

```
CCSD3ZF0000100000001NJPL3IF0PDS200000001 = SFDU_LABEL
RECORD_TYPE           = FIXED_LENGTH
RECORD_BYTES          = 80
SPACECRAFT_NAME       = MAGELLAN
TARGET_NAME           = VENUS
OBJECT                 = TEXT
PUBLICATION_DATE      = '1991-01-30'
NOTE                   = "MAGELLAN MIDR CD-ROM"
END_OBJECT
END
```

## MAGELLAN MIDR CD-ROM

### 1. Introduction

Overall, the collection of Magellan CD-ROMs contains three data sets. One is the MIDR data set, to which this CD-ROM belongs. Another data set contains the Altimetry and Radiometry Composite Data Record (ARCDR) from MIT. The third data set consists of MIT Altimetric and Radiometric Global Data Records: the Global Topography Data Record (GTDR), Global Emissivity Data Record (GEDR), Global Slope Data Record (GSDR), and Global Reflectivity Data Record (GREDR).

This CD-ROM contains 10 Mosaic Image Data Record (MIDR) files and associated documentation. The complete MIDR data set includes F-MIDRs, C1-MIDRs, C2-MIDRs, C3-MIDRs, and P-MIDRs. MIDRs generated by the Image Data Processing Team (IDPT) are recorded on CD-ROM in the order in which they are produced. Thus, this CD-ROM may have a mix of MIDR types. Further, some of the MIDRs have had cross track smoothing or seam removal procedures applied to them.

All data formats are based on the Planetary Data System document SPIDS 1.1 ("Standards for the Preparation and Interchange of Data Sets", D-4683, JPL, June 28, 1988) and are similar to the formats used in generating the Voyager CD-ROM set ("Voyagers to the Outer Planets", volumes 1-8, Planetary Data System, JPL, 1989).

### 2. Disk Format

The disk has been formatted so that a variety of computer systems (e.g. IBM PC, Macintosh, Sun, VAX) may access the data. Specifically, the disk is formatted according to the ISO 9660 level 1 Interchange Standard, and file attributes are specified by Extended Attribute Records (XARs). For computer software that fully supports XARs, access to the CD-ROM volume will be straightforward; the disk will appear to the user to be identical to a file system of directories, sub-

directories, and data files. Some computer systems that do not support XARs will ignore them; others will append the XAR to the beginning of the file, in which case the user must read past the first 512 bytes of the file. For further information, refer to the ISO 9660 Standard Document: RF# ISO 9660-1988, 15 April 1988.

### 3. File Formats

Each MIDR is divided into an array of 56 framelets, arranged in seven rows and eight columns. The framelets are numbered in increasing order from left to right, top to bottom. Each framelet is stored in a separate file. A framelet is 1024 lines by 1024 samples, with one byte per sample. The framelet files contain embedded VICAR2 labels and have detached PDS labels. The framelet files and supplementary data files for each MIDR are stored in a separate subdirectory. The MIDRs are all in the sinusoidal equal area map projection.

Additional general information about each product is found in the LABEL directory. The \*.LBL files in that directory contain the PDS catalog information for the Magellan Mission, the spacecraft, the radar instrument, and the data sets. Further information on MIDR products can also be obtained from the Magellan Software Interface Specification (SIS) documents IDPS-107, IDPS-109, and IDPS-123.

Browse versions of the MIDRs are provided for quick inspection of the images. The browse version of each MIDR is found in the subdirectory for that MIDR. The file name for the browse image is BROWSE.IMG. Each browse image is 896 lines by 1024 samples, and was created by averaging groups of 8x8 pixels in the original 7168x8192 MIDR. Browse images contain embedded VICAR2 labels and have detached PDS labels.

All document files and detached label files contain 80-byte fixed-length records, with a carriage return character (ASCII 13) in the 79th byte and a line feed character (ASCII 10) in the 80th byte. This allows the files to be read by the MacOS, DOS, Unix, and VMS operating systems. All tabular files are also 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 CONTENTS.TAB is accompanied by the detached label file CONTENTS.LBL in the same directory. The detached labels for MIDRs and GxDRs also contain PDS-defined map projection keywords that provide information needed to extract latitude and longitude values from given line and sample locations.

Tabular files are formatted so that they may be read directly 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 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 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 normal text file on other computers.

PDS labels are object-oriented. 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 caret character (^, also called a pointer in this context) indicates that the object starts at the given location. 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. For example:

```
^IMAGE = ("C102.IMG",3)
```

indicates that the IMAGE object begins at record 3 of the file C102.IMG, in the same directory as the detached label file. Below is a list of the possible formats that use the ^object keyword.

```
^object = n  
^object = n<BYTES>  
^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 upper-case file name  
ext is the 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)

#### 4. CD-ROM Contents

The files on this CD-ROM are organized in one top-level directory with several subdirectories. The following table shows the structure and content of these directories. In the table, directory names are enclosed in square brackets ([ ]), upper-case letters indicate an actual directory or file name, and lower-case letters indicate the general form of a set of directory or file names.

FILE	CONTENTS
------	----------

Top-level directory

- |  |  |
|--|--|
|  |  |
|  | - AAREADME.TXT    The file you are reading.  |
|  |  |
|  | - MCUMDIR.TAB    A table listing all MIDR and GxDR products published so far, including the MIDRs on this CD-ROM.  |
|  |  |
|  | - MCUMDIR.LBL    A PDS detached label that describes MCUMDIR.TAB.  |
|  |  |
|  | - MCUMCOMM.TXT    A cumulative listing of comments concerning all MIDR CD-ROMs published so far.   |
|  |  |
|  | - GEO.TAB        A table of IAU-approved Venus geologic features.  |
|  |  |
|  | - GEO.LBL        A PDS detached label that describes GEO.TAB.  |
|  |  |
|  | - CONTENTS.TAB    A tabular listing of each MIDR frame on this disk, the directory in which it is located, and its extent in latitude and longitude. Also includes whether MIDR has had seam removal procedures applied. |
|  |  |
|  | - CONTENTS.LBL    A PDS detached label that describes CONTENTS.TAB.  |
|  |  |
|  | - VOLDESC.SFD    A description of the contents of this CD-ROM volume in a format readable by both humans and computers.  |
|  |  |
|  | - [LABEL]        A directory containing catalog information describing the major Magellan data products that will be submitted to PDS. This  |
|  |  |

information can be used to gain a top-level understanding of the Magellan Mission, radar experiment, processing, and data products.

- CATALOG.LBL PDS high-level experiment-description catalog information.
- C1MIDRDS.LBL PDS high-level data set catalog information for C1-MIDR.
- C2MIDRDS.LBL PDS high-level data set catalog information for C2-MIDR.
- C3MIDRDS.LBL PDS high-level data set catalog information for C3-MIDR.
- FBIDRDS.LBL PDS high-level data set catalog information for F-BIDR. The F-BIDR is the basic image data product. This file provides the information on how to extract radar backscatter cross section from MIDRs, given the incidence angle information from GEOM.TAB as the image data.
- FMIDRDS.LBL PDS high-level data set catalog information for F-MIDR.
- PMIDRDS.LBL PDS high-level data set catalog information for P-MIDR.
- DSMAPC1.LBL PDS high-level data set catalog information describing C1-MIDR cartographic projections and references. This and following map projection files allow computation of latitude and longitude from image line and sample, using either the VICAR2 or PDS label information.
- DSMAPC2.LBL PDS high-level data set catalog information describing C2-MIDR cartographic projections and references.
- DSMAPC3.LBL PDS high-level data set catalog information describing C3-MIDR cartographic projections and references.
- DSMAPP.LBL PDS high-level data set catalog information describing P-MIDR cartographic projections and

- references.
- DSMAPF.LBL PDS high-level data set catalog information describing F-MIDR cartographic projections and references.
- [x(y)nnzmmm] Directories containing framelets that make up a single 7168 line by 8192 sample mosaic, where x is either C (compressed mosaic) or F (full mosaic), y is either 1, 2 or 3, (C1-MIDR, C2-MIDR, or C3-MIDR, i.e. once, twice, or thrice compressed using 3x3 moving averages), nn is the middle latitude of the mosaic, z is N or S (north or south latitude), and mmm is the middle longitude of the mosaic. Both middle latitude and longitude have been rounded off to the nearest integer number.
- BROWSE.IMG The browse version of the MIDR, 896 lines by 1024 samples, created by averaging groups of 8x8 pixels in the original MIDR.
- BROWSE.LBL A PDS detached label that describes BROWSE.IMG.
- FRAME.TAB A table describing the range of latitude and longitude within each image framelet.
- FRAME.LBL A PDS detached label that describes FRAME.TAB.
- GEOM.TAB Selected entries from the Magellan Experimenter's Notebook. The Notebook is generated from the Magellan Radar Mapping Sequencing Software and is based on predicted information. Information is included in GEOM.TAB on orbit numbers for which data were acquired and used in a given file, together with information on radar viewing geometry and image quality.
- GEOM.LBL A PDS detached label that describes GEOM.TAB.
- HIST.TAB A binary histogram of pixel values in each 8192x7168 MIDR.
- HIST.LBL A PDS detached label that describes HIST.TAB.

- | - xynn.LBL    PDS detached labels describing the framelet files, where x is C (compressed mosaic) or F (full mosaic), y is 1, 2, 3 or F (C1-MIDR, C2-MIDR, C3-MIDR, or F-MIDR), and nn is the framelet number (01 through 56).
- |
- | - xynn.IMG    A 1024x1024 image framelet, where x, y, and nn are the same as given above.

## 5. Recommended CD-ROM Drives and Driver Software

### VAX/VMS

Drive: Digital Equipment Corporation (DEC) RRD40 or RRD50.  
Driver: DEC VFS CD-ROM driver V4.7 or V5.2 and up.

Note: The driver software may be obtained from Jason Hyon at JPL. It is necessary to use this driver to access the XARs on the CD-ROM.

### VAX/Unix

Drive: DEC RRD40 or RRD50.  
Driver: Supplied with Unix 3.1.

Note: Use the "cdio" software package (in "~ftp/src/cdio.shar" from the "space.mit.edu" server). Contact Dr. Peter Ford for details (see below).

### IBM PC

Drive: Toshiba, Hitachi, Sony, or compatible.  
Driver: Microsoft MSCDEX version 2.2.

Note: The newest version of MSCDEX (released in February 1990) is generally available. Contact Jason Hyon for assistance in locating a copy.

### Apple Macintosh

Drive: Apple CD SC (Sony) or Toshiba.  
Driver: Apple CD-ROM driver.

Note: The Toshiba drive requires a separate driver, which may be obtained from Toshiba.

### Sun Micro

Drive: Delta Microsystems SS-660 (Sony).  
Driver: Delta Microsystems driver or SUN CD-ROM Driver.

Note: For questions concerning this driver, contact Denis Down  
at Delta Microsystems, 415-449-6881.

## 6. Who to Contact for Information

For questions about how to read the CD-ROM:

Jason J. Hyon  
MS 168-514  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109  
818-354-7050

Electronic mail addresses:  
SPAN: MIPL3::JJH345  
Internet: [jjh345@mipl3.jpl.nasa.gov](mailto:jjh345@mipl3.jpl.nasa.gov)  
NASAmail: JHYON

For questions concerning the IDPT products:

Jerry Clark  
Jet Propulsion Laboratory  
4800 Oak Grove Drive  
Pasadena, CA 91109  
818-354-3969

For questions concerning the MIT products:

Dr. Peter Ford  
Center for Space Research  
Building 37-601  
Massachusetts Institute of Technology  
Cambridge, MA 02139  
617-253-6485

Electronic mail addresses:  
SPAN: JPLPDS::PFORD  
Internet: [pgf@space.mit.edu](mailto:pgf@space.mit.edu)

For general questions about data products and documentation:

Professor Raymond E. Arvidson  
PDS Geosciences Node  
Washington University  
Campus Box 1169



St. Louis, MO 63130  
314-889-5609

Electronic mail addresses:  
SPAN: WURD::ARVIDSON  
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## 7. Cognizant Persons

Mike Martin (JPL), Gail Woodward (JPL), Peter Ford (MIT), Robert Mehlman (UCLA), and Jason Hyon (JPL) designed the PDS labels and the tables. Edward Guinness (Washington University), Kay Edwards (USGS), Eric Eliason (USGS) and Raymond Arvidson (Washington University) helped to develop the map projection keywords and tables. Florence Moss (JPL) and Jason Hyon developed the software to generate the PDS labels and tables. Raymond Arvidson and Gail Woodward created the catalog information files, with help from Pam Woncik (JPL), Edward Guinness (Washington University), Susan Slavney (Washington University), and Mary Dale-Bannister (Washington University). The Magellan Project supplied the relevant data and information used to populate the files on this CD-ROM. Judy Mankin and Bob Canada at DADC designed the cover of this CD-ROM.

This disk was produced by Jason Hyon.