

MARS EXPLORATION ROVER PROJECT

**SCIENCE
REDUCED DATA RECORD (RDR)
ARCHIVE VOLUME
SOFTWARE INTERFACE SPECIFICATION (SIS)**

Version 1.0

July 31, 2004

Mars Exploration Rover (MER)

Software Interface Specification

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DOCUMENT CHANGE LOG

Change	Date	Affected Portions
Initial version	7/31/04	All

TBD ITEMS

Section	Description
See other TBD Items in the Appendices.	

ACRONYMS AND ABBREVIATIONS

ASCII	American Standard Code for Information Interchange
CODMAC	Committee On Data Management And Computation
CORNELL	Cornell University
DVD	Digital Video Disc
EDR	Experiment Data Record
GIF	Graphics Interchange Format
HTML	Hypertext Markup Language
ILUT	Inverse Look-Up Table
IMG	Image
ISO	International Standards Organization
JPEG	Joint Photographic Experts Group
JPL	Jet Propulsion Laboratory
MER	Mars Exploration Rover
MI	Microscopic Imager
MIPL	Multimission Image Processing Laboratory
NASA	National Aeronautics and Space Administration
PANCAM	Panoramic Camera
NSSDC	National Space Science Data Center
PDF	Adobe® Portable Document Format
PDS	Planetary Data System
RDR	Reduced Data Record
SCI or SC	Science
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. 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 (for example, on a set of CD-ROMs), 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, Special 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 Mars Exploration Rover (MER) Science Reduced Data Record (RDR) Archives. Typically, these individuals would be software engineers, data analysts, or planetary scientists.

The specifications in this document apply to all MER Science RDR standard product archive volumes that are generated by the MER Project. Science RDRs differ from Operations RDRs in that they are generated by the instrument Science Teams rather than by MIPL. Science RDRs are generated for Pancam and the Microscopic Imager. Mini-TES and Mössbauer RDRs are also included in this document because they were generated by their respective Science Teams, but there are no corresponding Operations RDRs for Mini-TES or Mössbauer.

MER Science RDR Archives are intended to be stored online for electronic distribution. The online version will conform to the structure described in this document. In addition, copies of the archives will be stored on physical media such as CDs or DVDs for long-term preservation. The requirements for these physical copies are described in section 5.

1.2. Content Overview

The MER Science RDR Archive consists of MER derived data products along with documentation and other ancillary material. MER Science Reduced Data Records (RDRs) are produced by the Science Teams and assembled into archives with assistance from the Geosciences Node.

This Software Interface Specification (SIS) describes the format, content, and generation of the Mars Exploration Rover (MER) Science RDR Archives. Section 2, Archive Volume Contents, describes the general structure of the archive and the contents of each directory. Section 3, Archive Volume Format, describes file formats used in the archive. Section 4, Archive Volume Generation, describes procedures for assembling the archive. Section 6, Support Staff and Cognizant Persons, lists the individuals responsible for generating the archive volumes. Finally, an Appendix is included for the Science RDR data sets which describes the specific identifiers, specifications, and structure of the archive volumes produced for those data sets.

1.3. Applicable Documents and Constraints

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

1. Mars Exploration Program Data Management Plan, R. E. Arvidson and S. Slavney, Rev. 2, Nov. 2, 2000.
2. Mars Exploration Rover Project Archive Generation, Validation and Transfer Plan, Rev. A, R. E. Arvidson and S. Slavney, JPL D-19658, September 29, 2003.

3. *Planetary Data System Data Preparation Workbook*, February 17, 1995, Version 3.1, JPL D-7669, Part 1.
4. *Planetary Data System Standards Reference*, October 15, 2002, Version 3.5, JPL D-7669, Part 2.
5. ISO 9660-1988, Information Processing - Volume and File Structure of CD-ROM for Information Exchange, April 15, 1988.
6. Universal Disk Format™ Specification, Revision 1.02, August 30, 1996, Optical Storage Technology Association (OSTA).

1.4. Relationships with Other Interfaces

This Archive Volume SIS could be affected by changes to the design of any of the MER science RDR standard data products.

2. Archive Volume Contents

This section describes in general the contents of the MER Science RDR Archive, including the directory names and contents, file types, and the organization responsible for providing the files. Data set-specific MER archive contents can be found in the Appendices.

The MER Science RDR Archive is organized with each data set on a separate volume. Each volume includes the required directories listed below, and may include some or all of the optional directories.

2.1. Root Directory Contents (required)

Files in the Root Directory (the top-level directory) include an overview of the data set, a description of the volume for the PDS Catalog, and a list of errata or comments about the data set. The Root Directory includes the files and directories listed below. The directory contents are discussed in the following sections.

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

DATA	Directory containing data files. There may be more than one data directory.	Data provider
INDEX	Directory containing listings of all data files on the volume and on other volumes in the set	Data provider or PDS Node
DOCUMENT	Directory containing the Data Product SIS, Archive Volume SIS, and other documentation	Data provider or PDS Node
CATALOG	Directory containing text descriptions of the data set, instrument, spacecraft, mission, personnel, and references, which will become part of the PDS Catalog	Data provider or PDS Node
LABEL	Directory containing files referenced by pointer statements in PDS labels (optional)	Data provider
SOFTWARE	Directory containing software for use in viewing the data (optional)	Data provider
CALIB	Directory containing calibration plans, reports, and data (optional)	Data provider
GEOMETRY	Directory containing files needed to understand observation geometry (optional)	Data provider
BROWSE	Directory containing browse versions of data products (optional)	Data provider or PDS Node
EXTRAS	Directory containing useful but not critical ancillary information (optional)	Data provider or PDS Node

2.2. Data Directory Contents (required)

The contents and naming scheme of the data directory for the data sets are described in the Appendix. The naming scheme for data files is described in each data set's Data Product SIS (see the Applicable Documents section in the Appendix).

2.3. Index Directory Contents (required)

Files in the Index Directory are provided to help the user locate products on an archive volume and on other volumes in the archive. The following files are contained in the Index Directory. The format of the INDEX.TAB file is described in section 3.1.2.

File Name	File Contents	File Provided By
INDXINFO.TXT	A description of the contents of this directory	PDS Node
INDEX.TAB	A table listing all data products on this volume	PDS Node or Data Provider
INDEX.LBL	A PDS detached label that describes INDEX.TAB	PDS Node or Data Provider
CUMINDEX.TAB	A cumulative listing of all data products on this volume and on previous volumes in this set. This file and its label are only present on volumes that have been written to physical media.	PDS Node or Data Provider

CUMINDEX.LBL

A PDS detached label that describes CUMINDEX.TAB

PDS Node or Data
Provider

2.4. Document Directory Contents (required)

The Document Directory contains documentation to help the user understand and use the archive. The following files are required in the Document Directory. The data provider may include additional documentation as desired.

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

2.5. Catalog Directory Contents (required)

The files in the Catalog Directory provide a top-level understanding of the mission, spacecraft, instruments, and data sets. They constitute the primary PDS documentation for the archive. The files in this directory are coordinated with the PDS data engineer, who is responsible for loading them into the PDS catalog. The mission and spacecraft (instrument host) files are common to all MER archives and are maintained by the MER Project. Formats for these files are given in Appendix B of the PDS Standards Reference (Applicable Document 4). The following files are found in the Catalog Directory.

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

2.6. Label Directory Contents (optional)

The Label Directory contains files that describe data format and organization. Labels for data products may include pointers to format files in order to avoid repeating lengthy information in every label. If there are format files associated with the data labels, they are stored in the Label directory; otherwise the directory is omitted. The format files are to be treated as "include" files; that is, they are 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	PDS Node
[*].FMT files]		Data Provider

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. See the Appendices for details about software provided with this archive. If the data files are in a format that can be accessed by the user without any special tools, then no software is needed and the directory is omitted. 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	PDS Node
xx.ZIP	Software files and documentation packaged with Zip compression, as specified in the PDS Standards Reference, chapter 20, Zip Compression.	Data Provider

2.8. Calib Directory Contents (optional)

The optional Calib Directory contains calibration plans, reports, and data relevant to the archive. The contents of the Calib Directory are data set dependent, but must include the following file.

File Name	File Contents	File Provided By
CALINFO.TXT	A description of the contents of this directory	PDS Node

2.9. Geometry Directory Contents (optional)

The optional Geometry Directory contains files needed to understand observation geometry, if any. The contents of the Geometry Directory are data set dependent, but must include the following file.

File Name	File Contents	File Provided By
GEOMINFO.TXT	A description of the contents of this directory	PDS Node

2.10. Browse Directory Contents (optional)

The optional Browse Directory contains reduced-size, easily viewed versions of data products to be used to help identify products of interest. The contents of the Browse Directory are data set dependent, but must include the following file.

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

2.11. Extras Directory Contents (optional)

The optional 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; for example, a set of HTML pages for displaying the browse data. See the Appendices for details of the contents of the Extras directories, if any. If present, the Extras Directory must include the following file.

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

3. Archive Volume Format

This section describes the format of the MER Science RDR Archive Volumes. Data that comprise the Archive will be formatted in accordance with Planetary Data System specifications [Applicable Documents 3 and 4].

3.1. File Formats

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

3.1.1. Document File Format

Text files with the .TXT suffix exist in the Root, Index, Software, Catalog, Document, and Label directories. They are ASCII files that may have embedded PDS labels. Lines in a text 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. PDS recommends plain text files have line length restricted to 80 characters or fewer, including the carriage return and line feed.

For the purpose of long-term preservation PDS requires that documents in the Document directory be provided as ASCII text files or as HTML files, so that they can be read without reliance on proprietary software. However, these documents frequently contain formatting and figures that cannot be rendered as ASCII text. In this case the document may be 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.

Documents are described by PDS labels. Only text documents (.TXT) may have attached PDS labels; other types have detached labels.

3.1.2. Tabular File Format

Tabular files (.TAB suffix) exist in the Index directory and possibly in data directories. Tabular files are ASCII files formatted for direct reading into spreadsheets or 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 PDS 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.

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.

3.1.3. PDS Label Format

All data files in the archive have PDS labels, either embedded at the beginning of the file or detached. For examples of PDS labels for each type of data product, see the Data Product SISs listed in the Appendices.

A PDS label provides descriptive information about the associated file. The PDS label is an object-oriented structure consisting of sets of 'keyword=value' declarations. The object to which the label refers (e.g. IMAGE, TABLE, etc.) is denoted by a statement of the form

`^object = location`

in which the carat character (^, also called a pointer in this context) indicates where to find the object. In an attached label, the location is an integer representing the record number in the file where the object begins (the first record in the file is record 1). In a detached label, the location is the name of the data file with an optional record offset.

3.1.4. Software File Format

Software is provided in a Zip-compressed file with a detached PDS label as specified in the PDS Standards Reference, chapter 20, Zip Compression. The Zip file includes all files required to use the software, including user manuals.

3.1.5. Catalog File Format

Catalog files (suffix .CAT) exist in the Root and Catalog directories. They are text files formatted in an object-oriented structure consisting of sets of 'keyword=value' declarations. They follow the formatting rules specified for text files in section 3.1.1, along with additional formatting requirements specified in Appendix B of the PDS Standards Reference (Applicable Document 4).

3.1.6. Science Data File Formats

See the Data Product SIS for each Science RDR product for descriptions of the data file formats.

4. Archive Volume Generation

4.1. Data Transfer, Validation Methods, and Peer Review

Science RDR data provided by the MER Pancam, MI, MB, and Mini-TES science teams will meet the specifications detailed in the Data Product SISs.

The MER Pancam, MI, MB, and Mini-TES science teams, with the assistance of the PDS Geosciences Node, are responsible for the assembly and production not only of PDS formatted data, but of complete PDS-compliant archives.

Before final delivery of the archive, the PDS will conduct both peer review and validation. Peer review may be performed on the volume set as a whole, but validation must be performed on every individual volume. The Central Node may perform additional validation once the volume has been received.

The purpose of the peer review is to confirm that the archive will be useable by members of the science community, both present and future, who are not familiar with the mission and/or instrument. Reviewers include members of the PDS, a distributed representation of the project science teams, and members of the science community not associated with the mission.

The purpose of validation is to verify that each volume adheres to PDS standards and to this Archive Volume SIS.

4.2. MER Release Dates

The completed, validated, and peer-reviewed RDR archives will be released according to the schedule specified in the Archive Plan (Applicable Document 2), reproduced below.

EVENT	DATE
First release of MER-A data	August 3, 2004
First release of MER-B data	August 24, 2004
Second release of MER-A data	October 4, 2004
Second release of MER-B data	October 25, 2004
Third release of MER-A, if extended mission	January 6, 2005
Third release of MER-B, if extended mission	January 27, 2005

5. Physical Media Format

5.1. Disk Format

MER Science RDR Archive Volumes can be stored on digital video disk (DVD) in a format that is compatible with PC, Macintosh, and Unix computer operating systems. The volume format is in accordance with ISO 9660 level 2 Interchange Standard [Applicable Documents 5 and 6].

5.2. Interface Media Characteristics

All volumes in the MER Standard Product Archive conform to ISO 9660 standards [ISO 9660, 1988] and UDF standards [OSTA UDF Specification, Rev. 1.02, 1996].

5.3. Backup and Duplicates

It is the responsibility of the MER Project to ensure that at least three copies of each volume are produced on physical media (CD or DVD) for delivery to the PDS Central Node, the appropriate PDS Discipline Node, and the NSSDC. The delivery of these copies may occur with the last data delivery to ensure that the final versions of products are archived.

Until the physical media copies have been received by PDS, it is the responsibility of the MER Project to ensure that the archive volume contents are stored on electronic media with a reliable backup copy.

5.4. Labeling and Identification

The two MER rovers are identified as shown in the table below.

Rover Name	Rover ID	Mission ID	Launch Date	Arrival Date
Spirit	MER 2	MER A	June 10, 2003	January 4, 2004
Opportunity	MER 1	MER B	July 7, 2003	January 25, 2004

Please refer to the Appendices for the instrument-specific labeling schemes of archive volumes.

6. Support Staff and Cognizant Persons

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Appendix A. PANCAM AND MI ARCHIVE VOLUME CONTENTS

1. Introduction

This appendix to the MER Science RDR Archive Volume SIS describes archive volumes for the Pancam and MI Science RDR data sets. It also identifies responsibilities and a schedule for completion of the archive. This appendix will be updated during the mission as this information changes.

2. Change Log and TBD Items

Change	Date	Section
Initial version	7/31/04	All

3. Applicable Documents

1. Mars Exploration Program Data Management Plan, R. E. Arvidson and S. Slavney, Rev. 2, Nov. 2, 2000.
2. Mars Exploration Rover Project Archive Generation, Validation and Transfer Plan, R. E. Arvidson and S. Slavney, JPL D-19658, January 2, 2001.
3. MER Camera EDR and RDR Operations Data Products SIS, D. Alexander and H. Mortensen, Ver. 3, JPL D-22846, December 4, 2003.

4. Data Sets

The MER Camera Science RDR Archive is composed of the following data sets:

1. MER-1 Pancam Science RDR images
2. MER-1 Microscopic Imager Science RDR images
3. MER-2 Pancam Science RDR images
4. MER-2 Microscopic Imager Science RDR images

All archive volumes have the same organization, as described in the following sections. Archive volumes are intended to be distributed online. For long-term preservation, archive volumes are written to DVD media.

5. Data Set, Volume and File Identifiers

DATA SET	VOLUME ID	VOLUME NAME
MER1-M-PANCAM-3-RADCAL-RDR-V1.0	MER1PC_1XXX	MER 1 PANCAM SCIENCE RDRS
MER1-M-MI-2-RDR-SCI-V1.0	MER1MI_1XXX	MER 1 MI SCIENCE RDRS
MER2-M-PANCAM-3-RADCAL-RDR-V1.0	MER2PC_1XXX	MER 2 PANCAM SCIENCE RDRS
MER2-M-MI-2-RDR-SCI-V1.0	MER2MI_1XXX	MER 2 MI SCIENCE RDRS

Pancam and MI Science EDR data files are named according to the file naming scheme described in the MER Camera EDR and RDR Operations Data Products SIS. They are grouped into subdirectories beneath the top-level DATA directory by sol number.

6. Responsibilities

TASK	RESPONSIBLE PARTY
Data products produced by:	Cornell University (Pancam) U.S. Geological Survey (MI)
Ancillary files and documentation produced by:	Cornell University (Pancam) U.S. Geological Survey (MI) MER Project-JPL
Archive volume assembled by:	PDS Geosciences Node
Data and volume validated by:	PDS Geosciences Node and PDS Central Node data engineer
Data distributed by:	PDS Geosciences Node

7. Volume Structure

DIRECTORY	FILE	DESCRIPTION
ROOT	AAREADME.TXT{,HTM,LBL}	Introduction to the volume; description of the volume content and format.
	ERRATA.TXT{,HTM,LBL}	Description of errors and/or anomalies found on the current or previous volumes.
	VOLDESC.CAT	Description of the contents of the archive volume in a human and machine readable format.
CALIB	CALINFO.TXT	A textual description of the contents of the CALIB directory.
	.	Calibration plans, reports, and data.
CATALOG	CATINFO.TXT	Description of the contents of the CATALOG directory. These files are the primary PDS documentation for the archive and are used to populate the PDS catalog.
	PCAM_MERn_SCIRDR_DS.CAT MI_MERn_SCIRDR_DS.CAT	Description of the Science RDR data sets on these volumes. The descriptions include an overview of the data; descriptions of the primary measured parameters, the processing history, and the data format, ancillary information necessary to understand the data; any applicable coordinate systems, software necessary for the use of the data, and an analysis of the quality and limitations of the data. n = 1 or 2
	PCAM_INST.CAT MI_INST.CAT	Description of the camera instrument that acquired the data on this volume. The description includes scientific objectives, calibration information, operational considerations, a description of the detectors and electronics (and filters and optics, if appropriate), the operational modes, subsystems, and measured parameters.
	INSTHOST.CAT	Overview of the MER-1 and MER-2 rovers and spacecraft.
	MISSION.CAT	A detailed description of the MER mission.

	PERSON.CAT	Contact information for people responsible for producing the science data products and archive volumes.
	REF.CAT	Complete list of references of papers providing further information about the data sets and instrumentation on this volume.
DATA	data files (SOLnnn/* .IMG)	Image data files grouped in subdirectories by sol, e.g. SOL001, SOL002, etc.
DOCUMENT	DOCINFO.TXT	Contents of the DOCUMENT directory.
	CAMERA_DPSIS.{HTM,LBL,PDF}	Data Product Software Interface Specification for the camera instruments.
	SCIRDR_ARCHIVE_SIS.{HTM,LBL,PDF}	Archive Volume Software Interface Specification (this document).
	SCI_VS_OPS.TXT	Explanation of the difference between science and operations EDRs
	GEOMETRIC_CM.TXT	Reference to camera model description. Data labels contain a pointer to this file.
	VICAR2.TXT	Reference to a VICAR 2 header description. Data labels contain a pointer to this file.
	MER_TIME_ISSUES.TXT	Description of spacecraft time issues that apply to these data sets.
	PANCAM_USERS_GUIDE.{HTM,LBL,PDF}	Pancam User's Guide (on Pancam volumes only)
INDEX	INDXINFO.TXT	Contents of the INDEX directory.
	INDEX.{LBL,TAB}	A tabular summary of the data files on this volume.
	CUMINDEX.{LBL,TAB}	A cumulative tabular summary of the data files on all volumes in this volume set. This file is needed only when the data set is stored on multiple DVD volumes.

Appendix B. MINI-TES ARCHIVE VOLUME CONTENTS

1. Introduction

This appendix to the MER Science RDR Archive Volume SIS describes archive volumes for the Mini-TES RDR data sets. It also identifies responsibilities and a schedule for completion of the archive. This appendix will be updated during the mission as this information changes.

2. Change Log and TBD Items

Change	Date	Section
Initial version	7/31/04	All

3. Applicable Documents

1. Mars Exploration Program Data Management Plan, R. E. Arvidson and S. Slavney, Rev. 2, Nov. 2, 2000.
2. Mars Exploration Rover Project Archive Generation, Validation and Transfer Plan, R. E. Arvidson and S. Slavney, JPL D-19658, January 2, 2001.
3. MER Mini-TES EDR and RDR Data Products SIS, S. Anwar et al., Ver. 2.0, JPL D-22847, June 15, 2004.

4. Data Sets

The MER Mini-TES RDR Archive is composed of the following data sets:

1. MER-1 Mini-TES RDRs
2. MER-2 Mini-TES RDRs
3. MER-1-Mini-TES BTRs (brightness temperature products)
4. MER-2 Mini-TES BTRs
5. MER-1 Mini-TES EMRs (emissivity products)
6. MER-2 Mini-TES EMRs

All archive volumes have the same organization, as described in the following sections. Archive volumes are intended to be distributed online. For long-term preservation, archive volumes are written to DVD media.

5. Data Set, Volume and File Identifiers

DATA SET	VOLUME ID	VOLUME NAME
MER1-M-MTES-3-RDR-V1.0	MER1MT_1XXX	MER 1 MINI-TES RDRS
MER2-M-MTES-3-RDR-V1.0	MER2MT_1XXX	MER 2 MINI-TES RDRS
MER1-M-MTES-4-BTR-V1.0	MER1MT_2XXX	MER 1 MINI-TES BTRS
MER2-M-MTES-4-BTR-V1.0	MER2MT_2XXX	MER 2 MINI-TES BTRS
MER1-M-MTES-4-EMR-V1.0	MER1MT_3XXX	MER 1 MINI-TES EMRS
MER2-M-MTES-4-EMR-V1.0	MER2MT_3XXX	MER 2 MINI-TES EMRS

Mini-TES RDR data files are named according to the file naming scheme described in the MER Mini-TES EDR and RDR Data Products SIS. They are grouped into subdirectories beneath the top-level DATA directory by sol number.

6. Responsibilities

TASK	RESPONSIBLE PARTY
Data products produced by:	Arizona State University
Ancillary files and documentation produced by:	Arizona State University MER Project-JPL
Archive volume assembled by:	PDS Geosciences Node
Data and volume validated by:	PDS Geosciences Node and PDS Central Node data engineer
Data distributed by:	PDS Geosciences Node

7. Volume Structure

DIRECTORY	FILE	DESCRIPTION
ROOT	AAREADME.TXT{,HTM,LBL}	Introduction to the volume; description of the volume content and format.
	ERRATA.TXT{,HTM,LBL}	Description of errors and/or anomalies found on the current or previous volumes.
	VOLDESC.CAT	Description of the contents of the archive volume in a human and machine readable format.
CALIB	CALINFO.TXT	A textual description of the contents of the CALIB directory.
	.	Calibration plans, reports, and data.
CATALOG	CATINFO.TXT	Description of the contents of the CATALOG directory. These files are the primary PDS documentation for the archive and are used to populate the PDS catalog.
	MTES_MERn_xxx_DS.CAT	Description of the Mini-TES RDR data sets on these volumes. The descriptions include an overview of the data; descriptions of the primary measured parameters, the processing history, and the data format, ancillary information necessary to understand the data; any applicable coordinate systems, software necessary for the use of the data, and an analysis of the quality and limitations of the data. n = 1 or 2, xxx = RDR, BTR, or EMR.
	MINUTES_INST.CAT	Description of the Mini-TES instrument that acquired the data on this volume. The description includes scientific objectives, calibration information, operational considerations, a description of the detectors and electronics the operational modes, subsystems, and measured parameters.
	INSTHOST.CAT	Overview of the MER-1 and MER-2 rovers and spacecraft.
	MISSION.CAT	A detailed description of the MER mission.

	PERSON.CAT	Contact information for people responsible for producing the science data products and archive volumes. n = 1 or 2
	REF.CAT	Complete list of references of papers providing further information about the data sets and instrumentation on this volume. n = 1 or 2
DATA	data files (SOLnnn/*)	Data files grouped in subdirectories by sol, e.g. SOL001, SOL002, etc.
DOCUMENT	DOCINFO.TXT	Contents of the DOCUMENT directory.
	MTES_DPSIS.{HTM,LBL,PDF}	Data Product Software Interface Specification.
	SCIRDR_ARCHIVE_SIS.{HTM,LBL,PDF}	Archive Volume Software Interface Specification (this document).
	SCI_VS_OPS.TXT	Explanation of the difference between science and operations EDRs
	MER_TIME_ISSUES.TXT	Description of spacecraft time issues that apply to these data sets.
INDEX	INDXINFO.TXT	Contents of the INDEX directory.
	INDEX.{LBL,TAB}	A tabular summary of the data files on this volume.
	CUMINDEX.{LBL,TAB}	A cumulative tabular summary of the data files on all volumes in this volume set. This file is needed only when the data set is stored on multiple DVD volumes.

Appendix C. MÖSSBAUER ARCHIVE VOLUME CONTENTS

1. Introduction

This appendix to the MER Science RDR Archive Volume SIS describes archive volumes for the Mössbauer RDR data set. It also identifies responsibilities and a schedule for completion of the archive. This appendix will be updated during the mission as this information changes.

2. Change Log and TBD Items

Change	Date	Section
Initial version	7/31/04	All
Revised to eliminate Calibrated Spectra dataset (combined with Summed Spectra)	7/26/05	All

3. Applicable Documents

1. Mars Exploration Program Data Management Plan, R. E. Arvidson and S. Slavney, Rev. 2, Nov. 2, 2000.
2. Mars Exploration Rover Project Archive Generation, Validation and Transfer Plan, R. E. Arvidson and S. Slavney, JPL D-19658, January 2, 2001.
3. MER Mössbauer RDR Data Product SIS, E. Guinness, July 26, 2004.

4. Data Sets

The MER Mössbauer RDR Archive is composed of the following data sets:

1. MER-1 MB Summed Spectra
2. MER-2 MB Summed Spectra
3. MER-1 MB Mineral Analysis
4. MER-2 MB Mineral Analysis

All archive volumes have the same organization, as described in the following sections. Archive volumes are intended to be distributed online. For long-term preservation, archive volumes are written to DVD media.

5. Data Set, Volume and File Identifiers

DATA SET	VOLUME ID	VOLUME NAME
MER1-M-MB-4-SUMSPEC-SCI-V1.0	MER1MB_1XXX	MER 1 MB SUMSPEC RDRS
MER2-M-MB-4-SUMSPEC-SCI-V1.0	MER2MB_1XXX	MER 2 MB SUMSPEC RDRS
MER1-M-MB-5-MINERAL-SCI-V1.0	MER1MB_3XXX	MER 1 MB MINERAL RDRS
MER2-M-MB-5-MINERAL-SCI-V1.0	MER2MB_3XXX	MER 2 MB MINERAL RDRS

MB RDR data files are named according to the file naming scheme described in the MER Mössbauer RDR Data Products SIS. They are grouped into subdirectories beneath the top-level DATA directory by sol number.

6. Responsibilities

TASK	RESPONSIBLE PARTY
Data products produced by:	Arizona State University
Ancillary files and documentation produced by:	Arizona State University MER Project-JPL
Archive volume assembled by:	PDS Geosciences Node
Data and volume validated by:	PDS Geosciences Node and PDS Central Node data engineer
Data distributed by:	PDS Geosciences Node

7. Volume Structure

DIRECTORY	FILE	DESCRIPTION
ROOT	AAREADME.TXT{,HTM,LBL}	Introduction to the volume; description of the volume content and format.
	ERRATA.TXT{,HTM,LBL}	Description of errors and/or anomalies found on the current or previous volumes.
	VOLDESC.CAT	Description of the contents of the archive volume in a human and machine readable format.
CALIB	CALINFO.TXT	A textual description of the contents of the CALIB directory.
	.	Calibration plans, reports, and data.
CATALOG	CATINFO.TXT	Description of the contents of the CATALOG directory. These files are the primary PDS documentation for the archive and are used to populate the PDS catalog.
	MB_MERn_xxx_DS.CAT	Description of the Mössbauer RDR data sets on these volumes. The descriptions include an overview of the data; descriptions of the primary measured parameters, the processing history, and the data format, ancillary information necessary to understand the data; any applicable coordinate systems, software necessary for the use of the data, and an analysis of the quality and limitations of the data. n = 1 or 2; xxx = SUMSPEC or MINERAL.
	MB_INST.CAT	Description of the Mössbauer instrument that acquired the data on this volume. The description includes scientific objectives, calibration information, operational considerations, a description of the detectors and electronics the operational modes, subsystems, and measured parameters.
	INSTHOST.CAT	Overview of the MER-1 and MER-2 rovers and spacecraft.
	MISSION.CAT	A detailed description of the MER mission.

	PERSON.CAT	Contact information for people responsible for producing the science data products and archive volumes. n = 1 or 2
	REF.CAT	Complete list of references of papers providing further information about the data sets and instrumentation on this volume. n = 1 or 2
DATA	data files (SOLnnn/*)	Data files grouped in subdirectories by sol, e.g. SOL001, SOL002, etc.
DOCUMENT	DOCINFO.TXT	Contents of the DOCUMENT directory.
	MB_DPSIS.{HTM,LBL,PDF}	Data Product Software Interface Specification.
	SCIRDR_ARCHIVE_SIS.{HTM,LBL,PDF}	Archive Volume Software Interface Specification (this document).
	SCI_VS_OPS.TXT	Explanation of the difference between science and operations EDRs
	MER_TIME_ISSUES.TXT	Description of spacecraft time issues that apply to these data sets.
INDEX	INDXINFO.TXT	Contents of the INDEX directory.
	INDEX.{LBL,TAB}	A tabular summary of the data files on this volume.
	CUMINDEX.{LBL,TAB}	A cumulative tabular summary of the data files on all volumes in this volume set. This file is needed only when the data set is stored on multiple DVD volumes.

Appendix D. ATMOSPHERIC OPACITY ARCHIVE VOLUME CONTENTS

1. Introduction

This appendix to the MER Science RDR Archive Volume SIS describes archive volumes for the Atmospheric Opacity data set. It also identifies responsibilities and a schedule for completion of the archive. This appendix will be updated during the mission as this information changes.

2. Change Log and TBD Items

Change	Date	Section
Initial version	7/31/04	All

3. Applicable Documents

1. Mars Exploration Program Data Management Plan, R. E. Arvidson and S. Slavney, Rev. 2, Nov. 2, 2000.
2. Mars Exploration Rover Project Archive Generation, Validation and Transfer Plan, R. E. Arvidson and S. Slavney, JPL D-19658, January 2, 2001.
3. MER Atmospheric Opacity Data Product SIS, Mark Lemmon, JPL D-22853, June 19, 2003.

4. Data Sets

The MER Atmospheric Opacity RDR Archive is composed of the following data sets:

1. MER-1 and MER-2 Pancam Atmospheric Opacity Data

All archive volumes have the same organization, as described in the following sections. Archive volumes are intended to be distributed online. For long-term preservation, archive volumes are written to DVD media.

5. Data Set, Volume and File Identifiers

DATA SET	VOLUME ID	VOLUME NAME
MER1/MER2-M-PANCAM-5-ATMOS- OPACITY-V1.0	MERAO_1XXX	MER 1 AND 2 ATMOSPHERIC OPACITY DATA

Atmospheric Opacity data files are named according to the file naming scheme described in the MER Atmospheric Opacity Data Product SIS. They are grouped into subdirectories beneath the top-level DATA directory by sol number.

6. Responsibilities

TASK	RESPONSIBLE PARTY
Data products produced by:	Texas A&M University
Ancillary files and documentation produced by:	Texas A&M University MER Project-JPL
Archive volume assembled by:	PDS Geosciences Node
Data and volume validated by:	PDS Geosciences Node and PDS Central Node data engineer
Data distributed by:	PDS Geosciences Node

7. Volume Structure

DIRECTORY	FILE	DESCRIPTION
ROOT	AAREADME.TXT{,HTM,LBL}	Introduction to the volume; description of the volume content and format.
	ERRATA.TXT{,HTM,LBL}	Description of errors and/or anomalies found on the current or previous volumes.
	VOLDESC.CAT	Description of the contents of the archive volume in a human and machine readable format.
CATALOG	CATINFO.TXT	Description of the contents of the CATALOG directory. These files are the primary PDS documentation for the archive and are used to populate the PDS catalog.
	PCAM_MER_ATM_RDR_DS.CAT	Description of the Atmospheric Opacity data set on these volumes. The descriptions include an overview of the data; descriptions of the primary measured parameters, the processing history, and the data format, ancillary information necessary to understand the data; any applicable coordinate systems, software necessary for the use of the data, and an analysis of the quality and limitations of the data. n = 1 or 2.
	PCAM_INST.CAT	Description of the Pancam instrument that acquired the data on this volume. The description includes scientific objectives, calibration information, operational considerations, a description of the detectors and electronics the operational modes, subsystems, and measured parameters.
	INSTHOST.CAT	Overview of the MER-1 and MER-2 rovers and spacecraft.
	MISSION.CAT	A detailed description of the MER mission.

	PERSON.CAT	Contact information for people responsible for producing the science data products and archive volumes. n = 1 or 2
	REF.CAT	Complete list of references of papers providing further information about the data sets and instrumentation on this volume. n = 1 or 2
DATA	data files (SOLnnn/*)	Data files grouped in subdirectories by sol, e.g. SOL001, SOL002, etc.
DOCUMENT	DOCINFO.TXT AO_DPSIS.{HTM,LBL,PDF}	Contents of the DOCUMENT directory. Data Product Software Interface Specification.
	SCIRDR_ARCHIVE_SIS.{HTM,LBL,PDF} SCI_VS_OPS.TXT	Archive Volume Software Interface Specification (this document). Explanation of the difference between science and operations EDRs
	MER_TIME_ISSUES.TXT	Description of spacecraft time issues that apply to these data sets.
INDEX	INDXINFO.TXT INDEX.{LBL,TAB} CUMINDEX.{LBL,TAB}	Contents of the INDEX directory. A tabular summary of the data files on this volume. A cumulative tabular summary of the data files on all volumes in this volume set. This file is needed only when the data set is stored on multiple DVD volumes.