date annotation of last packet in the data set.	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 8.1.2.4-1 for the NASA PB-5 Code Format (containing GMT). This is a copy of the time of receipt from within the ESH that belongs to the last packet For this APID in the acquisition session.
24-16	For this APID, count of packets from VCDUs with errors corrected by R-S decoding	Unsigned Integer 4 Bytes	Range -> 0 through 4,294,967,295 Number of VCDUs corrected by Reed Solomon (R-S) (Grade 2 service for AM-1. This count is incremented whenever the ESH item - R-S Error Control Flag contains a zero and then the ESH item -Source VCDU Error Decode Results contains a value other than zero.)
24-17	For this APID, count of packets in the data set.	Unsigned Integer 4 Bytes	Range -> 1 through 4,294,967,295
24-18	For this APID, size (in octets)	Unsigned Integer 8 Bytes	Range -> 1 through (2 to the 64th power less 1)
24-19	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
24-20	For the next APID in the PDS/EDS, repeat the above items (24-1 through 24-19) (if applicable)		
Identify files that store this PDS/EDS			
25	For this PDS/EDS, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 8.1.2.7-1. PDS/EDS Construction Record (Continued)

Item No.	Name	Format & Size	Data Characteristics
25-1	For this PDS/EDS, Number of files that this PDS/EDS resides in.	Unsigned Integer 1 Byte	Range -> 2 through 255. The first file only contains the PDS Construction Record, and the remaining files contain the CCSDS Path SDU packets.
25-2	File Name for a PDS or an EDS	ASCII 40 Bytes	Value -> Refer to Table 8.1.2.10-1 Identifies a File Name that stores a part of a PDS or an EDS.
25-3	For this file, Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
25-4	For this file, Identify number of APIDs in the file.	Unsigned Integer 1 Byte	Value -> 1 through 3; one-up counter. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.1	For the APID, Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.2	APID (SCID and APID) in the data set.	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 8.1.2.5-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.3	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of first packet with this APID in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.4	For this APID, CCSDS binary timecode (CCSDS Day Segmented Time Code/ Spacecraft Time Format) from the secondary header of last packet with this APID in the data set.	Integer Formatted 8 Bytes	Variable -> Refer to Table 8.1.4.1.1-2. Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.5	For this APID, Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0). Will always contain a value of 0 for the file that stores the PDS/EDS Construction Record.
25-4.6	For the next APID, repeat the above items (25-4.1 through 25-4.5)		
25-5	For this PDS/EDS, for the next File Name, repeat the above items (25-2 through 25-4.6) (if applicable)		

8.1.2.8 PDS/EDS Identification

The PDS/EDS identification data structure, in ASCII format, used to uniquely identify a PDS and an EDS is shown in Table 8.1.2.8-1 below. The time item within this identification records when the PDS/EDS was created by EDOS.

Table 8.1.2.8-1. PDS/EDS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> "E" or "P"; Identifies the data structure as an EDS or PDS.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of "AAAAAAA".

Table 8.1.2.8-1. PDS/EDS Identification (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of "AAAAAAA".
5	Time of EDS/PDS creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set was created).
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. EDSs and PDSs utilize the same counter. This number aids in distinguishing the order of data set creation; provides uniqueness to the identification; and relieves the burden of resetting a counter every second to ensure no two identifications are the same.
7	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> "00"
A PDS/EDS Identification contains 36 bytes. Examples: P04202890420291AAAAAAA95030231459600 and E0420193AAAAAAAAAAAAAA95133235959900			

8.1.2.9 Signal File Naming Convention

The signal file name consists of the extension ".XFR" appended to the name of the data file referenced by the signal file, including its file name extensions. See the description of the signal file in Section 3.5 of this ICD.

The following is an example of a signal file name for an EDS Delivery Record:

Y0420064AAAAAAAAAAAAAA980221448590.EDR.XFR

The following is an example of a signal file name for a PDS Acceptance Notification: CCR 98-0008

I98045120059.PAN.XFR

Table 8.1.2.9-1 defines the signal file naming convention for the first Path SDU file of a PDS. CCR 98-0008

Table 8.1.2.9-1. Signal File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	Name of file transferred via FTP	ASCII String	For example, A PDS File Name contains a total of 40 Bytes. Example: P04202890420291AAAAAAA95030231459001.PDS
2	Signal File File Name Extension	ASCII 4 Bytes	Value->".XFR"
A PDS Signal File Name contains a total of 44 Bytes. Example: P04202890420291AAAAAAA95030231459001.PDS.XFR			

8.1.2.10 File Name Convention for a PDS and an EDS

File names that identify files storing a PDS or an EDS contain all ASCII characters in the format shown in Table 8.1.2.9-1 below. Content of the items for the APIDs, time, and Numeric Identification are an exact copy of the fields in the corresponding PDS/EDS Identification. EDOS will ensure that the file name in the destinations directory is unique.

Table 8.1.2.10-1. File Name Convention for a PDS and an EDS

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "E" or "P"; Identifies the file as containing an EDS or a PDS.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1, followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of 'AAAAAAA'.

Table 8.1.2.10-1. File Name Convention for a PDS and an EDS (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of 'AAAAAAA'.
5	Time of EDS/PDS creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set is created). This time is a copy of the GMT time in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created.
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. PDSs and EDSs utilize the same counter. This numeric identification is a copy of the numeric identification in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created. This number aids in distinguishing the order of data set creation during the day and provides uniqueness to the file name.
7	Unique File number.	ASCII 2 Bytes	Range -> "00" through "99" Every PDS and EDS (always) resides in two or more Files. The first File (number "00") always stores the Construction Record by itself, and the one or more time ordered File(s) thereafter sequentially store the Path SDUs (file number(s) "01" through "99").
8	File Name Extension	ASCII 4 Bytes	Value -> ".PDS" or ".EDS"
PDS and EDS File Names contain a total of 40 Bytes. Examples: P04202890420291AAAAAAA95030231459001.PDS and E0420193AAAAAAAAAAAAAA95133235959100.EDS			

8.1.2.11 File Name Convention for a PDS and an EDS Delivery Record

When EDOS stores a PDS, or an EDS, Delivery Record in a DAAC's directory, the file name storing the record has the format identified in Table 8.1.2.11-1. Content of the items for the APIDs, GMT time, and Numeric Identification are an exact copy of the fields in the corresponding PDS/EDS Identification. EDOS will ensure that the file name in the destinations directory is unique.

Table 8.1.2.11-1. File Name Convention for a PDS and an EDS Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "X" or "Y" ; "X" identifies the file as a PDS Delivery Record and "Y" identifies the file as an EDS Delivery Record.

2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of "AAAAAAA".
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 8.1.2.5-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of "AAAAAAA".
5	Time of EDS/PDS Creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set was created).
6	Numeric Identification	ASCII 1 Byte	Range -> "0" through "9", one-up, wrap around, data set counter. PDSs and EDSs utilize the same counter. This numeric identification is a copy of the numeric identification in the PDS/EDS Identification in Table 8.1.2.8-1 from when the PDS/EDS was created. This number aids in distinguishing the order of data set creation during the day and provides uniqueness to the file name.
7	File Name Extension	ASCII 4 Bytes	Value -> ".PDR" or ".EDR"
A File name for an EDS/PDS Delivery Record contains a total of 38 Bytes. Examples: X0420309042031104203109503023145 91.PDR and Y0420193AAAAAAAAAAAAAA953652359590.EDR			

8.1.2.12 File Name Convention for the PDS/EDS Acceptance Notification

When a DAAC stores a PDS/EDS Acceptance Notification in an EDOS directory via FTP, the file name storing the message has the format defined in Table 8.1.2.12-1. The sender of this message ensures that the file name in EDOS's directory is unique (i.e. doesn't have a time field with the same second field).

Table 8.1.2.12-1. File Name Convention for the PDS/EDS Acceptance Notification

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "I" identifies the PDS/EDS Acceptance Notification
2	Time of File Creation	ASCII 11 Bytes	Value -> Refer to Table 8.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data was placed within the destination's directory).

3	File Name Extension	ASCII 4 Bytes	Value -> ".PAN" or ".EAN"
File names contains a total of 16 Bytes. Examples: I95030231459.PAN and I95365235959.EAN			

8.1.2.13 File Name Convention for a PDS Physical Media Unit Delivery Record

When EDOS stores a PDS Physical Media Unit Delivery Record as the first file on a physical media unit, the file name storing the record has the following format. EDOS will ensure that each file name is unique.

Table 8.1.2.13-1. File Name Convention for a PDS Physical Media Unit Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> "D" means PDS Physical Media Unit Delivery Record.
2	Bar Code Label/Serial Tape Number (matches the Serial Number on the physical media unit label).	ASCII 6 Bytes	Values-> First character always equals: "Z" for EDOS Archived Physical Media Units. The remaining 5 alphanumeric characters in positions 2 through 6 (contain the letters A through Z and 0 through 9), provide the remaining uniqueness for this Physical Media Unit Identification.
3	File Name Extension	ASCII 4 Bytes	Value -> ".MDR"
A File name for an PDS Physical Media Delivery Record contains a total of 11 Bytes. Examples: DZBC012.MDR and DZ9ZA49.MDR			

8.1.3 Operations Management Data/Operations Management Test Data

The following paragraphs define the content of the Operations Management Data and Operations Management Test Data (Operations Management Data with the "Test Flag" set). Distinction between Operations Management Data and Operations Management Test Data lies entirely with the test flag being set or not set in the EDOS Ground Message Header.

8.1.3.1 PDS and EDS Delivery Records

After files for a PDS or an EDS are successfully transferred to a DAAC, EDOS sends the PDS/EDS Delivery Record to the DAAC providing notification of the data set's presence. The EDOS Ground Message Header identifies whether this message is a PDS or an EDS Delivery Record.

The PDS and EDS Delivery Records (see Table 8.1.3.1-1) consist of an EDOS Ground Message Header, an Exchange Data Unit Label, a PDS/EDS Delivery Record Label, and PDS/EDS Delivery Record PVL Statements.

Table 8.1.3.1-1. PDS and EDS Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value-> Refer to Table 8.1.2.1-1 for a definition of the EDOS Ground Message Header.
2	Exchange Data Unit Label	ASCII 20 Bytes	Value-> Refer to Table 8.1.3.1-2 for a definition of this label.
3	PDS/EDS Delivery Record Label	ASCII 20 Bytes	Value -> Refer to Table 8.1.3.1-3 for a definition of this label.
4	PDS/EDS Delivery Record PVL Statements	PVL Variable	Value -> Refer to Table 8.1.3.1-4 for a definition of the PVL statements.

Table 8.1.3.1-2. Exchange Data Unit Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> ’0000’ Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->’Z’ Class of label Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	Value ->’0001’ EDU Indicator
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to ‘1048576’ Length in ASCII of the PDS/EDS Delivery Record Label and PVL statements, including white space
Exchange Data Unit Label contains 20 bytes			

*Not used by ECS

Table 8.1.3.1-3. PDS/EDS Delivery Record Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	'0000 Value -> '0000' Note: This item is part of the DAAC required format.'
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to '1048576' Length in ASCII of PVL Statements for the PDS/EDS Delivery Record parameters, including white space
PDS/EDS Delivery Record Label contains 20 Bytes			

*Not used by ECS

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
1	ORIGINATING_SYSTEM	Unique IP address of the originator of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	EDOS Processor IP Address
2	CONSUMER_SYSTEM	Unique IP address of the consumer of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	ECS Processor IP Address

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Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
3	DAN_SEQ_NO	Sequence number assigned by originating system (1 up number starting from 0 and wrapping after 9,999,999,999)	ASCII 10 Bytes	≤ 9999999999
4*	PRODUCT_NAME	Name (i.e., type) of Product which defines the collection of files comprising of the product.	ASCII 25 Bytes	'PDS' or 'EDS'
5*	MISSION	Mission or investigation which includes the sensors producing the data of this notice	ASCII 20 Bytes	'AM-1'
6	TOTAL_FILE_COUNT	Total number of files transferred, a data set has a minimum of two files	ASCII 4 Bytes	0002 through 9999
7	AGGREGATE_LENGTH	Total number of bytes to transfer (sum for all files)	ASCII 10 Bytes	< 9999999999
8	EXPIRATION_TIME	Not used	Fixed String	999-99-99T99:99:99Z, where T and Z are literals
9	OBJECT	Start of file group parameters (not repeated in the PDS/EDS Delivery Record since a record refers to only one PDS)	ASCII 10 Bytes	'FILE_GROUP'
9-1	DATA_SET_ID	Data set identification number as assigned by EDOS. (Refer to Table 8.1.2.8-1)	ASCII 36 Bytes	ASCII representation of the Data Set Identification Number (alphanumeric)
9-2	DATA_TYPE	Data type for this APID	ASCII 20 Bytes	See Table 8.1.3.1-5. DATA_TYPE value applies to the sole APID or the first APID of a multiple APID data set.
9-3*	DESCRIPTOR	Name of sensor or instrument that collected the data	ASCII 60 Bytes	'NOT USED'
9-4*	DATA_VERSION	'Not Used'	ASCII 2 Bytes	'00'

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
9-5	NODE_NAME	Name of destination computer on which the data set files reside (Defined in the EDOS-DAAC OA)	ASCII 64 Bytes	e.g. 'ecs.gsfc.nasa.gov'
9-6	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-6.1	DIRECTORY_ID	File directory name (i.e., path name) (Directory defined in the EDOS-DAAC OA)	ASCII 256 Bytes,	e.g. '/EDOS/Level0/'
9-6-2	FILE_ID	File name (Refer to Table 8.1.2.10-1 for the file name)	ASCII 256 Bytes,	file name in ASCII
9-6.3	FILE_TYPE	Type of file contents; metadata if PDS/EDS construction record, or DATA	ASCII 20 Bytes	If the file has the data set's construction record, then this value = 'METADATA'. If the file has CCSDS packets then this value = 'DATA'

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
9-6.4	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	Maximum is 2 Gigabytes
9-6.5	END_OBJECT	End of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-7*	BEGINNING_DATE/TIME	ISO Start time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-8*	ENDING_DATE/TIME	ISO End time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-9	END_OBJECT	End of file group (not repeated since the PDS/EDS Delivery Record only refers to one PDS/EDS)	ASCII 10 Bytes	'FILE_GROUP'
Deleted				

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*Not used by ECS

Table 8.1.3.1-5. DATA_TYPE Values

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
Merged H/K	x'1'	1	AM1HK
Health & Safety	x'2'	2	AM1HS
Diagnostic	x'3'	3	AM1DIAG1
Ancillary	x'4'	4	AM1ANC
Standby	x'5'	5	AM1ST
Diagnostic	x'6'	6	AM1DIAG2
MODIS	x'40'	64	MOD000
MODIS	x'41'	65	MOD001
MODIS	x'42'	66	MOD002
MODIS	x'43'	67	MOD003

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Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
MODIS	x'44'	68	MOD004
MODIS	x'45'	69	MOD005
MODIS	x'46'	70	MOD006
MODIS	x'47'	71	MOD007
MODIS	x'48'	72	MOD008
MODIS	x'49'	73	MOD009
MODIS	x'4A'	74	MOD010
MODIS	x'4B'	75	MOD011
MODIS	x'4C'	76	MOD012
MODIS	x'4D'	77	MOD013
MODIS	x'4E'	78	MOD014
MODIS	x'4F'	79	MOD015
MODIS	x'50'	80	MOD016
MODIS	x'51'	81	MOD017
MODIS	x'52'	82	MOD018
MODIS	x'53'	83	MOD019
MODIS	x'54'	84	MOD020
MODIS	x'55'	85	MOD021
MODIS	x'56'	86	MOD022
MODIS	x'57'	87	MOD023
MODIS	x'58'	88	MOD024
MODIS	x'59'	89	MOD025
MODIS	x'5A'	90	MOD026
MODIS	x'5B'	91	MOD027
MODIS	x'5C'	92	MOD028
MODIS	x'5D'	93	MOD029
MODIS	x'5E'	94	MOD030
MODIS	x'5F'	95	MOD031
MODIS	x'60'	96	MOD032
MODIS	x'61'	97	MOD033
MODIS	x'62'	98	MOD034
MODIS	x'63'	99	MOD035
MODIS	x'64'	100	MOD036
MODIS	x'65'	101	MOD037

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Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
MODIS	x'66'	102	MOD038
MODIS	x'67'	103	MOD039
MODIS	x'68'	104	MOD040
MODIS	x'69'	105	MOD041
MODIS	x'6A'	106	MOD042
MODIS	x'6B'	107	MOD043
MODIS	x'6C'	108	MOD044
MODIS	x'6D'	109	MOD045
MODIS	x'6E'	110	MOD046
MODIS	x'6F'	111	MOD047
MODIS	x'70'	112	MOD048
MODIS	x'71'	113	MOD049
MODIS	x'72'	114	MOD050
MODIS	x'73'	115	MOD051
MODIS	x'74'	116	MOD052
MODIS	x'75'	117	MOD053
MODIS	x'76'	118	MOD054
MODIS	x'77'	119	MOD055
MODIS	x'78'	120	MOD056
MODIS	x'79'	121	MOD057
MODIS	x'7A'	122	MOD058
MODIS	x'7B'	123	MOD059
MODIS	x'7C'	124	MOD060
MODIS	x'7D'	125	MOD061
MODIS	x'7E'	126	MOD062
MODIS	x'7F'	127	MOD063
CERES	x'83'	131	CER00AF
CERES	x'84'	132	CERCALAF
CERES	x'85'	133	CERDIAF
CERES	x'A7'	167	CER00AA
CERES	x'A8'	168	CERCALAA
CERES	x'A9'	169	CERDIAA
MOPITT science	x'C0'	192	MOP00SCI
MOPITT engineering	x'C1'	193	MOP00ENG

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Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
MOPITT test	x'C2'	194	MOP00TST
MOPITT Burst Mode	x'C3'	195	MOP00BST
MOPITT Table	x'C4'	196	MOP00TBL
VNIR (1)/observation	x'101'	257	AST0V1S
VNIR (1)/observation	x'103'	259	AST0V1SE
VNIR (1)/calibration	x'105'	261	AST0V1C
VNIR (1)/calibration	x'107'	263	AST0V1CE
VNIR (1)/test	x'109'	265	AST0V1TS
VNIR (1)/test	x'10B'	267	ASTV1TSE
VNIR (2)/observation	x'111'	273	AST0V2S
VNIR (2)/observation	x'113'	275	AST0V2SE
VNIR (2)/calibration	x'115'	277	AST0V2C
VNIR (2)/calibration	x'117'	279	AST0V2CE
VNIR (2)/test	x'119'	281	AST0V2TS
VNIR (2)/test	x'11B'	283	ASTV2TSE
SWIR/observation	x'121'	289	AST0SS
SWIR/observation	x'123'	291	AST0SSE
SWIR/calibration	x'125'	293	AST0SCS
SWIR/calibration	x'127'	295	AST0SCSE
SWIR/test	x'129'	297	AST0STS
SWIR/test	x'12B'	299	AST0STSE
TIR/observation	x'131'	305	AST0TS
TIR/observation	x'132'	306	AST0TE
TIR/observation	x'133'	307	AST0TSE
TIR/calibration	x'135'	309	AST0TCS
TIR/calibration	x'136'	310	AST0TCE
TIR/calibration	x'137'	311	AST0TCSE
TIR/test	x'139'	313	AST0TTS
TIR/test	x'13A'	314	AST0TTE
TIR/test	x'13B'	315	AST0TTSE
MISR/science	x'140'	320	MISL0DF
MISR/science	x'143'	323	MISL0CF
MISR/science	x'145'	325	MISL0BF
MISR/science	x'146'	326	MISL0AF

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Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
MISR/science	x'149'	329	MISL0AN
MISR/science	x'14A'	330	MISL0AA
MISR/science	x'14C'	332	MISL0BA
MISR/science	x'14F'	335	MISL0CA
MISR/science	x'151'	337	MISL0DA
MISR/engineering	x'152'	338	MISL0ENG
MISR/calibration	x'154'	340	MISCALDF
MISR/calibration	x'157'	343	MISCALCF
MISR/calibration	x'158'	344	MISCALBF
MISR/calibration	x'15B'	347	MISCALAF
MISR/calibration	x'15D'	349	MISCALAN
MISR/calibration	x'15E'	350	MISCALAA
MISR/calibration	x'161'	353	MISCALBA
MISR/calibration	x'162'	354	MISCALCA
MISR/calibration	x'164'	356	MISCALDA
MISR/on board calibrator	x'167'	359	MISL0CAL
MISR/test	x'168'	360	MISL0TST
MISR/motor	x'16D'	365	MISL0MTR
MISR/out of sync, taxi low	x'175'	373	MISL0SY1
MISR/out of sync, taxi high	x'176'	374	MISL0SY2
MISR/out of sync, null pkt	x'17A'	378	MISL0SY3
MISR/spare	x'17C'	380	n/a

* The DATA_TYPE value assigned to a PDS/EDS applies to the sole APID or the first APID of a multiple-APID data set.

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8.1.3.2 PDS/EDS Acceptance Notification

A DAAC that receives PDS files and accompanying PDS Delivery Records (or the EDS files and accompanying EDS Delivery Records) returns a PDS/EDS Acceptance Notification in acknowledgment of receipt and acceptance of each PDS/PDR or EDS/EDR pair. The DAAC attaches the EDOS Ground Message Header to the Acceptance Notification, and transfers the notification to EDOS.

If for any reason the File Transfer Disposition indicates an error occurred, the DAAC sends a "Problem Report" to EDOS to report the problem as specified in the Operations Agreement.

EDOS stores a PDS, or an EDS, on disk until it is successfully transferred to the DAAC via FTP. At that time, EDOS deletes the PDS from on-line disk storage. EDOS archives the PDS. An EDS is removed from the disk and will cease to exist, since EDOS does not archive EDSs. If a copy of the PDS is requested within an operationally specified number of days of initial production and transmission, the requested PDS will be electronically retransmitted to the requesting DAAC. After the lapse of the operationally specified number of days, any request from a DAAC for a PDS that is already on tape, will result in EDOS making a copy of the entire archive tape and mailing that tape to the requesting DAAC (Reference paragraph 8.1.4.1.6 of this ICD - EDOS Archive Removable Physical Media Unit Format).

The PDS/EDS Acceptance Notification consists of, in sequence as shown below in Table 8.1.3.2-1, the EDOS Ground Message Header and then the PDS/EDS Acceptance Notification Description

Table 8.1.3.2-1. PDS/EDS Acceptance Notification Structure

Item No.	Name	Format	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 8.1.2.1-1 for a definition of the EDOS Ground Message Header in Binary Format.
2	PDS/EDS Acceptance Notification Description	Variable	Refer to table 8.1.3.2-2 - PDS/EDS Acceptance Notification Description

Table 8.1.3.2-2. PDS/EDS Acceptance Notification Description

Item No.	Name	Type (Length in Bytes)	Data Characteristics
2-1	Message Type	Unsigned Integer 1 Byte	Value -> 12. PDS/EDS Acceptance Notification
2-2	Message length	Unsigned Integer 3 Bytes	Value -> Greater than 16. Length of PDS/EDS Acceptance Notification excluding the EDOS Ground Message Header
2-3	DRR Sequence No.	Integer 4 bytes	Value -> 0. Note: This item is part of the DAAC required format.
2-4	PDS/EDS Delivery Record Sequence No.	Integer 4 Bytes	Value -> Sequence number assigned by Originating System. Supplied in the PDS/EDS Delivery Record.
2-5	Number of Files	ASCII 4 Bytes	Value -> Total File Count in the PDS/EDS Delivery Record. Supplied in the PDS/EDS Delivery Record.
2-5.1	File Directory	ASCII 256 Bytes	Value -> ASCII string specifying file directory location. Supplied in the PDS/EDS Delivery Record (including FILE_ID, but excluding the null terminator).

Table 8.1.3.2-2. PDS/EDS Acceptance Notification Description (Continued)

Item No.	Name	Type (Length in Bytes)	Data Characteristics
2-5.2	File Name	ASCII 256 Bytes	Value -> File name in ASCII. Supplied in the PDS/EDS Delivery Record (including DIRECTORY_ID, but excluding the null terminator).
2-5.3	File Transfer Disposition	Integer 1 Byte	Value -> 0 = Successful 4 = File Not Found 8 = File Unreadable 9 = Invalid PDS/EDS Construction Record Data 10 = Invalid PDS/EDS Delivery Record Data
2-5.4	Repeat items 2-5.1 through 2-5.3 for each file		

8.1.3.3 PDS Physical Media Unit Delivery Record

Upon request from ECS, EDOS will deliver PDSs from the EDOS archive (see Section 8.1.4.1.6 of this document). These PDSs will be transferred to physical media (D3 tapes) via the TAR utility. The PDS Physical Media Unit Delivery Record (PPMUDR), residing as the first recorded item on a removable physical media unit storing PDS(s), contains: 1) Physical Media Unit Identification (bar code and serial number that matches the bar code and serial number on the exterior of the physical media unit); 2) date and time the physical media unit was generated; and 3) identity of the PDS(s) stored on the media.

No absolute path name will be used in the TAR utility command. A single TAR file shall exist on the physical media.

The PDS Physical Media Unit Delivery Record consists of an Exchange Data Unit Label, a PDS Physical Media Unit Delivery Record Label; and PVL Statements for the PPMUDR.

Table 8.1.3.3-0. Physical Media Unit Delivery Record

Item No.	Name	Format & Size	Data Characteristics
1	Exchange Data Unit Label	ASCII 20 Bytes	Value-> Refer to Table 8.1.3.3-1 for a definition of this label.
2	PDS/EDS Delivery Record Label	ASCII 20 Bytes	Value -> Refer to Table 8.1.3.3-2 for a definition of this label.
3	PDS/EDS Delivery Record PVL Statements	PVL Variable	Value -> Refer to Table 8.1.3.3-3 for a definition of the PVL statements.

Table 8.1.3.3-1. Exchange Data Unit Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> ’0000’ Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->’Z’ Class of label Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->’0’ Note: This item is part of the DAAC required format.
6	Data Description	ASCII 4 Bytes	Value ->’0001’ EDU Indicator
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to ‘1048576’ Length in ASCII of the PDS Physical Media Unit Delivery Record Label and PVL statements, including white space.
Exchange Data Unit Label contains 20 bytes			

*Not used by ECS

Table 8.1.3.3-2. PDS Physical Media Unit Delivery Record Label*

Item No.	Name	Format & Size	Data Characteristics
1	Control Authority ID	ASCII 4 Bytes	Value -> '0000' Note: This item is part of the DAAC required format.
2	Version ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
3	Class ID	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
4	S1	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.
5	S2	ASCII 1 Byte	Value ->'0' Note: This item is part of the DAAC required format.

6	Data Description	ASCII 4 Bytes	’0000 Value -> ’0000’ Note: This item is part of the DAAC required format.
7	Delimitation Parameter	ASCII 8 Bytes	Value -> less than or equal to ‘1048576’ Length in ASCII of the PVL statements, including white space.
PDS Physical Media Unit Delivery Record Label contains 20 Bytes			

*Not used by ECS

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
1*	RECORD_TYPE	Unique Identifier for the PDS Physical Media Unit Delivery Record	ASCII 4 Bytes	‘0023’ for operational PPMUDR ‘0151’ for test PPMUDR
2*	CONSUMER_SYSTEM	For the EDOS Archive physical unit , identify ‘ARCHIVE’.	ASCII 20 Bytes	‘ARCHIVE’
3*	SOFTWARE_VERSION	Not used	ASCII 8 Bytes	‘NOT USED’

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value	
4*	BAR_CODE_ID	Bar code serial number on this physical unit. The first character signifies "Z" for an EDOS Archive physical unit. The remaining 5 positions contain alphanumeric characters.	ASCII 6 Bytes	1st character is alphabetic, the rest are alphanumeric.	
5*	COMPLETION_DATE/TIME	ISO date and time of completion of this physical media unit. (Time when recording terminated).	Fixed string 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T & Z are literals This value is marked "9999-99-99T99:99:99Z" in the PPMUDR stored on the tape. However, it is filled with the correct tape completion time on the PPMUDR file that is sent via FTP.	CCR 98-0001
6*	CONSTRUCTION_FILE	Not used for an EDOS Archive physical unit.	ASCII 13 Bytes	'NOT USED' for the EDOS Archive physical unit.	
7	TOTAL_FILE_COUNT	Total number of files on this media	ASCII 4 Bytes	0003 through 9999	CCR 98-0013R1
8*	PDS_COUNT	Total number of PDSs on this physical medium	ASCII 4 Bytes	≤ 9999	
8-1	OBJECT	Start of PDS specifications (repeat for each PDS)	ASCII 10 Bytes	'FILE_GROUP'	
8-2	DATA_SET_ID	EDOS Assigned Identification to the PDS (Refer to Table 8.1.2.8-1)	ASCII 36 Bytes	PDS Identification	
8-3	DATA_TYPE	Data type for this PDS	ASCII 20 Bytes	See Table 8.1.3.1-5. DATA_TYPE value applies to the sole APID or the first APID of a multiple APID data set.	

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value	
8-4*	FIRST_PACKET_TIME	C1 effectivity: Item is not used for the EDOS Archive physical unit C2 effectivity: For this PDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/Spacecraft Time Format) from the secondary header of the first packet in the PDS (Refer to Table 8.1.4.1.1-2)	ASCII 27 Bytes	C1 effectivity: For the EDOS Archive physical unit, the value is 'NOT USED' C2 effectivity: CCSDS Time Format yyyy-mm-ddThh:mm:ss.ddddddZ	
8-5*	LAST_PACKET_TIME	C1 effectivity: Item is not used for the EDOS Archive physical unit C2 effectivity: For this PDS, CCSDS binary timecode (CCSDS Day Segmented Time Code/Spacecraft Time Format) from the secondary header of the first packet in the PDS (Refer to Table 8.1.4.1.1-2)	ASCII 27 Bytes	C1 effectivity: For the EDOS Archive physical unit, the value is 'NOT USED' C2 effectivity: CCSDS Time Format yyyy-mm-ddThh:mm:ss.ddddddZ	
8-6*	PACKET_COUNT	Item is not used for the EDOS Archive physical unit.	ASCII 8 Bytes	For the EDOS Archive physical unit, the value is 'NOT USED'	
8-7*	OCTET_COUNT	Item is not used for the EDOS Archive physical unit.	ASCII 11 Bytes	For the EDOS Archive physical unit, the value is 'NOT USED'	
8-8*	TEST_FLAG	Item contains a default value of 'F' for the EDOS Archive physical unit.	ASCII 1 Byte	For the EDOS Archive physical unit, the value is 'F'. For test tapes/PDSs, the value is 'T'.	CCR 98-0008

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
8-9*	APID_COUNT	Number of APIDs in this PDS	ASCII 2 Bytes	≤ 3 ECS data will have exactly one APID per PDS. ASTER data may have up to three APIDs per PDS. Archive tape may contain both ECS and non-ECS PDSs.
8-10*	OBJECT	Start of APID specification (repeat for each APID)	ASCII 9 Bytes	‘APID_SPEC’
8-10.1*	APID_IN_PDS	Decimal value of the EDOS APID (first 3 bytes contain the SCID (Refer to Table 8.1.2.5-1) and the last 4 bytes contain the APID (Refer to Table 8.1.4.1.1-1)).	ASCII 7 Bytes	≤ 9999999
8-10.2*	END_OBJECT	End of APID Specification	ASCII 9 Bytes	‘APID_SPEC’
8-11*	FILE_COUNT	Number of files occupied by this PDS	ASCII 4 Bytes	≤ 9999
8-11.1	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
8-11.2*	DIRECTORY_ID	Not used	ASCII 255 Bytes including FILE_ID, but excluding null terminator)	‘NOT USED’
8-11.3	FILE_ID	File name (Refer to Table 8.1.2.10-1)	ASCII 255 Bytes including DIRECTORY_ID, but excluding null terminator)	file name in ASCII

Table 8.1.3.3-3. PDS Physical Media Unit Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
8-11.4	FILE_TYPE	Type of file contents; metadata if PDS/EDS construction record, or DATA	ASCII 20 Bytes	If the file has the data set's construction record, then this value = 'METADATA'. If the file has CCSDS packets then this value = 'DATA'
8-11.5	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	≤ 9999999999
8-11.6	END_OBJECT	End of file specification	ASCII 9 Bytes	'FILE_SPEC'
8-12	END_OBJECT	End of PDS specification	ASCII 10 Bytes	'FILE_GROUP'

*Not used by ECS

8.1.3.4 EDOS Archive PDS Physical Media Unit Delivery Letter

An EDOS Archive PDS Physical Media Unit Delivery Letter, in hardcopy, is shipped along with a copy of the EDOS Archive D3 tape containing the requested data. Table 8.1.3.4-1 defines the contents of the letter. This letter is generated through automation to minimize the possibility of operator error in documenting the location and identification of the requested PDS(s). PDSs are referenced by their PDS Identification. When copies of the archived physical media units (tapes) that contain the requested PDS(s) are made, a separate letter is generated for each tape. Then the tapes and letters are packaged and shipped to the requester. In the event that only a DEDS is available to be shipped to the requester, only one letter will accompany the shipment, even if there is more than one tape for that particular DEDS.

CCR 98-0008

Table 8.1.3.4-1. Archive PDS Physical Media Unit Delivery Letter Contents

Field Name	Meaning	
Message Type	"Archive PDS Physical Media Unit Delivery Letter"	
Originating System	EDOS	
Destination System	Shipment recipient (DAAC name). See Table 8.1.2.3-1 for the list of destinations.	
PMU ID	Physical Media Unit ID number on the tape's face label bar code.	CCR 98-0012
Reference Request Sequence Number	Request sequence number assigned by EDOS to track the request for generation of the tape containing archived PDSs. This number is contained in the Service Request Disposition which was sent by the EDOS operator to the requestor of the archived PDS(s).	
Number of requested data sets on this physical medium	The number of requested data sets that are on this medium.	
Requested PDS IDs	A list of the requested PDS IDs contained on this physical medium.	CCR 98-0012
All data set IDs	A list of PDS IDs (refer to Table 8.1.2.8-1) of all the PDSs on the tape.	

8.1.3.5 DEDS Packing List

The DEDS Packing List, in hardcopy, shall be included with the DEDS removable physical media unit. In addition to the hardcopy packing list, the DEDS Packing List shall be stored as a file on the DEDS physical media unit (D3 tape). If multiple tapes are required for the requested PDS(s), the Packing List shall only be stored on the first of the tape series. Therefore, when EDOS gets a DEDS shipment, the first record on the first tape is the DEDS Packing List, the second record is the DEDS Media Description File, followed by Data Records (PDS). The "first" record of the second tape of a DEDS shipment (if there is a second tape) will be the DEDS Media Description File, followed by the Data Records. Only the first tape will have the packing list as the first record. The tape(s) and Packing List are packaged and shipped to the requester.

Table 8.1.3.5-1 defines the contents of a Packing List, and Paragraph 8.1.3.5.1 provides a sample of a DEDS Packing List.

Table 8.1.3.5-1. DEDS Packing List Contents

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content Category: Value
DELIVERY LETTER PREAMBLE	Provide descriptor of media delivery including ECS requested ID and number of media	Variable text	ASCII (No Max)	see example
[blank line]				
[blank line]				
MEDIAID	Volume ID (Bar code) (Repeat for each media object)	Variable String	ASCII (8 Bytes)	'MediaId:<value>' [2]
[blank line]				
MEDIA	Media number within request (Indented) (Repeat for each media object)	Variable String	Integer (4 Bytes)	*** on Media Number 1 (of 1) contains:'
[blank line]				
[blank line]				
GRANULE UR	Indicates start of a data granule. GranuleUR is the ECS UR for that data granule UR. (Repeat for each granule.) (Indented.)	Variable String	ASCII (334 Bytes including 325 Bytes for GranuleUR) [1]	'Granule: <GranuleUR>'
[blank line]				
ESDT	Specifies the short name of the data's Earth Science Data Type. (Repeat for each granule.) (Indented.)	Variable String	ASCII (14 Bytes including 8 Bytes for the ESDT name) [1]	'ESDT: <Data Type>' See Table 8.1.3.1-5 for valid Data Type
[blank line]				
[blank line]				
FILES START INDICATOR	Detailed information on each file contained within the identified granule in sequential order.	Fixed String	ASCII (6 Bytes)	Files:
FILENAME	The filename for a file in the present granule. (Repeat for each file in present granule.) (Indented.)	Variable String	ASCII (256 Bytes)	'Distribution File Name: <name>'

Table 8.1.3.5-1. DEDS Packing List Contents (Continued)

Content Category	Description	Type	Format/ Max Size (bytes)	Value or Content Category: Value
FILESIZE	The file's size in Bytes (Repeat for each file in present granule.) (Indented.)	Variable String	ASCII (8 Bytes)	'Size: <size>'
ESTIMATED SIZE	The estimated size the file is expected to consume on the media. On Tape (Indented)	Variable String	Real (8 Bytes)	'Estimate Size: <estimate size>
COMPRESSION	Indicates if a file compression Algorithm has been applied (Repeat for each file in present granule.) (Indented.)	Variable String	Integer (4 Bytes)	Compression Status: <value> Possible Values: None, UNIXCompression, GZIP.
[blank line]				

Note 1. This field length includes a content category, a colon, 1 blank, and a value string.

Note 2. Angle brackets (< and >) enclose information to be supplied by ECS at distribution time.

Note 3. Size does not exceed a total of 256 bytes for FILENAME. Size limit includes the null terminator.

8.1.3.5.1 Sample Packing List

DEDS Packing List Contents

This set of tapes was produced using UNIX "tar" with no compression algorithms on the "tar" results. File compression status is indicated in the file specific information below. Once you extract the files from the tape(s), they are ready to use. A DEDS Packing List (named PACKING.LST.<requestID> in all caps) is provided on the first tape. Note that no "tar" file spans more than one tape: you should never be prompted to load additional tapes other than the one you are extracting files from. Data was written using the UNIX "tar" command to these tapes. To recover data use the following steps:

1. Move to the directory where you wish the files to reside.
2. Use "tar" with the x option to retrieve files.

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Specifying a blocking factor is not necessary. Consult your O/S documentation on using "tar" to extract specific files. Here are two examples you can use: CCR 98-0008

tar xvf /dev/tape PACKING.LST.<requestID>.

This extracts the DEDS Packing List out of the first tape onto the current directory (/dev/tape is the assumed tape device name).

tar xvf /dev/tape\n.

This extracts everything from the current tape part onto the current directory.

Check to make sure that the stream is OK. If it is not, log a message and return a failed status.

MediaId: <ECS supplied bar code>

*** on Media Number 1 (of n) contains:

Granule: UR:10:DsShESDTUR:UR:15:DsShSciServerUr:9athabasca:18:Science:MISL011:1302

ESDT: MISL0AN

Files:

Distribution File Name: P0420289AAAAAAAAAAAAAA95030231459000.PDS

Size: 33997

Estimated Size: 4096

Compression Status: none

Distribution File Name: P0420289AAAAAAAAAAAAAA95030231459001.PDS

Size: 4

Estimated Size: 36864

Compression Status: none

Distribution File Name: P0420289AAAAAAAAAAAAAA95030231459002.PDS

Size: 4

Estimated Size: 36864

Compression Status: none

8.1.3.6 DEDS Media Description File

A DEDS Media Description File, resides on each DEDS physical media unit (D3 tape) and lists all the files on that tape. If the requested PDSs span multiple tapes, each individual tape will contain a DEDS Media Description File describing only the files on that individual tape.

The DEDS Media Description File is an ASCII file composed of a series of text strings. The ASCII file has one text string line for each file contained on the tape. Each line has the information described in Table 8.1.3.6-1. Each field in the text string is separated by a single blank space. Paragraph 8.1.3.6.1 provides a sample Media Description File.

Table 8.1.3.6-1. Media Description File Contents

Field Name	Description	Type	Format/Max Size (bytes)	Value or Content Category: Value
Unique file name	This is the name that the ECS Server uses to uniquely identify the file generated by the request. This is for internal use within the subsystem	Variable String	ASCII (256 Bytes)	
Requested file name	This is the name of the file the requester actually ordered.	Variable String	ASCII (256 Bytes)	
File size	The size in bytes of the identified file.	Variable String	Integer (4 Bytes)	
Data source	This will be either an “L” or “C”, “L”inked from the archive read only cache or “C”opied from some other source, such as the ECS server created metadata file or the ECS server subset file	Fixed String	ASCII (1 Byte)	
Compression type	This indicates the current compression type. The supported type is UNIX compression.	Variable String	Integer (4 Bytes)	

8.1.3.6.1 Sample Media Description File

Unique file name: staging.dat

Requested file name: stagnin.dat.unique

File size: 343

Data source: C

Compression type: gzip

8.1.3.7 DEDS Tape Label

EGS Elements affix a face label onto DEDS tapes that are produced from archived data. This face label is annotated with the following data:

a. Bar code and media ID

b. Name of EGS Element that made the tape

c. Request ID

d. Mission dates for data on the tape

e. Number of files

f. Tape format, type and block size

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8.1.3.8 EDOS Archive Tape Label

In addition to the edge label, which contains bar code that is used by robotic systems, EDOS affixes a face label onto D3 tapes that are produced from archived data. This face label is annotated with the following data:

a. Bar code and tape ID (This 6-character ID matches the BAR_CODE_ID field in the PPMUDR, which is the first recorded file on the tape.)

b. Date and time of tape completion

c. EGS Element mailing address

8.1.4 Mission Data/Mission Test Data

The following paragraphs define the content of the Mission Data and the Mission Test Data (Mission Data with the "Test Flag" set). The distinction between Mission Data and a Mission Test Data lies entirely with the test flag being set or not set in the PDS and EDS Construction Records.

8.1.4.1 EDOS Mission Data

The following paragraphs define the EDOS data structures for Mission Data/Mission Test Data.

8.1.4.1.1 Path Service EDU

The Spacecraft returns Version 1 CCSDS Packets through the space network and ground terminals to EDOS. EDOS demultiplexes the CCSDS packets from the VCDUs designated by management information to contain multiplexed packets. The resulting packet is the Path Service Data Unit (SDU). EDOS builds PDSs and EDSs that contain these Path SDUs.

Path Service (Reference Paragraph 2.1.1 of this ICD, Applicable Document 8 - Paragraph 6.1.1 and Paragraph 2.1.2 Reference Document 4 - Paragraphs 2.3.1.2.a and 3.3.3.a) transfers variable-length application-layer science and non-science SDUs (Version-1 CCSDS Packets) through the space network to the ground network. Each SDU contains a delimited string of octets of user application data. The Path service is asynchronous and non-sequence preserving. It's primarily used for transferring, at moderate to very-high data rates, large volumes of structured, delimited data units between fairly static source and destination associations.

The Path SDU (Figure 8.1.4.1.1-1), referred to as a Version-1 CCSDS Packet, consists of a Primary Header, which is 6 octets long, a Secondary Header, which is 9 octets long, and the Application Data which is variable in length.

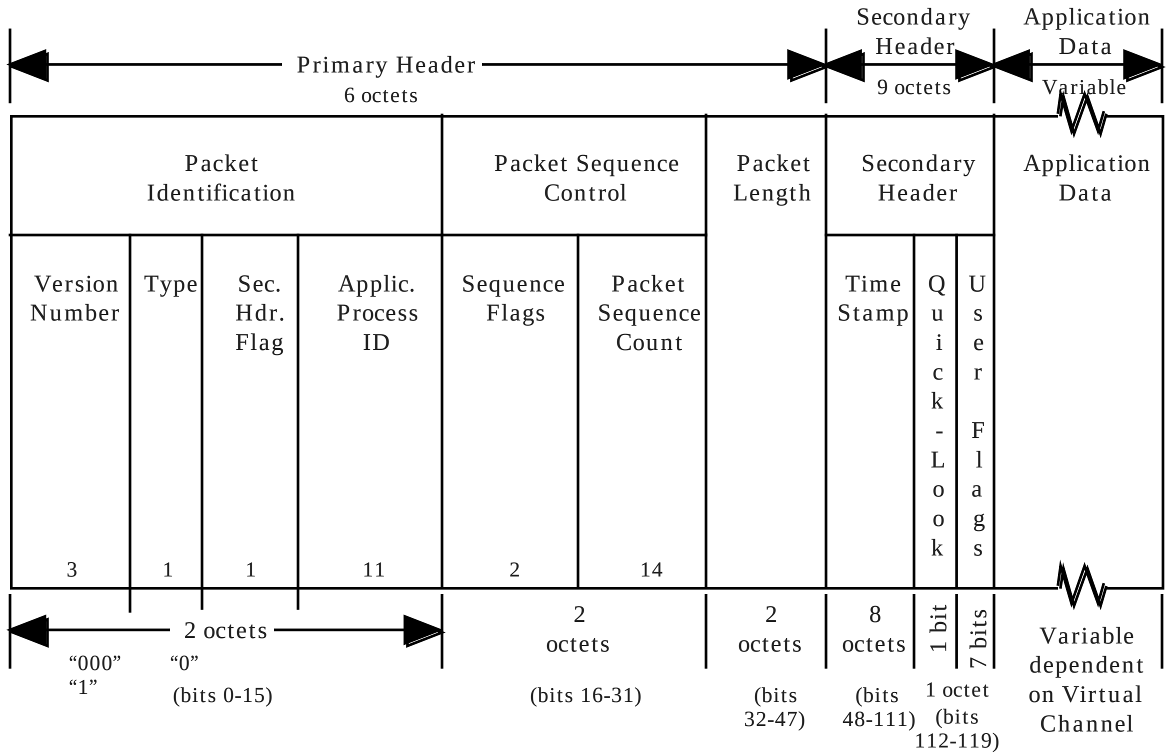

Figure 8.1.4.1.1-1. Path SDU (Version-1 CCSDS Packet Format)

Primary Header: The Primary Header consists of 2 octets of packet identification, 2 octets of packet sequence control, and 2 octets of packet length

- Packet Identification (2 Octets)

Bits 0 through 2 contain the Version Number. These three bits shall be set to "000", signifying the Version-1 CCSDS Packet.

Bit 3 contains the Type bit. The Type bit is not used within the CCSDS Advanced Orbiting Systems; however, the Type bit is set to "0" indicating a telemetry packet.

Bit 4 contains the Secondary Header Flag. All spacecraft telemetry and science data packets have secondary headers. The flag is set to value "1".

Bits 5 through 15 contain the Application Process Identifier (APID). The APID uniquely identifies the individual application process within the Spacecraft which created the application data in the CCSDS Packet. The APIDs for H/K telemetry, Health and Safety (H&S) telemetry and diagnostic telemetry are the same as their virtual channel identification numbers in the downlink. The APID assignments are as shown in Table 8.1.4.1.1-1. APIDs remain fixed throughout the spacecraft's mission life.

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
Non-Science Data				
Merged H/K	1 = x'1'	1 = x'1'	N/A	GSFC
Merged H/K	11 = x'B'	1 = x'1'	N/A	GSFC
Health & Safety	2 = x'2'	2 = x'2'	N/A	GSFC
Diagnostic	3 = x'3'	3 = x'3'	N/A	GSFC
Ancillary	11 = x'B'	4 = x'4'	N/A	GSFC
Standby	2 = x'2'	5 = x'5'	N/A	GSFC
Diagnostic	3 = x'3'	6 = x'6'	N/A	GSFC
Science Data				
MODIS / Science & Engineering, and Memory Dump	42 = x'2A'	Any single APID from 64 = x'40' through 127 = x'7F'	GSFC	GSFC
CERES - Fore / Science	11 = x'B'	131 = x'83'	LaRC, LATIS	LaRC, LATIS
CERES - Fore / Calibration	11 = x'B'	132 = x'84'	LaRC, LATIS	LaRC, LATIS
CERES - Fore / Diagnostic	11 = x'B'	133 = x'85'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Science	11 = x'B'	167 = x'A7'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Calibration	11 = x'B'	168 = x'A8'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Diagnostic	11 = x'B'	169 = x'A9'	LaRC, LATIS	LaRC, LATIS
MOPITT / Science	11 = x'B'	192 = x'C0'	LaRC	LaRC
MOPITT / Engineering	11 = x'B'	193 = x'C1'	LaRC	LaRC
MOPITT / Test	11 = x'B'	194 = x'C2'	LaRC	LaRC
MOPITT / Burst Mode	11 = x'B'	195 = x'C3'	LaRC	LaRC
MOPITT / Table	11 = x'B'	196 = x'C4'	LaRC	LaRC
Note: VNIR(1), VNIR(2), SWIR, and TIR EDSs each have 2 or more APIDs. Data Type: S = Science, S&E = Science and Engineering, E = Engineering.				
VNIR (1) / Observation	17 = x'11'	S = 257 = x'101' and S&E = 259 = x'103'	GSFC DAAC	N/A (ASTER)

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Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
VNIR (1) / Calibration	17 = x'11'	S = 261 = x'105' and S&E = 263 = x'107'	GSFC DAAC	N/A (ASTER)
VNIR (1) / Test	17 = x'11'	S = 265 = x'109' and S&E = 267 = x'10B'	GSFC DAAC	N/A (ASTER)
VNIR (2) / Observation	30 = x'1E'	S= 273 = x'111' and S&E = 275 = x'113'	GSFC DAAC	N/A (ASTER)
VNIR (2) / Calibration	30 = x'1E'	S = 277 = x'115' and S&E = 279 = x'117'	GSFC DAAC	N/A (ASTER)
VNIR (2) / Test	30 = x'1E'	S =281 = x'119' and S&E = 283 = x'11B'	GSFC DAAC	N/A (ASTER)
SWIR / Observation	18 = x'12'	S = 289 = x'121' and S&E = 291 = x'123'	GSFC DAAC	N/A (ASTER)
SWIR / Calibration	18 = x'12'	293 = x'125' and S&E = 295 = x'127'	GSFC DAAC	N/A (ASTER)
SWIR / Test	18 = x'12'	S = 297 = x'129' and S&E = 299 = x'12B'	GSFC DAAC	N/A (ASTER)
TIR / Observation	23 = x'17'	S = 305 = x'131', S&E = 307 = x'133', and E = 306 = x'132'	GSFC DAAC	N/A (ASTER)
TIR / Calibration	23 = x'17'	S = 309 = x'135', S&E = 311 = x'137', and E = 310 = x'136'	GSFC DAAC	N/A (ASTER)
TIR / Test	23 = x'17'	S = 313 = x'139', S&E = 315 = x'13B', and E = 314 = x'13A'	GSFC DAAC	N/A (ASTER)
MISR Charge Coupled Device (CCD) (1 Science APID for each of 9 cameras) / Science	41 = x'29'	320 = x'140'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	323 = x'143'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	325 = x'145'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	326 = x'146'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	329 = x'149'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	330 = x'14A'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	332 = x'14C'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	335 = x'14F'	LaRC	LaRC

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Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
MISR CCD /Science	41 = x'29'	337 = x'151'	LaRC	LaRC
MISR / Non Calibration / Engineering	41 = x'29'	338 = x'152'	LaRC	LaRC
MISR CCD / Calibration (1 Calibration for each of 9 cameras)	41 = x'29'	340 = x'154'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	343 = x'157'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	344 = x'158'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	347 = x'15B'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	349 = x'15D'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	350 = x'15E'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	353 = x'161'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	354 = x'162'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	356 = x'164'	LaRC	LaRC
MISR (On Board Calibrator) / Calibration	41 = x'29'	359 = x'167'	LaRC	LaRC
MISR / Test	41 = x'29'	360 = x'168'	LaRC	LaRC
MISR / Motor	41 = x'29'	365 = x'16D'	LaRC	LaRC
MISR / Out of Sync, Taxi Low	41 = x'29'	373 = x'175'	LaRC	LaRC
MISR / Out of Sync, Taxi High	41 = x'29'	374 = x'176'	LaRC	LaRC

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MISR / Out of Sync, Null Packet	41 = x’29’	378 = x’17A’	LaRC	LaRC	CCR 98-0013R1
MISR / Spare	41 = x’29’	380 = x’17C’	LaRC	LaRC	

- Packet Sequence Control (2 Octets) (Note: Packet Sequence Control bits are not applicable for EDOS processing)

Bits 16 and 17 contain the Sequence Flags. The Sequence Flags indicate the sequence of the data in the VCDU relative to a packet. The Sequence Flags are not processed by EDOS since they are not part of the CCSDS protocol.

Bits 18 through 31 contain the Packet Sequence Count. All telemetry packets contain a sequence number. This field is a monotonically increasing field returning to zero upon exceeding the maximum value of 16,383.

- Packet Length (2 Octets)

Bits 32 through 47 contain the Packet Length. The Packet Length field contains a sequential 16-bit binary count of the length "C" (in octets) of the packet excluding the primary header. The field shall be the count of the total number of octets which occur in the packet following the last bit of the Primary Header, expressed as: C = { (number of octets) -1 }.

Secondary Header: The Secondary Header contains the Time Stamp within 8 octets, and the quick-look and User Flags within 1 octet.

Bits 48 through 111, the Time Stamp (Time Code) field (Table 8.1.4.1.1-2), contains the 64-bit CCSDS Day Segmented Time Code (Reference ICD Paragraph 2.1.2, Applicable Document 9). This applies to the H/K telemetry, the H&S telemetry, the diagnostic telemetry, and the science data.

Bit 112, the quick-look flag is set and reset by command. The quick-look flag is true when its value is "1".

Bits 113 through 119 contain the User Flags. The seven flags, 1-bit each, are reserved and are set to "0".

Table 8.1.4.1.1-2. Spacecraft Time Format (Time Stamp/Time Code)

Spacecraft Time Format (Time Stamp/Time Code)						
Data Word No. (*)	**Starting (MSB) Bit (**)**	**No. Bits (***)**	**Description**	**Units**	**Format**	**Scaling**
1	0	16	Days since 1958 January 1 (****)	Days	US	0
2/3	0	32	Millisecond of Day (number milliseconds since beginning of current day)	msec	US	0
4	0	16	Microsecond of Millisecond (number microseconds in current millisecond)	micro-sec	US	0

Notes:

(*) - Word 1 is the first data word transmitted

(**) - Bit 0 is the first bit transmitted

(***) - Values which extend beyond the end of a 16-bit data word are continued starting bit 0 of the next data word.

(****) - The first seven bits of the day field, the P field (preamble), are implied and not actually transmitted (i.e., this information is not included in the Spacecraft Time Stamp). These seven bits are: "1000001" (reading left to right: bits "100"=Day Segmented, "0"=1958 1 epoch, "0"=16-bit day segment, and "01"=Microsecond resolution.

US - Unsigned

MSB - Most significant bit

- Application Data: The Application Data contains the variable length Telemetry data characteristics.

The application data contains the source data from the corresponding instrument data group and operation mode.

8.1.4.1.2 Production Data Set (PDS) Processing

Each instrument’s operation mode yields a unique APID. EDOS gathers CCSDS packets with the same APID into Production Data Sets (PDSs) (Reference Table 8.1.4.1.1-1 of this ICD). For example, the MOPITT instrument has three modes: Science, Engineering, and Test; each with a unique APID. Therefore EDOS builds three PDSs, each with CCSDS packets of a single APID.

EDOS creates a PDS for each science and non-science (e.g., housekeeping) (Reference Table 8.1.4.1.1-1 of this ICD) data type generated by the AM-1 Spacecraft instruments. CCSDS packet ordering within a single APID PDS is forward ordered by CCSDS Packet Secondary Header Time and forward ordered by Source Sequence Count (SSC). The SSC is a modulo 16,384 value (returning to zero upon exceeding the maximum value of 16,383) that could wrap around many times during the PDS.

To conform to Level Zero processing requirements, EDOS identifies the packets missing from the PDS. Duplicate packets are excluded from the current PDS.

DAACs' can specify the content of a PDS by modifying the PDS construction criteria in the EDOS-DAAC OA. The amount of data in any individual PDS depends on the PDS construction attributes specified in the EDOS-DAAC OA for that particular PDS.

8.1.4.1.3 Production Data Set (PDS) Format

A PDS consists of a PDS Construction Record and one (1) or more CCSDS Path SDUs.

A PDS always resides within two (2) or more files, each file being less than or equal to the maximum size specified in the EDOS-SDPS OA (Reference ICD Table 8.1.2.9-1 of this ICD for the file name convention). The first file only contains a copy of the PDS Construction Record. The remaining file(s) store the CCSDS Path SDU Packets. When the CCSDS Path SDU packets reside in two or more files, all packets with the same CCSDS packet secondary header time must reside in the same file.

When a PDS requires less than the maximum file size specified in the EDOS-SDPS OA to store the CCSDS Path SDU Packets, the PDS resides in its entirety in two files as shown below:

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	PDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for all Path SDUs in the PDS		

When a PDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the PDS resides in its entirety in more than two files as shown below. The storage of Path SDUs continues (in the normal PDS construction Path SDU sequential order) across the file boundaries.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	PDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the PDS		

. . . . . . Additional Files as required . . . . . .

File number “n” (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the PDS		

A pictorial view of the above PDS stored in the files, when the PDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, is as shown below:

File number 1 (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

PDS Construction Record

File number 2 (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

Path SDU	...	Path SDU

.
.
.

File number “n” (<= the maximum size specified in the EDOS- DAAC OA) in the PDS

Path SDU	...	Path SDU

8.1.4.1.4 Expedited Data Set (EDS) Processing

EDSs provide an expedited look at the science and engineering data generated by the AM-1 instruments. An EDS is built by EDOS when the CCSDS version 1 packets received by EDOS have the quick-look flag set in the secondary header by the on-board instrument or as directed by the EOC (as defined in the EDOS-DAAC OA), to build an EDS for the next SCS. EDS processing takes precedence over PDS processing.

EDOS creates EDSs on a multiple APID basis for instruments VNIR(1), VNIR(2), SWIR, and TIR, and on a single APID basis for the other instruments (refer to Table 8.1.4.1.1-1). Refer to ICD Paragraph 2.1.1 Applicable Document number 19 for CCSDS packet ordering for and EDS with multiple APIDs. CCSDS packet ordering within an EDS with a single APID is forward ordered by CCSDS Packet Secondary Header Time and forward ordered by SSC. The actual sequence number of the packet is the CCSDS Source Sequence Count assigned to the packet by the instrument that generated it. The SSC is a modulo 16,384 value (returning to zero upon exceeding the maximum value of 16,383) that could wrap around many times during the EDS.

Redundant packets are excluded from an EDS. When more than one copy of a packet exists, only the best quality packet is included in the EDS.

Packets within an EDS will also be used to build a PDS. Each EDS contains packets from a single specific SCS.

EDOS stores packets for an EDS in the order they are received with minimal processing. Therefore, EDSs constructed when the CCSDS packet's secondary header quick-look flag is set could have an erroneous count for the number of packets with SSC discontinuities. EDOS is unable to distinguish between a packet that is truly missing, a packet that is out of order, and a packet that erroneously does not have the quick-look flag set. This means the number of SSC discontinuities is incremented when packets do not have the quick-look flag set, a packet that is out of order, and when the packets are truly missing. To determine if a packet is truly missing, an evaluation needs to be made of the associated PDS that contains the packets within the EDS to determine its absence. EDOS does not perform this type of missing packet processing for expedited data.

An EDS always resides within two (2) or more files, each file being less than or equal to the maximum size specified in the EDOS-DAAC OA. The first file only contains a copy of the EDS Construction Record. The remaining file(s) store the CCSDS Path SDU Packets. When the CCSDS Path SDU packets reside in two or more files, all packets with the same CCSDS packet secondary header time must reside in the same file.

EDOS has the capability to build EDSs for the non-science data (Reference ICD Table 8.1.4.1.1-1). However, EDOS anticipates that requests for preparing non-science EDSs will be rare since EDOS already delivers non-science data per SCS in the form of Rate Buffered Path Service EDUs (Reference ICD Table 5.3.3-1) and Real-time Path Service EDUs (Reference ICD Table 5.3.2-1).

8.1.4.1.5 Expedited Data Set (EDS) Format

After an EDS is built, EDOS electronically transmits the EDS to a DAAC. The GSFC DAAC receives the ASTER GDS EDSs (VNIR(1), VNIR(2), SWIR, and TIR) (Reference Table 8.1.4.1.1-1).

An EDS consists of a EDS Construction Record and one (1) or more CCSDS Path SDUs.

When an EDS requires less than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the EDS resides in its entirety in two files as shown below.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	EDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for all Path SDUs in the EDS.		

When an EDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, the EDS resides in its entirety in more than two files as shown below. The storage of Path SDUs continues (in the normal EDS construction Path SDU sequential order) across the file boundaries.

File number one (1) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	EDS Construction Record (Refer to Table 8.1.2.7-1)		

File number two (2) (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the EDS		

. . . . . . Additional Files as required . . . . . .

File number “n” (<= the maximum size specified in the EDOS-DAAC OA) contains:

Item No.	Name	Format & Size	Data Characteristics
1	Path SDU	Integer Formatted Variable Size	Variable -> Refer to Figure 8.1.4.1.1-1.
1-1	Repeat item 1 for the Path SDUs in the EDS		

A pictorial view of the above EDS stored in the files, when the EDS requires more than the maximum file size specified in the EDOS-DAAC OA to store the CCSDS Path SDU Packets, is as shown below:

File number 1 (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

EDS Construction Record

File number 2 (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

Path SDU	...	Path SDU

.
.
.
File number "n" (<= the maximum size specified in the EDOS- DAAC OA) in the EDS

Path SDU	...	Path SDU

8.1.4.1.6 EDOS Archive Removable Physical Media Unit Format

In response to a DAAC request via the Service Request, EDOS will deliver EDOS Archive Removable Physical Media Units containing level 0 products. A media unit contains a PDS Physical Media Unit Delivery Record (PPMUDR) file and PDS files. This data is stored on D3 tape as two UNIX "tar" files. The block size is 256k bytes. The first "tar" file contains the PPMUDR file. The second "tar" file contains all of the PDSs. Each media unit contains PDSs for non-science spacecraft data, and science data from multiple, potentially all, spacecraft instruments.

EDOS stores all science and non-science Path SDUs in their respective PDSs according to the established construction criteria specified by the interface receiving the PDS. PDSs stored on a physical media unit reside in their entirety on this physical media unit, i.e., not partially stored on one physical media unit and continued onto the next physical media unit. The format and content of an EDOS Archive Removable Physical Media Unit storing PDSs is as follows: CCR 98-0008

PDS Physical Media Unit Delivery Record File (Refer to Table 8.1.3.3-1 of this ICD).

End of first "tar" file

PDS files (Refer to Paragraph 8.1.4.1.3):

For PDS number "1" (Two or more files are present, each being less than or equal to the maximum size specified in the OA. The first file only contains the PDS Construction Record, and each file thereafter contains the Path SDUs.) CCR 98-0008

PDS files for additional PDSs (if applicable)...

PDS number "n"

End of second “tar” file

End of tape

Note: Any End of “tar” file is generated by the “tar” facilities. “Tar” by default performs the function of generating End of “tar” and End of tape.

A pictorial view of the above PPMUDR and associated archived PDSs (varying in size) in files on a Physical Media Unit is shown below:

PDS Physical Media Unit Delivery Record File

End of first “tar” file.

PDS Construction Record in a separate file for "<PDS1>00"	Path SDUs in a file for "<PDS1>01"	Path SDUs in a file for "<PDS1>02"

PDS Construction Record in a separate file for "<PDS2>00"	Path SDUs in a file for "<PDS2>01"	Path SDUs in a file for "<PDS2>02"	Path SDUs in a file for "<PDS2>03"	PDS Construction Record in a separate file for "<PDS3>00"

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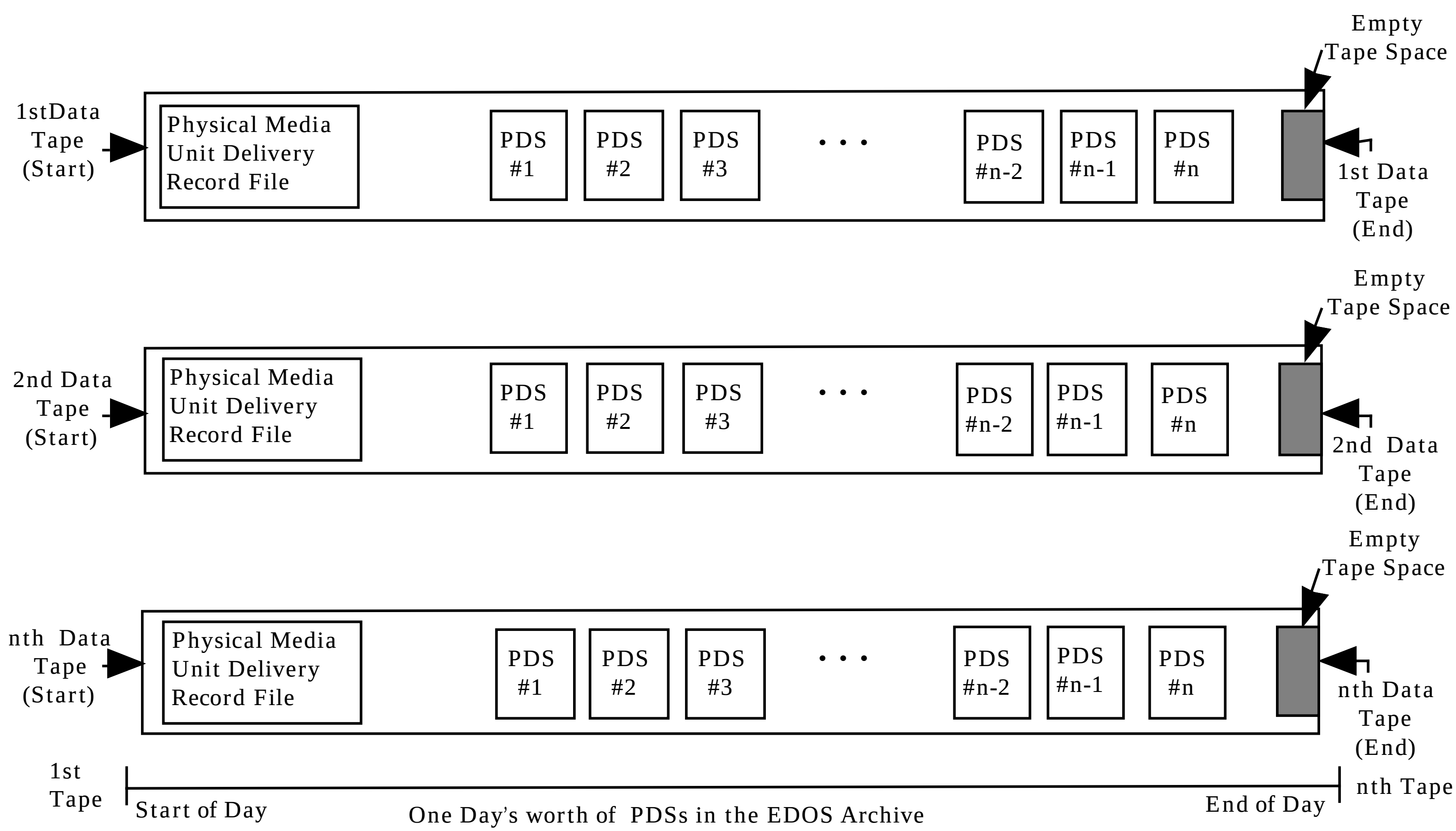
Path SDUs in a file for "<PDS3>01"

.
.
.

PDS Construction Record in a separate file for "<PDSn>00"	Path SDUs in a file for "<PDSn>01"

End of second “tar” file.

A second pictorial view of the archived data in files on a Removable Physical Media Unit is shown in Figure 8.1.4.1.6-1:



NOTES:
1) The maximum size of a file that stores data for a PDS will be as defined in an OA.
2) A PDS resides in 2 or more files (the Construction Record in a file and followed by 1 or more files containing Path SDUs).
3) The maximum size of a PDS will be as specified in an OA.
4) A PDS resides in its entirety on one physical media unit.
5) PDSs are ordered on the physical media in ascending time order.
6) Destinations that EDOS delivers the PDSs to specify the size of the Files and PDSs. The respective OAs for these interfaces define the maximum size of the files and PDSs.

Figure 8.1.4.1.6-1. EDOS Archive Removable Physical Media Unit

8.1.4.1.7 EDOS Archive Media Requests and Bar Code

A DAAC may request PDSs from the EDOS archive to replace missing or corrupted data. Such archived data will be sent to the DAAC on magnetic tape (Removable Physical Media Unit).

EDOS records Archive PDSs, on magnetic tape (D3 tapes) (Reference Paragraph 8.1.4.1.3 and 8.1.4.1.6 of this ICD for information about EDOS Archive PDS Processing and Physical Media Unit format). When a DAAC requires one or more PDSs from the EDOS Archive, the DAAC requests the PDS(s) following the procedure(s) defined in the EDOS-DAAC OA. EDOS personnel will send a copy of the entire EDOS Archive media (with all the PDSs that reside on the unit) to the DAAC on D3 tapes. This physical media unit will have an accompanying EDOS Archive Physical Media Unit Identification and an EDOS Archive PDS Physical Media Unit Delivery Letter (Reference Paragraph 8.1.3.4 of this ICD).

The EDOS Archive Physical Media Unit Identification is the bar code. Each D3 physical media unit will contain a bar code scheme of "3-of-9" formatted as specified by Storage Technologies (STK) Inc. for its tape robotic system. EDOS does not use robotics for archive management, but both ASTER GDS and the DAACs will use D3 robotics systems. The bar code 3-of-9 scheme contains six (6) alphanumeric characters. This bar code is affixed as an edge label. In addition to the edge label, each D3 tape has a separate label affixed to the face of the tape. This face label contains a standard 3-of-9 formatted bar code. The face label is defined in Paragraph 8.1.3.8. CCR 98-0008

8.1.4.2 DAAC to EDOS Data Sets (DEDS)

EDOS may request data sets from a DAAC archive to replace missing or corrupted data. Level 0 PDSs will be maintained at the DAACs for one year. After one year, Level 1A data corresponding to the desired PDS will be supplied to EDOS.

DAACs will supply DEDS on D3 media. The media will contain a DEDS Media Description File that describes its contents. The media will also be accompanied by a Packing List (Reference paragraph 8.1.3.5) describing the contents of the tape(s). Operational procedures for the delivery of these products are described in the EDOS - DAAC OA.

The DEDS are in UNIX “tar” format on D3 tapes. The blocking factor is 256k bytes. No absolute path names are utilized in the “tar” command creating the data sets. A DEDS tape contains a Packing List, a Media Description File and data set files. Data is stored on the D3 tape as two UNIX “tar” files. The first “tar” file contains the Packing List and Media Description File. The second “tar” file contains all of the PDSs or data sets. For those DEDS that have more than one tape, any tapes following the first tape will not have a Packing List file within the first “tar”. CCR 98-0008

8.1.4.3 ASTER Mission Data to/from the EDC DAAC

Since EDOS archives the ASTER Ground Data System Level 0 PDSs, EGS Elements may contact EDOS to request copies of such archived PDSs. EDOS stores in its archive all the PDSs it generates for ASTER GDS, whether or not the PDSs were initially sent to ASTER GDS after their construction by EDOS. Since EDC DAAC archives the ASTER GDS Level 1A data sets, EDOS may contact the EDC DAAC to request ASTER Level 1A DEDS.

8.2 Operations Coordination

The Operations Agreements, Applicable Documents 10 and 13, provide details about operator to operator interaction. CCR 98-0001

8.2.1 Service Requests

The DAAC operator manually sends Service Requests to the EDOS operator to request changes to regular service. A major purpose of the Service Request is to enable or disable delivery of EDOS products, or to change the address to which they are to be sent.

8.2.1.1 Service Request Data Format Overview

Service Request Data may include:

A. Service Request ID and Desired Time of Execution CCR 98-0001
   a. EGS Element Service Request ID (shall not exceed 12 characters)
   b. Greenwich Mean Time

B. Ground Communications Changes
   a. Real-time EDU Service (APID (or VCID), Operational/Test Flag, Multicast IP Address, and UDP Port Number)
   b. Rate Buffered Service for Path Service EDUs (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)
   c. Rate Buffered Service for VCDU Service EDUs (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)
   d. PDS Service (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)
   e. EDS Service (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)

f. CODA Report (SCID, IP Address, Host Name, UDP Port Number, and Operational/Test Flag)

g. SCS Summary Report (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)

h. PDS/EDS Delivery Record (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)

i. PDS Physical Media Unit Delivery Record (SCID, IP Address, Host Name, Directory, and Operational/Test Flag)

C. Rate Buffered Data Transfer Requests

a. Send or not send Rate Buffered Path Service or VCDU Service EDU files for a given SCID

b. Retransmit specific EDU files (SCS & SCID & VCID, or SCS & SCID & APID) as rate buffered data

c. Send Trash Buffer (SCS and SCID) (request from EOC)

D. EDS Transfer Requests Without Quick-Look Flag (request from EOC) CCR 98-0001

a. Request delivery of EDS for specified non-science and/or science APIDs

1. Identify number of APIDs

2. APID (SCID and APID) List

E. PDS Transfer Requests

a. Start/Stop delivery of PDS for specified non-science and science APID(s)

1. Start/Stop service

2. Identify number of APIDs

3. Choose from an APID (SCID and APID) List

b. Request delivery of one or more PDSs from the EDOS Archive or LZPF storage. PDS delivery may be via electronic retransmission (C3) or via physical media. PDSs may be requested by one of two options, PDS-ID based, or Spacecraft time-based.

1. PDS-ID based:

a. Number of PDSs

b. List of PDS-IDs

2. Spacecraft time-based:

a. PDS APID(s)

b. Start Spacecraft time.

c. End Spacecraft time.

F. Real-time EDU Transfer Requests

a. Start/Stop real-time EDU service

b. Based on APID or VCID CCR 98-0001

G. Reporting Requirements Changes

a. CODA Report Content Indicators

1. EDOS Return Link Physical Channel Status Block

2. EDOS Forward Link Physical Channel Status Block

3. EDOS Return Link CCSDS Service Status Block

4. EDOS Forward Link CCSDS Service Status Block

5. Ground Communications Return Link Service Status

b. Send SCS Summary Report (Flag)

H. Operator Comments

8.2.2 Service Request Dispositions

EDOS validates the Service Request data input by the operator and generates feedback in the form of a Service Request Disposition to the operator regarding the acceptance or rejection of the requested change(s). The operator may manually provide the Service Request Disposition to the DAAC in accordance with the OA. The Service Request Disposition contains:

a. EGS Service Request ID CCR 98-0001

b. Service Request description

c. Request disposition

d. EDOS operator comment on disposition

8.2.3 Requests for Expedited Data Sets

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Expedited Data Sets are normally created for packets that have the Quick-Look flag set in the secondary header of the Path SDU. However, EDSs may also be requested, per the OA, for APID(s) on an SCS basis. Such requests, however, must first go to the EOC for approval. The EOC operator may then pass the request to the EDOS operator for action.

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SECTION 9

SYSTEM MONITORING AND COORDINATION CENTER (SMC) INTERFACE

Section 9 - System Monitoring and Coordination Center (SMC) Interface

This section identifies those characteristics specific to the EDOS - SMC interface. It defines the communication protocol, identifies the messages exchanged, and defines the performance characteristics that exist between EDOS and the SMC.

The EDOS System Configuration 3 (C3) upgrade is currently scheduled to be implemented eight months after launch of the AM-1 spacecraft. The EDOS System Configuration 4 (C4) upgrade is currently scheduled to be implemented twelve months after launch of the AM-1 spacecraft. CCR 98-0001

9.1 Data Flow

EDOS transfers the Summary Performance Report to SMC as depicted in Figure 9.1-1.

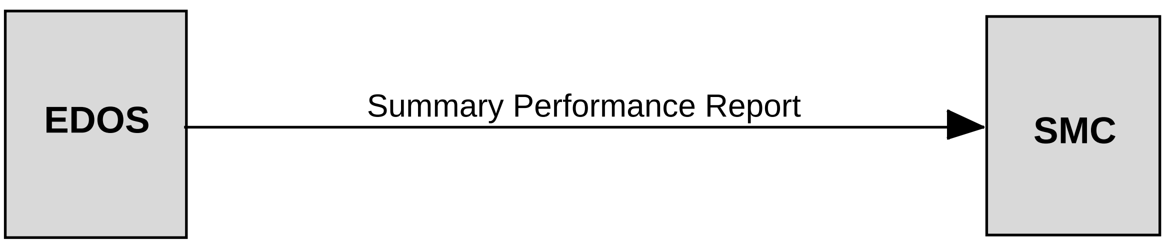

Figure 9.1-1. (C1) EDOS - SMC Interface

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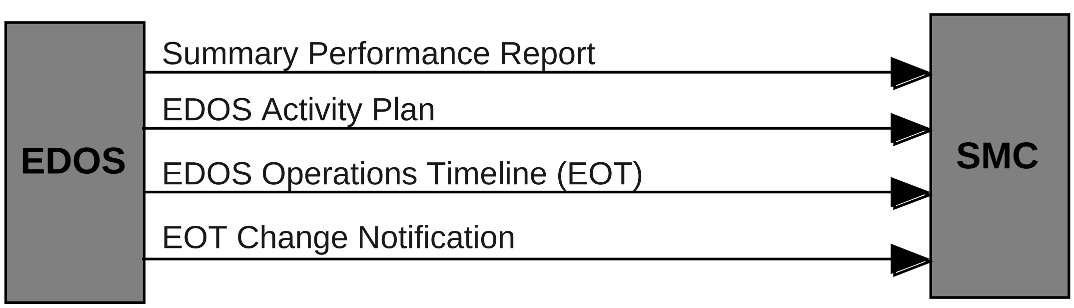

Figure 9.1-1. (C3) EDOS - SMC Interface

9.1.1 EDOS to SMC Data Flow Description

The following paragraphs describe the data flow presented in Figure 9.1-1.

Summary Performance Report: EDOS generates a daily, weekly, and monthly Summary Performance Report for EDOS events and activities. This statistical data is used to monitor EDOS's performance and to facilitate trend analysis.

(C3) EDOS Activity Plan (EAP): EDOS generates an EAP on a daily basis for all events and activities scheduled to occur in the time period between forty-eight (48) hours and three (3) weeks in the future.

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(C3) EDOS Operations Timeline (EOT): EDOS generates an EOT every 8 hours for all events and activities scheduled to occur in the next 48 hours.

(C3) EOT Change Notification: EDOS generates an EOT Change Notification whenever a change occurs in scheduled events and activities in the EOT.

9.2 EDOS to SMC Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EDOS and the SMC for all messages and data products exchanged via the Internet protocols. Refer to the EDOS-EBnet ICD (Section 2 of this ICD, Applicable Document 4).

The following paragraphs and Table 9.2-1 define the type of network addresses and protocols that govern the EDOS to SMC electronic interface.

Table 9.2-1. Addresses and Protocols For Data Sent from EDOS to SMC

EDOS - SMC Data Product	Protocol-Address
Summary Performance Report	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EDOS Activity Plan (EAP)	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EDOS Operations Timeline (EOT)	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EOT Change Notification	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.

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9.2.1 Protocols

Reference Section 3 of this ICD, Paragraph 3.5, Data Transmission Protocols for additional information regarding protocols.

File transfers via FTP follow the file name convention defined in Table 10.1.2.2-1.

9.2.1.1 Addresses

SMC's IP address(es), host name(s), login(s), password(s), and directory(ies) are defined in the EDOS-SDPS OA (Reference Section 2 of this ICD, Applicable Document 10). CCR 98-0001

9.2.1.2 Reserved

Deleted

9.3 EDOS to SMC Performance Characteristics

Performance requirements specifying the rates for transfer and receipt of data between the EDOS and the SMC are described in the Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements (refer to Section 2 of this ICD, Applicable Document 3).

9.3.1 Summary Performance Report Delivery Rate

The EDOS-SMC interface shall support the transfer of OM data (Summary Performance Reports, EAP, EOT, and EOT Change Notification) at a rate up to 49 Kilobits per second (Kbps). CCR 98-0001

9.3.2 Operations Management Data Delivery Timing

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The following subsections define the timing of Summary Performance Reports, EAPs, EOTs, and EOT Change Notifications.

9.3.2.1 Summary Performance Report Delivery Timing

EDOS shall transmit Summary Performance Reports to the SMC daily, weekly, and monthly. EDOS shall generate an EDOS Summary Performance Report within 1 minute of initiation of report generation for each day of report coverage.

9.3.2.2 EAP Data Delivery Timing

EDOS shall initiate transfer of an EAP within 10 minutes of the initiation of EAP generation. CCR 98-0001

9.3.2.3 EOT Data Delivery Timing

EDOS shall initiate transfer of an EOT within 10 minutes of the initiation of EOT generation.

9.3.2.4 EOT Change Notification Data Delivery Timing

EDOS shall initiate transfer of an EOT Change Notification within 30 seconds of receipt of any change to the current EOT.

SECTION 10

EDOS - SMC INTERFACE DESIGN

Section 10 - EDOS - SMC Interface Design

10.1 Data Description and Formats

This section describes the content and format for each message exchanged across the EDOS - SMC interface, including data items, data representation, and data structures.

10.1.1 Data Formats Overview

EDOS Ground Message Header (in PVL Format)

A. Message Type
B. Test Message Type
C. Source Identification
D. Destination Identification
E. Message Generation Date and Time
F. Mission's Spacecraft Identification
G. Message Sequence Number
H. EDOS Software Version Number
I. Message Length

Summary Performance Report (in PVL Format)

A. EDOS Ground Message Header
B. Report_coverage_start_time
C. Report_coverage_stop_time
D. Individual_mission_summary
  a. Mission_Identification
  b. Mission_total_number_contact_sessions
  c. Mission_total_number_SCS_contacts
  d. Mission_total_number_contingency_contacts
  e. Individual_session_summary
    1. Contact_identification
    2. Ground_location_identification
    3. Actual_contact_start_time
    4. Actual_contact_stop_time
    (Return Link Statistics)
    5. Percent_time_in_frame_lock
    6. Total_number_frame_synch_lock_drops
    7. Total_number_CADUs_received
    (Forward Link Statistics)
    8. Total_number_CDBs_received
    9. Total_number_forward_link_octets_received
    10. Total_number_forward_link_octets_transmitted

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(VCDU Processing Statistics)

11. Total_number_corrected_VCDUs_with_RS_errors
12. Reed_Solomon_cumulative_data_quality
13. Total_number_VCDUs_with_cyclic_ redundancy_check_errors
14. Cyclic_redundancy_check_ cumulative_data_quality
15. Total_number_VCDU-IDs_found
16. Total_number_VCDUs_demultiplexed
17. Individual_VCDU_Summary

17.a. Identification

17.b. Total_number_VCDUs_demultiplexed

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(Packet Processing Statistics)

18. Session_total_number_packets_demultiplexed
19. Session_total_number_APID(s)_found
20. Individual_APID_summary
    a. APID_identification
    b. APID_total_number_packets
21. Total_number_transferred_return_link_EDUs

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(PDS/EDS Production Statistics)

f. Total_number_of_packets_received_for_inclusion_ in_PDSs+EDSs

g. Total_number_of_PDSs_generated

h. Total_number_of_packets_included_in_PDSs

i. Total_number_of_EDSs_generated

j. Total_number_of_packets_included_in_EDSs

k. Total_number_of_packets_in_PDSs_ transferred_to_EGS_elements

l. Total_number_of_packets_within_EDSs_transmitted

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(C4) (Service Request Processing Statistics)

m. Total_number_of_ground_communications_changes

n. Total_number_of_rate_buffered_data_transfer_changes

o. Total_number_of_PDS_transfer_changes

p. Total_number_of_real-time_EDU_transfer_changes

q. Total_number_of_reporting_requirements_changes

r. Total_number_of_EDU_files_retransmitted

s. Total_number_of_EDSs_transmitted_without_Quick-Look_flag

t. Total_number_of_PDSs_transferred

E. EDOS-operator_remarks

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<u>**EDOS Activity Plan:**</u>

A. EDOS Ground Message Header (in PVL format).

B. Planned Service Requests.

C. Spacecraft Contact Schedules (based on schedules received electronically, and operator entered changes).

D. Operator entries of EDOS planned testing, maintenance, and engineering change activities.
E. RLSS schedules.

EDOS Operations Timeline:

A. EDOS Ground Message Header (in PVL format).
B. Planned Service Requests.
C. Spacecraft Contact Schedules (based on schedules received electronically, and operator entered changes).
D. Operator entries of EDOS planned testing, maintenance, and engineering change activities.
E. RLSS schedules.

EDOS Operations Timeline Change Notification: CCR 98-0001

A. EDOS Ground Message Header (in PVL format).
B. Time and Date of EOT Change Notification generation.
C. Identity of the EOT being modified.
D. Date and Time of last EOT change.
E. Modifications to existing Planned Service Requests.
F. Modifications to existing spacecraft contact schedules.
G. Modifications to existing EDOS planned testing, maintenance, and engineering change activities.

File Name Convention for Operations Management Messages::

A. File Identification Character
B. Time of File Creation
C. File Name Extension

Greenwich Mean Time (in ASCII Format):

A. Year CCR 98-0001
B. Julian Day
C. Hour
D. Minute
E. Second

File Name Convention for the Signal File:

A. Name of File to be sent via FTP
B. Signal File Name Extension (.XFR)

10.1.2 General Data Format

The format and content of these general data records reside in multiple Operations Management Data messages and/or Operations Management Data.

10.1.2.1 EDOS Ground Message Header (in PVL Format)

EDOS Ground Message Header in the PVL format (Table 10.1.2.1-1) precedes the Summary Performance Report that is transmitted to the SMC.

Table 10.1.2.1-1. EDOS Ground Message Header

Item No.	Field	Format & Maximum Size	Value
1	MESSAGE_TYPE	ASCII 30 Bytes	'------------------------------' For example: 'SUMMARY PERFORMANCE REPORT'
2	TEST_MESSAGE	ASCII 1 Byte	'N' for an operational message. (Note: 'Y' for a test message does not apply for OM data to SMC)
3	SOURCE_IDENTIFICATION	ASCII 4 Bytes	'EDOS'
4	DESTINATION_IDENTIFICATION	ASCII 3 Bytes	Value -> Reference Table 10.1.2.4-1 EDOS Source/Destination Identification Example: "SMC"
5	MESSAGE_GENERATION_DATE_AND_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6	MISSION_SPACECRAFT_IDENTIFICATION	ASCII 4 Bytes	'AM-1'
7	MESSAGE_SEQUENCE_NUMBER	ASCII 5 Bytes	Value -> "00000" through "65535"; one-up counter that wraps around, returning to zero upon exceeding the maximum value; This number is one-up per Source Identification, and is assigned by the originator.
8	EDOS_SOFTWARE_VERSION_NUMBER	ASCII 6 Bytes	Value -> "000" through "255" (first 3 bytes - identifies a major EDOS release) and "000" through "255" (second 3 bytes - represents a version of the major release - initial version or an update version)
9	MESSAGE_LENGTH	ASCII 6 Bytes	N/A

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10.1.2.2 File Name Convention for Operations Management Messages

EDOS deposits an EAP, EOT, EOT Change Notification, or Summary Performance Report file in SMC's directory via FTP. Each file that EDOS generates is given a unique file name per the naming convention defined in Table 10.1.2.2-1.

Table 10.1.2.2-1. File Name Convention

Item No.	Name	Format & Size	Data Characteristics	
1	File Identification Character	ASCII 1 Byte	Value -> "B" identifies the file as an EAP; "C" identifies the file as an EOT; "F" identifies the file as an EOT Change Notification; "G" identifies the file as a Summary Performance Report	CCR 98-0001
2	Time of File Creation	ASCII 11 Bytes	Value -> Refer to Table 10.1.2.7-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data was placed within the destination's directory).	
3	File Name Extension	ASCII 4 Bytes	Value-> ".SPR" for Summary Performance Reports ".EAP" for EDOS Activity Plans ".EOT" EDOS Operations Timelines ".ECN" for EOT Change Notifications	CCR 98-0001
File name contains a total of 16 Bytes. Examples: G95365235959.SPR, B98230231459.EAP, C98365235959.EOT, and F98185205959.ECN				

10.1.2.3 SCS Identification Data Structure

The SCS identification, in ASCII format, that is used in the data structures throughout this section is shown in Table 10.1.2.3-1. The time item within this identification records when the SCS was initiated on EDOS.

Table 10.1.2.3-1. SCS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> T. Identifies the data structure as a SCS Identification.
2	Mission Identification.	ASCII 3 Bytes	Value -> SCID Identification -> Refer to Table 10.1.2.5-1 (Contains a SCID decimal value, right justified and, if necessary, zero filled on left).
3	Ground Location Identification	ASCII 3 Bytes	Value -> Refer to Table 10.1.2.4-1 for the Ground Location receiving the Spacecraft return link data in CCSDS format.
4	Time of SCS initiation.	ASCII 11 Bytes	Value -> Refer to Table 10.1.2.6-1 for a definition of the GMT/ZULU time in ASCII format (GMT from when the SCS was initiated on EDOS).
5	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> "00"
A SCS Identification contains a total of 20 Bytes. Example: T042WSG9536623595900			

10.1.2.4 EDOS Source/Destination Identification

Table 10.1.2.4-1 - EDOS Source/Destination Identification identifies EDOS and all its external interfaces in order to identify the source and destination within the data structure (Summary Performance Report) transmitted to the SMC.

Table 10.1.2.4-1. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF

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Table 10.1.2.4-1. EDOS Source/Destination Identification (Continued)

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Langley TRMM Information System (LATIS)	19	LAT
Reserved for future use	20- 255	N/A

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10.1.2.5 Spacecraft Identification (SCID)

Table 10.1.2.5-1 - Spacecraft Identification (SCID) identifies the forward and return link spacecraft identifications within the data structures that are transmitted to the SMC.

Table 10.1.2.5-1. Spacecraft Identification (SCID)

Spacecraft	Identifier *
Refer to Applicable Document 8, Paragraph 6.1.3.1.2.1	
EOS AM-1 Telemetry (Return Link)	42 = x'2A'
*The Return Link identifier is used as the Spacecraft ID for both forward and return links to the Spacecraft.	

10.1.2.6 Greenwich Mean Time (GMT) in ASCII Format

The Greenwich Mean Time (GMT), in ASCII format that is used within the data structures transmitted to the SMC, is as defined in Table 10.1.2.6-1.

Table 10.1.2.6-1. Greenwich Mean Time (GMT) in ASCII Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	ASCII 2 Bytes	Value -> "00 " through "99"; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian Day	ASCII 3 Bytes	Value -> "001" through "366"; contains the Julian day (from the GMT/ZULU).
3	Hour	ASCII 2 Bytes	Value -> "00" through "23"; contains the hour (from the GMT/ZULU).
4	Minute	ASCII 2 Bytes	Value -> "00" through "59"; contains the minute (from the GMT/ZULU).
5	Second	ASCII 2 Bytes	Value -> "00" through "59"; contains the second (from the GMT/ZULU).
This GMT/ZULU ASCII format contains 11 bytes. Example: 95366235959			

10.1.2.7 Signal File Naming Convention

The signal file name consists of the extension ".XFR" appended to the name of the data file referenced by the signal file, including its file name extensions. See the description of the signal file in Section 3.5 of this ICD.

The following example (Table 10.1.2.7-1) illustrates a signal file for a PDS.

Table 10.1.2.7-1. Signal File Name Convention

Item No.	Name	Format & Size	Data Characteristics
1	Name of file to transferred via FTP	ASCII String	For example, Summary Performance Report file names contain a total of 16 bytes. Examples: G95365235959.SPR
2	Signal File File Name Extension	ASCII 4 Bytes	Value->".XFR"
A summary Performance Report Signal File Name contains a total of 20 bytes. Examples: G95365235959.SPR.XFR			

10.2 Operations Management Data/Operations Management Test Data

The following paragraphs define the content of the Operations Management Data.

For information regarding Operations Management Test Data refer to Section 3 of this ICD, paragraph 3.6.

10.2.1 Summary Performance Report

EDOS generates a Summary Performance Report (Table 10.1.2.1-1) for EDOS events and activities that occurred within the reporting period. EDOS attaches the EDOS Ground Message Header (in PVL format) to the Summary Performance Report and transmits the report to the SMC.

Table 10.2.1-1. Summary Performance Report

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 10.1.2.1-1 in PVL format.
2	Summary Performance Report	ASCII Variable Size	Reference Table 10.2.1-2 for content of the Summary Performance Report.

Table 10.2.1-2. Summary Performance Report Format in PVL

Item No.	Field	Format & Maximum Size	Data Characteristics
2-1	REPORT_COVERAGE_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-2	REPORT_COVERAGE_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3	OBJECT	ASCII 26 Bytes	"INDIVIDUAL_MISSION_SUMMARY"
3-1	MISSION_IDENTIFICATION	ASCII 6 Bytes	Value -> Spacecraft name representing the mission identification. Example: AM-1
3-2	MISSION_TOTAL_NUMBER_CONTACT_SESSIONS	ASCII 4 Bytes	Value -> "0000" through "9999" Total number contact sessions during this reporting period.
3-2.1	MISSION_TOTAL_NUMBER_SCS_CONTACTS	ASCII 4 Bytes	Value -> "0000" through "9999", number SCS contact sessions during this reporting period.

Table 10.2.1-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-2.2	MISSION_TOTAL_NUMBER_CONTINGENCY_CONTACTS	ASCII 4 Bytes	Value -> “0000” through “9999”, number contingency contact sessions during this reporting period.
3-3	OBJECT	ASCII 26 Bytes	‘INDIVIDUAL_SESSION_SUMMARY’
3-3.1	CONTACT_IDENTIFICATION	ASCII 20 Bytes	Value -> SCS Identification (reference Table 10.1.2.3-1) Example: T042WSG9536523595900
3-3.2	GROUND_LOCATION_IDENTIFICATION	ASCII 3 Bytes	Value -> Ground Location Identification (Reference Table 10.1.2.4-1 for the Ground Location receiving the Spacecraft return link data).
3-3.3	ACTUAL_CONTACT_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References earliest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.4	ACTUAL_CONTACT_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References latest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.5	PERCENT_TIME_IN_FRAME_LOCK	ASCII 4 Bytes	Value -> 000% to 100%
3-3.6	TOTAL_NUMBER_FRAME_SYNCH_LOCK_DROPS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of times that frame synchronization was lost during this contact session
3-3.7	TOTAL_NUMBER_CADUS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of CADUS received by EDOS during this contact session
3.3.8	TOTAL_NUMBER_CDBS_RECEIVED	ASCII 6 Bytes	Value -> 0 to 999999. Count of Command Data Blocks received by EDOS during this contact session.
3-3.9	TOTAL_NUMBER_FORWARD_LINK_OCTETS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of 8 bit bytes received by EDOS on forward link channels this contact session
3-3.10	TOTAL_NUMBER_FORWARD_LINK_OCTETS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 to 999999999; Count of 8 bit bytes transmitted by EDOS on forward link channels this contact session
3-3.11	TOTAL_NUMBER_CORRECTED_VCDUS_WITH_RS_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs with Reed-Solomon errors corrected by EDOS this contact session

Table 10.2.1-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.12	REED_SOLOMON_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 000% to 100% Estimated bit error rate based on Reed-Solomon symbol errors during this contact session (Number R-S symbols corrected times the number of bits per symbol) plus (the number of uncorrectable VCDUs times the number of bits per VCDU)) divided by (the number of VCDUs received times the number of bits per VCDU).
3-3.13	TOTAL_NUMBER_VCDUSWITH_CYCLIC_REDUNDANCY_CHECK_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of VCDUs received by EDOS with Cyclic Redundancy Check errors during this contact session.
3-3.14	CYCLIC_REDUNDANCY_CHECK_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 0% to 100%. Estimated bit error rate based on Cyclic Redundancy Check (CRC) symbol errors during the contact session (Number of uncorrectable VCDUs divided by the number of VCDUs received). Not applicable for AM-1 as AM-1 is a Grade 2 service using Reed-Solomon.
3-3.15	TOTAL_NUMBER_VCDU-IDS_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999” Total number VCDU IDs found during this contact session
3-3.16	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this contact session
3-3.17	OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’
3-3.17.1	IDENTIFICATION	ASCII 4 Bytes	Value -> “0000” to “9999”. Virtual Channel Data Unit -ID (VCDU-ID)
3-3.17.2	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this VCDU-ID for this contact session
3-3.17.3	END_OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’
3-3.18	SESSION_TOTAL_NUMBER_PACKETS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of packets demultiplexed by EDOS this contact session
3-3.19	SESSION_TOTAL_NUMBER_APID(S)_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999” Total number APIDs found during this contact session
3-3.20	OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_APID_SUMMARY’

Table 10.2.1-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.20.1	APID_IDENTIFICATION	ASCII 7 Bytes	Value -> “0000000” to “9999999”. Identify SCID and APID The first three (3) bytes = SCID (Refer to Table 10.1.2.5-1) and the Last four (4) bytes = APID (Refer to Table 8.1.4.1.1-1)
3-3.20.2	APID_TOTAL_NUMBER_PACKETS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of CCSDS Packets for this APID.
3-3.20.3	END_OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_APID_SUMMARY’
3-3.21	TOTAL_NUMBER_TRANSFERRED_RETURN_LINK_EDUS	ASCII 8 Bytes	Value -> 0 to 99999999. Count of return link EDUs transferred by EDOS this contact session
3-3.22	END_OBJECT	ASCII 26 Bytes	‘INDIVIDUAL_SESSION_SUMMARY’
3-4	TOTAL_NUMBER_OF_PACKETS_RECEIVED_FOR_INCLUSION_IN_PDS+EDS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets received to be included in PDSs and EDSs for this mission.
3-5	TOTAL_NUMBER_OF_PDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of PDSs generated for this mission.
3-6	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_PDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDS production for this mission.
3-7	TOTAL_NUMBER_OF_EDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of EDSs generated for this mission.

Table 10.2.1-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-8	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_EDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDS production for this mission.
3-9	TOTAL_NUMBER_OF_PACKETS_IN_PDSS_TRANSFERRED_TO_EGS_ELEMENTS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDSs transferred to EGS elements for this mission.
3-10	TOTAL_NUMBER_OF_PACKETS_WITHIN_EDSS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDSs transferred for this mission.
3-11	END_OBJECT	ASCII 26 Bytes	'INDIVIDUAL_MISSION_SUMMARY'
4	EDOS_OPERATOR_REMARKS	ASCII 1024 Bytes	Operator remarks regarding the Summary Performance Report reporting period. Reason(s) for exceeding the required time to deliver) Real-time CCSDS Packets to any destination; 2) Rate Buffered Data to any destination; 3) PDS or EDS to any destination; 4) ASTER production physical media; 5) generation of EDOS archive physical media unit; and 6) any processing problems encountered during this reporting period.

Table 10.2.1-2. (C4) Summary Performance Report Format in PVL

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Item No.	Field	Format & Maximum Size	Data Characteristics
2-1	REPORT_COVERAGE_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-2	REPORT_COVERAGE_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3	OBJECT	ASCII 26 Bytes	"INDIVIDUAL_MISSION_SUMMARY"

Table 10.2.1-2. (C4) Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-1	MISSION_IDENTIFICATION	ASCII 6 Bytes	Value -> Spacecraft name representing the mission identification. Example: AM-1
3-2	MISSION_TOTAL_NUMBER_CONTACT_SESSIONS	ASCII 4 Bytes	Value -> "0000" through "9999" Total number contact sessions during this reporting period.
3-2.1	MISSION_TOTAL_NUMBER_SCS_CONTACTS	ASCII 4 Bytes	Value -> "0000" through "9999", number SCS contact sessions during this reporting period.
3-2.2	MISSION_TOTAL_NUMBER_CONTINGENCY_CONTACTS	ASCII 4 Bytes	Value -> "0000" through "9999", number contingency contact sessions during this reporting period.
3-3	OBJECT	ASCII 26 Bytes	'INDIVIDUAL_SESSION_SUMMARY'
3-3.1	CONTACT_IDENTIFICATION	ASCII 20 Bytes	Value -> SCS Identification (reference Table 10.1.2.3-1) Example: T042WSG9536523595900
3-3.2	GROUND_LOCATION_IDENTIFICATION	ASCII 3 Bytes	Value -> Ground Location Identification (Reference Table 10.1.2.4-1 for the Ground Location receiving the Spacecraft return link data).
3-3.3	ACTUAL_CONTACT_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References earliest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.4	ACTUAL_CONTACT_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References latest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.5	PERCENT_TIME_IN_FRAME_LOCK	ASCII 4 Bytes	Value -> 000% to 100%
3-3.6	TOTAL_NUMBER_FRAME_SYNCH_LOCK_DROPS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of times that frame synchronization was lost during this contact session.
3-3.7	TOTAL_NUMBER_CADUS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of CADUS received by EDOS during this contact session.
3.3.8	TOTAL_NUMBER_CDBS_RECEIVED	ASCII 6 Bytes	Value -> 0 to 999999. Count of Command Data Blocks received by EDOS during this contact session.
3-3.9	TOTAL_NUMBER_FORWARD_LINK_OCTETS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of 8 bit bytes received by EDOS on forward link channels this contact session.
3-3.10	TOTAL_NUMBER_FORWARD_LINK_OCTETS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 to 999999999; Count of 8 bit bytes transmitted by EDOS on forward link channels this contact session.

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Table 10.2.1-2. (C4) Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics	
3-3.11	TOTAL_NUMBER_CORRECTED_VCDUS_WITH_RS_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs with Reed-Solomon errors corrected by EDOS this contact session.	CCR 98-0001
3-3.12	REED_SOLOMON_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 000% to 100%. Estimated bit error rate based on Reed-Solomon symbol errors during this contact session. (Number R-S symbols corrected times the number of bits per symbol) plus (the number of uncorrectable VCDUs times the number of bits per VCDU)) divided by (the number of VCDUs received times the number of bits per VCDU).	
3-3.13	TOTAL_NUMBER_VCDUS_WITH_CYCLIC_REDUNDANCY_CHECK_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of VCDUs received by EDOS with Cyclic Redundancy Check errors during this contact session.	
3-3.14	CYCLIC_REDUNDANCY_CHECK_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 0% to 100%. Estimated bit error rate based on Cyclic Redundancy Check (CRC) symbol errors during the contact session (Number of uncorrectable VCDUs divided by the number of VCDUs received). Not applicable for AM-1 as AM-1 is a Grade 2 service using Reed-Solomon.	
3-3.15	TOTAL_NUMBER_VCDU-IDS_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999”. Total number VCDU IDs found during this contact session.	
3-3.16	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this contact session.	
3-3.17	OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’	
3-3.17.1	IDENTIFICATION	ASCII 4 Bytes	Value -> “0000” to “9999” Virtual Channel Data Unit -ID (VCDU-ID).	
3-3.17.2	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this VCDU-ID for this contact session.	
3-3.17.3	END_OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’	
3-3.18	SESSION_TOTAL_NUMBER_PACKETS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of packets demultiplexed by EDOS this contact session.	
3-3.19	SESSION_TOTAL_NUMBER_APID(S)_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999”. Total number APIDs found during this contact session.	CCR 98-0001

Table 10.2.1-2. (C4) Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.20	OBJECT	ASCII 24 Bytes	'INDIVIDUAL_APID_SUMMARY'
3-3.20.1	APID_IDENTIFICATION	ASCII 7 Bytes	Value -> "0000000" to "9999999". Identify SCID and APID The first three (3) bytes = SCID (Refer to Table 10.1.2.5-1) and the Last four (4) bytes = APID (Refer to Table 8.1.4.1.1-1).
3-3.20.2	APID_TOTAL_NUMBER_PACKETS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of CCSDS Packets for this APID.
3-3.20.3	END_OBJECT	ASCII 24 Bytes	'INDIVIDUAL_APID_SUMMARY'
3-3.21	TOTAL_NUMBER_TRANSFERRED_RETURN_LINK_EDUS	ASCII 8 Bytes	Value -> 0 to 99999999. Count of return link EDUs transferred by EDOS this contact session.
3-3.22	END_OBJECT	ASCII 26 Bytes	'INDIVIDUAL_SESSION_SUMMARY'
3-4	TOTAL_NUMBER_OF_PACKETS_RECEIVED_FOR_INCLUSION_IN_PDS+EDS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets received to be included in PDSs and EDSs for this mission.
3-5	TOTAL_NUMBER_OF_PDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of PDSs generated for this mission.
3-6	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_PDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDS production for this mission.
3-7	TOTAL_NUMBER_OF_EDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of EDSs generated for this mission.
3-8	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_EDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDS production for this mission.
3-9	TOTAL_NUMBER_OF_PACKETS_IN_PDSS_TRANSFERRED_TO_EGS_ELEMENTS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDSs transferred to EGS elements for this mission.
3-10	TOTAL_NUMBER_OF_PACKETS_WITHIN_EDSS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDSs transferred for this mission.
3-11	TOTAL_NUMBER_OF_GROUND_COMMUNICATIONS_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of changes to address, directory and/or port number to which EDOS products are sent during report coverage period (items 2-1, 2-2) as a result of Service Requests.

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Table 10.2.1-2. (C4) Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-12	TOTAL_NUMBER_OF_RATE_BUFFERED_DATA_TRANSFER_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of changes to Rate Buffered data transfer service during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-13	TOTAL_NUMBER_OF_PDS_TRANSFER_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of changes to PDS transfer service during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-14	TOTAL_NUMBER_OF_REAL-TIME_EDU_TRANSFER_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of changes to real-time EDUs transfer service during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-15	TOTAL_NUMBER_OF_REPORTING_REQUIREMENTS_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of changes to CODA (content indicators) and SCS Summary Report transfer service during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-16	TOTAL_NUMBER_OF_EDU_FILES_RETRANSMITTED	ASCII 12 BYTES	Value -> 0 through 999999999. Number of EDU files (re)transmitted and Trash Buffer files transmitted during report coverage period (items 2-1, 2-2) as a result of Service Requests. CCR 98-0001
3-17	TOTAL_NUMBER_OF_EDSS_TRANSMITTED _WITHOUT_QUICK-LOOK_FLAG	ASCII 12 BYTES	Value -> 0 through 999999999. Number of EDSs transmitted during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-18	TOTAL_NUMBER_OF_PDSS_TRANSFERRED	ASCII 12 BYTES	Value -> 0 through 999999999. Number of PDSs retransmitted and archived PDSs transferred during report coverage period (items 2-1, 2-2) as a result of Service Requests.
3-19	END_OBJECT	ASCII 26 Bytes	'INDIVIDUAL_MISSION_SUMMARY'
4	EDOS_OPERATOR_REMARKS	ASCII 1024 Bytes	Operator remarks regarding the Summary Performance Report reporting period. Reason(s) for exceeding the required time to deliver EDOS products and any processing problems encountered during this reporting period.

10.2.2 (C3) EDOS Activity Plans

EDOS generates an EAP on a daily basis for all events and activities scheduled to occur in the time period between forty-eight (48) hours and three (3) weeks in the future. Events and activities include active and test schedules, and schedules relating to training, maintenance, and hardware/software modifications. EDOS attaches the PVL version of the EDOS Ground Message Header to the message and transmits it to the SMC via FTP.

The EAP message, in PVL format, is shown in Table 10.2.2-1.

Table 10.2.2-1. (C3) EDOS Activity Plan

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header in PVL Format	ASCII Variable Size	Reference Table 10.1.2.1-1 for content of the EDOS Ground Message Header.
2	EDOS Activity Plan (EAP)	ASCII Variable Size	Reference Table 10.2.2-2 for content of the PVL Statements in the EAP.

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Table 10.2.2-2. (C3) EAP PVL Statements

Item No.	Field	Format & Maximum Size	Value
2	NUMBER_PLANNED_SERVICE_REQUEST_EVENTS	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 2-1 through 2-5, else repeat 2-1 through 2-5 for each event.
2-1	OBJECT	ASCII 23 Bytes	'PLANNED_SERVICE_REQUEST'
2-2	PLANNED_SR_ID	ASCII 5 BYTES	Value -> "00000" through "65535". Message Sequence Number from the EDOS Ground Message Header received with the Service Request.
2-3	DATE/TIME_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-4	DATE/TIME_PLANNED_SR_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals

Table 10.2.2-2. (C3) EAP PVL Statements (Continued)

Item No.	Field	Format & Maximum Size	Value
2-5	END_OBJECT	ASCII 23 Bytes	'PLANNED_SERVICE_REQUEST'

Table 10.2.2-2. (C3) EAP PVL Statements (Continued)

Item No.	Field	Format & Maximum Size	Value
3	NUMBER_SPACECRAFT_CONTACT_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 3-1 through 3-4, else repeat 3-1 through 3-4 for each schedule.
3-1	OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'
3-2	SPACECRAFT_CONTACT_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-3	SPACECRAFT_CONTACT_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-4	END_OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'
4	NUMBER_SCHEDULED_EDOS_EVENTS	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 4-1 through 4-5, else repeat 4-1 through 4-5 for each event.
4-1	OBJECT	ASCII 20 Bytes	'EDOS_SCHEDULED_EVENT'
4-2	EDOS_PURPOSE	ASCII 12 Bytes	'TESTING', 'MAINTENANCE', or 'ENGINEERING'
4-3	DATE/TIME_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-4	DATE/TIME_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-5	END_OBJECT	ASCII 20 bytes	'EDOS_SCHEDULED_EVENT'
6	NUMBER_RLSS_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 6-1 through 6-4, else repeat 6-1 through 6-4 for each schedule.
6-1	OBJECT	ASCII 13 Bytes	'RLSS_SCHEDULE'
6-2	RLSS_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-3	RLSS_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-4	END_OBJECT	ASCII 13 Bytes	'RLSS_SCHEDULE'

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10.2.3 (C3) EDOS Operations Timeline (EOT)

EDOS generates an EOT every 8 hours for all events and activities scheduled to occur in the next 48 hours. EDOS attaches the PVL version of the EDOS Ground Message Header to the message, and transmits it to the SMC via FTP.

The EOT message, in PVL format, is shown in Table 10.2.3-1.

Table 10.2.3-1. (C3) EOT Structure

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Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 10.1.2.1-1 for content of the EDOS Ground Message Header in PVL Format.
2	EDOS Operations Timeline (EOT)	ASCII Variable Size	Reference Table 10.2.3-2 for content of the PVL Statements in the EOT.

Table 10.2.3-2. (C3) EOT PVL Statements

Item No.	Field	Format & Maximum Size	Value
2	NUMBER_PLANNED_SERVICE_REQUEST_EVENTS	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 2-1 through 2-4, else repeat 2-1 through 2-4 for each event.
2-1	OBJECT	ASCII 23 Bytes	'PLANNED_SERVICE_REQUEST'
2-2	PLANNED_SR_ID	ASCII 5 Bytes	Value -> "00000" through "65535". Message Sequence Number from the EDOS Ground Message Header received with the Service Request.
2-3	DATE/TIME_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals (Note: Service Request events do not have a planned termination time; they remain in effect until a new Service Request starts a different service)
2-4	END_OBJECT	ASCII 23 Bytes	'PLANNED_SERVICE_REQUEST'
3	NUMBER_SPACECRAFT_CONTACT_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 3-1 through 3-4, else repeat 3-1 through 3-4 for each schedule.
3-1	OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'
3-2	SPACECRAFT_CONTACT_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-3	SPACECRAFT_CONTACT_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-4	END_OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'
4	NUMBER_SCHEDULED_EDOS_EVENTS	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 4-1 through 4-5, else repeat 4-1 through 4-5 for each event.
4-1	OBJECT	ASCII 20 Bytes	'EDOS_SCHEDULED_EVENT'

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Table 10.2.3-2. (C3) EOT PVL Statements (Continued)

Item No.	Field	Format & Maximum Size	Value
4-2	EDOS_PURPOSE	ASCII 12 Bytes	'TESTING', 'MAINTENANCE', or 'ENGINEERING'
4-3	DATE/TIME_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-4	DATE/TIME_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-5	END_OBJECT	ASCII 20 bytes	'EDOS_SCHEDULED_EVENT'
6	NUMBER_RLSS_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999" If value is 000, then skip 6-1 through 6-4, else repeat 6-1 through 6-4 for each schedule.
6-1	OBJECT	ASCII 13 Bytes	'RLSS_SCHEDULE'
6-2	RLSS_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-3	RLSS_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-4	END_OBJECT	ASCII 13 Bytes	'RLSS_SCHEDULE'

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10.2.4 (C3) EOT Change Notification

EDOS generates an EOT Change Notification whenever a change occurs in events and activities scheduled in the EDOS Operations Timeline (EOT). EDOS then attaches the PVL version of the EDOS Ground Message Header to the message and transmits it to the SMC via FTP.

The EOT Change Notification message, in PVL format, is shown in Table 10.2.4-1.

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Table 10.2.4-1. (C3) EOT Change Notification Structure

Item No.	Field	Format & Maximum Size	Value

1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 10.1.2.1-1 for content of the EDOS Ground Message Header in PVL Format.
2	EDOS Operations Timeline (EOT) Change Notification	ASCII Variable Size	Reference Table 10.2.4-2 for content of the PVL Statements in the EOT Change Notification.

Table 10.2.4-2. (C3) EOT Change Notification PVL Statements

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Item No.	Field	Format & Maximum Size	Value
2	IDENTITY_OF_EOT_BEING_MODIFIED	ASCII 5 Bytes	Value -> “00000” through “65535”; EDOS Ground Message Header item -Message Sequence Number from the EOT that is being modified
2-1	DATE/TIME_OF_EOT_BEING_MODIFIED	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. Start date and time of EOT that is being modified.
3	IDENTITY_OF_LAST_MODIFICATION_TO_EOT	ASCII 5 Bytes	Value -> “00000” through “65535”; EDOS Ground Message Header item -Message Sequence Number from the last EOT modification.
3-1	DATE/TIME_OF_LAST_EOT__MODIFICATION	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. Date and time of last EOT modification.
4	NUMBER_PLANNED_SERVICE_REQUEST_CHANGES	ASCII 3 Bytes	Value -> “000” through “999” If value is 000, then skip 4-1 through 4-4, else repeat 4-1 through 4-4 for each change.
4-1	OBJECT	ASCII 30 Bytes	‘PLANNED_SERVICE_REQUEST_CHANGE’
4-2	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> ‘ADDED’, ‘DELETED’, or ‘MODIFIED’

Table 10.2.4-2. (C3) EOT Change Notification PVL Statements (Continued)

Item No.	Field	Format & Maximum Size	Value
4-3	DATE/TIME_MODIFIED_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-4	END_OBJECT	ASCII 30 Bytes	'PLANNED_SERVICE_REQUEST_CHANGE'
5	NUMBER_MODIFIED_SPACECRAFT_CONTACT_SESSIONS	ASCII 3 Bytes	Range -> "000" through "999" If value is 000, then skip 5-1 through 5-4, else repeat 5-1 through 5-4 for each modified SCS.
5-1	OBJECT	ASCII 33 Bytes	'SPACECRAFT_CONTACT_SESSION_CHANGE'
5-2	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> 'ADDED', 'DELETED', or 'MODIFIED' Modified SCSs are the result of changes entered by the operator.
5-3	DATE/TIME_MODIFIED_SPACECRAFT_CONTACT_SESSION_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
5-4	DATE/TIME_MODIFIED_PLANNED_SPACECRAFT_CONTACT_SESSION_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
5-5	END_OBJECT	ASCII 33 Bytes	'SPACECRAFT_CONTACT_SESSION_CHANGE
6	NUMBER_MODIFIED_EDOS_SCHEDULED_EVENTS	ASCII 3 Bytes	Range -> "000" through "999" If value is 000, then skip 6-1 through 6-6, else repeat 6-1 through 6-6 for each modified event.
6-1	OBJECT	ASCII 27 Bytes	'EDOS_SCHEDULED_EVENT_CHANGE'
6-2	EDOS_PURPOSE	ASCII 12 Bytes	'TESTING', 'MAINTENANCE', or 'ENGINEERING'
6-3	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> 'ADDED', 'DELETED', or 'MODIFIED'
6-4	DATE/TIME_MODIFIED_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals

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Table 10.2.4-2. (C3) EOT Change Notification PVL Statements (Continued)

Item No.	Field	Format & Maximum Size	Value
6-5	DATE/TIME_MODIFIED_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-6	END_OBJECT	ASCII 27 bytes	'EDOS_SCHEDULED_EVENT_CHANGE'

0	Section	Change From...	Change To...	Rationale
1	EDOS-EGS ICD			
2	Page 8-31 to 8-35, Table 8.1.3.1-5	[new]	MOPITT Burst Mode, x'C3' 195, MOP00BST	Add
		[new]	MOPITT Table, x'C4' 196, MOP00TBL	Add
		MISR/engineering, x'152' 338, MISL0ENG	MISR/engineering, x'152' 338, MISL0ENG	Move into sequence
		MISR/motor, x'169' 361, MISL0MTR	MISR/motor, x'16D' 365, MISL0MTR	Change APID
		[new]	MISR/out of sync, taxi low, x'175' 373, MISL0SY1	Add
			MISR/out of sync, taxi high, x'176' 374, MISL0SY2	
		[new]	MISR/out of sync, null pkt, x'17A' 378, MISL0SY3	Add
			MISR/spare, x'17C' 380, n/a	
		[new]	DATA_TYPE Value*	Add
		[new]	*The DATA_TYPE value assigned to a PDS/EDS applies to the sole APID or the first APID of a multiple-APID data set.	Add
		DATA_TYPE Value		Add header line asterisk
		[new note added at end of Table]		Add asterisk note at end of Table

0	Section	Change From...	Change To...	Rationale
3	Page 8-51 to 8-53, Table 8.1.4.1.1-1, CERES APIDs 131, 132, 133, 167, 168, 169, change 4th and 5th columns	[EDS Destination] LaRC [PDS Destination] LaRC [EDS Destination] LaRC [PDS Destination] LaRC [EDS Destination] LaRC [PDS Destination] LaRC [EDS Destination] LaRC [PDS Destination] LaRC [EDS Destination] LaRC [PDS Destination] LaRC [EDS Destination] LaRC [PDS Destination] LaRC	[EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS [EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS [EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS [EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS [EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS [EDS Destination] LaRC, LATIS [PDS Destination] LaRC, LATIS	Add LATIS as a destination for EDSs and PDSs for the 6 CERES APIDs
	Add two new MOPITT APIDs	[new]	MOPITT / Burst Mode, 11 = x’B’, 195= x’C3’, LaRC, LaRC	Add
		[new]	MOPITT / Table, 11 = x’B’, 196 = x’C4’, LaRC, LaRC	Add

0	Section	Change From...	Change To...	Rationale
4	Page 8-51 to 8-53, Table 8.1.4.1.1-1, Clarify 12 ASTER data sets' destinations	N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A N/A	N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER) N/A (ASTER)	Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER) Indicate (ASTER)
	Move MISR into sequential order, Table 8.1.4.1.1-1			
5	Page 8-51 to 8-53, Table 8.1.4.1.1-1, Move MISR into sequential order, change MISR Motor APID, Add 4 new MISR APIDs	MISR / Non Calibration / Engineering, 41 = x'29', 338 = x'152', LaRC, LaRC MISR / Motor, 41 = x'29', 361 = x'169', LaRC, LaRC [new] [new] [new] [new]	MISR / Non Calibration / Engineering, 41 = x'29', 338 = x'152', LaRC, LaRC MISR / Motor, 41 = x'29', 365 = x'16D', LaRC, LaRC MISR / Out of Sync, Taxi Low, 41 = x'29', 373 = x'175', LaRC, LaRC MISR / Out of Sync, Taxi High, 41 = x'29', 374 = x'176', LaRC, LaRC MISR / Out of Sync, Null Packet, 41 = x'29', 378 = x'17A', LaRC, LaRC MISR / Spare, 41 = x'29', 380 = x'17C', LaRC, LaRC	Move into sequence. Change MISR Motor APID. Add APID Add APID Add APID Add APID

0	Section	Change From...	Change To...	Rationale
6	Page 8-28 to 8-31, Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements, Items #1 and #2 Description and Value columns, and the Note at end of Table.	Originator of the PDS/EDS Delivery Record (See Note) (Defined in the EDOS-DAAC OA) EDOS Processor Identifier Destination of the PDS/EDS Delivery Record (See Note) (Defined in the EDOS-DAAC OA) ECS Processor Identifier Note: Each processor must have a unique identifier	Unique IP address of the originator of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA) EDOS Processor IP Address Unique IP address of the consumer of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA) ECS Processor IP Address [deleted note]	Clarify that the processor identifier is the IP address. (Clarification is needed due to 4/15/98 interface test results.)
7	Page 8-40, Table 8.1.3.3-3, Item 7, Value	0002 through 9999	0003 through 9999	Minimum 3 files include PPMUDR, Construction Record and packet file
8	Page 8-9, Table 8.1.2.3-1, last items in Table	[new] Reserved for future use, 19-255, N/A	Langley TRMM Information System (LATIS), 19, LAT Reserved for future use, 20-255, N/A	New destination for EDSs and PDSs
9	Page 7-2, Figure 7.1-1, labeling on two arrows (See figure in Section 2 below)	EDS (Destined for the GSFC or the LaRC DAAC) PDS (Destined for the GSFC or the LaRC DAAC)	EDS (Destined for the GSFC or the LaRC DAAC/LATIS) PDS (Destined for the GSFC or the LaRC DAAC/LATIS)	Add LATIS as a separate destination for EDOS EDSs/PDSs
10	Acronym List	[new]	LATIS Langley TRMM Information System TRMM Tropical Rainfall Measuring Mission	Add new terms.

SECTION 2

Table 8.1.3.1-5. DATA_TYPE Values

Instrument Identification/ Operation Mode	APID Hex	APID Decimal	DATA_TYPE Value*
Merged H/K	x'1'	1	AM1HK
Health & Safety	x'2'	2	AM1HS
Diagnostic	x'3'	3	AM1DIAG1
Ancillary	x'4'	4	AM1ANC
Standby	x'5'	5	AM1ST
Diagnostic	x'6'	6	AM1DIAG2
MODIS	x'40'	64	MOD000
MODIS	x'41'	65	MOD001
MODIS	x'42'	66	MOD002
MODIS	x'43'	67	MOD003

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID		DATA_TYPE Value
	Hex	Decimal	
MODIS	x'44'	68	MOD004
MODIS	x'45'	69	MOD005
MODIS	x'46'	70	MOD006
MODIS	x'47'	71	MOD007
MODIS	x'48'	72	MOD008
MODIS	x'49'	73	MOD009
MODIS	x'4A'	74	MOD010
MODIS	x'4B'	75	MOD011
MODIS	x'4C'	76	MOD012
MODIS	x'4D'	77	MOD013
MODIS	x'4E'	78	MOD014
MODIS	x'4F'	79	MOD015
MODIS	x'50'	80	MOD016
MODIS	x'51'	81	MOD017
MODIS	x'52'	82	MOD018
MODIS	x'53'	83	MOD019
MODIS	x'54'	84	MOD020
MODIS	x'55'	85	MOD021
MODIS	x'56'	86	MOD022
MODIS	x'57'	87	MOD023
MODIS	x'58'	88	MOD024
MODIS	x'59'	89	MOD025
MODIS	x'5A'	90	MOD026
MODIS	x'5B'	91	MOD027
MODIS	x'5C'	92	MOD028
MODIS	x'5D'	93	MOD029
MODIS	x'5E'	94	MOD030
MODIS	x'5F'	95	MOD031
MODIS	x'60'	96	MOD032
MODIS	x'61'	97	MOD033
MODIS	x'62'	98	MOD034
MODIS	x'63'	99	MOD035
MODIS	x'64'	100	MOD036

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID		DATA_TYPE Value
	Hex	Decimal	
MODIS	x'65'	101	MOD037
MODIS	x'66'	102	MOD038
MODIS	x'67'	103	MOD039
MODIS	x'68'	104	MOD040
MODIS	x'69'	105	MOD041
MODIS	x'6A'	106	MOD042
MODIS	x'6B'	107	MOD043
MODIS	x'6C'	108	MOD044
MODIS	x'6D'	109	MOD045
MODIS	x'6E'	110	MOD046
MODIS	x'6F'	111	MOD047
MODIS	x'70'	112	MOD048
MODIS	x'71'	113	MOD049
MODIS	x'72'	114	MOD050
MODIS	x'73'	115	MOD051
MODIS	x'74'	116	MOD052
MODIS	x'75'	117	MOD053
MODIS	x'76'	118	MOD054
MODIS	x'77'	119	MOD055
MODIS	x'78'	120	MOD056
MODIS	x'79'	121	MOD057
MODIS	x'7A'	122	MOD058
MODIS	x'7B'	123	MOD059
MODIS	x'7C'	124	MOD060
MODIS	x'7D'	125	MOD061
MODIS	x'7E'	126	MOD062
MODIS	x'7F'	127	MOD063
CERES	x'83'	131	CER00AF
CERES	x'84'	132	CERCALAF
CERES	x'85'	133	CERDIAF
CERES	x'A7'	167	CER00AA
CERES	x'A8'	168	CERCALAA
CERES	x'A9'	169	CERDIAA
MOPITT science	x'C0'	192	MOP00SCI

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID		DATA_TYPE Value
	Hex	Decimal	
MOPITT engineering	x'C1'	193	MOP00ENG
MOPITT test	x'C2'	194	MOP00TST
MOPITT Burst Mode	x'C3'	195	MOP00BST
MOPITT Table	x'C4'	196	MOP00TBL
VNIR (1)/observation	x'101'	257	AST0V1S
VNIR (1)/observation	x'103'	259	AST0V1SE
VNIR (1)/calibration	x'105'	261	AST0V1C
VNIR (1)/calibration	x'107'	263	AST0V1CE
VNIR (1)/test	x'109'	265	AST0V1TS
VNIR (1)/test	x'10B'	267	ASTV1TSE
VNIR (2)/observation	x'111'	273	AST0V2S
VNIR (2)/observation	x'113'	275	AST0V2SE
VNIR (2)/calibration	x'115'	277	AST0V2C
VNIR (2)/calibration	x'117'	279	AST0V2CE
VNIR (2)/test	x'119'	281	AST0V2TS
VNIR (2)/test	x'11B'	283	ASTV2TSE
SWIR/observation	x'121'	289	AST0SS
SWIR/observation	x'123'	291	AST0SSE
SWIR/calibration	x'125'	293	AST0SCS
SWIR/calibration	x'127'	295	AST0SCSE
SWIR/test	x'129'	297	AST0STS
SWIR/test	x'12B'	299	AST0STSE
TIR/observation	x'131'	305	AST0TS
TIR/observation	x'132'	306	AST0TE
TIR/observation	x'133'	307	AST0TSE
TIR/calibration	x'135'	309	AST0TCS
TIR/calibration	x'136'	310	AST0TCE
TIR/calibration	x'137'	311	AST0TCSE
TIR/test	x'139'	313	AST0TTS
TIR/test	x'13A'	314	AST0TTE
TIR/test	x'13B'	315	AST0TTSE
MISR/science	x'140'	320	MISL0DF
MISR/science	x'143'	323	MISL0CF
MISR/science	x'145'	325	MISL0BF

Table 8.1.3.1-5. DATA_TYPE Values (Continued)

Instrument Identification/ Operation Mode	APID		DATA_TYPE Value
	Hex	Decimal	
MISR/science	x'146'	326	MISL0AF
MISR/science	x'149'	329	MISL0AN
MISR/science	x'14A'	330	MISL0AA
MISR/science	x'14C'	332	MISL0BA
MISR/science	x'14F'	335	MISL0CA
MISR/science	x'151'	337	MISL0DA
MISR/engineering	x'152'	338	MISL0ENG
MISR/calibration	x'154'	340	MISCALDF
MISR/calibration	x'157'	343	MISCALCF
MISR/calibration	x'158'	344	MISCALBF
MISR/calibration	x'15B'	347	MISCALAF
MISR/calibration	x'15D'	349	MISCALAN
MISR/calibration	x'15E'	350	MISCALAA
MISR/calibration	x'161'	353	MISCALBA
MISR/calibration	x'162'	354	MISCALCA
MISR/calibration	x'164'	356	MISCALDA
MISR/on board calibrator	x'167'	359	MISL0CAL
MISR/test	x'168'	360	MISL0TST
MISR/motor	x'16D'	365	MISL0MTR
MISR/out of sync, taxi low	x'175'	373	MISL0SY1
MISR/out of sync, taxi high	x'176'	374	MISL0SY2
MISR/out of sync, null pkt	x'17A'	378	MISL0SY3
MISR/spare	x'17C'	380	n/a

*The DATA_TYPE value assigned to a PDS/EDS applies to the sole APID or the first APID of a multiple-APID data set.

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
Non-Science Data				
Merged H/K	1 = x'1'	1 = x'1'	N/A	GSFC
Merged H/K	11 = x'B'	1 = x'1'	N/A	GSFC
Health & Safety	2 = x'2'	2 = x'2'	N/A	GSFC
Diagnostic	3 = x'3'	3 = x'3'	N/A	GSFC
Ancillary	11 = x'B'	4 = x'4'	N/A	GSFC
Standby	2 = x'2'	5 = x'5'	N/A	GSFC
Diagnostic	3 = x'3'	6 = x'6'	N/A	GSFC
Science Data				
MODIS / Science & Engineering, and Memory Dump	42 = x'2A'	Any single APID from 64 = x'40' through 127 = x'7F'	GSFC	GSFC
CERES - Fore / Science	11 = x'B'	131 = x'83'	LaRC, LATIS	LaRC, LATIS
CERES - Fore / Calibration	11 = x'B'	132 = x'84'	LaRC, LATIS	LaRC, LATIS
CERES - Fore / Diagnostic	11 = x'B'	133 = x'85'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Science	11 = x'B'	167 = x'A7'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Calibration	11 = x'B'	168 = x'A8'	LaRC, LATIS	LaRC, LATIS
CERES - Aft / Diagnostic	11 = x'B'	169 = x'A9'	LaRC, LATIS	LaRC, LATIS
MOPITT / Science	11 = x'B'	192 = x'C0'	LaRC	LaRC
MOPITT / Engineering	11 = x'B'	193 = x'C1'	LaRC	LaRC
MOPITT / Test	11 = x'B'	194 = x'C2'	LaRC	LaRC
MOPITT / Burst Mode	11 = x'B'	195= x'C3'	LaRC	LaRC
MOPITT / Table	11 = x'B'	196 = x'C4'	LaRC	LaRC
Note: VNIR(1), VNIR(2), SWIR, and TIR EDSs each have 2 or more APIDs. Data Type: S = Science, S&E = Science and Engineering, E = Engineering.				
VNIR (1) / Observation	17 = x'11'	S = 257 = x'101' and S&E = 259 = x'103'	GSFC DAAC	N/A (ASTER)
VNIR (1) / Calibration	17 = x'11'	S = 261 = x'105' and S&E = 263 = x'107'	GSFC DAAC	N/A (ASTER)
VNIR (1) / Test	17 = x'11'	S = 265 = x'109' and S&E = 267 = x'10B'	GSFC DAAC	N/A (ASTER)

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
VNIR (2) / Observation	30 = x'1E'	S= 273 = x'111' and S&E = 275 = x'113'	GSFC DAAC	N/A (ASTER)
VNIR (2) / Calibration	30 = x'1E'	S = 277 = x'115' and S&E = 279 = x'117'	GSFC DAAC	N/A (ASTER)
VNIR (2) / Test	30 = x'1E'	S =281 = x'119' and S&E = 283 = x'11B'	GSFC DAAC	N/A (ASTER)
SWIR / Observation	18 = x'12'	S = 289 = x'121' and S&E = 291 = x'123'	GSFC DAAC	N/A (ASTER)
SWIR / Calibration	18 = x'12'	293 = x'125' and S&E = 295 = x'127'	GSFC DAAC	N/A (ASTER)
SWIR / Test	18 = x'12'	S = 297 = x'129' and S&E = 299 = x'12B'	GSFC DAAC	N/A (ASTER)
TIR / Observation	23 = x'17'	S = 305 = x'131', S&E = 307 = x'133', and E = 306 = x'132'	GSFC DAAC	N/A (ASTER)
TIR / Calibration	23 = x'17'	S = 309 = x'135', S&E = 311 = x'137', and E = 310 = x'136'	GSFC DAAC	N/A (ASTER)
TIR / Test	23 = x'17'	S = 313 = x'139', S&E = 315 = x'13B', and E = 314 = x'13A'	GSFC DAAC	N/A (ASTER)
MISR Charge Coupled Device (CCD) (1 Science APID for each of 9 cameras) / Science	41 = x'29'	320 = x'140'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	323 = x'143'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	325 = x'145'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	326 = x'146'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	329 = x'149'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	330 = x'14A'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	332 = x'14C'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	335 = x'14F'	LaRC	LaRC
MISR CCD /Science	41 = x'29'	337 = x'151'	LaRC	LaRC

Table 8.1.4.1.1-1. Science and Non-Science Destinations and APID Assignments (Continued)

Instrument Identification/ Operation Mode	Virtual Channel Identifier	APID(s) in Data Set	DAAC Destination for an EDS	DAAC Destination for a PDS
MISR / Non Calibration / Engineering	41 = x'29'	338 = x'152'	LaRC	LaRC
MISR CCD / Calibration (1 Calibration for each of 9 cameras)	41 = x'29'	340 = x'154'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	343 = x'157'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	344 = x'158'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	347 = x'15B'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	349 = x'15D'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	350 = x'15E'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	353 = x'161'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	354 = x'162'	LaRC	LaRC
MISR CCD / Calibration	41 = x'29'	356 = x'164'	LaRC	LaRC
MISR (On Board Calibrator) / Calibration	41 = x'29'	359 = x'167'	LaRC	LaRC
MISR / Test	41 = x'29'	360 = x'168'	LaRC	LaRC
MISR / Motor	41 = x'29'	365 = x'16D'	LaRC	LaRC
MISR / Out of Sync, Taxi Low	41 = x'29'	373 = x'175'	LaRC	LaRC
MISR / Out of Sync, Taxi High	41 = x'29'	374 = x'176'	LaRC	LaRC
MISR / Out of Sync, Null Packet	41 = x'29'	378 = x'17A'	LaRC	LaRC
MISR / Spare	41 = x'29'	380 = x'17C'	LaRC	LaRC

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
1	ORIGINATING_SYSTEM	Unique IP address of the originator of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	EDOS Processor IP Address
2	CONSUMER_SYSTEM	Unique IP address of the consumer of the PDS/EDS Delivery Record (Defined in the EDOS-DAAC OA)	ASCII 20 Bytes	ECS Processor IP Address

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
3	DAN_SEQ_NO	Sequence number assigned by originating system (1 up number starting from 0 and wrapping after 9,999,999,999)	ASCII 10 Bytes	≤ 9999999999
4*	PRODUCT_NAME	Name (i.e., type) of Product which defines the collection of files comprising of the product.	ASCII 25 Bytes	'PDS' or 'EDS'
5*	MISSION	Mission or investigation which includes the sensors producing the data of this notice	ASCII 20 Bytes	'AM-1'
6	TOTAL_FILE_COUNT	Total number of files transferred, a data set has a minimum of two files	ASCII 4 Bytes	0002 through 9999
7	AGGREGATE_LENGTH	Total number of bytes to transfer (sum for all files)	ASCII 10 Bytes	< 9999999999
8	EXPIRATION_TIME	Not used	Fixed String	999-99-99T99:99:99Z, where T and Z are literals
9	OBJECT	Start of file group parameters (not repeated in the PDS/EDS Delivery Record since a record refers to only one PDS)	ASCII 10 Bytes	'FILE_GROUP'
9-1	DATA_SET_ID	Data set identification number as assigned by EDOS. (Refer to Table 8.1.2.8-1)	ASCII 36 Bytes	ASCII representation of the Data Set Identification Number (alphanumeric)
9-2	DATA_TYPE	Data type for this APID	ASCII 20 Bytes	See Table 8.1.3.1-5. DATA_TYPE value applies to the sole APID or the first APID of a multiple APID data set.
9-3*	DESCRIPTOR	Name of sensor or instrument that collected the data	ASCII 60 Bytes	'NOT USED'
9-4*	DATA_VERSION	'Not Used'	ASCII 2 Bytes	'00'

Table 8.1.3.1-4. PDS/EDS Delivery Record PVL Statements (Continued)

Item No.	Parameter	Description	Type (Maximum Length in Bytes)	Value
9-5	NODE_NAME	Name of destination computer on which the data set files reside (Defined in the EDOS-DAAC OA)	ASCII 64 Bytes	e.g. 'ecs.gsfc.nasa.gov'
9-6	OBJECT	Start of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-6.1	DIRECTORY_ID	File directory name (i.e., path name) (Directory defined in the EDOS-DAAC OA)	ASCII 256 Bytes,	e.g. '/EDOS/Level0/'
9-6-2	FILE_ID	File name (Refer to Table 8.1.2.10-1 for the file name)	ASCII 256 Bytes,	file name in ASCII
9-6.3	FILE_TYPE	Type of file contents; metadata if PDS/EDS construction record, or DATA	ASCII 20 Bytes	If the file has the data set's construction record, then this value = 'METADATA'. If the file has CCSDS packets then this value = 'DATA'
9-6.4	FILE_SIZE	Length of file in bytes	ASCII 10 Bytes	Maximum is 2 Gigabytes
9-6.5	END_OBJECT	End of file parameters (repeat for each file)	ASCII 9 Bytes	'FILE_SPEC'
9-7*	BEGINNING_DATE/TIME	ISO Start time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-8*	ENDING_DATE/TIME	ISO End time of transmitting the data set	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ, where T and Z are literals
9-9	END_OBJECT	End of file group (not repeated since the PDS/EDS Delivery Record only refers to one PDS/EDS)	ASCII 10 Bytes	'FILE_GROUP'

*Not used by ECS

Table 8.1.3.3-3 PDS Physical Media Unit Delivery Record PVL Statements

6*	CONSTRUCTION_FILE	Not used for an EDOS Archive physical unit.	ASCII 13 Bytes	'NOT USED' for the EDOS Archive physical unit.
7	TOTAL_FILE_COUNT	Total number of files on this media	ASCII 4 Bytes	0003 through 9999
8*	PDS_COUNT	Total number of PDSs on this physical medium	ASCII 4 Bytes	≤ 9999
8-1	OBJECT	Start of PDS specifications (repeat for each PDS)	ASCII 10 Bytes	'FILE_GROUP'

Old Table

Table 8.1.2.3-1. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
Reserved for future use	2-4	N/A
EOS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
Reserved for future use	9	N/A
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved for future use	11	N/A

Table 8.1.2.3-1. EDOS Source/Destination Identification (Continued)

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (at White Sands)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (WOTS) (at Wallops Island Station)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Reserved for future use	19- 255	N/A

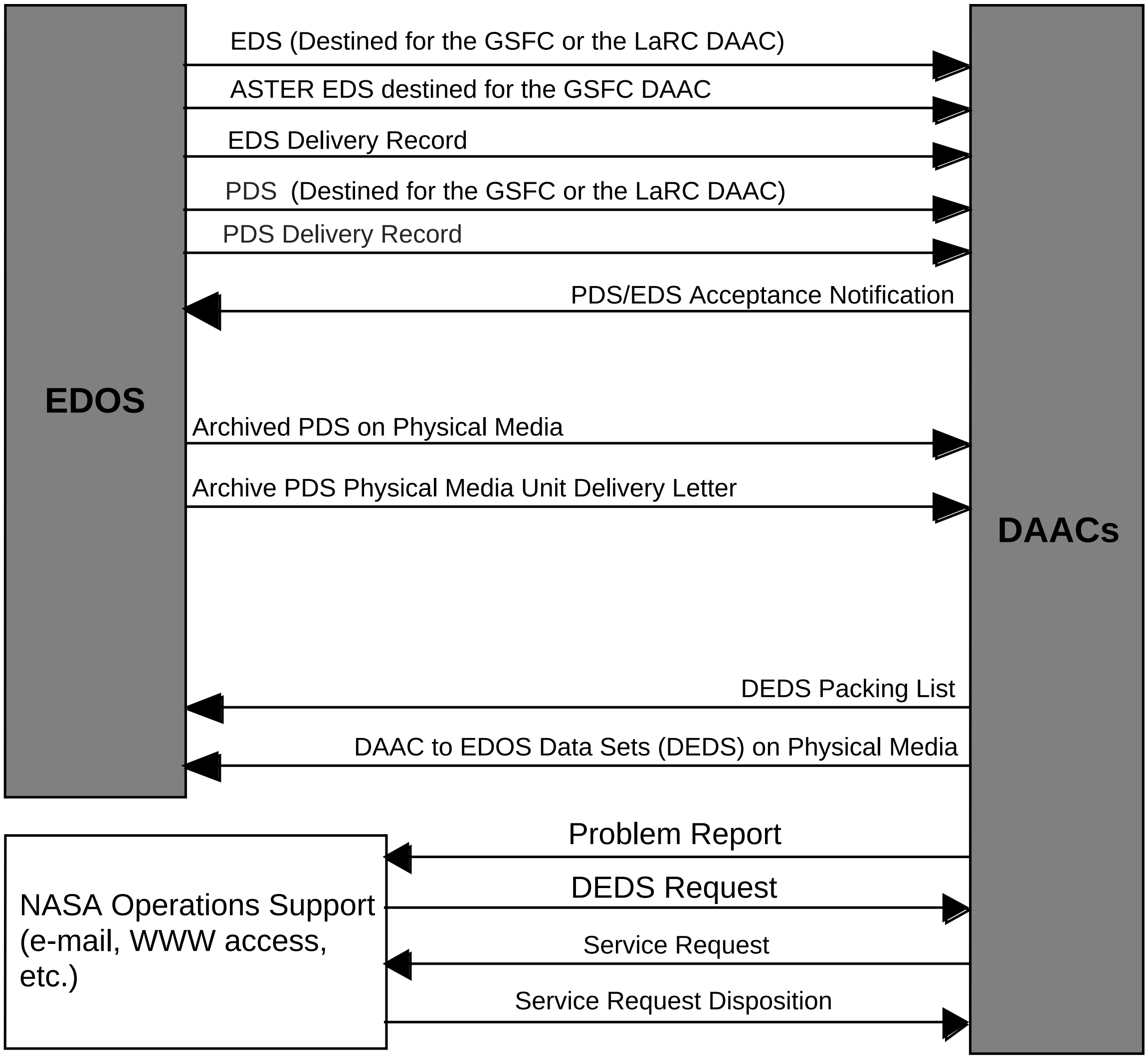
New Table 8.1.2.3-1

Table 8.1.2.3-1. EDOS Source/Destination Identification

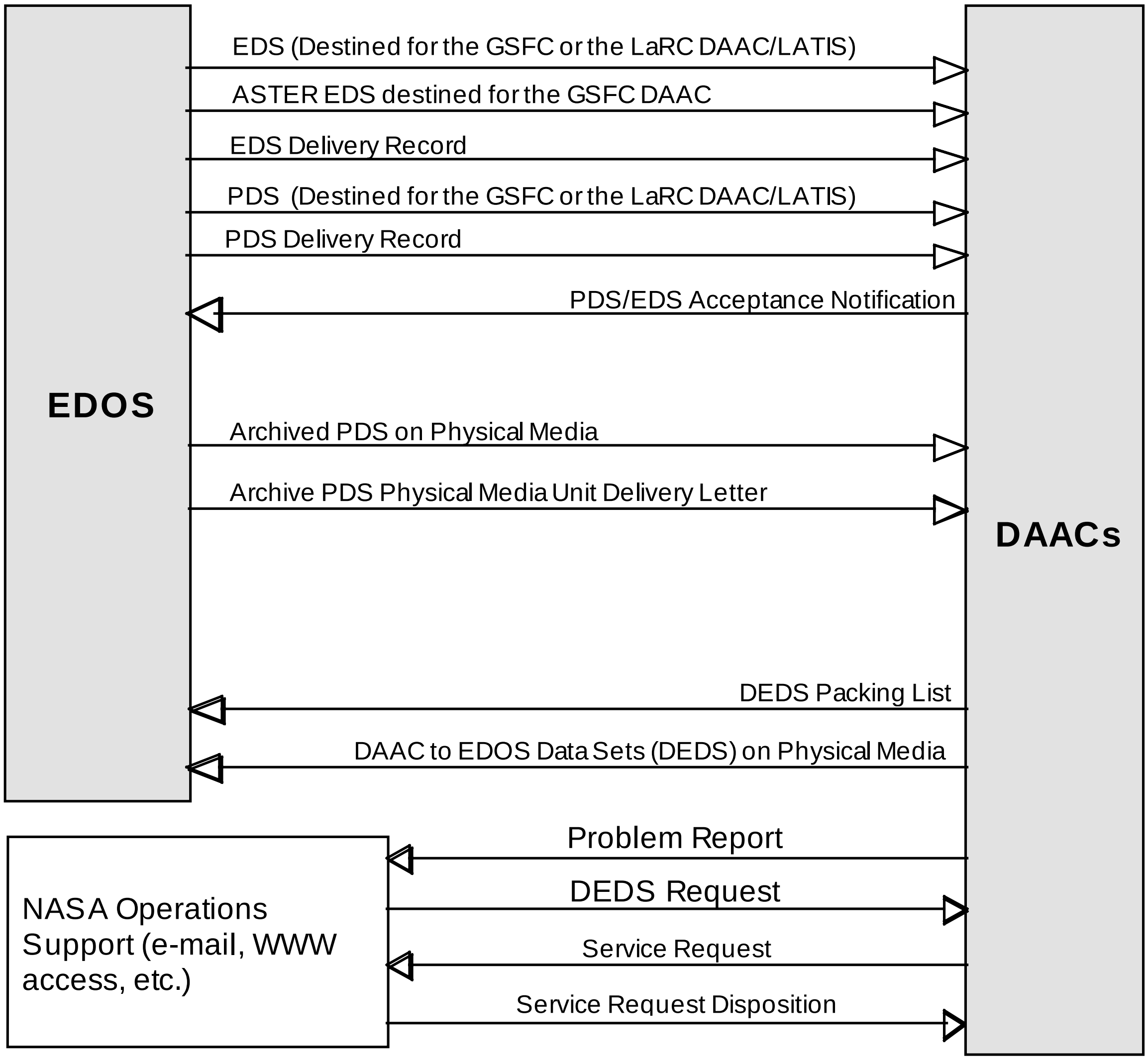
Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG

Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
Reserved	15	N/A
Wallops Orbital Tracking Station (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Langley TRMM Information System (LATIS)	19	LAT
Reserved for future use	20- 255	N/A

Old Figure 7.1-1 (also reference CCR 505-01-35-082)



New Figure 7.1-1 (also reference CCR 505-01-35-082)



SECTION 11

SYSTEM UPGRADE #1 (POST-AM-1 LAUNCH) MODIFICATIONS

Section 11 - System Upgrade #1 (post-AM-1 Launch) Modifications

11.1 General

EDOS System Upgrade Number 1 (SU#1) is currently scheduled to be implemented one year after launch of the AM-1 spacecraft.

11.1.1 Purpose

This section identifies the planned interface configuration at EDOS SU#1. It refers to the existing message exchange across the interfaces, and documents changes that are to be implemented at EDOS SU#1.

11.1.2 Scope

This section defines the communication protocol, identifies the messages exchanged, and defines the performance characteristics that will exist between EDOS and the EGS elements at SU#1.

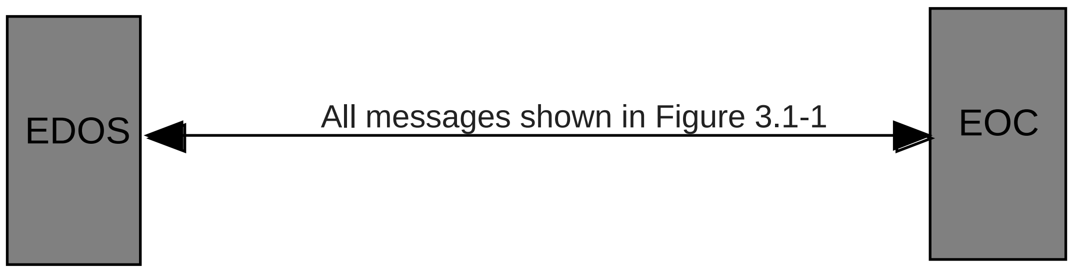
11.1.3 Effective Date

This section will take effect at EDOS SU#1.

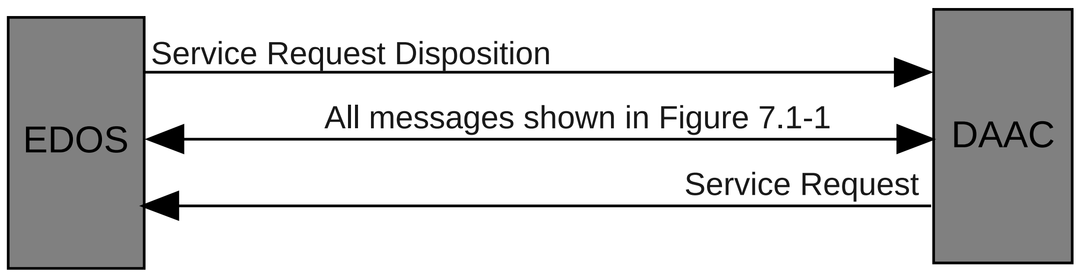
11.2 Data Flow

Figure 11.2-1 identifies those messages that will be exchanged with the ECS Segments (EOC, DAACs and SMC) at SU#1.

EOC:



GDFC and LaRC DAACs:



SMC:

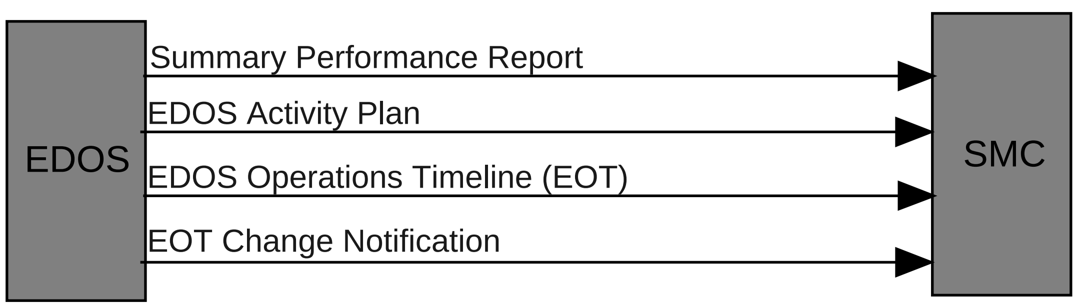


Figure 11.2-1. EDOS - ECS Data Exchange at SU#1

11.2.1 EDOS - ECS Data Exchange Overview

Implementation of the electronic transfer of, and processing of, the messages described below will be implemented at SU#1.

EDOS Activity Plan (EAP): EDOS generates an EAP on a daily basis for all events and activities scheduled to occur in the time period between forty-eight (48) hours and three (3) weeks in the future.

EDOS Operations Timeline (EOT): EDOS generates an EOT every 8 hours for all events and activities scheduled to occur in the next 48 hours.

EOT Change Notification: EDOS generates an EOT Change Notification whenever a change occurs in scheduled events and activities in the EOT.

Service Request: EDOS receives an electronic form of the Service Request from either the GSFC or LaRC DAACs requesting a change to one or more EDOS services agreed to in the applicable OA, or a previous Service Request. A change identified in a Service Request will remain in effect until EDOS receives another Service Request that again changes a service.

Service Request Disposition: EDOS transmits an electronic form of the Service Request Disposition to either the GSFC or LaRC DAACs in response to receipt of a Service Request from that ECS Segment.

Updates to the Summary Performance Report: EDOS provides Service Request processing summary for the EDOS Performance Summary Report by Mission-ID for Service Requests processed.

11.3 EDOS to ECS Electronic Data Exchange and Associated Protocols

The EBnet system provides the interface between EDOS and the ECS Segments for all data exchanged via internet protocols. Refer to the EDOS - EBnet ICD (Reference paragraph 2.1.1, Applicable Document 4) and the ECS - EBnet ICDs (Applicable Documents 15 and 16) for a detailed physical description of these interfaces.

The following paragraphs and Table 11.3-1 define the type of network addresses and protocols that govern the EDOS - ECS electronic interface.

11.3.1 Protocols

Reference Section 3 of this ICD, paragraph 3.5, Data Transmission Protocols for additional information regarding protocols.

Files transferred via FTP will follow the File Name Convention defined in Table 12.1.2.3-1.

11.3.1.1 Addresses

The EDOS and ECS IP address(es), host name(s), login(s), password(s) and directory(ies) that receive these messages, sent while using FTP, shall be as defined in the applicable OA.

Table 11.3-1. Addresses and Protocols For Data Sent from EDOS to ECS

EDOS - ECS Data Product	Protocol-Address
EDOS Activity Plan (EAP)	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EDOS Operations Timeline (EOT)	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
EOT Change Notification	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
Service Request	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.
Service Request Disposition	FTP-IP Addresses (data server), Host Names, User IDs, data server destination directory, and Password.

11.3.1.2 Reserved

Deleted

11.4 Performance Characteristics

Performance requirements specifying the rates of transfer can be found in the Interface Requirements Document (IRD) Between the Earth Observing System (EOS) Data and Operations System (EDOS) and the EOS Ground System (EGS) Elements (refer to Section 2 of this ICD, Applicable Document 3).

11.4.1 Operations Management (OM) Data Delivery Rate

The EDOS - ECS interface shall support OM data (EAP, EOT, EOT Change Notification, Service Request, and Service Request Disposition) transfer at a rate up to 49 Kilobits per second (Kbps).

11.4.2 Operations Management Data Delivery Timing

The following subsections define the timing of EAPs and EOTs.

11.4.2.1 EAP Data Delivery Timing

EDOS will initiate transfer of an EAP within 10 minutes of the initiation of EAP generation.

11.4.2.2 EOT Data Delivery Timing

EDOS will initiate transfer of an EOT data within 10 minutes of the initiation of EOT generation.

11.4.2.3 EOT Change Notification Data Delivery Timing

EDOS will initiate transfer of an EOT Change Notification within 30 seconds of receipt of any change to the current EOT

11.4.3 Service Request Processing

Specifications within a Service Request will remain in effect until EDOS receives a new Service Request changing the previously defined specifications.

11.4.3.1 EDOS Response to a Service Request

EDOS shall initiate a system change within 5 seconds of receipt of a Service Request.

11.4.3.2 Service Request Disposition

EDOS transmits a Service Request Disposition (indicating acceptance or rejection) in response to receipt of a Service Request.

11.4.4 Real-time Return Link Data Transfer

The EDOS-EOC interface shall provide the capability to support the transfer of real-time return link data at a rate of up to 64 Kbps.

11.4.5 Real-time Forward Link Data Transfer

The EDOS-EOC interface shall provide the capability to support the transfer of real-time forward link data at a rate of up to 12 Kbps.

11.4.6 Expedited and Production Data Set Transfer

The EDOS-GSFC interface shall support the transfer of expedited and production data sets at a rate of 95 Mbps.

SECTION 12

EDOS -ECS INTERFACE DESIGN AT SU#1

Section 12 - EDOS -ECS Interface Design at SU#1

12.1 Data Description and Formats

These paragraphs define the content and format for each interface message exchanged between EDOS and the ECS Segments, including data items, data representation, and data structures.

12.1.1 Data Formats Overview

EDOS Ground Message Header (in Binary Format)

A. Message Type/Test Message Type
B. Source Identification
C. Destination Identification
D. Message Generation Date and Time
E. Mission's Spacecraft Identification
F. Message Sequence Number
G. EDOS Software Version Number
H. Message Length

EDOS Ground Message Header (in PVL Format)

A. Message Type
B. Test Message Type
C. Source Identification
D. Destination Identification
E. Message Generation Date and Time
F. Mission's Spacecraft Identification
G. Message Sequence Number
H. EDOS Software Version Number
I. Message Length

EDOS Operations Timeline:

A. EDOS Ground Message Header (in PVL format)
B. Planned Service Requests
C. Electronically received Spacecraft Contact Schedules.
D. Operator entries of planned EDOS Testing, Maintenance, and Engineering Change Activities
E. RLSS schedules.

EDOS Operations Timeline Change Notification:

A. EDOS Ground Message Header (in PVL format)

B. Time and Date of EOT Change Notification generation.
C. Identity of the EOT being modified
D. Date and Time of last EOT change.
E. Modifications to existing Planned Service Requests
F. Modifications to existing SN Schedules
G. Modifications to existing EDOS Planned Testing, Maintenance, and Engineering Change Activities

EDOS Activity Plan:

A. EDOS Ground Message Header (in PVL format)
B. Planned Service Requests
C. Electronically received Spacecraft Contact Schedules.
D. Planned EDOS Testing, Maintenance, and Engineering Change Activities
E. RLSS schedules.

File Name Convention to store Operations Management Messages:

A. File Identification Character
B. Date and Time of File Creation

Greenwich Mean Time (in ASCII and Binary Format):

A. Year
B. Julian Day
C. Hour
D. Minute
E. Second

Service Request:

A. EDOS Ground Message Header (in Binary format)
B. Return Link CCSDS Service Change
C. Ground Communications Changes
   a. Real-time EDU Service (APID (or VCID), Operational/Test Flag, Multicast IP Address, and UDP Port Number)
   b. Rate Buffered Service for Path Service EDUs (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
   c. Rate Buffered Service for VCDU Service EDUs (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
   d. PDS Service (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
   e. EDS Service (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
   f. CODA Report (SCID, IP Address, Host Name, Host Name Alias, UDP Port Number, and Operational/Test Flag)
   g. SCS Summary Report (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)

h. PDS/EDS Delivery Record (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
i. PDS Physical Media Unit Delivery Record (SCID, IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)
j. Service Request Disposition (IP Address, Host Name, Host Name Alias, Directory, and Operational/Test Flag)

D. Rate Buffering Changes
   a. SCID
   b. Send or not send Rate Buffered Path Service or VCDU Service EDU files

E. PDS Transfer Requests
   a. Construction Attribute Changes
   b. Start/Stop delivery of PDS for specified non-science and science APID(s)
      1. Start/Stop service
      2. Identify number of APIDs
      3. APID (SCID and APID) List
   c. Request delivery of one or more PDSs from the EDOS Archive. PDSs may be requested by one of two options, PDS-ID based, or Spacecraft time-based.
      1. PDS-ID based:
         a. Number of PDSs
         b. List of PDS-IDs
      2. Spacecraft time-based:
         a. PDS APID(s)
         b. Start Spacecraft time.
         c. End Spacecraft time.

F. EDU Transfer Request
   a. Start/Stop service

G. Time of Service Request Execution
   a. Greenwich Mean Time

H. Reporting Requirements Changes
   a. CODA Report Content Indicators
      1. EDOS Return Link Physical Channel Status Block
      2. EDOS Forward Link Physical Channel Status Block
      3. EDOS Return link CCSDS Service Status Block
      4. EDOS Forward Link CCSDS Service Status Block
      5. Ground Communications Return Link Service Status

b. Send SCS Summary Report (Flag)

I. Initiating Operator Comments

Service Request Disposition:

A. EDOS Ground Message Header (in Binary format)
B. Service Request Identification
C. Service Request Description and Disposition
D. Operator Comment on Disposition

Summary Performance Report (in PVL Format):

A. EDOS Ground Message Header (in PVL)
B. Report_coverage_start_time
C. Report_coverage_stop_time
D. Individual_mission_summary
  a. Identification
  b. Total_number_contact_sessions
  c. Total_number_SCS_contacts
  d. Total_number_contingency_contacts
  e. Individual session summary
    1. Contact_identification
    2. Ground_location_identification
    3. Actual_contact_start_time
    4. Actual_contact_stop_time
    (Return Link Statistics)
    5. Percent_time_in_frame_lock
    6. Total_number_of_frame_synch_lock_drops
    7. Total_number_of_CADUs_received
    (Forward Link Statistics)
    8. Total_number_of_CDBs_received
    9. Total_number_of_forward_link_octets_received
    10. Total_number_of_forward_link_octets_ transmitted
    (VCDU Processing Statistics)
    11. Total_number_of_corrected_ VCDUs_with_RS_errors
    12. Reed_Solomon_cumulative_data_quality

13. Total_number_VCDUs_with_cyclic_ redundancy_check_errors
14. Cyclic_redundancy_check_
cumulative_data_quality
15. Total_number_VCDU-IDs_found
16. Total_number_VCDUs_demultiplexed
17. Individual_VCDU_Summary

17.a. Identification

17.b. Total_number_VCDUs_demultiplexed_
this_VCDU-ID

(Packet Processing Statistics)

18. Total_number_apid(s)_found
19. Total_number_packets_demultiplexed
20. Individual apid summary
    a. Identification
    b. Total_number_packets_this_APID
21. Total_number_transferred_return_link_EDUs

(PDS/EDS Production Statistics)

f. Total_number_of_packets_received_for_inclusion_
in_PDSs_and_EDSs

g. Total_number_PDSs_generated

h. Total_number_PDS_packets_generated

i. Total_number_EDSs_generated

j. Total_number_EDS_packets_generated

k. Total_number_packets_in_PDSs_
transferred_to_EGS_elements

l. Total_number_packets_within_EDSs_transmitted to EGS elements

(Service Requests Processing Statistics)

m. Total_number of return link service changes

n. Total_number of ground communications changes

o. Total_number of rate buffering changes

p. Total_number of expedited data processing changes

q. Total_number of PDS transfer requests

r. Total_number of EDU transfer requests

s. Total_number of reporting requirements changes

E. EDOS-operator_remarks

12.1.2 General Data Format

The format and content of these general data records reside in one or more Operations Management messages.

12.1.2.1 EDOS Ground Message Header (in Binary Format)

This EDOS Ground Message Header in Binary format (Reference Table 12.1.2.1-1), precedes each of the following messages sent by, and/or received at, EDOS (Service Request and Service Request Disposition).

Table 12.1.2.1-1. EDOS Ground Message Header (in Binary Format)

Item No.	Name	Format & Size	Data Characteristics
1	Message Type/Test Message Type	Unsigned Integer 1 Byte	Range for Message Type -> 0 through 127, and Range for Test Message type > 128 through 255 (Test Message Type equals Message Type plus 128). Refer to Table 12.1.2.4-1 for EDOS External Message Type Definitions. This field uniquely identifies the message, and indicates to the receiver what message format to expect and process.
2	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
3	Source Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 12.1.2.5-1.
4	Destination Identification	Unsigned Integer 1 Byte	Range -> 0 through 255, Reference Table 12.1.2.5-1.
5	Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).

Table 12.1.2.1-1. EDOS Ground Message Header (in Binary Format) (Continued)

Item No.	Name	Format & Size	Data Characteristics
6	Message Generation Date and Time	NASA PB-5 Code Format 7 Bytes	Range -> Refer to Table 12.1.2.6-1 for the NASA PB-5 Code Format (containing GMT).
7	Mission's Spacecraft Identification	Unsigned Integer 2 Bytes	Value -> 0=Not applicable for this message; 42 = AM-1; Reference Table 12.1.2.7-1 Spacecraft identification for the Mission associated with this message.
8	Message Sequence Number	Unsigned Integer 2 Bytes	Range -> 0 through 65,535; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up per Source Identification, and is assigned by the originator.

9	EDOS Software Version Number	Unsigned Integer 2 Bytes	Range -> 0 through 255 (first byte - identifies a major EDOS release) and 0-255 (second byte - represents a version of the major release - initial version or an update version)
10	Message Length	Unsigned Integer 2 Bytes	Range -> 24 through 65,535 Number of bytes in the message. This value includes the EDOS Ground Message Header plus the attached message's length. A length of 24 means the EDOS Ground Message Header is self contained.
11	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
Total of 24 bytes exist in the EDOS Ground Message Header.			

12.1.2.2 EDOS Ground Message Header (in PVL Format)

This EDOS Ground Message Header in PVL format (Reference Table 12.1.2.2-1), precedes each of the following messages sent by EDOS (EAP, EOT, EOT Change Notification).

Table 12.1.2.2-1. EDOS Ground Message Header (in PVL Format)

Item No.	Field	Format & Maximum Size	Value
1	MESSAGE_TYPE	ASCII 30 Bytes	'------------------------------' For example: 'EDOS ACTIVITY PLAN' or 'EDOS OPERATIONS TIMELINE' or 'EOT CHANGE NOTIFICATION'
2	TEST_MESSAGE	ASCII 1 Byte	'N' for an operational message and 'Y' for a test message
3	SOURCE_IDENTIFICATION	ASCII 4 Bytes	'EDOS'
4	DESTINATION_IDENTIFICATION	ASCII 3 Bytes	Value -> Reference Table 12.1.2.5-1 - EDOS Source/Destination Identification Example: "SMC"
5	MESSAGE_GENERATION_DATE_AND_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6	MISSION_SPACECRAFT_IDENTIFICATION	ASCII 4 Bytes	'AM-1', 'PM-1', other EOS spacecraft as available
7	MESSAGE_SEQUENCE_NUMBER	ASCII 5 Bytes	Value -> "00000" through "65535"; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up per Source Identification, and is assigned by the originator.
8	EDOS_SOFTWARE_VERSION_NUMBER	ASCII 6 Bytes	Value -> "000" through "255" (first 3 bytes - identifies a major EDOS release) and "000" through "255" (second 3 bytes - represents a version of the major release - initial version or an update version)

9	MESSAGE_LENGTH	ASCII 6 Bytes	‘N/A’. This field is only useful for the transmission of a message containing binary data. Messages that have an EDOS Message Header in PVL have ASCII contents and will be transmitted via FTP. Their file size will be known.
	[deleted]		

12.1.2.3 File Name Convention for Operations Management Messages

When EDOS deposits an EAP, EOT, EOT Change Notification, or a Service Request Disposition file in an ECS Segment’s directory via FTP, or an ECS Segment deposits a Service Request in an EDOS directory via FTP, the file name storing the message has the format defined in Table 12.1.2.3-1. The sender of each message ensures that the file name in the destinations directory is unique.

Table 12.1.2.3-1. File Name Convention for Operations Management Messages

Item No.	Name	Format & Size	Data Characteristics
1	File Identification Character	ASCII 1 Byte	Value -> “A” identifies the file as a Service Request Disposition; “B” identifies the file as an EAP; “C” identifies the file as an EOT; “F” identifies the file as an EOT Change Notification; “G“ identifies the file as a Summary Performance Report; “H” identifies the file as a Service Request;
2	Time of File Creation	ASCII 11 Bytes	Value -> Refer to Table 12.1.2.8-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data was placed within the destination’s directory).
3	Suffix	ASCII 4 Bytes	Value -> “.SER” for Service Requests “.SRD” for Service Request Dispositions “.SPR” for Summary Performance Reports “.EAP” for EDOS Activity Plans “.EOT” EDOS Operations Timelines “.ECN” for EOT Change Notifications
File name contains a total of 16 Bytes. Examples: A95030231459.SRD, and H95365235959.SER			

12.1.2.4 EDOS External Message Type Definitions

Table 12.1.2.4-1 - EDOS External Message Type Definitions identifies the message type within the EDOS Ground Message Header (in Binary format).

Table 12.1.2.4-1. EDOS External Message Type Definitions

EDOS External Message Name	Message Type

Reserved	0-12
Service Request (SR)	13
Service Request Disposition	14
Summary Performance Report	15
Reserved	16-17
EDOS Activity Plan (EAP)	18
EDOS Operations Timeline (EOT)	19

Table 12.1.2.4-1. EDOS External Message Type Definitions (Continued)

EDOS External Message Name	Message Type
Reserved	20
EOT Change Notification	21
Reserved	22-127
Test Message Type - equals Message Type plus 128	128-255

12.1.2.5 EDOS Source/Destination Identification

Table 12.1.2.5-1 - EDOS Source/Destination Identification identifies EDOS and all its external interfaces in order to identify the source and destination locations within the data structures in this section.

Table 12.1.2.5-1. EDOS Source/Destination Identification

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
Reserved for future use	0	Not Applicable (N/A)
EDOS	1	EDO
System Monitoring and Coordination Center (SMC)	2	SMC
EROS Data Center (EDC)	3	EDC
EOS Operations Center (EOC)	4	EOC
EOSDIS Test System (ETS)	5	ETS
Goddard Space Flight Center (GSFC)	6	GSF
ASTER Instrument Control Center (ICC)	7	ICC
Langley Research Center (LaRC)	8	LRC
National Oceanic and Atmospheric Administration (NOAA)	9	NOA
ASTER Science Data Processing Segment (SDPS)	10	SDP
Reserved	11	N/A
White Sands Ground Terminal Upgrade (WSGTU)	12	WSG
Second TDRSS Ground Terminal (STGT) (White Sands Complex)	13	STG
Reserved	14	N/A
	15	N/A
Wallops Orbital Tracking Station (WOTS) (Wallops Island)	16	WOT
EOS Polar Ground Station (EPGS) at Poker Flat, Alaska	17	AGS

Table 12.1.2.5-1. EDOS Source/Destination Identification (Continued)

Source/Destination Identification	Corresponding Integer Code	Corresponding 3 Character ASCII Code
EOS Polar Ground Station (EPGS) at Spitzbergen, Norway	18	SGS
Reserved for future use	19- 255	N/A

12.1.2.6 NASA PB-5 Code Format

Table 12.1.2.6-1 - NASA PB-5 Code Format (Option C) identifies the time of an event, in PB-5 format (Reference Section 2 of this ICD, Applicable Document 9), that is used within the data structures in this section.

Table 12.1.2.6-1. NASA PB-5 Code Format (Option C)

Item No.	Name	Format & Size	Data Characteristics
PB-5 is the format in which the Greenwich Mean Time (GMT) is stored.			
1	Flag Bit	Integer 1 Bit	Value = 1, Reference PB-5 Time Code "option C".
2	Truncated Julian Day	Unsigned Integer 14 Bits	Range -> Variable; Truncate the most significant decimal digits, retaining only the four least significant decimal digits ranging from 0000 to 9999; The current Julian day epoch begins on October 10, 1995 and continues for a period of 27.379 years.
3	Seconds of Day	Unsigned Integer 17 Bits	Range -> Variable, Seconds-of-day from 0 to 86,399.
4	Milliseconds of a Second	Unsigned Integer 10 Bits	Range -> 0 through 999
5	Microseconds of a Millisecond	Unsigned Integer 10 Bits	Range -> 0 through 999
6	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bits	Value -> zero (0).
NASA PB-5 code format (Option C) has 6 items placed within 7 bytes. Reference Section 2 - Applicable Document 9, for additional information.			

12.1.2.7 Spacecraft Identification (SCID)

Table 12.1.2.7-1 - Spacecraft Identification (SCID) identifies the spacecraft identification present in the data structures in this section.

Table 12.1.2.7-1. Spacecraft Identification (SCID)

Spacecraft	Identifier *
Refer to Applicable Document 8, Paragraph 6.1.3.1.2.1	
EOS AM-1	42 = x'2A'
*Return Link SCID is used as SCID	

12.1.2.8 Greenwich Mean Time (GMT) in ASCII Format

The Greenwich Mean Time (GMT) data structure, in ASCII format that is present in the data structures in this section, is as defined in Table 12.1.2.8-1.

Table 12.1.2.8-1. Greenwich Mean Time (GMT) in ASCII Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	ASCII 2 Bytes	Value -> "00 " through "99"; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian Day	ASCII 3 Bytes	Value -> "001" through "366"; contains the Julian day (from the GMT/ZULU).
3	Hour	ASCII 2 Bytes	Value -> "00" through "23"; contains the hour (from the GMT/ZULU).
4	Minute	ASCII 2 Bytes	Value -> "00" through "59"; contains the minute (from the GMT/ZULU).
5	Second	ASCII 2 Bytes	Value -> "00" through "59"; contains the second (from the GMT/ZULU).
This GMT/ZULU ASCII format contains 11 bytes. Example: 95366235959			

12.1.2.9 Greenwich Mean Time (GMT) in Binary Format

The Greenwich Mean Time (GMT) data structure, in binary format that is used in the data structures in this section, is as defined in Table 12.1.2.9-1.

Table 12.1.2.9-1. Greenwich Mean Time (GMT) in Binary Format

Item No.	Name	Format & Size	Data Characteristics
1	Year	Unsigned Integer 1 Byte	Value -> 0 through 99; contains the value of the two least significant digits of the Year (from the GMT/ZULU).
2	Julian day	Unsigned Integer 2 Bytes	Value -> 1 through 366; contains the Julian day (from the GMT/ZULU).
3	Hour	Unsigned Integer 1 Byte	Value -> 0 through 23; contains the hour (from the GMT/ZULU).

4	Minute	Unsigned Integer 1 Byte	Value -> 0 through 59; contains the minute (from the GMT/ZULU).
5	Second	Unsigned Integer 1 Byte	Value -> 0 through 59; contains the second (from the GMT/ZULU).
This GMT/ZULU integer format contains 6 bytes.			

12.1.2.10 PDS/EDS Identification

The PDS/EDS identification data structure, in ASCII format, that is present in the data structures in this section, is as shown in Table 12.1.2.10-1. The time item within this identification records when the PDS/EDS was created by EDOS.

Table 12.1.2.10-1. PDS/EDS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> "E" or "P"; Identifies the data structure as an EDS or PDS.
2	First APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 12.1.2.7-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on left).
3	Second APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 12.1.2.7-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a second APID is not present in the data set, this item will contain a value of "AAAAAAA".

Table 12.1.2.10-1. PDS/EDS Identification (Continued)

Item No.	Name	Format & Size	Data Characteristics
4	Third APID in the Data Set	ASCII 7 Bytes	Value -> SCID and APID (SCID-3 Bytes (Refer to Table 12.1.2.7-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If a third APID is not present in the data set, this item will contain a value of "AAAAAAA".
5	Time of EDS/PDS creation	ASCII 11 Bytes	Value -> Refer to paragraph 12.1.2.8-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU when the data set was created).
6	Numeric Identification	ASCII 1 Byte	Range -> 0-9, one-up, wrap around, data set counter. EDSs and PDSs utilize the same counter. This number aids in distinguishing the order of data set creation; provides uniqueness to the identification; and relieves the burden of resetting a counter every second to ensure no two identifications are the same.
7	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> "00"
A PDS/EDS Identification contains 36 bytes. Examples: P04202890420291AAAAAAA95030231459600 and E0420193AAAAAAAAAAAAAA95133235959900			

12.1.2.11 SCS Identification

The SCS identification data structure, in ASCII format, that is present in the data structures in this section, is as shown in Table 12.1.2.11-1. The time item within this identification records when the SCS was initiated by EDOS.

Table 12.1.2.11-1. SCS Identification

Item No.	Name	Format & Size	Data Characteristics
1	Data Structure Identification Character	ASCII 1 Byte	Value -> T. Identifies the data structure as a SCS Identification.
2	Mission Identification.	ASCII 3 Bytes	Value -> SCID Return Link Identification -> Refer to Table 12.1.2.7-1 (Contains a SCID decimal value, right justified and, if necessary, zero filled on left).
3	Ground Location Identification	ASCII 3 Bytes	Value -> Refer to Table 12.1.2.5-1 for the Ground Location receiving the Spacecraft return link data in CCSDS format).
4	Time of SCS initiation.	ASCII 11 Bytes	Value -> Refer to paragraph 12.1.2.8-1 for a definition of the GMT/ZULU time in ASCII format (GMT from when the SCS was initiated on EDOS).

5	Fill/Spare, reserved for future use.	ASCII 2 Bytes	Value -> “00”
A SCS Identification contains a total of 20 Bytes. Example: T042WSG9536623595900			

12.1.3 Operations Management Data/Operations Management Test Data

Operations Management Data and Operations Management Test Data are defined in the following subsections.

12.1.3.1 EDOS Operations Timeline (EOT)

EDOS generates an EOT every 8 hours for all events and activities scheduled to occur in the next 48 hours. EDOS attaches the PVL version of the EDOS Ground Message Header to the message, and transmits it to the SMC via FTP.

The EOT message, in PVL format, is shown in Table 12.1.3.1-1.

Table 12.1.3.1-1. EOT Structure

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 12.1.2.2-1 for content of the EDOS Ground Message Header in PVL Format.
2	EDOS Operations Timeline (EOT)	ASCII Variable Size	Reference Table 12.1.3.1-2 for content of the PVL Statements in the EOT.

Table 12.1.3.1-2. EOT PVL Statements

Item No.	Field	Format & Size	Value
2	NUMBER_PLANNED_SERVICE_REQUEST_EVENTS	ASCII 3 Bytes	Value -> “000” through “999”
2-1	OBJECT	ASCII 20 Bytes	‘PLANNED_SR_SCHEDULES’
2-2	PLANNED_SR_ID	ASCII 5 BYTES	Value -> “00000” through “65535”. Message Sequence Number from the EDOS Ground Message Header received with the Service Request.

2-3	DATE/TIME_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals (Note: Service Request events do not have a planned termination time; they remain in effect until a new Service Request starts a different service)
	[deleted]		
2-4	END_OBJECT	ASCII 20 Bytes	'PLANNED_SR_SCHEDULES'
3	NUMBER_SPACECRAFT_CONTACT_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999"
3-1	OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'

Table 12.1.3.1-2. EOT PVL Statements (Continued)

Item No.	Field	Format & Size	Value
3-2	SPACECRAFT_CONTACT_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-3	SPACECRAFT_CONTACT_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-4	END_OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'
4	NUMBER_SCHEDULED_EDOS_EVENTS	ASCII 3 Bytes	Value -> "000" through "999"
4-1	OBJECT	ASCII 20 Bytes	'EDOS_SCHEDULED_EVENT'
4-2	EDOS_PURPOSE	ASCII 12 Bytes	'TESTING', 'MAINTENANCE', or 'ENGINEERING'
4-3	DATE/TIME_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-4	DATE/TIME_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-5	END_OBJECT	ASCII 20 bytes	'EDOS_SCHEDULED_EVENT'
6	NUMBER_RLSS_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999"

Table 12.1.3.1-2. EOT PVL Statements (Continued)

Item No.	Field	Format & Size	Value
6-1	OBJECT	ASCII 14 Bytes	'RLSS_SCHEDULES'
6-2	RLSS_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-3	RLSS_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-4	END_OBJECT	ASCII 14 Bytes	'RLSS_SCHEDULES'
7	EDOS_OPERATOR_COMMENTS	ASCII 256 Bytes	EDOS Operator Comments

12.1.3.2 EOT Change Notification

EDOS generates an EOT Change Notification whenever a change occurs in events and activities scheduled in the EDOS Operations Timeline (EOT). EDOS then attaches the PVL version of the EDOS Ground Message Header to the message and transmits it to the SMC via FTP.

The EOT Change Notification message, in PVL format, is shown in Table 12.1.3.2-1.

Table 12.1.3.2-1. EOT Change Notification Structure

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 12.1.2.2-1 for content of the EDOS Ground Message Header in PVL Format.
2	EDOS Operations Timeline (EOT) Change Notification	ASCII Variable Size	Reference Table 12.1.3.2-2 for content of the PVL Statements in the EOT Change Notification.

Table 12.1.3.2-2. EOT Change Notification PVL Statements

Item No.	Field	Format & Size	Value
2	IDENTITY_OF_EOT_BEING_MODIFIED	ASCII 5 Bytes	Value -> “00000” through “65535”; EDOS Ground Message Header item -Message Sequence Number from the EOT that is being modified
2-1	DATE/TIME_OF_EOT_BEING_MODIFIED	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. Start Date and time of EOT that is being modified.
3	IDENTITY_OF_LAST_MODIFICATION_TO_EOT	ASCII 5 Bytes	Value -> “00000” through “65535”; EDOS Ground Message Header item -Message Sequence Number from the last EOT modification.
3-1	DATE/TIME_OF_LAST_EOT__MODIFICATION	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. Date and time of last EOT modification.
4	NUMBER_PLANNED_SERVICE_REQUEST_EVENTS_MODIFIED	ASCII 3 Bytes	Value -> “000” through “999”
4-1	OBJECT	ASCII 20 Bytes	‘PLANNED_SR_SCHEDULES’
4-2	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> ‘ADDED’, ‘DELETED’, or ‘MODIFIED’
4-3	DATE/TIME_MODIFIED_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
	[deleted]		
4-5	END_OBJECT	ASCII 20 Bytes	‘PLANNED_SR_SCHEDULES’
5	NUMBER_MODIFIED_PLANNED_SN_SCHEDULES	ASCII 3 Bytes	Range -> “000” through “999”

Table 12.1.3.2-2. EOT Change Notification PVL Statements (Continued)

Item No.	Field	Format & Size	Value
5-1	OBJECT	ASCII 12 Bytes	'SN_SCHEDULES'
5-2	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> 'ADDED', 'DELETED', or 'MODIFIED'
5-3	DATE/TIME_MODIFIED_PLANNED_SN_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
5-4	DATE/TIME_MODIFIED_PLANNED_SN_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
5-5	END_OBJECT	ASCII 12 Bytes	'SN_SCHEDULES'
6	NUMBER_MODIFIED_PLANNED_EDOS_CHANGE_ACTIVITIES	ASCII 3 Bytes	Range -> "000" through "999"
6-1	OBJECT	ASCII 20 Bytes	'EDOS_SCHEDULED_EVENT'
6-2	EDOS_PURPOSE	ASCII 12 Bytes	'TESTING', 'MAINTENANCE', or 'ENGINEERING'
6-3	REASON_FOR_MODIFICATION	ASCII 8 Bytes	VALUE -> 'ADDED', 'DELETED', or 'MODIFIED'
6-4	DATE/TIME_MODIFIED_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-5	DATE/TIME_MODIFIED_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-6	END_OBJECT	ASCII 20 bytes	'EDOS_SCHEDULED_EVENT'
7	EDOS_OPERATOR_COMMENTS	ASCII 256 Bytes	EDOS Operator Comments

12.1.3.3 EDOS Activity Plans

EDOS generates an EAP on a daily basis for all events and activities scheduled to occur in the time period between forty-eight (48) hours and three (3) weeks in the future. Events and activities include active and test schedules, and schedules relating to training, maintenance, and hardware/software modifications. EDOS attaches the PVL version of the EDOS Ground Message Header to the message and transmits it to the SMC via FTP.

The EAP message, in PVL format, is shown in Table 12.1.3.3-1.

Table 12.1.3.3-1. EDOS Activity Plan

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header in PVL Format	ASCII Variable Size	Reference Table 12.1.2.2-1 for content of the EDOS Ground Message Header.
2	EDOS Activity Plan (EAP)	ASCII Variable Size	Reference Table 12.1.3.3-2 for content of the PVL Statements in the EAP.

Table 12.1.3.3-2. EAP PVL Statements

Item No.	Field	Format & Size	Value
2	NUMBER_PLANNED_SERVICE_REQUEST_EVENTS	ASCII 3 Bytes	Value -> "000" through "999"
2-1	OBJECT	ASCII 20 Bytes	'PLANNED_SR_SCHEDULES'
2-2	PLANNED_SR_ID	ASCII 5 BYTES	Value -> "00000" through "65535". Message Sequence Number from the EDOS Ground Message Header received with the Service Request.
2-3	DATE/TIME_PLANNED_SR_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-4	DATE/TIME_PLANNED_SR_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-5	END_OBJECT	ASCII 20 Bytes	'PLANNED_SR_SCHEDULES'

Table 12.1.3.3-2. EAP PVL Statements (Continued)

Item No.	Field	Format & Size	Value
3	NUMBER_SPACECRAFT_CONTACT_SCHEDULES	ASCII 3 Bytes	Value -> "000" through "999"
3-1	OBJECT	ASCII 27 Bytes	'SPACECRAFT_CONTACT_SCHEDULE'

Table 12.1.3.3-2. EAP PVL Statements (Continued)

Item No.	Field	Format & Size	Value
3-2	SPACECRAFT_CONTACT_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-3	SPACECRAFT_CONTACT_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3-4	END_OBJECT	ASCII 27 Bytes	‘SPACECRAFT_CONTACT_SCHEDULE’
4	NUMBER_SCHEDULED_EDOS_EVENTS	ASCII 3 Bytes	Value -> “000” through “999”
4-1	OBJECT	ASCII 20 Bytes	‘EDOS_SCHEDULED_EVENT’
4-2	EDOS_PURPOSE	ASCII 12 Bytes	‘TESTING’, ‘MAINTENANCE’, or ‘ENGINEERING’
4-3	DATE/TIME_EDOS_SCHEDULED_EVENT_STARTS	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-4	DATE/TIME_EDOS_SCHEDULED_EVENT_TERMINATES	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
4-5	END_OBJECT	ASCII 20 bytes	‘EDOS_SCHEDULED_EVENT’
6	NUMBER_RLSS_SCHEDULES	ASCII 3 Bytes	Value -> “000” through “999”
6-1	OBJECT	ASCII 14 Bytes	‘RLSS_SCHEDULES’
6-2	RLSS_SCHEDULED_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-3	RLSS_SCHEDULED_END_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
6-4	END_OBJECT	ASCII 14 Bytes	‘RLSS_SCHEDULES’
7	EDOS_OPERATOR_COMMENTS	ASCII 256 Bytes	EDOS Operator Comments

12.1.3.4 Service Request

EDOS receives Service Requests from the GSFC or LaRC DAACs requesting a change to the EDOS services agreed to in the applicable OA. This electronic Service Request also allows an EGS Segment to request an Archived PDS(s). Implementation of this change occurs when specified in the SR item “Time of Service Request execution”.

Changes specified in the SR remain in effect until receipt of another SR that changes that same item. Format of the Service Request is shown in Table 12.1.3.4-1.

Table 12.1.3.4-1. Service Request

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 12.1.2.1-1 for a definition of the EDOS Ground Message Header in Binary format.
2	Return link CCSDS Service changes		
2-1	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
3	Reserved		
3-1	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
4	Ground Communications Changes		
4-1	Real-time (RT) Path Service and VCDU EDU service (Via UDP) (Define where to deliver ALL the RT EDUs for an APID (SCID&APID))		
4-1.1	RT Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-1.2	RT, Number of RT changes in list	Unsigned Integer 1 Byte	Value -> 0 through 255, Number of RT changes in list. 0 = No RT change, and items 4-1.2.1 through 4-1.2.6 will not be present.
4-1.2.1	APID	Unsigned Integer 3 Bytes	Value -> SCID and APID (SCID-8 Bits (Refer to Table 12.1.2.7-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)).
4-1.2.2	RT Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-1.2.3	RT Fill/Spare 2, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4-1.2.4	RT Multicast IP Address	ASCII 15 Bytes	Value -> Variable value for Multicast IP Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 192.10.0.19, 192.66.12.1, 192.2.34.255)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-1.2.5	RT UDP Port Number	Unsigned Integer 2 Bytes	Value -> 20,000 through 65,535
4-1.2.6	RT Fill/Spare 3, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
4-1.2.7	For the next RT service change, repeat items 4-1.2.1 through 4-1.2.6.		
4-1.3	RT Fill/Spare 4, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-2	Rate Buffered (RB) service for Path Service EDUs (Via FTP) (Define where to deliver ALL the RB files for a Mission, by SCID)		
4-2.1	RB Service Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-2.2	RB Service Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-2.2.1 through 4-2.3 will not be present. 1 = A change is requested and items 4-2.2.1 through 4-2.3 are present
4-2.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Return Link SCID, Refer to Table 12.1.2.7-1)
4-2.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-2.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-2.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-2.2.5	RB Service Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-2.2.6	RB Service Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-2.2.7	RB Service Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-2.2.8	RB Service Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-2.2.9	RB Service Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash (“/”). (Example: /name/ftp/rb)
4-2.3	RB Service Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-3	Rate Buffered VCDU EDU Buffer service (Via FTP) (Define where to deliver ALL the Rate Buffered VCDU EDU Buffer files for a SCID)		
4-3.1	VCDU Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-3.2	VCDU Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-3.2.1 through 4-3.3 will not be present. 1 = A change is requested and items 4-3.2.1 through 4-3.3 are present
4-3.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Return Link SCID, Refer to Table 12.1.2.7-1, for Spacecraft ID)
4-3.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-3.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-3.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-3.2.5	VCDU Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-3.2.6	VCDU Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-3.2.7	VCDU Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-3.2.8	VCDU Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-3.2.9	VCDU Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash (“/”). (Example: /name/ftp/VCDU)
4-3.3	VCDU Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-4	PDS service (Via FTP) (Define where to deliver the PDS files for a mission, by SCID)		
4-4.1	PDS Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-4.2	PDS Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-4.2.1 through 4-4.3 will not be present. 1 = A change is requested and items 4-4.2.1 through 4-4.3 are present
4-4.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Refer to Table 12.1.2.7-1 for Spacecraft ID)
4-4.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-4.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-4.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-4.2.5	PDS Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-4.2.6	PDS Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-4.2.7	PDS Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-4.2.8	PDS Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-4.2.9	PDS Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash (“/”). (Example: /name/ftp/pds)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-4.3	PDS Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-5	EDS service (Via FTP) (Define where to deliver the EDS files (Construction Record file and Path SDU files) for a SCID)		
4-5.1	EDS Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-5.2	EDS Change Flag	Unsigned Integer 1 Byte	Value -> 0 = no change and items 4-5.2.1 through 4-5.3 will not be present. 1 = a change is requested and items 4-5.2.1 through 4-5.3 are present
4-5.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Refer to Table 12.1.2.7-1, for Spacecraft ID)
4-5.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-5.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-5.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-5.2.5	EDS Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-5.2.6	EDS Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-5.2.7	EDS Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-5.2.8	EDS Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-5.2.9	EDS Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash ("/"). (Example: /name/ftp/eds)
4-5.3	EDS Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-6	CODA Report (Via UDP) (Define where to deliver the CODA Reports for a SCID)		

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-6.1	CODA Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-6.2	CODA Change	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-6.2.1 through 4-6.2.7 will not be present. 1 = A change is requested and items 4-6.2.1 through 4-6.2.7 are present
4-6.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Refer to Table 12.1.2.7-1, for Spacecraft ID)
4-6.2.2	CODA Multicast IP Address	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-6.2.3	Reserved	36 Bytes	Value -> 0.
4-6.2.4	Reserved	12 Bytes	Value -> 0.
4-6.2.5	CODA UDP Port Number	Unsigned Integer 2 Bytes	Value -> 20,000 through 65,535
4-6.2.6	CODA Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-6.2.7	CODA Fill/Spare, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4-7	SCS Summary (SCS) Report (Via FTP) (Define where to deliver the SCS Summary Reports for a SCID)		
4-7.1	SCS Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-7.2	SCS Change Flag	Unsigned Integer 1 Byte	Value -> 0 = no change and items 4-7.2.1 through 4-7.3 will not be present. 1 = a change is requested and items 4-7.2.1 through 4-7.3 are present
4-7.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Return Link SCID, Refer to Table 12.1.2.7-1)
4-7.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-7.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-7.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-7.2.5	SCS Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-7.2.6	SCS Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-7.2.7	SCS Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-7.2.8	SCS Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-7.2.9	SCS Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash (“/”). (Example: /name/ftp/tss)
4-7.3	SCS Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-8	PDS/EDS Delivery Record (PDR/EDR) (Via FTP) (Define where to deliver the Delivery Records for a SCID)		
4-8.1	PDR/EDR Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-8.2	PDR/EDR Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-8.2.1 through 4-8.3 will not be present. 1 = A change is requested and items 4-8.2.1 through 4-8.3 are present
4-8.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Refer to Table 12.1.2.7-1, for Spacecraft ID)
4-8.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-8.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-8.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-8.2.5	PDR/EDR Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-8.2.6	PDR/EDR Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-8.2.7	PDR/EDR Host Domain Name (for Data Server	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-8.2.8	PDR/EDR Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-8.2.9	PDR/EDR Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash ("/"). (Example: /name/ftp/pedr)
4-8.3	PDR/EDR Fill/Spare 2, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-9	PDS Physical Media Unit Delivery Record (PPMUDR) (Via FTP) (Define where to deliver the PPMUDRs for a SCID)		
4-9.1	PPMUDR Fill/Spare, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-9.2	PPMUDR Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-9.2.1 through 4-9.3 will not be present. The Value will always be 0 for ECS. 1 = A change is requested and items 4-9.2.1 through 4-9.3 are present
4-9.2.1	SCID	Unsigned Integer 1 Byte	Value -> SCID (Return Link SCID, Refer to Table 12.1.2.7-1)
4-9.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-9.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-9.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-9.2.5	PPMUDR Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-9.2.6	PPMUDR Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-9.2.7	PPMUDR Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)
4-9.2.8	PPMUDR Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-9.2.9	PPMUDR Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash ("/"). (Example: /name/ftp/pdspmudr)
4-9.3	PPMUDR Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
4-10	Service Request Dispositions (SRD) (Via FTP) (Define where to deliver the Service Request Dispositions)		
4-10.1	SRD Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
4-10.2	SRD Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 4-10.2.1 through 4-10.3 will not be present. 1 = A change is requested and items 4-10.2.1 through 4-10.3 are present
4-10.2.1	SRD Fill/Spare 2, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
4-10.2.2	Reserved	ASCII 15 Bytes	Value -> blank filled
4-10.2.3	Reserved	ASCII 36 Bytes	Value -> blank filled
4-10.2.4	Reserved	ASCII 12 Bytes	Value -> blank filled
4-10.2.5	SRD Operational/Test	Unsigned Integer 1 Byte	Value -> 0 = Change is for Operational data only, 1 = Change is for Test data only, and 2 = Change is for BOTH Operational and Test Data.
4-10.2.6	SRD Internet Protocol (IP) Address (for Data Server)	ASCII 15 Bytes	Value -> Variable value for Internet Protocol (IP) Address. Right justified, blank filled on left, each portion (representing 8 bits of the 32 bit address) of the address is separated by a period. (Examples: 26.10.0.19, 128.66.12.1, 128.2.34.255)
4-10.2.7	SRD Host Domain Name (for Data Server)	ASCII 36 Bytes	Value -> Variable value for the Host Domain name. Right justified, blank filled on left, each portion of the name is separated by a period. (Example: almond.nuts.com)

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
4-10.2.8	SRD Host Name Alias (for Data Server)	ASCII 12 Bytes	Value -> Variable value for the Host name alias. Right justified, blank filled on left. (Example: hickory)
4-10.2.9	SRD Directory Name (for Data Server)	ASCII 256 Bytes	Value -> Variable value for the Directory Name. Right justified, blank filled on left, each portion of the name is separated by a slash ("/"). (Example: /name/ftp/SRD)
4-10.3	SRD Fill/Spare 3, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
5	Rate buffering changes for Path Service or VCDU EDUs		
5-1	RB Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
5-2	RB Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No change and items 5-3 through 5-5 will not be present. 1 = A change is requested and items 5-3 through 5-5 are present
5-3	SCID	Unsigned Integer 1 Byte	Value -> SCID (SCID-8 Bits (Refer to Table 12.1.2.7-1, for Spacecraft ID)).
5-4	RB, Send Rate Buffered EDU files	Unsigned Integer 1 Byte	Value -> 0 through 2. 0=False (No - do not send Rate Buffered EDU files - stop sending the Rate Buffered EDU files). 1=True (Yes - send Rate Buffered EDU files - start sending the Rate Buffered EDU files;
5-5	RB, Fill/Spare 2, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
6	Reserved.		
6-1	Fill/Spare, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
7	PDS Transfer Requests		
7-1	PDS Construction Attributes		
7-1.1	Fill/Spare, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0). Note: Construction Attributes changes occur in accordance with the applicable OA.
7-2	Change in EDOS Service: Start or stop delivery of PDSs for specified non-science and science APIDs.		
7-2.1	PDS Transfer, Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
7-2.2	PDS Transfer, Number of APIDs in list	Unsigned Integer 1 Byte	Value -> 0 through 20. Number of entries in the following list of APIDs that this Service Request applies to. 0 = No PDS Transfer change, and items 7-2.2.1 through 7-2.2.5 will not be present.
7-2.2.1	PDS Transfer, Service start/stop	Unsigned Integer 1 Byte	Value -> 0 through 1. 0=False (No - do not continue the service for this APID). 1=True (Yes - start service for this APID).
7-2.2.2	PDS Transfer, Fill/Spare 2, reserved for future use.	Unsigned Integer 4 Byte	Value -> zero (0).
7-2.2.3	PDS Transfer, APID	Unsigned Integer 3 Bytes	SCID and APID (Return Link SCID-8 Bits (Refer to Table 12.1.2.7-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)) (if multiple APIDs are present in a PDS, only identify the APID for the science data).
7-2.2.4	PDS Transfer, Fill/Spare 3, reserved for future use.	Unsigned Integer 4 Byte	Value -> zero (0).
7-2.2.5	For the next APID, repeat the above items 7-2.2.1 through 7-2.2.4.		
7-3	Request delivery of one or more PDS(s) contained within one or more EDOS Archive removable physical media unit(s) (Tape(s)). EDOS will deliver, via mail, the Archive Tape(s), containing the PDS(s), to the requesting source.		
7-3.1	Archive, Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
7-3.2	Archive, Change Flag	Unsigned Integer 1 Byte	Value -> 0 = No Archive PDS(s) requested and items 7-3.2.1 through 7-3.3 will not be present. 1 = An Archive PDS(s) is requested and items 7-3.2.1 through 7-3.3 are present
7-3.2.1	Archive, Fill/Spare 2, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
7-3.2.2	Archive Search Method	Unsigned Integer 1 Byte	Value -> 0 = PDS ID-based, 1 = Spacecraft time-based.
7-3.2.3	Number of Requested PDSs	Unsigned integer 2 Bytes	Value -> 0 to 64K. Supplied only if the PDS ID-based search method is specified. Value -> SCID and APID (SCID-3 Bytes (Refer to Table 12.1.2.7-1), followed by APID-4 Bytes (Refer to Table 8.1.4.1.1-1)) (Contains SCID and CCSDS Packet APID decimal values. Both values are right justified and, if necessary, zero filled on the left). If multiple APIDs are present in a PDS, only identify the APID for the science data. Identify APID within the PDS(s).

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
7-3.2.4	PDS ID	ASCII 36 Bytes	Identify the first PDS (PDS Identification) that is being retrieved from the EDOS Archive (Reference Table 12.1.2.10-1).
7-3.2.5	For the next PDS, repeat the above item 7-3.2.4.		
7-3.2.6	Archive, Fill/Spare 3, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
7-3.2.7	Start Spacecraft date and time of requested data	ASCII 11 Bytes	Value -> Refer to paragraph 12.1.2.8-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU of the Spacecraft time).
7-3.2.8	Archive, Fill/Spare 4, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
7-3.2.9	End Spacecraft date and time of requested data	ASCII 11 Bytes	Value -> Refer to paragraph 12.1.2.8-1 for a definition of the GMT/ZULU time in ASCII format (GMT/ZULU of the Spacecraft time). Note: The time span could include multiple PDSs. If multiple PDSs are involved, these PDSs could reside on multiple EDOS Archive removable physical media units (tapes). If the time span only includes the first part of a PDS, then that entire PDS shall be included on the tape.
7-3.3	Archive, Fill/Spare 5, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
8	EDU Transfer Requests Change in EDOS Service: Start or stop delivery of EDUs for specified non-science and science Path Service APIDs and VCDU VCIDs.		
8-2.1	EDU Transfer, Fill/Spare 1, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
8-2.2	EDU Transfer, Number of APIDs/VCIDs in list	Unsigned Integer 1 Byte	Value -> 0 through 20. Number of entries in the following list of APIDs that this Service Request applies to. 0 = No EDU Transfer change, and items 8-2.2.1 through 8-2.2.5 will not be present.
8-2.2.1	EDU Transfer, Service start/stop	Unsigned Integer 1 Byte	Value -> 0 through 1. 0=False (No - do not continue the service for this APID/VCID). 1=True (Yes - start service for this APID/VCID).
8-2.2.2	EDU Transfer, Fill/Spare 2, reserved for future use.	Unsigned Integer 3 Bytes	Value -> zero (0).
8-2.2.3	EDU Transfer, APID/VCID	Unsigned Integer 3 Bytes	SCID and APID (SCID-8 Bits (Refer to Table 12.1.2.7-1), Fill Bits-5 Bits, and followed by APID-11 Bits (Refer to Table 8.1.4.1.1-1)) or VCDU ID (SCID followed by VCID) (if multiple APIDs are present in an EDU, only identify the APID for the science data).

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
8-2.2.4	EDU Transfer, Fill/Spare 3, reserved for future use.	Unsigned Integer 1 Byte	Value -> zero (0).
8-2.2.5	For the next APID, repeat the above items 8-2.2.1 through 8-2.2.4.		
9	Time of Service Request Execution		
9-1	Execution, Fill/Spare 1, reserved for future use.	Unsigned Integer 2 Bytes	Value -> zero (0).
9-2	Execution, GMT	Formatted Unsigned Integer 6 Bytes	Range -> Refer to Table 12.1.2.9-1 for the Greenwich Mean Time (GMT) in Binary Format. GMT time when this SR will take effect.
9-3	Execution, Fill/Spare 2, reserved for future use.	Unsigned Integer 8 Bytes	Value -> zero (0).
10	Reporting requirements changes		
10-1	CODA Report content indicators (CRCI)		
10-1.1	CRCI, EDOS Return Link Physical Channel Status Block Content Indicator	Unsigned Integer 1 Byte	Values -> 0=false (Do not include this block of information in the CODA Report); 1=true (Include this block of information in the CODA Report); 2=No Change - Not applicable for this Service Request.
10-1.2	CRCI, EDOS Forward Link Status Block Content Indicator	Unsigned Integer 1 Byte	Values -> 0=false (Do not include this block of information in the CODA Report); 1=true (Include this block of information in the CODA Report); 2=No Change - Not applicable for this Service Request.
10-1.3	CRCI, EDOS CCSDS VCDU Service Processing Status Block Content Indicator	Unsigned Integer 1 Byte	Values -> 0=false (Do not include this block of information in the CODA Report); 1=true (Include this block of information in the CODA Report); 2=No Change - Not applicable for this Service Request.
10-1.4	CRCI, EDOS CCSDS Path Service Processing Status Block Content Indicator	Unsigned Integer 1 Byte	Values -> 0=false (Do not include this block of information in the CODA Report); 1=true (Include this block of information in the CODA Report); 2=No Change - Not applicable for this Service Request.
10-1.5	CRCI, Ground Communication Service Status Block Content Indicator	Unsigned Integer 1 Byte	Values -> 0=false (Do not include this block of information in the CODA Report); 1=true (Include this block of information in the CODA Report); 2=No Change - Not applicable for this Service Request.

Table 12.1.3.4-1. Service Request (Continued)

Item No.	Name	Format & Size	Data Characteristics
10-2	CRCI, Fill/Spare 1, reserved for future use.	Unsigned Integer 4 Bytes	Value -> zero (0).
10-3	Reserved		
10-4	Send SCS Indicator		
10-4.1	Send SCS Summary Report	Unsigned Integer 1 Byte	Value -> 0 through 2. 0=false (no - do not send report - stop sending the SCS Summary Report). 1=true (yes - send report - start sending the SCS Summary Report; 2=No Change - Not applicable for this Service Request.
10-4.2	Send SCS, Fill/Spare, reserved for future use.	Unsigned Integer 7 Bytes	Value -> zero (0).
11	SR Initiating Operator Comments		
11-1	Operator Comment	ASCII 256 Bytes	Value -> variable, as input by operator, blank filled on right. (Example: Telephone number change)

12.1.3.5 Service Request Disposition

EDOS generates, and transfers, a Service Request Disposition to an ECS element in response to receipt of a Service Request.

The Service Request Disposition message is shown in Table 12.1.3.5-1.

Table 12.1.3.5-1. Service Request Disposition

Item No.	Name	Format & Size	Data Characteristics
1	EDOS Ground Message Header	Integer Formatted 24 Bytes	Value -> Refer to Table 12.1.2.1-1 for a definition of the EDOS Ground Message Header in Binary format.
2	Service Request Identification/Description	Unsigned Integer 2 Bytes	Range -> 0-65,535; one-up counter that wraps around, on reaching the largest value, to smallest value; This number is one-up, and is assigned by the originator. (Message Sequence Number from the Ground Message Header in the Service Request)
3	Fill/Spare, reserved for future use.	Unsigned Integer 5 Bytes	Value -> zero (0).

4	Request Disposition	Unsigned Integer 12 Bytes	Value -> Range = 0 to 12 0 = EDOS approved the Service Request. All other values (First Service Request Item Number that is in error) indicate disapproval. When the Service Request is disapproved, due to an error in one or more items, all changes in the entire Service Request were NOT implemented. Values are: 1 = Return Link CCSDS Service Change 2 = Ground Communications Changes 3 = Rate Buffering Changes 4 = PDS Transfer request 5 = EDU Transfer Requests 6 = Time of Service Request Execution 7= CODA Reporting Requirements changes 8= SCS Reporting Requirements change 9 = SR Initiating operator comments 10-12 = Reserved Values are right justified and blank filled on the left.
5	Comments on disposition	ASCII 256 Bytes	All Blanks; or any ASCII text supporting the Service Request Status (Blank filled at the end (on the right)

12.1.3.6 Summary Performance Report

EDOS generates a Summary Performance Report (Tables 12.1.3.6-1 and 12.1.3.6-2) for EDOS events and activities that occurred within the reporting period. EDOS attaches the EDOS Ground Message Header (in PVL format) to the Summary Performance Report and transmits the report to the SMC.

Table 12.1.3.6-1. Summary Performance Report

Item No.	Field	Format & Size	Value
1	EDOS Ground Message Header	ASCII Variable Size	Reference Table 12.1.2.2-1 in PVL format.
2	Summary Performance Report	ASCII Variable Size	Reference Table 12.1.3.6-2 for content of the Summary Performance Report.

Table 12.1.3.6-2. Summary Performance Report Format in PVL

Item No.	Field	Format & Maximum Size	Data Characteristics
2-1	REPORT_COVERAGE_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
2-2	REPORT_COVERAGE_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals
3	OBJECT	ASCII 26 Bytes	'INDIVIDUAL_MISSION_SUMMARY'
3-1	MISSION_IDENTIFICATION	ASCII 6 Bytes	Value -> Spacecraft name representing the mission identification. Example: AM-1
3-2	MISSION_TOTAL_NUMBER_CONTACT_SESSIONS	ASCII 4 Bytes	Value -> "0000" through "9999" Total number contact sessions during this reporting period.
3-2.1	MISSION_TOTAL_NUMBER_SCS_CONTACTS	ASCII 4 Bytes	Value -> "0000" through "9999", number SCS contact sessions during this reporting period.
3-2.2	MISSION_TOTAL_NUMBER_CONTINGENCY_CONTACTS	ASCII 4 Bytes	Value -> "0000" through "9999", number contingency contact sessions during this reporting period.
3-3	OBJECT	ASCII 26 Bytes	'INDIVIDUAL_SESSION_SUMMARY'
3-3.1	CONTACT_IDENTIFICATION	ASCII 20 Bytes	Value -> SCS Identification (reference Table 10.1.2.3-1) Example: T042WSG9536523595900

Table 12.1.3.6-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.2	GROUND_LOCATION_IDENTIFICATION	ASCII 3 Bytes	Value -> Ground Location Identification (Reference Table 10.1.2.4-1 for the Ground Location receiving the Spacecraft return link data).
3-3.3	ACTUAL_CONTACT_START_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References earliest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.4	ACTUAL_CONTACT_STOP_TIME	ASCII 20 Bytes	yyyy-mm-ddThh:mm:ssZ where T and Z are literals. References latest time of frame synch lock for this SCS on any Ground Terminal Port.
3-3.5	PERCENT_TIME_IN_FRAME_LOCK	ASCII 4 Bytes	Value -> 000% to 100%
3-3.6	TOTAL_NUMBER_FRAME_SYNCH_LOCK_DROPS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of times that frame synchronization was lost during this contact session
3-3.7	TOTAL_NUMBER_CADUS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of CADUS received by EDOS during this contact session
3.3.8	TOTAL_NUMBER_CDBS_RECEIVED	ASCII 6 Bytes	Value -> 0 to 999999. Count of Command Data Blocks received by EDOS during this contact session.
3-3.9	TOTAL_NUMBER_FORWARD_LINK_OCTETS_RECEIVED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of 8 bit bytes received by EDOS on forward link channels this contact session
3-3.10	TOTAL_NUMBER_FORWARD_LINK_OCTETS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 to 999999999; Count of 8 bit bytes transmitted by EDOS on forward link channels this contact session
3-3.11	TOTAL_NUMBER_CORRECTED_VCDUS_WITH_RS_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs with Reed-Solomon errors corrected by EDOS this contact session
3-3.12	REED_SOLOMON_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 000% to 100% Estimated bit error rate based on Reed-Solomon symbol errors during this contact session (Number R-S symbols corrected times the number of bits per symbol) plus (the number of uncorrectable VCDUs times the number of bits per VCDU)) divided by (the number of VCDUs received times the number of bits per VCDU).

Table 12.1.3.6-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.13	TOTAL_NUMBER_VCDUS_WITH_CYCLIC_REDUNDANCY_CHECK_ERRORS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of VCDUs received by EDOS with Cyclic Redundancy Check errors during this contact session.
3-3.14	CYCLIC_REDUNDANCY_CHECK_CUMULATIVE_DATA_QUALITY	ASCII 4 Bytes	Value -> 0% to 100%. Estimated bit error rate based on Cyclic Redundancy Check (CRC) symbol errors during the contact session (Number of uncorrectable VCDUs divided by the number of VCDUs received). Not applicable for AM-1 as AM-1 is a Grade 2 service using Reed-Solomon.
3-3.15	TOTAL_NUMBER_VCDU-IDS_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999” Total number VCDU IDs found during this contact session
3-3.16	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this contact session
3-3.17	OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’
3-3.17.1	IDENTIFICATION	ASCII 4 Bytes	Value -> “0000” to “9999”. Virtual Channel Data Unit -ID (VCDU-ID)
3-3.17.2	TOTAL_NUMBER_VCDUS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of VCDUs demultiplexed by EDOS for this VCDU-ID for this contact session
3-3.17.3	END_OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_VCDU_SUMMARY’
3-3.18	SESSION_TOTAL_NUMBER_PACKETS_DEMULTIPLEXED	ASCII 12 Bytes	Value -> 0 to 999999999. Count of packets demultiplexed by EDOS this contact session
3-3.19	SESSION_TOTAL_NUMBER_APID(S)_FOUND	ASCII 4 Bytes	Value -> “0000” through “9999” Total number APIDs found during this contact session
3-3.20	OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_APID_SUMMARY’
3-3.20.1	APID_IDENTIFICATION	ASCII 7 Bytes	Value -> “0000000” to “9999999”. Identify SCID and APID The first three (3) bytes = SCID (Refer to Table 10.1.2.5-1) and the Last four (4) bytes = APID (Refer to Table 8.1.4.1.1-1)
3-3.20.2	APID_TOTAL_NUMBER_PACKETS	ASCII 12 Bytes	Value -> 0 to 999999999. Total number of CCSDS Packets for this APID.
3-3.20.3	END_OBJECT	ASCII 24 Bytes	‘INDIVIDUAL_APID_SUMMARY’

Table 12.1.3.6-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
3-3.21	TOTAL_NUMBER_TRANSFERRED_RETURN_LINK_EDUS	ASCII 8 Bytes	Value -> 0 to 99999999. Count of return link EDUs transferred by EDOS this contact session
3-3.22	END_OBJECT	ASCII 26 Bytes	'INDIVIDUAL_SESSION_SUMMARY'
3-4	TOTAL_NUMBER_OF_PACKETS_RECEIVED_FOR_INCLUSION_IN_PDS+EDS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets received to be included in PDSs and EDSs for this mission.
3-5	TOTAL_NUMBER_OF_PDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of PDSs generated for this mission.
3-6	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_PDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDS production for this mission.
3-7	TOTAL_NUMBER_OF_EDSS_GENERATED	ASCII 12 Bytes	Value -> 0 through 999999999. Running count of EDSs generated for this mission.
3-8	TOTAL_NUMBER_OF_PACKETS_INCLUDED_IN_EDSS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDS production for this mission.
3-9	TOTAL_NUMBER_OF_PACKETS_IN_PDSS_TRANSFERRED_TO_EGS_ELEMENTS	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in PDSs transferred to EGS elements for this mission.
3-10	TOTAL_NUMBER_OF_PACKETS_WITHIN_EDSS_TRANSMITTED	ASCII 12 Bytes	Value -> 0 through 999999999999. Running count of packets included in EDSs transferred for this mission.
3-11	TOTAL_NUMBER_OF_RETURN_LINK _CCSDS_SERVICE_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of Return Link CCSDS Service changes since last report covering similar time span.
3-12	TOTAL_NUMBER_OF_GROUND_COMMUNICATIONS_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of Ground Communication changes since last report covering similar time span.
3-13	TOTAL_NUMBER_OF_RATE_BUFFERING_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of Rate Buffering changes since last report covering similar time span.
3-14	TOTAL_NUMBER_OF_PDS_TRANSFER_REQUESTS	ASCII 12 BYTES	Value -> 0 through 999999999. Number of PDS Transfer Requests since last report covering similar time span.
3-15	TOTAL_NUMBER_OF_EDU_TRANSFER_REQUESTS	ASCII 12 BYTES	Value -> 0 through 999999999. Number of EDU transfer requests since last report covering similar time span.
3-16	TOTAL_NUMBER_OF_REPORTING_REQUIREMENTS_CHANGES	ASCII 12 BYTES	Value -> 0 through 999999999. Number of Reporting Requirements changes since last report covering similar time span.
3-17	END_OBJECT	ASCII 26 Bytes	'INDIVIDUAL_MISSION_SUMMARY'

Table 12.1.3.6-2. Summary Performance Report Format in PVL (Continued)

Item No.	Field	Format & Maximum Size	Data Characteristics
4	EDOS_OPERATOR_REMARKS	ASCII 1024 Bytes	Operator remarks regarding the Summary Performance Report reporting period. Reason(s) for exceeding the required time to deliver) Real-time CCSDS Packets to any destination; 2) Rate Buffered Data to any destination; 3) PDS or EDS to any destination; 4) ASTER production physical media; 5) generation of EDOS archive physical media unit; and 6) any processing problems encountered during this reporting period.

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