

**ARCHIVE VOLUME**  
**SOFTWARE INTERFACE SPECIFICATION**  
**TEMPLATE**

Version 1.0

(Date)

(Author's Name)

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## DOCUMENT CHANGE LOG

Change	Date	Affected Portions

## TBD ITEMS

Section	Description

## ACRONYMS AND ABBREVIATIONS

ASCII	American Standard Code for Information Interchange
CD-ROM	Compact Disk - Read-Only Memory
CD-WO	Write-Once Compact Disk
ISO	International Standards Organization
JPL	Jet Propulsion Laboratory
NSSDC	National Space Science Data Center
PDS	Planetary Data System
PSG	Project Science Group
SDVT	Science Data Validation Team
SIS	Software Interface Specification
TBD	To Be Determined

## GLOSSARY

**Archive** – An archive consists of one or more data sets along with all the documentation and ancillary information needed to understand and use the data. An archive is a logical construct independent of the medium on which it is stored.

**Archive Volume, Archive Volume Set** – A volume is a unit of media on which data products are stored; for example, one CD-ROM or DVD-ROM. An *archive volume* is a volume containing all or part of an archive; that is, data products plus documentation and ancillary files. When an archive spans multiple volumes, they are called an *archive volume set*. Usually the documentation and some ancillary files are repeated on each volume of the set, so that a single volume can be used alone.

**Catalog Information** – Descriptive information about a data set (e.g. mission description, spacecraft description, instrument description), expressed in Object Description Language (ODL) which is suitable for loading into a PDS catalog.

**Data Product** – A labeled grouping of data resulting from a scientific observation, usually stored in one file. A product label identifies, describes, and defines the structure of the data. An example of a data product is a planetary image, a spectrum table, or a time series table.

**Data Set** – An accumulation of data products. A data set together with supporting documentation and ancillary files is an archive.

**Standard Data Product** – A data product generated in a predefined way using well-understood procedures, processed in "pipeline" fashion. Data products that are generated in a nonstandard way are sometimes called *special data products*.

# 1. Introduction

## 1.1. Purpose and Scope

This Software Interface Specification is intended to be used by those who wish to understand the format and content of the [named] Archive. Typically, these individuals would be software engineers, data analysts, or planetary scientists.

The specifications in this document apply to all [named] standard product archive volumes that are generated by the [named] Project.

## 1.2. Content Overview

[Briefly describe the data products in the archive and what instrument and mission they come from. If there are many different products, list them in a table. Say who is responsible for generating the products and assembling the archive.]

This Software Interface Specification (SIS) describes the format, content, and generation of the [named] Archive. Section 2, Archive Volume Generation, describes the procedure for transferring data products to archive media. Section 3, Archive Volume Contents, describes the structure of the archive volumes and the contents of each file. Section 4, Archive Volume Format, describes the file formats used on the archive volumes. Finally, Section 5, Support Staff and Cognizant Persons, lists the individuals responsible for generating the archive volumes.

## 1.3. Applicable Documents and Constraints

This Archive Volume SIS is intended to be consistent with the following documents:

1. Mars Exploration Program Data Management Plan, R. E. Arvidson et al., Rev. 3.0, March 20, 2002. [only for data from Mars Program missions]
2. [Project Archive Plan].
3. [Data Product SIS].
4. *Planetary Data System Archive Preparation Guide*, August 29, 2006, Version 1.1, JPL D-31224.
5. *Planetary Data System Standards Reference*, March 20, 2006, Version 3.7. JPL D-7669, Part 2.
6. ISO 9660-1988, Information Processing - Volume and File Structure of CD-ROM for Information Exchange, April 15, 1988.

## 1.4. Relationships with Other Interfaces

[Say what products, software, and documents, if any, would be affected by a change in this SIS.]

This Archive Volume SIS could be affected by changes to the design of the [named] standard data products (Applicable Document #3).

## 2. Archive Volume Contents

This section describes the contents of the [named] Archive volumes, including the file names, file contents, file types, and organization responsible for providing the files.

### 2.1. Root Directory Contents

Files in the Root Directory include an overview of the archive, a description of the volume for the PDS Catalog, and a list of errata or comments about the archive. The following files are contained in the Root Directory.

File Name	File Contents	File Provided By
AAREADME.TXT	Volume content and format information	(e.g., PDS Node or Instrument Team)
AAREADME.HTM	Hypertext version of AAREADME.TXT (optional)	
AAREADME.LBL	A PDS detached label that describes both AAREADME.TXT and AAREADME.HTM (optional, could be attached to AAREADME.TXT).	
ERRATA.TXT	A cumulative listing of comments and updates concerning all archive volumes published to date	
VOLDESC.CAT	A description of the contents of this volume in a PDS format readable by both humans and computers	

### 2.2. Data Directory Contents and Naming

[Describe contents of data directories. For example: Under the Data directory there is a separate subdirectory for each type of product. Each data directory is further divided into subdirectories by groups of 100 orbits. The directory naming scheme is ... Data files are named according to the form ....]

### 2.3. Index Directory Contents

Files in the Index Directory are provided to help the user locate products on this archive volume and on previously released volumes in the archive. The following files are contained in the Index Directory. [If there is more than one data set on a volume, each one should have a separate index table; see Standards Reference for how to name them. If there is only one archive volume, then the CUMINDEX files should be omitted.]

File Name	File Contents	File Provided By
INDXINFO.TXT	A description of the contents of this directory	
INDEX.TAB	A table listing all data products on this volume	
INDEX.LBL	A PDS detached label that describes INDEX.TAB	
CUMINDEX.TAB	A cumulative listing of all data products on this volume and on previous volumes in this set (only for data sets with multiple volumes)	
CUMINDEX.LBL	A PDS detached label that describes CUMINDEX.TAB	

## 2.4. Document Directory Contents

The Document Directory contains documentation to help the user understand and use the archive data. The following files are contained in the Document Directory. [The Data Product SIS and Archive Volume SIS shown below are customary but are not a PDS requirement.]

File Name	File Contents	File Provided By
DOCINFO.TXT	A description of the contents of this directory	
DPSIS.TXT or .HTM	The Data Product SIS as text or hypertext	
DPSIS.PDF	The Data Product SIS as a PDF file	
DPSIS.LBL	A PDS detached label that describes both DPSIS.TXT(HTM) and DPSIS.PDF	
ARCHSIS.TXT or .HTM	The Archive Volume SIS (this document) as text or hypertext	
ARCHSIS.PDF	The Archive Volume SIS (this document) as a PDF file	
ARCHSIS.LBL	A PDS detached label that describes both ARCHSIS.TXT(HTM) and ARCHSIS.PDF.	

[other files]

## 2.5. Catalog Directory Contents

The files in the Catalog Directory provide a top-level understanding of the mission, spacecraft, instruments, and data sets. The files in this directory are coordinated with the PDS data engineer, who is responsible for loading them into the PDS catalog. The following files are found in the Catalog Directory. [If more than one data set or instrument is represented, they should have separate catalog files. See the Standards Reference for how to name them.]

File Name	File Contents	File Provided By
CATINFO.TXT	A description of the contents of this directory	
DS.CAT	Data set information for the PDS catalog	
INSTHOST.CAT	Instrument host (i.e., spacecraft) information for the PDS catalog	
INST.CAT	Instrument information for the PDS catalog	
MISSION.CAT	Mission information for the PDS catalog	
PERSON.CAT	Personnel information for the PDS catalog (Team and PDS personnel responsible for generating the archive)	
REF.CAT	References mentioned in other *.CAT files	

## 2.6. Label Directory Contents (optional)

The Label Directory contains files that describe data format and organization. These files are referred to in the PDS labels that accompany the data products. They are "include" files that are intended to be parsed as if they were part of the PDS labels that refer to them. The following files are contained in the Label Directory.

File Name	File Contents	File Provided By
LABINFO.TXT	A description of the contents of this directory	
	[*.FMT files]	

## 2.7. Software Directory Contents (optional)

The Software Directory contains utilities or application programs to aid the user in viewing or extracting data from the data product files. The following files are contained in the Software Directory.

File Name	File Contents	File Provided By
SOFTINFO.TXT	A description of the contents of this directory	
	[other files]	
	[Add more information about software, such as what the software does, who maintains it, how updates can be obtained.]	

## 2.8. Calib Directory Contents (optional)

The Calib Directory contains calibration files used to process the data products, or calibration data needed to use the data products. The following files are contained in the Calib Directory.

File Name	File Contents	File Provided By
CALINFO.TXT	A description of the contents of this directory	
	[other files]	

## 2.9. Geometry Directory Contents (optional)

The Geometry Directory contains files needed to understand observation geometry. The following files are contained in the Geometry Directory.

File Name	File Contents	File Provided By
GEOMINFO.TXT	A description of the contents of this directory	
	[other files]	

## 2.10. Browse Directory Contents (optional)

The Browse Directory contains reduced-size, easily viewed versions of data products to be used to help identify products of interest. The following files are contained in the Browse Directory.

File Name	File Contents	File Provided By
BROWINFO.TXT	A description of the contents of this directory	
	[other files]	

## 2.11. Extras Directory Contents (optional)

The Extras Directory contains documentation, utility programs, or other materials that the user may find helpful, but that are beyond the scope of the required elements of the archive. The contents of this directory are exempt from PDS requirements for labeling, etc. The Extras Directory is intended for "value-added" material, handy to have but not crucial for understanding the data. (If it's crucial, it is in one of the standard directories.) The following files are contained in the Extras Directory.

File Name	File Contents	File Provided By
EXTRINFO.TXT	A description of the contents of this directory	

[other files]

[An example would be a set of web pages for displaying the browse data. Since the directory is nonstandard, a thorough explanation of its purpose on the archive volume should be included here.]

## 3. Archive Volume Format

This section describes the format of [named] Archive Volumes. Data that comprise the Archive will be formatted in accordance with Planetary Data System specifications [Applicable Documents 4 and 5].

### 3.1. Disk Format

When stored on compact disk, Archive Volumes have a format that is compatible with the computer operating systems MS-DOS, Macintosh, and SunOS. The volume format is in accordance with ISO 9660 level 2 Interchange Standard [Applicable Document 6].

### 3.2. File Formats

This section describes file formats for the kinds of files contained on Archive Volumes.

#### 3.2.1. Document File Format

Document files with the .TXT suffix exist in the Root, Index, Software, Catalog, [Document?], and Label directories. They are ASCII files which may have embedded PDS labels. Lines in a .TXT file end with a carriage return character (ASCII 13) and a line feed character (ASCII 10). This allows the files to be readable under various operating systems.

[This is for HTML and PDF documents, if any:] Documents in the Document directory may contain formatting and figures that cannot be rendered as ASCII text. Therefore each document is given in two formats, hypertext and PDF. The hypertext file contains ASCII text plus hypertext markup language (HTML) commands that enable it to be viewed in a Web browser such as Netscape Navigator or Microsoft Internet Explorer. The hypertext file may be accompanied by ancillary files such as images and style sheets that are incorporated into the document by the Web browser. The second format, PDF (Portable Document Format) is a proprietary format of Adobe Systems Incorporated that is frequently used for distributing documents. Adobe offers free software, Acrobat Reader, for viewing PDF files.

### 3.2.2. Tabular File Format

Tabular files (.TAB suffix) exist in the Index directory. Tabular files are ASCII files formatted for direct reading into many database management systems on various computers. All fields are separated by commas, and character fields are enclosed in double quotation marks ("). (Character fields are padded with spaces to keep quotation marks in the same columns of successive records.) Character fields are left justified, and numeric fields are right justified. The "start byte" and "bytes" values listed in the labels do not include the commas between fields or the quotation marks surrounding character fields. The records are of fixed length, and the last two bytes of each record contain the ASCII carriage return and line feed characters. This allows a table to be treated as a fixed length record file on computers that support this file type and as a text file with embedded line delimiters on those that don't.

All tabular files are described by PDS labels, either embedded at the beginning of the file or detached. If detached, the PDS label file has the same name as the data file it describes, with the extension .LBL; for example, the file INDEX.TAB is accompanied by the detached label file INDEX.LBL in the same directory.

### 3.2.3. PDS Label Format

All data files in the archive have PDS labels, either embedded at the beginning of the file or detached in a separate file. For examples of PDS labels for each type of data product, see the Data Product SIS [Applicable Document 3].

A PDS label, whether embedded or detached from its associated file, consists of lines of ASCII text in the form of keyword = value statements that provide descriptive information about the data file. The label is intended to be readable both by humans and by software. Details of the syntax and semantics of PDS labels can be found in the PDS Standards Reference (Applicable Document 5), and definitions of the keywords used in the label can be found by using the PDS Data Dictionary Lookup web service at [http://pds.jpl.nasa.gov/tools/data\\_dictionary\\_lookup.cfm](http://pds.jpl.nasa.gov/tools/data_dictionary_lookup.cfm).

Lines of text in detached labels end with a carriage return character (ASCII 13) and a line feed character (ASCII 10). This allows the files to be read under various operating systems.

### 3.2.4. Software File Format [if any]

[Describe file formats; e.g. machines for which compiled executables are provided, languages used for source code or scripts.]

### 3.2.5. Catalog File Format

Catalog files (suffix .CAT) exist in the Root and Catalog directories. Like PDS labels, they are text files formatted as keyword = value statements. They contain descriptions of the data set, instrument, spacecraft, and mission, as well as personnel contact information and references to published literature. They are called Catalog Files because they are loaded into the PDS online catalog to make the information available to users searching for data.

### 3.2.6. Science Data File Formats

[Describe data file format(s). For example, type of data (image, spectra, table); ASCII or binary; integer or floating point; number of bytes; amount of data in one file (one orbit, one day, 12 measurements, etc.).]

For more information about the format and content of the data products, see the Data Product SIS [Applicable Document 3].

## 4. Archive Volume Generation

### 4.1. Data Transfer and Validation Methods

[Describe details of how, where and by whom the archive is generated and validated. Discuss how data products are delivered to PDS. If this has already been discussed in an ICD, refer to that document and add it to the list of Applicable Documents in section 1.3. ]

### 4.2. Data Product Sizes and Delivery Rates

Table 1 summarizes expected sizes and production rates for the [named] Standard Products.

*Table 1 – Standard Product Sizes and Delivery Rates*

Product	Product Size	Production Rate (e.g., number of products per day)	Expected Number of Products for Primary Mission (xxx days)	Expected Total Data Volume for Primary Mission

[The above table is just an example; revise as needed. Discuss schedule for release of data products as described in the Project Archive Plan; consider including a table showing dates of data acquisition and delivery. ]

### 4.3. Interface Media Characteristics

All volumes in the [named] Standard Product Archive conform to ISO 9660 standards [ISO 9660, 1988].

### 4.4. Backup and Duplicates

[Discuss plans for backup copies of data products.]

### 4.5. Labeling and Identification

[Discuss labeling scheme for archive volumes. For example:

Volume ID	Mission Phase
USA_NASA_JPL_mmmi_0nnn	Pre-mapping
USA_NASA_JPL_mmmi_1nnn	Primary mission mapping phase
USA_NASA_JPL_mmmi_2nnn	Extended mission

where *mmm* is a Mission ID, *i* is an Instrument ID, and *nnn* is a sequence number.]

## **5. Support Staff and Cognizant Persons**

[List names and affiliations -- these are probably the same people who should be listed in the Personnel catalog file.]