Thermal Emission Imaging System

2001 Mars Odyssey

STANDARD DATA PRODUCT
ARCHIVE VOLUME
SOFTWARE INTERFACE SPECIFICATION

(THEMIS Archive Volume SIS)

Version 3.1

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Mars Space Flight Facility, Arizona State University

DOCUMENT CHANGE LOG

Change	Date	Affected Sections
Initial Draft	5/31/2002	All
First revision	10/01/2002	Most
Archive design revision; added BTR & ABR as standard products; defined virtual volume	01/01/03	Most
Browse image format change	07/01/03	Acronyms, Sections 2.2, 3.2.4, Appendices A & B
VIS calibration files changed to subdirectories containing multiple files	04/01/04	Section 2.3, Appendix A
Update to INDEX directory contents	07/01/04	Section 2.7, Appendices A & B
Update to DOCUMENT directory contents	10/01/04	Section 2.6, Appendices A & B
Addition of Appendix C. GEOMETRY	01/01/06	Acronyms, Sections 1.2, Appendices B & C
Update of references 6 & 10		Section 1.3
Updates related to IR-GEO products	07/01/09	Acronyms, Sections 1.2, 5.0, Appendices B & C
Addition of ODY_ORIENT_POINT text		Sections 2.6, Appendices A & B
Version 3.0 Reflects split of archive into two volume sets: ODTSDP & ODTGEO	01/01/15	All sections and Appendices
Update to publication schedule	01/01/18	Section 4.3

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ACRONYMS AND ABBREVIATIONS

ABR	Apparent Brightness Record
ALB	Projected Visible ALBedo record
ASCII	American Standard Code for Information Interchange
ASU	Arizona State University
BTR	Brightness Temperature Record
DCS	DeCorrelation Stretch record
DVD	Digital Versatile Disk
EDR	Experiment Data Record
GEO	Geometrically registered record
IR	Infrared
ISIS	Integrated Software for Imaging Spectrometers
ISO	International Standards Organization
JPEG	Joint Photographic Experts Group
JPL	Jet Propulsion Laboratory
Mbyte	Megabyte
NASA	National Aeronautics and Space Administration
NSSDC	National Space Science Data Center
ODY	2001 Mars Odyssey
ODTGEO	Mars ODyssey Themis (GEOgraphically) Projected Data Products
ODTSDP	Mars ODyssey Themis Standard Data Products
PBT	Projected Brightness Temperature record
PDS	Planetary Data System
PNG	Portable Network Graphics
RGB	Red, Green, Blue; Visible false color composite image
SDVT	Science Data Validation Team
SIS	Software Interface Specification
RDR	Reduced Data Record
TLM	Telemetry
THM	THermal EMission Imaging System
VIS	Visible

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 – 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.

    Archive Volume Set – 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.

    Virtual Archive Volume – When an archive is available online, it is not constrained by the size limitations of physical media and it is called a *virtual archive volume*. The virtual archive mimics the directory structure of a single archive volume, with an expanded data directory to contain all of the data available on the archive volume set.

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 non-standard 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 THEMIS Archive. Typically, these individuals would be software engineers, data analysts, or planetary scientists.

The specifications in this document apply to all THEMIS product archive volumes that are generated by the Mars Odyssey Project.

1.2 Content Overview

This Software Interface Specification (SIS) describes the content, generation, and format of the THEMIS data archive. THEMIS is a combination visible (VIS) and infrared (IR) multi-spectral imager onboard the 2001 Mars Odyssey Orbiter. The data products include a variety of raw, calibrated and derived products presented in both raw raster and geographically projected coordinates. The complete data archive is delivered as two related archive volume sets: Mars Odyssey THEMIS Standard Products and Mars Odyssey THEMIS Projected Products. The THEMIS Team at the ASU Mars Space Flight Facility is responsible for generating these products and assembling the archive.

All products presented in raw raster (as collected) order are archived in the Mars Odyssey THEMIS Standard Products (ODTSDP) volume set. The standard data products in the archive are the raw (EDR) and the calibrated (RDR) spectral image QUBEs, and either a visible apparent brightness image (ABR) or an infrared brightness temperature image (BTR) derived from the RDR QUBE. All products are available at both visible and thermal infrared wavelengths: VISEDR or IREDR, VISRDR or IRRDR, and VISABR or IRBTR. In this text, the acronyms THM-EDR and THM-RDR may be used to collectively reference the raw and calibrated data products at both wavelengths.

All products presented in geographically projected coordinates are archived in the Mars Odyssey THEMIS Projected Products (ODTGEO) volume set. The special data products in this archive are the projected and calibrated (GEO) spectral image CUBEs, available at both visible and thermal infrared wavelengths, and collectively referenced in the text as THM-GEO. The available derived infrared products include projected brightness temperature images (PBT) and decorrelation stretch browse images (DCS). The available derived visible products include projected albedo images (ALB) and false color composite browse images (RGB). All products in the ODTGEO archive were generated from the corresponding RDR QUBE in the ODTSDP archive.

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 and S. Slavney, Rev. 2, Nov. 2, 2000.

2. 2001 Mars Odyssey Orbiter Archive Generation, Validation and Transfer Plan, R. E. Arvidson, R. S. Saunders, and S. Slavney, JPL D-20679, November 21, 2014.

3. Planetary Data System Data Preparation Workbook, February 1995, Version 3.1, JPL D-7669, Part 1.

4. Planetary Data System Standards Reference, October 30, 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.

The user is referred to the following THEMIS documents for additional information:

6. The Thermal Emission Imaging System (THEMIS) for the Mars 2001 Odyssey Mission, P.R. Christensen, et. Al., *Space Science Review*, 2001, Vol 110, pp85-130, 2004.

7. Calibration Report for the Thermal Emission Imaging System (THEMIS) for the 2001 Mars Odyssey Mission, P.R. Christensen.

8. THEMIS Standard Data Products Software Interface Specification, April 2014, JPL D-xxxx.

9. Mars Odyssey THEMIS: Data Processing User's Guide, P.R. Christensen, April 2009.

10. Mars Odyssey THEMIS: Geometric Processing User's Guide, K. Murray, July 2014.

1.4 Relationships with Other Interfaces

This Archive Volume SIS could be affected by changes to the design of the THEMIS data products or the THEMIS processing software, described in the THEMIS Software Interface Specification [8], in the THEMIS Processing User's Guide [9], and in the THEMIS Geometric Processing User's Guide [10].

2. Archive Volume Contents

This section describes the contents of the THEMIS archive volumes, including the file names, file contents, file types, and organization responsible for providing the files. The two archive volume sets are organized with a similar directory structure, as described below; details for each archive volume are shown in Appendices A & B. Each archive volume contains the data products from a single publication release period (typically, three months of data collection) and is named using the appropriate RELEASE_ID.

THEMIS archive volumes will be available on physical media only for permanent archive purposes and available online for public consumption (details in section 4). The online archive, also referred to as the "virtual volume", is a logical volume based on the format of the physical archive, with minor differences due to the size limitations of the latter. The format of the virtual archive is described in Appendix C.

Pattern placeholder abbreviations are used repeatedly throughout the next few sections; for example, release subdirectories follow the pattern odtPPP_vxxxx, data subdirectories follow the pattern AoooXXPPP, and data product filenames follow the pattern AooooonnnPPP.EXT. Use this key to interpret their meanings:

A is a 1 letter description of the type of image collected;
[V = visible image; I = infrared image;]

oooXX is the first three digits of a mission orbit number for one-hundred orbit directory;
[010XX includes all orbits between 01000 and 01099]

ooooo is a 5-digit mission orbit number when the image was collected;
[01234 = mapping orbit number example]

nnn is a 3-digit image sequence number indicating the order that images were collected each orbit; [001 = first image collected in the ooooo orbit]

PPP is a 3-letter suffix uniquely identifying the product type;
[example EDR]

vxxxx version number and release number identifies this volume in the volume set;
OR v_xxxx [2_0001 = version 2, release_id=0001]

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. All files in this directory are provided by the THEMIS team. The following files are contained in the Root directories of both the ODTSDP and ODTGEO archive volumes.

Root File Name	File Contents
AAREADME.TXT	Volume content and format information
AAREADME.HTM	Hypertext version of AAREADME.TXT
AAREADME.LBL	A PDS detached label that describes both AAREADME.TXT and AAREADME.HTM
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; the filename maybe modified with an abbreviation of the volume id (example: voldesc_vxxxx.cat)

2.2 Browse Directory Contents

The Browse subdirectories contain reduced-size, easily viewed versions of data products to be used to help identify products of interest available on the archive volume. The overview files in this directory are provided by the THEMIS team. The following files are contained in the Browse directory of both the ODTSDP and ODTGEO archive volumes.

Browse File Name	File Contents

	BROWSINFO.TXT	A description of the contents of this directory; the contents of this file varies on each of the archive volumes

The Browse directory is organized into release volume subdirectories named for the browse product types included and the volume name. These, in turn, contain image subdirectories which follow the same organizational conventions of the Data image subdirectories (see pattern key above and Section 2.5). All products in the subdirectories are provided by the THEMIS team. The following subdirectories are contained in the Browse directory of the indicated archive volume set.

Volume Set	Release Subdirectory	Image Subdirectories and Contents
ODTSDP	ODTBWSv_xxxx	Includes one browse image for each IR and VIS image on this volume; image subdirectories follow pattern IoooXX or VoooXX
ODTGEO	ODTBWSv_xxxx	Includes one browse image for each IR-GEO and VIS-GEO image on this volume; image subdirectories follow pattern IoooXXBWS2 or VoooXXBWS2
ODTGEO	ODTDCSv_xxxx	Includes up to four DCS images for each qualified IR-RDR; image subdirectories follow pattern IoooXXDCS
ODTGEO	ODTRGBv_xxxx	Includes one RGB image for each qualified VIS-RDR; image subdirectories follow pattern VoooXXRGB

Individual browse and thumbnail images are contained in the data subdirectories and have filenames based on the PRODUCT_ID of the data product that they represent. Each browse image has the same dimensions (samples by lines) as a single band of the source data product. Infrared browse images are usually derived from the data collected in band 9 (centered at 12.57 µm) of the source product; visible browse images are usually derived from the data in band 3 (centered at 0.654 µm) of the source product. If the named band is not available in the source product the first available band, in numerical order, is used to create the browse image. Note that there are no browse images for infrared reset (R-RDR) or infrared shutter (S-EDR) images.

Thumbnail images are browse images reduced to 10% of the original file size. Thumbnail image names follow the pattern of Aooooonnn_small.jpg, as defined as above.

2.3 Calib Directory Contents

The Calib directory is available on both the ODTSDP and ODTGEO archive volumes; the files on each are identical. The Calib directory contains calibration documentation and files used to process the data products. Several subdirectories have been created within the Calib directory to store related calibration files. All files in this directory and its subdirectories are provided by the THEMIS team. The following files and subdirectories are contained in the Calib directory.

Calib File Name	File Contents
CALIBINFO.TXT	A description of the contents of this directory
CALIB.LBL	A PDS detached label that describes CALIB.PDF files
CALIB.PDF	The THEMIS Calibration Report as a PDF file
CALIB_APXB.PDF	The THEMIS Calibration Report, Appendix B as a PDF file
CALIB_FIGS.PDF	Figures for the THEMIS Calibration Report as a PDF file
IRF_FILE	Used in IR calibration; see THEMIS Processing User's Guide [9]
PROCESS.HTM	The THEMIS Data Processing User Guide in HTML format
PROCESS.PDF	The THEMIS Data Processing User Guide as a PDF file
PROCESS.LBL	A PDS detached label that describes both PROCESS.TXT and PROCESS.PDF
TEMP2RAD_FILE	Used in IR calibration; see THEMIS Processing User's Guide [9]

Calib Subdirectory Name	Subdirectory Contents
BIAS_FILES	Files used in VIS calibration; see THEMIS Processing User's Guide [9] for list of current files
DESMEAR_FILES	Files used in VIS calibration; see THEMIS Processing User's Guide [9] for list of current files
SENSITIVITY_FILES	Files used in VIS calibration; see THEMIS Processing User's Guide [9] for list of current files
STRAYLIGHT_FILES	Files used in VIS calibration; see THEMIS Processing User's Guide [9] for list of current files

2.4 Catalog Directory Contents

The files in the Catalog directory provide a top-level understanding of the mission, spacecraft, and instruments are identical on both archive volumes (indicated with a *). The Catalog files related to specific data sets are only available on the archive volume that contains the relevant dataset. The files in this directory are coordinated with the PDS data engineer, who is responsible for loading them into the PDS catalog. The THEMIS team has provided all of the files in this directory except the INSTHOST.CAT, MARTGT.CAT, and MISSION.CAT. The following files are contained in the Catalog directory of the indicated archive volume set.

Volume Set	Catalog File Name	File Contents
*	CATINFO.TXT	A description of the contents of this directory; the contents of this file varies on each of the archive volumes
*	INSTHOST.CAT	Instrument host (Mars Odyssey spacecraft) information for the PDS catalog
*	INST.CAT	Instrument information for the PDS catalog
*	MARTGT.CAT	Physical information for the planetary target Mars

Volume Set	Catalog File Name	File Contents
*	MISSION.CAT	Mission information for the PDS catalog
*	PERSON.CAT	THEMIS and PDS personnel information for the PDS catalog
*	PERSON.CAT	THEMIS and PDS personnel information for the PDS catalog
*	REF.CAT	References mentioned in other *.CAT files
ODTSDP	ODTIBDS.CAT	IRBTR data set information for the PDS catalog
ODTSDP	ODTIBREL.CAT	IRBTR release information for the PDS catalog
ODTSDP	ODTIEDS.CAT	IREDR data set information for the PDS catalog
ODTSDP	ODTIEREL.CAT	IREDR release information for the PDS catalog
ODTSDP	ODTIRDS.CAT	IRRDR data set information for the PDS catalog
ODTSDP	ODTIRREL.CAT	IRRDR release information for the PDS catalog
ODTSDP	ODTVBDS.CAT	VISABR data set information for the PDS catalog
ODTSDP	ODTVBREL.CAT	VISABR release information for the PDS catalog
ODTSDP	ODTVEDS.CAT	VISEDR data set information for the PDS catalog
ODTSDP	ODTVEREL.CAT	VISEDR release information for the PDS catalog
ODTSDP	ODTVRDS.CAT	VISRDR data set information for the PDS catalog
ODTSDP	ODTVRREL.CAT	VISRDR release information for the PDS catalog
ODTGEO	ODTIGREL.CAT	IRGEO release information for the PDS catalog
ODTGEO	ODTIGDS.CAT	IRGEO data set information for the PDS catalog
ODTGEO	ODTIPREL.CAT	IRPBT release information for the PDS catalog
ODTGEO	ODTIPDS.CAT	IRPBT data set information for the PDS catalog
ODTGEO	ODTVAREL.CAT	VISALB release information for the PDS catalog
ODTGEO	ODTVADS.CAT	VISALB data set information for the PDS catalog
ODTGEO	ODTVGREL.CAT	VISGEO release information for the PDS catalog
ODTGEO	ODTVGDS.CAT	VISGEO data set information for the PDS catalog

2.5 Data Directory Contents and Naming

The Data image subdirectories contain the data products as appropriate for the archive volume. The overview files in this directory are provided by the THEMIS team. The following files are contained in the Data directory of both the ODTSDP and ODTGEO archive volumes.

Data File Name	File Contents
DATAINFO.TXT	A description of the contents of this directory; the contents of this file varies on each of the archive volumes

The Data directory is organized into release volume subdirectories named for the dataset included and the volume name. These, in turn, contain image subdirectories that follow the pattern AoooXXPPP (see pattern key above) and include 100 orbits of image data. The size of the image subdirectories will vary between each archive volume due to inconsistent data volume collected during any given block of orbits. All files and standard data products in the Data directory of the ODTSDP and ODTGEO archive volumes are provided by the THEMIS team.

The following subdirectories are contained in the Data directory of the ODTSDP archive volume. A detailed description of the data products is available in the THEMIS Software Interface Specification [8].

Release Subdirectory	Image Subdirectories and Contents
ODTIBv_xxxx	Image subdirectories follow pattern IoooXXBTR and include the IR-BTR images
ODTIEv_xxxx	Image subdirectories follow pattern [IRS]oooXXEDR and include the IR-EDR images. Each image subdirectory also includes one copy of the TLM.FMT file; The TLM format file contains the names of all fields stored in the TLM table header object in infrared raw data QUBEs.
ODTIRv_xxxx	Image subdirectories follow pattern IoooXXRDR or RoooXXRDR and include the IR-RDR images
ODTVBv_xxxx	Image subdirectories follow pattern VoooXXABR and include the VIS-ABR images
ODTVEv_xxxx	Image subdirectories follow pattern VoooXXEDR and include the VIS-EDR images
ODTVRv_xxxx	Image subdirectories follow pattern VoooXXRDR and include the VIS-RDR images

The following subdirectories are contained in the Data directory of the ODTGEO archive volume. A detailed description of the data products is available in the THEMIS Geometric Processing User's Guide [10].

Release Subdirectory	Image Subdirectories and Contents
ODTIGv_xxxx	Image subdirectories follow pattern IoooXXGEO and include the IR-GEO images
ODTIPv_xxxx	Image subdirectories follow pattern IoooXXPBT and include the IR-PBT images
ODTVAv_xxxx	Image subdirectories follow pattern VoooXXALB and include the VIS-ALB images
ODTVGv_xxxx	Image subdirectories follow pattern VoooXXGEO and include the VIS-GEO images

2.6 Document Directory Contents

The Document directory contains documentation to help the user understand and manipulate the data. Some documents are provided on both archive volumes (indicated with a *); documents that are related to a specific data set are only available on the archive volume that contains the relevant dataset. All files in this directory and all subdirectories are provided by the THEMIS team. The following files are contained in the Document directory of the indicated archive volume set.

Volume Set	Document File Name	File Contents
*	DOCINFO.TXT	A description of the contents of this directory; the contents of this file varies on each of the archive volumes
*	ARCHSIS.HTM	The Archive Volume SIS (this document) in HTML format
*	ARCHSIS.PDF	The Archive Volume SIS (this document) as a PDF file
*	ARCHSIS.LBL	A PDS detached label that describes both ARCHSIS.TXT and ARCHSIS.PDF
*	ODY_ORIENT_POINT.TXT	A text file describing the orientation and pointing of the Odyssey spacecraft
ODTSDP	SDPSIS_HTM	A subdirectory containing the HTML files of the THEMIS Standard Data Product SIS; see next table
ODTSDP	SDPSIS.PDF	The THEMIS Standard Data Product SIS as a PDF file
ODTSDP	SDPSIS.LBL	A PDS detached label that describes both SDPSIS.TXT and SDPSIS.PDF
ODTGEO	GEOMETRY_HTM	A subdirectory containing the HTML files of the THEMIS GEOMETRY Processing document; see next table
ODTGEO	GEOMETRY.PDF	The THEMIS GEOMETRY Processing document as a PDF file
ODTGEO	GEOMETRY.LBL	A PDS detached label that describes both GEOMETRY.TXT and GEOMETRY.PDF

The following files are contained in the *_HTM subdirectory indicated.

Document Subdirectory	File Name	File Contents
SDPSIS_HTM	SDPSIS.HTM	The THEMIS Standard Data Product SIS in HTML format
SDPSIS_HTM	SDPSIS_IMG00x.GIF	GIF formatted images sourced by the SDPSIS.HTM.
GEOMETRY_HTM	GEOMETRY.HTM	The THEMIS GEOMETRY Processing document in HTML format
GEOMETRY_HTM	GEOMETRY_IMG00x.GIF	GIF formatted images sourced by the GEOMETRY.HTM.

2.7 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 general information indexes are available on both archive volumes (indicated with a *) as their contents are useful to all data sets. All files in this directory are provided by the THEMIS team. The following files are contained in the Index directory of the indicated archive volume set.

Volume Set	Index File Name	File Contents
*	INDXINFO.TXT	A description of the contents of this directory; the contents of this file varies on each of the archive volumes
*	THMIDX_IR.LBL	A PDS detached label that describes THMIDX_IR.TAB
*	THMIDX_IR.TAB	Cumulative index table listing general observation information and geometric parameters for all available IR observations
*	THMIDX_IRxxxx.LBL	A PDS detached label that describes THMIDX_IRxxxx.TAB
*	THMIDX_IRxxxx.TAB	Index table listing general observation information and geometric parameters for all IR observations on this release volume
*	THMIDX_VIS.LBL	A PDS detached label that describes THMIDX_VIS.TAB
*	THMIDX_VIS.TAB	Cumulative index table listing general observation information and geometric parameters for all available VIS observations
*	THMIDX_VISxxxx.LBL	A PDS detached label that describes THMIDX_VISxxxx.TAB
*	THMIDX_VISxxxx.TAB	Index table listing general observation information and geometric parameters for all VIS observations on this release volume
ODTSDP	CMIDX_ODTIB.TAB	Cumulative index table listing release information for all IR-BTR data products released to date
ODTSDP	CMIDX_ODTIB.LBL	A PDS detached label that describes the CMIDX_ODTIB.TAB
ODTSDP	CMIDX_ODTIE.TAB	Cumulative index table listing release information for all IR-EDR data products released to date
ODTSDP	CMIDX_ODTIE.LBL	A PDS detached label that describes the CMIDX_ODTIEX.TAB
ODTSDP	CMIDX_ODTIR.TAB	Cumulative index table listing release information for all IR-RDR data products released to date
ODTSDP	CMIDX_ODTIR.LBL	A PDS detached label that describes the CMIDX_ODTIR.TAB
ODTSDP	CMIDX_ODTVB.TAB	Cumulative index table listing release information for all VIS-ABR data products released to date
ODTSDP	CMIDX_ODTVB.LBL	A PDS detached label that describes the CMIDX_ODTVB.TAB
ODTSDP	CMIDX_ODTVE.TAB	Cumulative index table listing release information for all VIS-EDR data products released to date
ODTSDP	CMIDX_ODTVE.LBL	A PDS detached label that describes the CMIDX_ODTVE.TAB

Volume Set	Index File Name	File Contents
ODTSDP	CMIDX_ODTVR.TAB	Cumulative index table listing release information for all VIS-RDR data products released to date
ODTSDP	CMIDX_ODTVR.LBL	A PDS detached label that describes the CMIDX_ODTVR.TAB
ODTSDP	INDEX_ODTIBxxxx.TAB	Index table listing release information for all IR-BTR data products on this release volume
ODTSDP	INDEX_ODTIBxxxx.LBL	A PDS detached label that describes INDEX_ODTIBxxxx.TAB
ODTSDP	INDEX_ODTIExxxx.TAB	Index table listing release information for all IR-EDR data products on this release volume
ODTSDP	INDEX_ODTIExxxx.LBL	A PDS detached label that describes INDEX_ODTIExxxx.TAB
ODTSDP	INDEX_ODTIRxxxx.TAB	Index table listing release information for all IR-RDR data products on this release volume
ODTSDP	INDEX_ODTIRxxxx.LBL	A PDS detached label that describes INDEX_ODTIRxxxx.TAB
ODTSDP	INDEX_ODTVBxxxx.TAB	Index table listing release information for all VIS-ABR data products on this release volume
ODTSDP	INDEX_ODTVBxxxx.LBL	A PDS detached label that describes INDEX_ODTVBxxxx.TAB
ODTSDP	INDEX_ODTVExxxx.TAB	Index table listing release information for all VIS-EDR data products on this release volume
ODTSDP	INDEX_ODTVExxxx.LBL	A PDS detached label that describes INDEX_ODTVExxxx.TAB
ODTSDP	INDEX_ODTVRxxxx.TAB	Index table listing release information for all VIS-RDR data products on this release volume
ODTSDP	INDEX_ODTVRxxxx.LBL	A PDS detached label that describes INDEX_ODTVRxxxx.TAB
ODTGEO	CMIDX_IRDCS.TAB	Cumulative index table listing release information for all IR-DCS browse products released to date
ODTGEO	CMIDX_IRDCS.LBL	A PDS detached label that describes the CMIDX_IRDCS.TAB
ODTGEO	CMIDX_ODTIG.TAB	Cumulative index table listing release information for all IR-GEO data products released to date
ODTGEO	CMIDX_ODTIG.LBL	A PDS detached label that describes the CMIDX_ODTIG.TAB
ODTGEO	CMIDX_ODTIP.TAB	Cumulative index table listing release information for all IR-PBT data products released to date
ODTGEO	CMIDX_ODTIP.LBL	A PDS detached label that describes the CMIDX_ODTIP.TAB
ODTGEO	CMIDX_ODTVA.TAB	Cumulative index table listing release information for all VIS-ALB data products released to date
ODTGEO	CMIDX_ODTVA.LBL	A PDS detached label that describes the

Volume Set	Index File Name	File Contents
		CMIDX_ODTVA.TAB
ODTGEO	CMIDX_ODTVG.TAB	Cumulative index table listing release information for all VIS-GEO data products released to date
ODTGEO	CMIDX_ODTVG.LBL	A PDS detached label that describes the CMIDX_ODTVG.TAB
ODTGEO	CMIDX_VISRGB.TAB	Cumulative index table listing release information for all VIS-RGB browse products released to date
ODTGEO	CMIDX_ODVISRGB.LBL	A PDS detached label that describes the CMIDX_VISRGB.TAB
ODTGEO	INDEX_IRDCSxxxx.TAB	Index table listing release information for all IR-DCS browse products on this release volume
ODTGEO	INDEX_IRDCSxxxx.LBL	A PDS detached label that describes INDEX_IRDCSxxxx.TAB
ODTGEO	INDEX_ODTIGxxxx.TAB	Index table listing release information for all IR-GEO data products on this release volume
ODTGEO	INDEX_ODTIGxxxx.LBL	A PDS detached label that describes INDEX_ODTIGxxxx.TAB
ODTGEO	INDEX_ODTIPxxxx.TAB	Index table listing release information for all IR-PBT data products on this release volume
ODTGEO	INDEX_ODTIPxxxx.LBL	A PDS detached label that describes INDEX_ODTIPxxxx.TAB
ODTGEO	INDEX_ODTVAxxxx.TAB	Index table listing release information for all VIS-ALB data products on this release volume
ODTGEO	INDEX_ODTVAxxxx.LBL	A PDS detached label that describes INDEX_ODTVAxxxx.TAB
ODTGEO	INDEX_ODTVGxxxx.TAB	Index table listing release information for all VIS-GEO data products on this release volume
ODTGEO	INDEX_ODTVGxxxx.LBL	A PDS detached label that describes INDEX_ODTVGxxxx.TAB
ODTGEO	INDEX_VISRGBxxxx.TAB	Index table listing release information for all VIS-RGB browse products on this release volume
ODTGEO	INDEX_VISRGBxxxx.LBL	A PDS detached label that describes INDEX_VISRGBxxxx.TAB

2.8 Software Directory Contents

The Software directory contains software documentation and source code that may be useful when manipulating the THEMIS data products; the files on both the ODTSDP and ODTGEO archive volumes are identical. All files in this directory and software subdirectories are provided by the THEMIS team. These files are subject to change throughout the mission and only the

most recent version will be available on the archive. The following files are contained in the Software directory or the indicated subdirectory.

Software File Name	File Contents
SOFTINFO.TXT	A description of the contents of this directory
SRCINFO.TXT	A description of the contents of SRC subdirectory; available in the SRC subdirectory
MD5_QUBE.PL	Pearl source code to calculate the MD5 value of a THM-EDR or THM-RDR; available in the SRC subdirectory
NASAVIEW.TXT	Hints for opening THEMIS data products using the NASA View software

3. Archive Volume Format

This section describes the format of THEMIS Archive Volumes. Data that comprise the archive will be formatted in accordance with Planetary Data System specifications (PDS Data Preparation Workbook, [4] and PDS Standards Reference, [5]).

3.1 Disk Format

Archive Volumes have a digital versatile disk (DVD) 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 [6].

3.2 File Formats

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

3.2.1 PDS Label Format

All text and data files in the archive have PDS labels associated with them, either embedded at the beginning of the file or detached in a separate file; the label location is described in each of the following individual "file format" sections. For examples of PDS labels for each type of data product, see the THEMIS Standard Data Product SIS [8].

A PDS label, whether embedded or detached from its associated file, 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 embedded label, the location is an integer representing the starting record number of the object (the first record in the file is record 1). In a detached label, the location denotes the name of the file containing the object, along with the starting record or byte number, if there is more than one object in the file. For example:

^HEADER = ("F01.IMG",1)

^IMAGE = ("F01.IMG",1025 <BYTES>)

indicates that the IMAGE object begins at byte 1025 of the file F01.IMG, in the same directory as the detached label file. Below is a list of the possible formats for the ^object definition.

^object = n
^object = n<BYTES>
^object = "filename.ext"
^object = ("filename.ext",n)
^object = ("[dirlist]filename.ext",n)
^object = ("filename.ext",n<BYTES>)
^object = ("[dirlist]filename.ext",n<BYTES>)

where

n	is the starting record or byte number of the object, counting from the beginning of the file (record 1, byte 1),
<BYTES>	indicates that the number given is in units of bytes,
filename	is the up to 8 character, alphanumeric upper-case file name,
ext	is the 3 character upper-case file extension,
dirlist	is a period-delimited path-list of parent directories, in upper case, that specifies the object file directory (used only when the object is not in the same directory as the label file). The list begins at the directory level below the root directory of the DVD. '[dirlist]' may be omitted when the object being described is located either in the same directory as the detached label, or in a subdirectory named LABEL that is located in a higher level of the directory tree, typically the DVD root itself.

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 readable under various operating systems.

3.2.2 Document File Format

Document files with the .TXT suffix exist in the Root, Browse, Catalog, Data, Document, and Index directories. They are ASCII files which 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.

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, and is accompanied by a detached PDS label. 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.

3.2.3 Catalog File Format

Catalog files (suffix .CAT) exist in the Root and Catalog directories. They are ASCII text files with an embedded PDS label. The text contents are formatted in an object-oriented structure consisting of sets of 'keyword=value' declarations. Lines in a .CAT 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.

3.2.4 PNG and JPG File Formats

THEMIS browse images are stored as PNG and JPEG files (.jpg suffix) in the Browse subdirectories. PNG and JPG images are 24-bit per pixel, color images in binary format. The THEMIS team uses the standardized image compression algorithms to create the browse files. For more information see http://www.libpng.org/pub/png and http://www.jpg.org.

3.2.5 IMAGE File Format

THEMIS brightness records are single band images stored as IMAGE files (.IMG suffix) in the Data subdirectories. All THEMIS IMAGEs adhere to the PDS standards for IMAGE objects as defined in the PDS Standards Reference [4]. Each IMAGE is composed of a header and a binary array of data derived from radiometric calibration of one observation. Each IMAGE header includes the embedded, ASCII PDS label, with information stored as ASCII text in a "keyword = value" format compliant with PDS standards.

For more information about the format and content of these data products, see the THEMIS Data Product SIS [8].

3.2.6 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.

3.2.7 QUBE File Format

THEMIS raw and calibrated data are multispectral images stored as QUBE files (.QUB suffix) in the Data subdirectories. All THEMIS QUBEs adhere to the PDS standards for

SPECTRAL_QUBE objects as defined in the PDS Standards Reference [4]. Each QUBE is composed of a header and a binary array of data collected during one observation.

Each QUBE header includes the embedded, ASCII PDS label and a HISTORY data object; raw infrared (IR-EDR) data products also contain a telemetry (TLM) data table. The HISTORY object is a cumulative record of all the computer manipulations of the data file. The information is stored as ASCII text in a "keyword = value" format similar to, but not intended to be compliant with, PDS standards. The TLM table follows the PDS standards for a binary table of fixed-length records, and is accompanied by a detached PDS label (TLM.FMT) that defines the table structure.

For more information about the format and content of these standard data products, see the THEMIS Data Product SIS [8].

3.2.8 CUBE File Format

THEMIS projected products are multispectral images stored as ISIS CUBE files (.CUB suffix) in the Data subdirectories. The THEMIS CUBE files themselves are not PDS compliant, however each image CUBE is associated with a PDS detached label following the standards defined in the PDS Standards Reference [4]. Each CUBE is composed of a header, a binary array of data collected during one observation, and a history object. For more information about the format and content of these projected data products, see the THEMIS Geometry Processing User's Guide [10].

4. Archive Volume Generation

4.1 Interface Media Characteristics

All archive volumes in the THEMIS Standard Product Archive conform to the ISO 9660 standards (ISO 9660-1988, [6]).

4.2 Labeling and Identification

The THEMIS data archive is compliant with the PDS Standards Reference [4] for the VOLUME_SET, VOLUME_ID, and DATASET_ID values used to identify the archive. All THEMIS archive volumes are part of the "Odyssey Mission to Mars" VOLUME_SERIES.

The THEMIS data products are delivered in one of two related archive volume sets, commonly referred to throughout this document as ODTSDP and ODTGEO. Each volume set will be divided into smaller volumes which include only the data collected during a specific time range (typically three months) and delivered as part of a single release; the RELEASE_ID (xxxx) is used in name of the VOLUME_ID.

VOLUME_SET_NAME	VOLUME_SET_ID	VOLUME_ID
Mars Odyssey THEMIS Standard Data Products	USA_NASA_PDS_ODTSDP_100XX	USA_NASA_PDS_ODTSDP_1xxxx
Mars Odyssey THEMIS Projected Products	USA_NASA_PDS_ODTGEO_200XX	USA_NASA_PDS_ODTGEO_2xxxx

Each of the archive volume sets includes multiple THEMIS data products. The following THEMIS data sets are available on the archive volume set indicated.

VOLUME_SET_ID	DATA_SET_ID
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-2-IREDR-v1.0
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-2-VISEDR-v1.0
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-3-IRRDR-v1.0
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-3-VISRDR-v1.0
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-3-IRBTR-v1.0
USA_NASA_PDS_ODTSDP_100XX	ODY-M-THM-3-VISRDR-v1.0
USA_NASA_PDS_ODTGEO_200XX	ODY-M-THM-5-IRGEO-v2.0
USA_NASA_PDS_ODTGEO_200XX	ODY-M-THM-5-VISGEO-v2.0
USA_NASA_PDS_ODTGEO_200XX	ODY-M-THM-5-IRGPBT-v2.0
USA_NASA_PDS_ODTGEO_200XX	ODY-M-THM-5-VISALB-v2.0

4.3 Data Product Sizes and Delivery Rates

The size of individual raw data products (VISEDR & IREDR) depends on several factors: image type (VIS vs. IR), length of an image (# frames), and the number of bands in the image. Within these parameters, a raw VIS image (VISEDR) can vary in size from 0.38 to 3.7 Mbytes; a raw IR image (IREDR) can vary in size from 0.07 to 199 Mbytes. Calibration (VISRDR & IRRDR) increases the file size approximately by a factor of two, as compared to the corresponding raw image; projection (VISGEO & IRGEO) increases the file size approximately by a factor of four, as compared to the corresponding raw image.

The estimated total volume of data to be collected over the course of the mission is limited by the available downlink allocated to THEMIS. Many factors affect the actual downlink available on any given day, which can vary from 0 to 375 Mbytes per day. THEMIS mission planners will maximize data collection by balancing the day's available allocated downlink against the size-defining parameters of the daily planned observations (VIS/IR, image length, number of bands).

For example, the following shows the expected content range of the 100 orbit data subdirectories over the course of the mission, taking into account the primary variables affecting file size and data volume.

Subdirectory Name	No. of Files	Subdirectory Size
IoooXXEDR	1 - 400	5 - 2800 Mbytes
VoooXXEDR	1 - 400	4 – 1500 Mbytes
IoooXXRDR	1 - 400	10 – 5800 Mbytes
VoooXXRDR	1 - 400	8 – 3000 Mbytes
IoooXXBTR	1 - 400	5 – 700 Mbytes
VoooXXABR	1 - 400	4 – 1500 Mbytes
IoooXXGEO	1 - 400	5 - 11200 Mbytes
VoooXXGEO	1 - 400	4 – 8000 Mbytes
IoooXXPBT	1 - 400	5 - 700 Mbytes
VoooXXALB	1 - 400	4 – 1500 Mbytes
IoooXXDCS	1 - 400	5 - 1400 Mbytes
VoooXXRGB	1 - 400	4 – 150 Mbytes

In compliance with the Odyssey Archive Plan [2], THEMIS standard data products will become available through PDS six months after ground receipt of the last raw data within the three month acquisition period. An *approximate* THEMIS archive volume delivery schedule, based on the nominal science mission timeline and THEMIS primary data acquisition periods, is shown below.

Data Collection Period	Delivery Date
March 2002	Oct 2002*
Apr – Jun 2002	Jan 2003
Jul – Sept 2002	April 2003
Oct – Dec 2002	July 2003
Jan – Mar 2003	Oct 2003
Apr – Jun 2003	Jan 2004
Jul – Sept 2003	April 2004
Oct – Dec 2003	July 2004
Jan – Mar 2004	Oct 2004
Apr - Jun 2004	Jan 2005

*Delivery includes only ABR, BTR, and EDR standard data products.

Due to extenuating circumstances, THEMIS data collected in or after the Extended Mission 7 phase (2017) will become available through PDS seven months after ground receipt of the last raw data within the three month acquisition period.

4.4 Data Transfer and Validation Methods

In compliance with the Odyssey Archive Plan [2], the THEMIS Team will produce complete ODTSDP and ODTGEO Archive Volumes at the ASU Mars Space Flight Facility. Archive volumes will be written as necessary to write-once DVDs (DVD-Rs) for distribution to co-investigators and the Science Data Validation Team (SDVT). The PDS Imaging Node will receive a copy of each archive volume to verify that it conforms to the THM Standard Data Product SIS [3] and to PDS standards for archive volumes.

Upon approval of a volume by the SDVT, the THEMIS Team will make the volume available online for public consumption (see Appendix B). For archive purposes, the THEMIS Team will deliver copies to the permanent archive sites: PDS Imaging Node, PDS Central Node, and the National Space Science Data Center (NSSDC).

5. Support Staff and Cognizant Persons

5.1 THEMIS Archive Volume Staff

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Appendix A: ODTSDP Archive Volume Directory Structure

Below are the directory structures of the THEMIS ODTSDP archive volumes. There are six datasets included on each archive volume: IREDR, VISEDR, IRRDR, VISRDR, IRBTR, and VISABR. Each archive volume contains the data products published during a single release (usually three months of data collection); the RELEASE_ID is used as the "xxxx" part of the VOLUME_ID. In the structure below, names without extensions are directory names (e.g. CATALOG), while names with extensions are file names (e.g. CATINFO.TXT). Lowercase letters in names are placeholders for numbers described in Section 2.0 of the main text.

ODTSDP_1xxxx

```
ROOT
| ------ AAREADME.HTM
| ------ AAREADME.LBL
| ------ AAREADME.TXT
| ------ ERRATA.TXT
| ------ VOLDESC_1xxxx.CAT
| ------ BROWSE
|        | ----- BROWINFO.TXT
|        | ----- ODTBWSv_xxxx
|        |        | ----- IoooXX
|        |        |        | ----- Ioooooonnn.png
|        |        |        | ----- Ioooooonnn_small.jpg
|        |        | ----- VoooXX
|        |        |        | ----- Voooooonnn.png
|        |        |        | ----- Voooooonnn_small.jpg
| ------ CALIB
|        | ----- BIAS_FILES
|        |        | ----- ZEROFRAME*_BIAS.FITS
|        | ----- CALIBINFO.TXT
|        | ----- CALIB.LBL
|        | ----- CALIB.PDF
|        | ----- CALIB_APXB.PDF
|        | ----- CALIB_FIGS.PDF
|        | ----- DESMEAR_FILES
|        |        | ----- DEZERO*_COEEFS.TXT
|        |        | ----- ZEROFRAME*_ZERO.FITS
|        | ----- IRF_FILE
|        | ----- PROCESS_HTM
|        |        | ----- PROCESS_IR.HTM
|        |        | ----- PROCESS_VIS.HTM
|        |        | ----- VISIMAGE00x.GIF
|        |        | ----- VISIMAGE00x.JPG
|        | ----- PROCESS.LBL
|        | ----- PROCESS_IR.PDF
|        | ----- PROCESS_VIS.PDF
```

```
|         | ----- SENSITIVITY_FILES
|         |         | ----- FLAT_FRAMES*.PROF*.FITS
|         | ----- STRAYLIGHT_FILES
|         |         | ----- DESTRAY*_FRAME*_*.FITS
|         | ----- TEMP2RAD_FILE
| ------ CATALOG
|         | ----- CATINFO.TXT
|         | ----- INST.CAT
|         | ----- INSTHOST.CAT
|         | ----- MARTGT.CAT
|         | ----- MISSION.CAT
|         | ----- ODTIBDS.CAT
|         | ----- ODTIBREL.CAT
|         | ----- ODTIEDS.CAT
|         | ----- ODTIEREL.CAT
|         | ----- ODTIRDS.CAT
|         | ----- ODTIRREL.CAT
|         | ----- ODTVBDS.CAT
|         | ----- ODTVBREL.CAT
|         | ----- ODTVEDS.CAT
|         | ----- ODTVEREL.CAT
|         | ----- ODTVRDS.CAT
|         | ----- ODTVRREL.CAT
|         | ----- PERSON.CAT
|         | ----- REF.CAT
| ------ DATA
|         | ----- DATAINFO.TXT
|         | ----- ODTIBv_xxxx
|         |         | ----- IoooXXBTR
|         |         |         | ----- IoooooonnnBTR.IMG
|         | ----- ODTIEv_xxxx
|         |         | ----- IoooXXEDR
|         |         |         | ----- IoooooonnnEDR.QUB
|         |         |         | ----- TLM.FMT
|         |         | ----- RoooXXEDR
|         |         |         | ----- RoooooonnnEDR.QUB
|         |         |         | ----- TLM.FMT
|         |         | ----- SoooXXEDR
|         |         |         | ----- SoooooonnnEDR.QUB
|         |         |         | ----- TLM.FMT
|         | ----- ODTIRv_xxxx
|         |         | ----- IoooXXRDR
|         |         |         | ----- IoooooonnnRDR.QUB
|         |         | ----- RoooXXRDR
|         |         |         | ----- RoooooonnnRDR.QUB
|         | ----- ODTVBv_xxxx
```

```
|        |          | ----- VoooXXABR
|        |          |          | ----- VoooooonnnABR.IMG
|        | ----- ODTVEv_xxxx
|        |          | ----- VoooXXEDR
|        |          |          | ----- VoooooonnnEDR.QUB
|        | ----- ODTVRv_xxxx
|        |          | ----- VoooXXRDR
|        |          |          | ----- VoooooonnnRDR.QUB
| ------ DOCUMENT
|        | ----- ARCHSIS.HTM
|        | ----- ARCHSIS.LBL
|        | ----- ARCHSIS.PDF
|        | ----- DOCINFO.TXT
|        | ----- ODY_ORIENT_POINT.TXT
|        | ----- SDPSIS_HTM
|        |          | ----- SDPSIS.HTM
|        |          | ----- SDPSIS_IMG00x.GIF
|        | ----- SDPSIS.LBL
|        | ----- SDPSIS.PDF
| ------ INDEX
|        | ----- CMIDX_ODTIB.LBL
|        | ----- CMIDX_ODTIB.TAB
|        | ----- CMIDX_ODTIE.LBL
|        | ----- CMIDX_ODTIE.TAB
|        | ----- CMIDX_ODTIR.LBL
|        | ----- CMIDX_ODTIR.TAB
|        | ----- CMIDX_ODTVB.LBL
|        | ----- CMIDX_ODTVB.TAB
|        | ----- CMIDX_ODTVE.LBL
|        | ----- CMIDX_ODTVE.TAB
|        | ----- CMIDX_ODTVR.LBL
|        | ----- CMIDX_ODTVR.TAB
|        | ----- INDEX_ODTIBxxxx.LBL
|        | ----- INDEX_ODTIBxxxx.TAB
|        | ----- INDEX_ODTIExxxx.LBL
|        | ----- INDEX_ODTIExxxx.TAB
|        | ----- INDEX_ODTIRxxxx.LBL
|        | ----- INDEX_ODTIRxxxx.TAB
|        | ----- INDEX_ODTVBxxxx.LBL
|        | ----- INDEX_ODTVBxxxx.TAB
|        | ----- INDEX_ODTVExxxx.LBL
|        | ----- INDEX_ODTVExxxx.TAB
|        | ----- INDEX_ODTVRxxxx.LBL
|        | ----- INDEX_ODTVRxxxx.TAB
|        | ----- THMIDX_IR.LBL
|        | ----- THMIDX_IR.TAB
```

```
|        | ----- THMIDX_IRxxxx.LBL
|        | ----- THMIDX_IRxxxx.TAB
|        | ----- THMIDX_VIS.LBL
|        | ----- THMIDX_VIS.TAB
|        | ----- THMIDX_VISxxxx.LBL
|        | ----- THMIDX_VISxxxx.TAB
|        | ----- INDXINFO.TXT
| ------ SOFTWARE
|        | ----- DOC
|        |        | ----- NASAVIEW.TXT
|        | ----- SOFTINFO.TXT
|        | ----- SRC
|        |        | ----- SRCINFO.TXT
|        |        | ----- MD5_QUBE.PL
```

Appendix B: ODTGEO Archive Volume Directory Structure

Below are the directory structures of the THEMIS ODTGEO archive volumes. There are four datasets and two browse data collections included on each archive volume: IRGEO, VISGEO, IRPBT, VISALB, IRDCS, and VISRGB. Each archive volume contains the data products published during a single release (usually three months of data collection); the RELEASE_ID is used as the "xxxx" part of the VOLUME_ID. In the structure below, names without extensions are directory names (e.g. CATALOG), while names with extensions are file names (e.g. CATINFO.TXT). Lowercase letters in names are placeholders for numbers described in Section 2.0 of the main text.

ODTGEO_2xxxx
```
ROOT
|------ AAREADME.HTM
|------ AAREADME.LBL
|------ AAREADME.TXT
|------ ERRATA.TXT
|------ VOLDESC_1xxxx.CAT
|------ BROWSE
|       |----- BROWINFO.TXT
|       |----- ODTBWSv_xxxx
|       |       |----- IoooXXBWS2
|       |       |       |----- Iooooonnnggg.png
|       |       |----- VoooXXBWS2
|       |       |       |----- Vooooonnnggg.png
|       |----- ODTDCSv_xxxx
|       |       |----- IoooXXDCS
|       |       |       |----- IoooooonnnDCS.png
|       |----- ODTRGBv_xxxx
|       |       |----- VoooXXRGB
|       |       |       |----- VoooooonnnRGB.png
|------ CALIB
|       |----- BIAS_FILES
|       |       |----- ZEROFRAME*_BIAS.FITS
|       |----- CALIBINFO.TXT
|       |----- CALIB.LBL
|       |----- CALIB.PDF
|       |----- CALIB_APXB.PDF
|       |----- CALIB_FIGS.PDF
|       |----- DESMEAR_FILES
|       |       |----- DEZERO*_COEEFS.TXT
|       |       |----- ZEROFRAME*_ZERO.FITS
|       |----- IRF_FILE
|       |----- PROCESS_HTM
|       |       |----- PROCESS_IR.HTM
|       |       |----- PROCESS_VIS.HTM
```

```
|         |          | ----- VISIMAGE00x.GIF
|         |          | ----- VISIMAGE00x.JPG
|         | ----- PROCESS.LBL
|         | ----- PROCESS_IR.PDF
|         | ----- PROCESS_VIS.PDF
|         | ----- SENSITIVITY_FILES
|         |          | ----- FLAT_FRAMES*.PROF*.FITS
|         | ----- STRAYLIGHT_FILES
|         |          | ----- DESTRAY*_FRAME*_*.FITS
|         | ----- TEMP2RAD_FILE
| ------ CATALOG
|         | ----- CATINFO.TXT
|         | ----- DSMAP_EQR.CAT
|         | ----- DSMAP_POL.CAT
|         | ----- DSMAP_SNU.CAT
|         | ----- INST.CAT
|         | ----- INSTHOST.CAT
|         | ----- MARTGT.CAT
|         | ----- MISSION.CAT
|         | ----- ODTIGDS.CAT
|         | ----- ODTIGREL.CAT
|         | ----- ODTIPDS.CAT
|         | ----- ODTIPREL.CAT
|         | ----- ODTVADS.CAT
|         | ----- ODTVAREL.CAT
|         | ----- ODTVGDS.CAT
|         | ----- ODTVGREL.CAT
|         | ----- PERSON.CAT
|         | ----- REF.CAT
| ------ DATA
|         | ----- DATAINFO.TXT
|         | ----- ODTIGv_xxxx
|         |          | ----- IoooXXGEO
|         |          |          | ----- Iooooonnnggg.CUB.gz
|         |          |          | ----- Iooooonnnggg.LBL
|         | ----- ODTIPv_xxxx
|         |          | ----- IoooXXPBT
|         |          |          | ----- IoooooonnnPBT.IMG
|         | ----- ODTVAv_xxxx
|         |          | ----- VoooXXALB
|         |          |          | ----- VooooonnnnALB.IMG
|         | ----- ODTVGv_xxxx
|         |          | ----- VoooXXGEO
|         |          |          | ----- Vooooonnnnggg.CUB
|         |          |          | ----- Vooooonnnnggg.LBL
| ------ DOCUMENT
```

```
|        | ----- ARCHSIS.HTM
|        | ----- ARCHSIS.LBL
|        | ----- ARCHSIS.PDF
|        | ----- DOCINFO.TXT
|        | ----- GEOMETRY_HTM
|        |        | ----- GEOMETRY.HTM
|        |        | ----- GEOMETRY_IMG00x.GIF
|        | ----- GEOMETRY.LBL
|        | ----- GEOMETRY.PDF
|        | ----- ODY_ORIENT_POINT.TXT
|        | ----- ZIP.CAT
| ------ INDEX
|        | ----- CMIDX_IRDCS.LBL
|        | ----- CMIDX_IRDCS.TAB
|        | ----- CMIDX_ODTIG.LBL
|        | ----- CMIDX_ODTIG.TAB
|        | ----- CMIDX_ODTIP.LBL
|        | ----- CMIDX_ODTIP.TAB
|        | ----- CMIDX_VISRGB.LBL
|        | ----- CMIDX_VISRGB.TAB
|        | ----- CMIDX_ODTVA.LBL
|        | ----- CMIDX_ODTVA.TAB
|        | ----- CMIDX_ODTVG.LBL
|        | ----- CMIDX_ODTVG.TAB
|        | ----- INDEX_IRDCSxxxx.LBL
|        | ----- INDEX_ODTIBxxxx.TAB
|        | ----- INDEX_ODTIGxxxx.LBL
|        | ----- INDEX_ODTIGxxxx.TAB
|        | ----- INDEX_ODTIPxxxx.LBL
|        | ----- INDEX_ODTIPxxxx.TAB
|        | ----- INDEX_VISRGBxxxx.LBL
|        | ----- INDEX_VISRGBxxxx.TAB
|        | ----- INDEX_ODTVAxxxx.LBL
|        | ----- INDEX_ODTVAxxxx.TAB
|        | ----- INDEX_ODTVGxxxx.LBL
|        | ----- INDEX_ODTVGxxxx.TAB
|        | ----- THMIDX_IR.LBL
|        | ----- THMIDX_IR.TAB
|        | ----- THMIDX_IRxxxx.LBL
|        | ----- THMIDX_IRxxxx.TAB
|        | ----- THMIDX_VIS.LBL
|        | ----- THMIDX_VIS.TAB
|        | ----- THMIDX_VISxxxx.LBL
|        | ----- THMIDX_VISxxxx.TAB
|        | ----- INDXINFO.TXT
| ------ SOFTWARE
```

```
|        | ----- DOC
|        |          | ----- NASAVIEW.TXT
|        | ----- SOFTINFO.TXT
|        | ----- SRC
|        |          | ----- SRCINFO.TXT
|        |          | ----- MD5_QUBE.PL
```

Appendix C: THEMIS Virtual Archive Volume

In compliance with the Odyssey Archive Plan [2] and in Section 4.0 above, THEMIS standard data products will be made available online from the PDS THEMIS Sub Node (http://themis-data.asu.edu). The THEMIS Virtual Archive is composed of two very large PDS logical volumes, containing all of the THEMIS datasets. Although the overall structure of the Virtual Archive mimics the directory structure of the individual archive volumes described in the body of this text, there are a few significant differences to be noted.

1. The DATA directory in each logical volume includes the release subdirectories from all of the archive volumes. The same release subdirectory naming convention established on the archive volumes (see Section 2.5) is maintained in the virtual volume.

2. The BROWSE directory in each logical volume includes the release subdirectories from all of the archive volumes. The same release subdirectory naming convention established on the archive volumes (see Section 2.2) is maintained in the virtual volume.

3. A logical volume VOLDESC.CAT files will be available at the root level describing all the data in the virtual volume. The volume catalogs from the individual archive volumes (VOLDESC_vxxxx.CAT) are available in special subdirectory (VOLDESC/) within the DATA directory.

4. Only the cumulative indexes are available in the top level of the INDEX directory; a VOL_INDEX/ subdirectory has been added to contain a copy of the individual archive volume index files.

Below is the directory structure of the THEMIS Virtual Archive Volume. All directory and file names listed below are case insensitive. Lowercase letters in names are placeholders for numbers described in Section 2.0 of the main text.

```
ROOT
|------ ODTGEO_v2
|       |------ AAREADME.HTM
|       |------ AAREADME.LBL
|       |------ AAREADME.TXT
|       |------ ERRATA.TXT
|       |------ VOLDESC.CAT
|       |------ BROWSE
|       |         |----- BROWINFO.TXT
|       |         |----- ODTBWSv_xxxx
|       |         |         |----- IoooxxBWS2
|       |         |         |         |----- Iooooonnnggg.PNG
|       |         |         |----- VoooxxBWS2
|       |         |         |         |----- Vooooonnnggg.PNG
|       |         |----- ODTDCSv_xxxx
|       |         |         |----- IoooxxDCS
|       |         |         |         |----- IoooooonnnDCS.PNG
```

```
|       |        | ----- ODTRGBv_xxxx
|       |        |        | ----- VoooxxRGB
|       |        |        |        | ----- VooooonnnRGB.PNG
|       | ------ CALIB
|       |        | ----- BIAS_FILES
|       |        |        | ----- ZEROFRAME*_BIAS.FITS
|       |        | ----- CALIBINFO.TXT
|       |        | ----- CALIB.LBL
|       |        | ----- CALIB.PDF
|       |        | ----- CALIB_APXB.PDF
|       |        | ----- CALIB_FIGS.PDF
|       |        | ----- DESMEAR_ FILES
|       |        |        | ----- DEZERO*_COEFF.TXT
|       |        |        | ----- ZEROFRAME*_ZERO.FITS
|       |        | ----- IRF_FILE
|       |        | ----- PROCESS_HTM
|       |        |        | ----- PROCESS_IR.HTM
|       |        |        | ----- PROCESS_VIS.HTM
|       |        |        | ----- VISIMAGE00x.GIF
|       |        |        | ----- VISIMAGE00x.JPG
|       |        | ----- PROCESS.lbl
|       |        | ----- PROCESS_IR.PDF
|       |        | ----- PROCESS_VIS.PDF
|       |        | ----- SENSITIVITY_ FILES
|       |        |        | ----- FLAT_FRAMES*.PROF*.FITS
|       |        | ----- STRAYLIGHT_ FILES
|       |        |        | ----- DESTRAY*_FRAME*_*.FITS
|       |        | ----- TEMP2RAD_ FILE
|       | ------ CATALOG
|       |        | ----- CATINFO.TXT
|       |        | ----- DSMAP_EQR.CAT
|       |        | ----- DSMAP_POL.CAT
|       |        | ----- DSMAP_SNU.CAT
|       |        | ----- INST.CAT
|       |        | ----- INSTHOST.CAT
|       |        | ----- MARTGT.CAT
|       |        | ----- MISSION.CAT
|       |        | ----- ODTIGDS.CAT
|       |        | ----- ODTIGREL.CAT
|       |        | ----- ODTIPDS.CAT
|       |        | ----- ODTIPREL.CAT
|       |        | ----- ODTVADS.CAT
|       |        | ----- ODTVAREL.CAT
|       |        | ----- ODTVGDS.CAT
|       |        | ----- ODTVGREL.CAT
|       |        | ----- PERSON.CAT
```

```
|       |        |----- REF.CAT
|       |------ DATA
|       |        |----- DATAINFO.TXT
|       |        |----- ODTIGv_xxxx
|       |        |        |----- IoooxxGEO
|       |        |        |        |----- Iooooonnnggg.CUB.gz
|       |        |        |        |----- Iooooonnnggg.LBL
|       |        |----- ODTIPv_xxxx
|       |        |        |----- IoooXXPBT
|       |        |        |        |----- IoooooonnnPBT.IMG
|       |        |----- ODTVAv_xxxx
|       |        |        |----- VoooxxALB
|       |        |        |        |----- VooooonnnALB.IMG
|       |        |----- ODTVGv_xxxx
|       |        |        |----- VoooxxGEO
|       |        |        |        |----- Voooooonnnggg.CUB
|       |        |        |        |----- Voooooonnnggg.LBL
|       |------ DOCUMENT
|       |        |----- ARCHSIS.HTM
|       |        |----- ARCHSIS.LBL
|       |        |----- ARCHSIS.PDF
|       |        |----- DOCINFO.TXT
|       |        |----- GEOMETRY_HTM
|       |        |        |----- GEOM_IMG00x.GIF
|       |        |        |----- GEOMETRY.HTM
|       |        |----- GEOMETRY.LBL
|       |        |----- GEOMETRY.PDF
|       |        |----- ODY_ORIENT_POINT.TXT
|       |        |----- ZIP.CAT
|       |------ INDEX
|       |        |----- CMIDX_IRDCS.LBL
|       |        |----- CMIDX_IRDCS.TAB
|       |        |----- CMIDX_ODTIG.LBL
|       |        |----- CMIDX_ODTIG.TAB
|       |        |----- CMIDX_ODTIP.LBL
|       |        |----- CMIDX_ODTIP.TAB
|       |        |----- CMIDX_ODTVA.LBL
|       |        |----- CMIDX_ODTVA.TAB
|       |        |----- CMIDX_ODTVG.LBL
|       |        |----- CMIDX_ODTVG.TAB
|       |        |----- CMIDX_VISRGB.LBL
|       |        |----- CMIDX_VISRGB.TAB
|       |        |----- INDXINFO.TXT
|       |        |----- THMIDX_IR.LBL
|       |        |----- THMIDX_IR.TAB
|       |        |----- THMIDX_VIS.LBL
```

```
|        |        | ----- THMIDX_VIS.TAB
|        |        | ----- VOL_INDEX
|        |        |        | ----- INDEX_IRDCSxxxx.LBL
|        |        |        | ----- INDEX_IRDCSxxxx.TAB
|        |        |        | ----- INDEX_ODTIGxxxx.LBL
|        |        |        | ----- INDEX_ODTIGxxxx.TAB
|        |        |        | ----- INDEX_ODTIPxxxx.LBL
|        |        |        | ----- INDEX_ODTIPxxxx.TAB
|        |        |        | ----- INDEX_ODTVAxxxx.LBL
|        |        |        | ----- INDEX_ODTVAxxxx.TAB
|        |        |        | ----- INDEX_ODTVGxxxx.LBL
|        |        |        | ----- INDEX_ODTVGxxxx.TAB
|        |        |        | ----- INDEX_VISRGBxxxx.LBL
|        |        |        | ----- INDEX_VISRGBxxxx.TAB
|        |        |        | ----- THMIDX_IRxxxx.LBL
|        |        |        | ----- THMIDX_IRxxxx.TAB
|        |        |        | ----- THMIDX_VISxxxx.LBL
|        |        |        | ----- THMIDX_VISxxxx.TAB
|        | ------ SOFTWARE
|        |        | ----- DOC
|        |        |        | ----- NASAVIEW.TXT
|        |        | ----- SOFTINFO.TXT
|        |        | ----- SRC
|        |        |        | ----- SRCINFO.TXT
|        |        |        | ----- MD5_QUBE.PL
|
| ------ ODTSDP_v1
|        | ------ AAREADME.HTM
|        | ------ AAREADME.LBL
|        | ------ AAREADME.TXT
|        | ------ ERRATA.TXT
|        | ------ VOLDESC.CAT
|        | ------ BROWSE
|        |        | ----- BROWINFO.TXT
|        |        | ----- ODTBWSv_xxxx
|        |        |        | ----- IoooXX
|        |        |        |        | ----- Iooooonnn.png
|        |        |        |        | ----- Iooooonnn_small.jpg
|        |        |        | ----- VoooXX
|        |        |        |        | ----- Voooooonnn.png
|        |        |        |        | ----- Voooooonnn_small.jpg
|        | ------ CALIB
|        |        | ----- BIAS_FILES
|        |        |        | ----- ZEROFRAME*_BIAS.FITS
|        |        | ----- CALIBINFO.TXT
|        |        | ----- CALIB.LBL
```

```
|       |       | ----- CALIB.PDF
|       |       | ----- CALIB_APXB.PDF
|       |       | ----- CALIB_FIGS.PDF
|       |       | ----- DESMEAR_ FILES
|       |       |       | ----- DEZERO*_COEFF.TXT
|       |       |       | ----- ZEROFRAME*_ZERO.FITS
|       |       | ----- IRF_FILE
|       |       | ----- PROCESS_HTM
|       |       |       | ----- PROCESS_IR.HTM
|       |       |       | ----- PROCESS_VIS.HTM
|       |       |       | ----- VISIMAGE00x.GIF
|       |       |       | ----- VISIMAGE00x.JPG
|       |       | ----- PROCESS.lbl
|       |       | ----- PROCESS_IR.PDF
|       |       | ----- PROCESS_VIS.PDF
|       |       | ----- SENSITIVITY_ FILES
|       |       |       | ----- FLAT_FRAMES*.PROF*.FITS
|       |       | ----- STRAYLIGHT_ FILES
|       |       |       | ----- DESTRAY*_FRAME*_*.FITS
|       |       | ----- TEMP2RAD_ FILE
|       | ------ CATALOG
|       |       | ----- CATINFO.TXT
|       |       | ----- INST.CAT
|       |       | ----- INSTHOST.CAT
|       |       | ----- MARTGT.CAT
|       |       | ----- MISSION.CAT
|       |       | ----- ODTIBDS.CAT
|       |       | ----- ODTIBREL.CAT
|       |       | ----- ODTIEDS.CAT
|       |       | ----- ODTIEREL.CAT
|       |       | ----- ODTIRDS.CAT
|       |       | ----- ODTIRREL.CAT
|       |       | ----- ODTVBDS.CAT
|       |       | ----- ODTVBREL.CAT
|       |       | ----- ODTVEDS.CAT
|       |       | ----- ODTVEREL.CAT
|       |       | ----- ODTVRDS.CAT
|       |       | ----- ODTVRREL.CAT
|       |       | ----- PERSON.CAT
|       |       | ----- REF.CAT
|       | ------ DATA
|       |       | ----- DATAINFO.TXT
|       |       | ----- ODTIBv_xxxx
|       |       |       | ----- IoooxxBTR
|       |       |       |       | ----- IooooonnnBTR.IMG
|       |       | ----- ODTIEv_xxxx
```

```
|       |       |       |       | ----- IoooxxEDR
|       |       |       |       |       | ----- IooooonnnEDR.QUB
|       |       |       |       |       | ----- TLM.FMT
|       |       |       |       | ----- RoooxxEDR
|       |       |       |       |       | ----- RooooonnnEDR.QUB
|       |       |       |       |       | ----- TLM.FMT
|       |       |       |       | ----- SoooxxEDR
|       |       |       |       |       | ----- SoooooonnnEDR.QUB
|       |       |       |       |       | ----- TLM.FMT
|       |       | ----- ODTIRv_xxxx
|       |       |       | ----- IoooxxRDR
|       |       |       |       | ----- IoooooonnnRDR.QUB
|       |       |       | ----- RoooxxRDR
|       |       |       |       | ----- RoooooonnnRDR.QUB
|       |       | ----- ODTVBv_xxxx
|       |       |       | ----- VoooxxABR
|       |       |       |       | ----- VooooonnnABR.IMG
|       |       | ----- ODTVEv_xxxx
|       |       |       | ----- voooxxEDR
|       |       |       |       | ----- vooooonnnEDR.QUB
|       |       | ----- ODTVGv_xxxx
|       |       |       | ----- VoooxxRDR
|       |       |       |       | ----- VoooooonnnRDR.QUB
|       | ------ DOCUMENT
|       |       | ----- ARCHSIS.HTM
|       |       | ----- ARCHSIS.LBL
|       |       | ----- ARCHSIS.PDF
|       |       | ----- DOCINFO.TXT
|       |       | ----- ODY_ORIENT_POINT.TXT
|       |       | ----- SDPSIS_HTM
|       |       |       | ----- SDPSIS.HTM
|       |       |       | ----- SDPSIS_IMG00x.GIF
|       |       | ----- SDPSIS.LBL
|       |       | ----- SDPSIS.PDF
|       | ------ INDEX
|       |       | ----- CMIDX_ODTIB.LBL
|       |       | ----- CMIDX_ODTIB.TAB
|       |       | ----- CMIDX_ODTIE.LBL
|       |       | ----- CMIDX_ODTIE.TAB
|       |       | ----- CMIDX_ODTIR.LBL
|       |       | ----- CMIDX_ODTIR.TAB
|       |       | ----- CMIDX_ODTVB.LBL
|       |       | ----- CMIDX_ODTVB.TAB
|       |       | ----- CMIDX_ODTVE.LBL
|       |       | ----- CMIDX_ODTVE.TAB
|       |       | ----- CMIDX_ODTVR.LBL
```

```
|        |          | ----- CMIDX_ODTVR.TAB
|        |          | ----- INDXINFO.TXT
|        |          | ----- THMIDX_IR.LBL
|        |          | ----- THMIDX_IR.TAB
|        |          | ----- THMIDX_VIS.LBL
|        |          | ----- THMIDX_VIS.TAB
|        |          | ----- VOL_INDEX
|        |          |        | ----- INDEX_ODtIbxxxx.LBL
|        |          |        | ----- INDEX_ODtIbxxxx.TAB
|        |          |        | ----- INDEX_ODTIExxxx.LBL
|        |          |        | ----- INDEX_ODTIExxxx.TAB
|        |          |        | ----- INDEX_ODtIrxxxx.LBL
|        |          |        | ----- INDEX_ODtIrxxxx.TAB
|        |          |        | ----- INDEX_ODTVBxxxx.LBL
|        |          |        | ----- INDEX_DOTVBxxxx.TAB
|        |          |        | ----- INDEX_ODTVExxxx.LBL
|        |          |        | ----- INDEX_ODTVExxxx.TAB
|        |          |        | ----- INDEX_ODTVRxxxx.LBL
|        |          |        | ----- INDEX_ODTVRxxxx.TAB
|        |          |        | ----- THMIDX_IRxxxx.LBL
|        |          |        | ----- THMIDX_IRxxxx.TAB
|        |          |        | ----- THMIDX_VISxxxx.LBL
|        |          |        | ----- THMIDX_VISxxxx.TAB
|        | ------ SOFTWARE
|        |          | ----- DOC
|        |          |        | ----- NASAVIEW.TXT
|        |          | ----- SOFTINFO.TXT
|        |          | ----- SRC
|        |          |        | ----- SRCINFO.TXT
|        |          |        | ----- MD5_QUBE.PL
```

Appendix D: ODTGEO Version-1 Archive Volume

At the time of the original release of the THEMIS GEO products, all data was included in a single archive volume with the projected products under the GEOMETRY subdirectory. The upgrade to Version-2 of the THEMIS GEO products was initially released concurrent with the split of the two archive volumes (ODTSDP and ODTGEO), and the two volumes were reorganized to mirror each other. Available ODTGEO Version-1 volumes still maintain the directory structure of the original volumes, and include the original documentation that described that structure. Below is an outline of the directory structure of the ODTGEO_1xxxx archive volumes; lowercase letters in names are placeholders for numbers described in Section 2.0 of the main text.

ODTGEO_1xxxx
```
ROOT
|------ AAREADME.HTM
|------ AAREADME.LBL
|------ AAREADME.TXT
|------ ERRATA.TXT
|------ VOLDESC_.CAT
|------ CALIB
|        |----- BIAS_FILES
|        |        |----- ZEROFRAME*_BIAS.FITS
|        |----- CALIBINFO.TXT
|        |----- CALIB.LBL
|        |----- CALIB.PDF
|        |----- CALIB_APXB.PDF
|        |----- CALIB_FIGS.PDF
|        |----- DESMEAR_FILES
|        |        |----- DEZERO*_COEEFS.TXT
|        |        |----- ZEROFRAME*_ZERO.FITS
|        |----- IRF_FILE
|        |----- PROCESS_HTM
|        |        |----- PROCESS_IR.HTM
|        |        |----- PROCESS_VIS.HTM
|        |        |----- VISIMAGE00x.GIF
|        |        |----- VISIMAGE00x.JPG
|        |----- PROCESS.LBL
|        |----- PROCESS_IR.PDF
|        |----- PROCESS_VIS.PDF
|        |----- SENSITIVITY_FILES
|        |        |----- FLAT_FRAMES*.PROF*.FITS
|        |----- STRAYLIGHT_FILES
|        |        |----- DESTRAY*_FRAME*_*.FITS
|        |----- TEMP2RAD_FILE
|------ CATALOG
|        |----- CATINFO.TXT
```

```
|        | ----- INST.CAT
|        | ----- INSTHOST.CAT
|        | ----- MARTGT.CAT
|        | ----- MISSION.CAT
|        | ----- ODTIGDS.CAT
|        | ----- ODTIGREL.CAT
|        | ----- ODTIPDS.CAT
|        | ----- ODTIPREL.CAT
|        | ----- ODTVGDS.CAT
|        | ----- ODTVGREL.CAT
|        | ----- PERSON.CAT
|        | ----- REF.CAT
| ------ GEOMETRY
|        | ----- BROWSE
|        |        | ----- BWS2INFO.TXT
|        |        | ----- IoooXXBWS2
|        |        |        | ----- Iooooonnnggg.png
|        | ----- BROWSE_DCS
|        |        | ----- DCSINFO.TXT
|        |        | ----- IoooXXDCS
|        |        |        | ----- IooooonnnDCS.png
|        | ----- GEOINFO.TXT
|        | ----- ODTIG0_xxxx
|        |        | ----- IoooXXGEO
|        |        |        | ----- IooooonnnGEO.CUB.gz
|        |        |        | ----- IooooonnnGEO.LBL
|        | ----- ODTIP0_xxxx
|        |        | ----- IoooXXPBT
|        |        |        | ----- IooooonnnPBT.IMG
|        | ----- ODTVG0_xxxx
|        |        | ----- VoooXXGEO
|        |        |        | ----- VooooonnnGEO.CUB
|        |        |        | ----- VooooonnnGEO.LBL
|        | ----- GEOMETRY_HTM
|        |        | ----- GEOMETRY.HTM
|        |        | ----- GEOMETRY_IMG00x.GIF
|        | ----- GEOMETRY.LBL
|        | ----- GEOMETRY.PDF
| ------ DOCUMENT
|        | ----- ARCHSIS.HTM
|        | ----- ARCHSIS.LBL
|        | ----- ARCHSIS.PDF
|        | ----- DOCINFO.TXT
|        | ----- ODY_ORIENT_POINT.TXT
| ------ INDEX
|        | ----- INDEX_IRDCS.LBL
```

```
|         | ----- INDEX_ODTIB.TAB
|         | ----- INDEX_ODTIG.LBL
|         | ----- INDEX_ODTIG.TAB
|         | ----- INDEX_ODTIP.LBL
|         | ----- INDEX_ODTIP.TAB
|         | ----- INDEX_ODTVG.LBL
|         | ----- INDEX_ODTVG.TAB
|         | ----- THMIDX_IR.LBL
|         | ----- THMIDX_IR.TAB
|         | ----- THMIDX_VIS.LBL
|         | ----- THMIDX_VIS.TAB
|         | ----- INDXINFO.TXT
| ------ SOFTWARE
|         | ----- DOC
|         |         | ----- NASAVIEW.TXT
|         | ----- SOFTINFO.TXT
|         | ----- SRC
|         |         | ----- SRCINFO.TXT
|         |         | ----- MD5_QUBE.PL
```